PAUL SCHERRER INSTITUT

PSI Scientific Highlights 2011

Cover photo:

PSI scientists Peter-Raymond Kettle and Stefan Ritt in front of the beamline guiding the muons to the MEG experiment, which looks for the rare decay of a positive muon into a positron and a photon. (See page 36 for details)

PSI Scientific Highlights 2011

PSI Scientific Highlights 2011

Published by
Paul Scherrer Institute

Editor
Paul Piwnicki

English language editing
Trevor Dury

Coordination
Evelyne Gisler

Design and Layout
Monika Blétry

Photographs
PSI, unless stated otherwise

Printing
Binkert Druck AG, Laufenburg

Available from
Paul Scherrer Institute
Communications Services
5232 Villigen PSI, Switzerland
Phone +41 56 310 21 11
www.psi.ch

PSI public relations
info@psi.ch

Communications officer
Dagmar Baroke

ISSN 2235-381X

Paul Scherrer Institute, April 2012

Table of contents


SINQ

New materials determine progress

Dear Reader,

Prehistory is divided into the Stone, Bronze and Iron Ages. With each new material, the human race took an important step forward in its development. Today, we are concerned with designing and analysing advanced materials with new functionalities, for application in fields as diverse as communications and energy technology, transportation, construction and medicine. Using the most advanced super-microscopes conceived and realized at the Paul Scherrer Institute, researchers are studying the static and dynamic structures of such materials in the finest detail, in order to thereby establish the foundation of tomorrow's technologies. Of particular topical interest are research projects on materials for application in the field of energy, for example for improving batteries for future electrically powered vehicles. The goal here is to increase the range of the vehicles and the lifetime of the batteries, and materials for such batteries are being developed and tested at PSI, together with industrial partners. The realization of commercial products, however, will be left to industry. Another example is in the field of catalysers. Environmentally harmful compounds, such as nitrogen oxide and sulphur dioxide produced in an engine, are transformed into non-toxic gases through catalytic conversion. Catalytic converters are, unfortunately, expensive, since they contain precious metals, such as platinum. Research at PSI aims at discovering cheaper and more efficient alternatives. Needless to say, our local industry will directly benefit from such developments.

The examples mentioned above from materials research serve to improve existing products. The technologies are near to marketable products, even if it will take a few more years before a customer benefits from the research. In other research projects, scientists are further away from a concrete product and are investigating the fundamental properties of new materials. For example, high-temperature superconductivity has been known since 1986, but the mechanism causing it is still debated. Thus, an important prerequisite is missing, with which even more efficient superconductors could be sought after. The time span between fundamental discoveries and commercial products can be rather long. For instance, physicists discovered electron spin at the beginning of the 20th century. Today, almost a century later, this property is being used in the read/write heads of hard discs. Scientists are now toying with the idea of also using electron spin for data processing in computers. Chips based on spintronics would be faster and energy saving. Last but not least, research is underway to find new magnetic materials and new magnetic nanostructures for hard discs, on which data can be more densely stored and more rapidly retrieved. In a different context, nanostructures are now being produced to develop new imaging techniques for less invasive and more accurate medical diagnosis. The few examples given above illustrate that our scientists at PSI are carrying out research on a vast variety of materials, in order to generate knowledge today from which our society can broadly benefit tomorrow.

Professor Dr. Joël Mesot
Director, Paul Scherrer Institute


113
winzeler

An important political milestone for the realization of the SwissFEL facility was reached on 23 August 2011, when the Parliament of the Canton of Aargau voted in favour of the SwissFEL building site. The legally valid building permit is expected by the end of July 2012.

On 9 December 2011, PSI and Max Daetwyler AG signed a contract of cooperation on the construction and development of undulator components for the SwissFEL. This is a great technical challenge, as extreme mechanical precision is required over long distances, in the presence of extremely strong mechanical forces. Thanks to Swiss governmental measures to mitigate the strong Swiss Franc, preliminary construction of these components has been possible, which has enabled the SwissFEL project to be speeded up.

Two partnerships where signed in November 2011: The first is a Swiss-Swedish Partnership, between PSI, EPFL and three Swedish research institutions, which covers technology development for the next generation of free-electron lasers and collaboration in photon and neutron science. The second, a Memorandum of Understanding between PSI-SwissFEL and the British Science and Technology Facilities Council, will establish a collaborative research effort to enable the exploitation and expansion of the scientific capabilities of the SwissFEL project at PSI.

The collection of user input for the design of the initial set of instruments at the SwissFEL hard X-ray ARAMIS beamline was started in 2011 with two Workshops on Hard X-Ray Instrumentation with the SwissFEL. The first concentrated on spectroscopic experiments, the second on scattering and diffraction experiments. The next step in the instrument design process will be four focused Workshops, to be held at PSI.

On the European level, two new projects have started under the 7th EU Framework Programme with the involvement of PSI-SwissFEL: CRISP and PaNData ODI (http://www.psi.ch/swissfel/).

◀ **At PSI's Open Day in September, shooting at an apple was used to explain how fast processes will be observed by the SwissFEL free-electron laser.**

SwissFEL machine project

Hans Braun, Romain Ganter, Christoph Hauri and Marco Pedrozzi,
SwissFEL Project, PSI

Major progress was made in SwissFEL R&D during 2011. A first, prototype C-Band accelerating cavity for the SwissFEL main linear accelerator was machined with micron precision in the PSI workshops. High-power testing of this cavity achieved a field strength well above that nominally required. For this test, a new high-power RF test bench was set up at PSI, featuring the first high-power C-band transmitter in operation outside Japan. In the SwissFEL Injector Test Facility, the bunch compressor was installed and commissioned, as was the RF deflecting cavity for bunch-length and slice emittance measurements. The technically very challenging design of the support frame for the undulator of the ARAMIS beamline was completed and production of a prototype was started by industry. A new technique for the conversion of laser light into Terahertz radiation has provided record radiation field strength for future SwissFEL pump-probe experiments.

Breakthrough for SwissFEL main Linac C-band accelerating systems

One focus of SwissFEL R&D activities at PSI is on radio frequency (RF) systems for the main linear accelerator. On top of stringent technical requirements, overall system cost and electrical power consumption of these systems is critical. A large fraction of the overall SwissFEL cost, and more than half of SwissFEL's power consumption, is related to these RF systems, which use C-band technology operating at 5.72 GHz. This technology was pioneered by our colleagues at the KEK and SPring-8 laboratories in Japan. For SwissFEL, this technology is being further refined and adapted to satisfy SwissFEL's specific needs. The technical concept and parameters for these systems were defined in the previous year and reported on in the PSI Scientific Report 2010.

During 2011, C-band hardware development moved into full swing, in a common effort by the RF Group in PSI's Large Research Facilities Department (GFA) and the workshops operated by the Mechanical Engineering Sciences Division (AMI) within PSI's Logistics Department (LOG). A first accelerating cavity was machined and vacuum brazed in the AMI workshops (Figure 1). Low-level RF measurements of this cavity confirmed the achievement of an impressive mechanical precision of the order of micrometres. The prototype cavity is shorter than the nominal 2m structures, because of the length limit imposed by the present PSI vacuum-brazing furnace.

A new furnace for nominal-length cavities has been ordered and will be delivered to PSI in summer 2012.

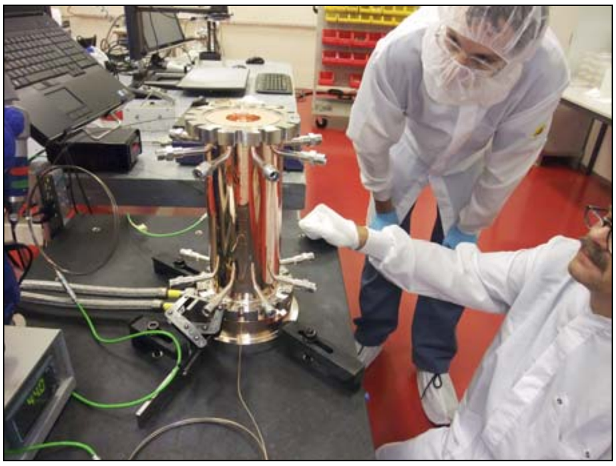


Figure 1: **Careful inspection of the first C-band structure after brazing.**

A new high-power RF test-stand was set up in PSI's OBLA building for testing C-band prototypes at nominal field strength level, and beyond. This is the first high-power C-band source in operation outside Japan. The prototype cavity has been power processed without problems, to an accelerating field of 35MV/m for an input power of 45MW. This is well above the maximum accelerating field of 30MV/m required for SwissFEL. This shows that the cavity surface quality and production cleanliness are appropriate for SwissFEL purposes.

Parallel to hardware development, a study along with industry was launched and completed, establishing the production concept for the series of 104 C-band cavities required for SwissFEL.

Figure 2: **Bunch compressor section installed in the tunnel of the SwissFEL Injector Test Facility.**

SwissFEL injector – bunch compressor and deflecting cavity

During the summer of 2011, the 12-metre-long bunch compressor was installed in the SwissFEL Injector Test Facility (Figure 2). The bunch compressor is based on a 4-dipole magnetic chicane in which the electron bunches are longitudinally compressed, typically by a factor 10. The compression must be applied in a controlled way, to avoid deterioration of beam quality. To explore different compression regimes and select the best operational settings for SwissFEL, a sophisticated mechanical design allows the bending angle of the chicane to be modified between 0 and 5°, with a positional reproducibility of 1 µm. Along the dispersive arms of the chicane, two BPS stations allow direct measurement of the electron beam energy, and a screen placed between the central dipoles is used to visualize the beam. The basic mechanical and magnetic functionality of the compressor were successfully tested with the beam on. The diagnostic components associated with this assembly, and providing non-destructive monitoring of the longitudinal parameters of the beam, will be implemented in successive shut-downs in February 2012. A second, important diagnostic tool commissioned in 2011 [1] is the RF deflecting cavity. This allows direct visualization of the longitudinal profile of the electron bunch, projected onto a screen monitor intercepting the transver-

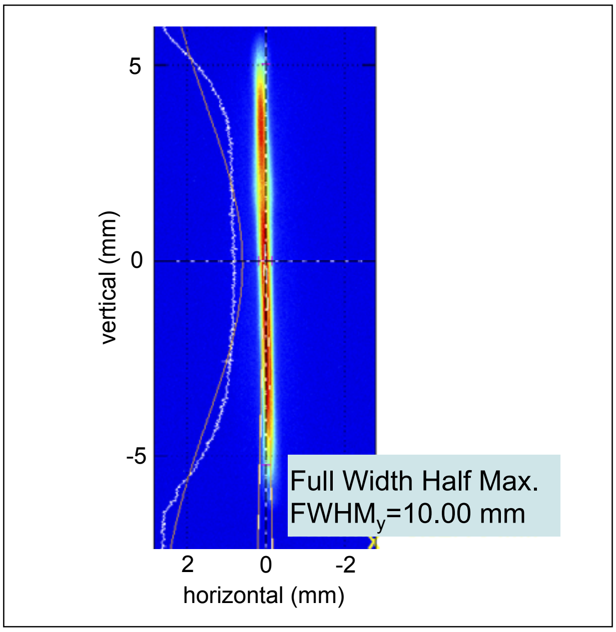


Figure 3: **Intensity projection of the longitudinal profile of the 10 ps bunch. The vertical scale corresponds to time (0.985 ps/mm).**

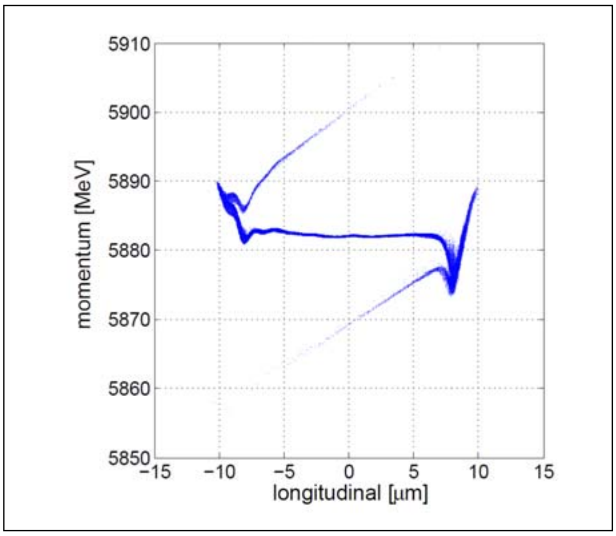


Figure 4: **Electron-bunch longitudinal phase space (200 pC; 3 kA) when entering the undulator line Aramis (courtesy of B. Beutner).**

sally deflected bunch (Figure 3). This tool is essential for controlled adjustment of bunch compressor parameters and for analyzing the slice properties of the electron beam.

Status of the undulators and transfer line

After 400 m of acceleration and careful compression, the electron bunch (Figure 4) enters the undulator line, where the FEL process effectively takes place. The electron bunch follows a sinusoidal trajectory in the undulator segments and radiates light as it propagates through the undulator. The co-propagating radiation field in turn induces micro-bunching by slowing down some electrons and accelerating others. This leads to the enhancement of the radiation field (FEL process), because the micro-bunches emit coherently.

In order to have an effective FEL process, the electron bunch must preserve the transverse overlap with the radiation field and remain in phase with this field. This means that the electron trajectory should oscillate around a straight line of about 10 % of the beam size (i.e. 1 µm) over the entire 60 m of undulator line. In addition, the magnetic field amplitude along the 265 magnet periods in each of the 12 undulator segments must be shimmed within 10^{-4} of the peak field, which corresponds to a mechanical adjustment of the pole gap on a sub-micron level. Finally, to allow control of the radiated wavelength, and also to compensate for electron energy losses during the FEL process, the overall gap of a module must be controlled with a precision of less than one micrometre.

All these technological challenges will be achieved with the new SwissFEL undulator design (Figure 5). The mechanical support which provides this precision will be produced by the

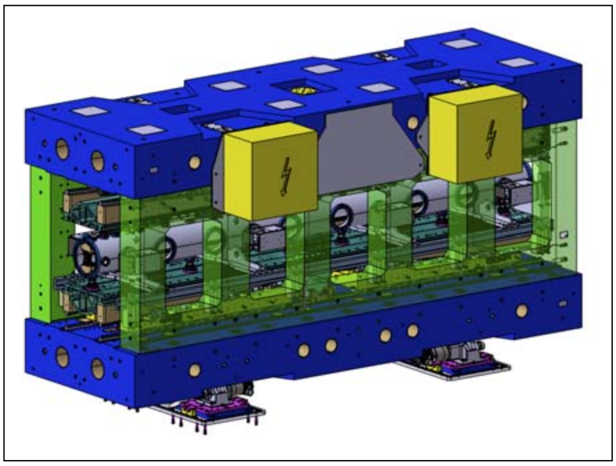


Figure 5: **U15 undulator (courtesy of P. Boehler).**

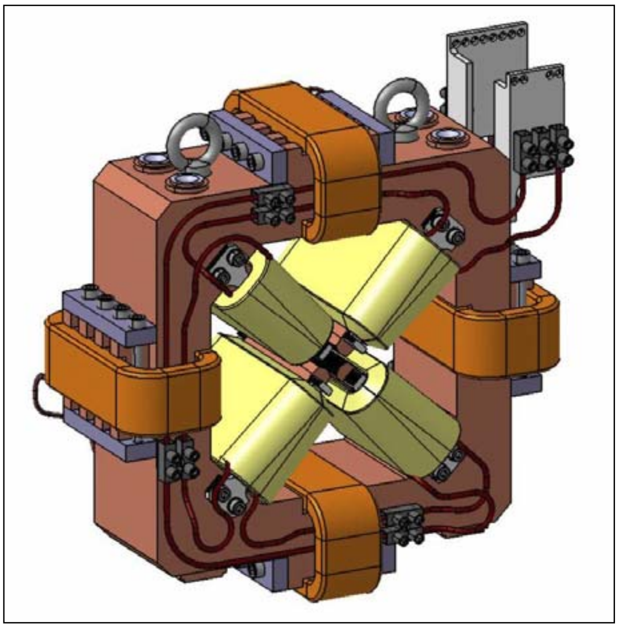


Figure 6: **Quadrupole magnets of the undulator line (courtesy of S. Sidorov).**

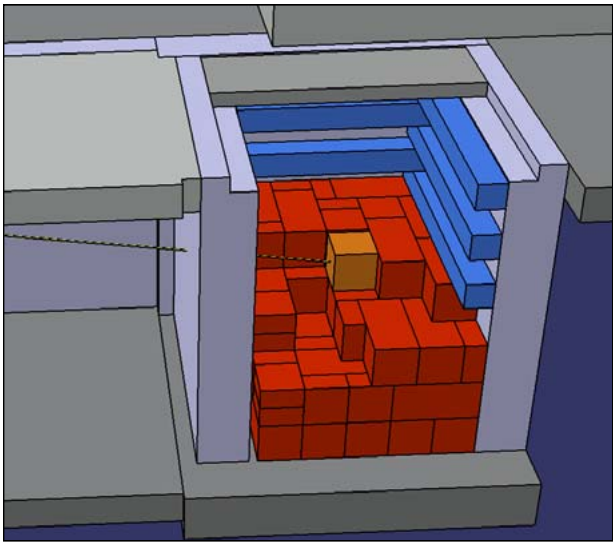


Figure 7: **SwissFEL beam dump (7 GeV; 560 W) (courtesy of R. Fulginiti).**

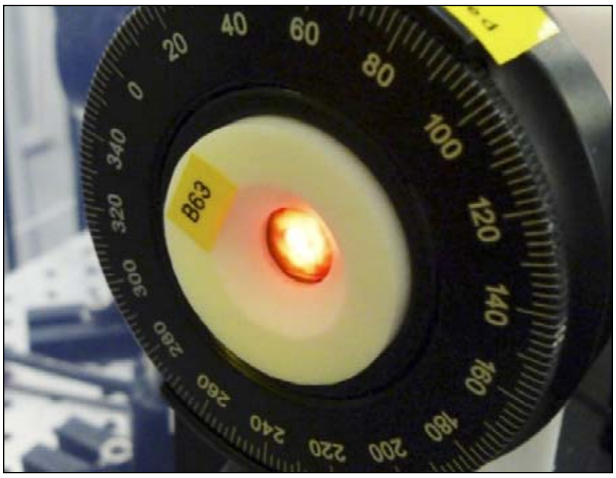


Figure 8: **Terahertz generation with organic non-linear crystals.**

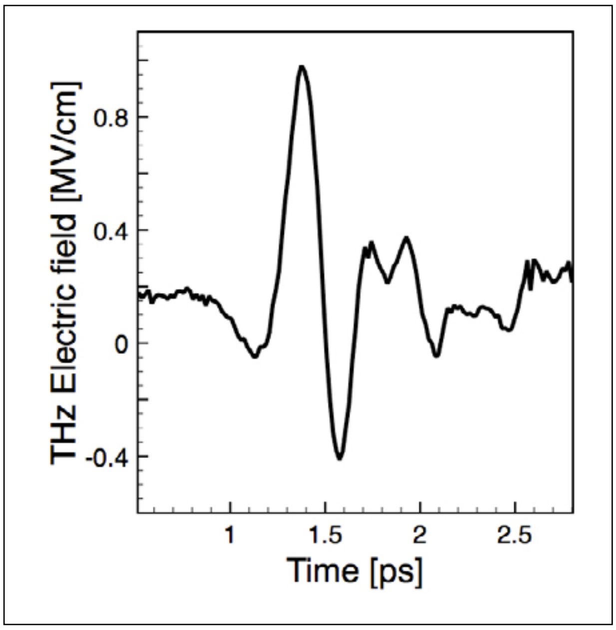


Figure 9: **Example of a single-cycle THz pulse.**

company MDC Max Daetwyler AG (Bleienbach). In parallel to the undulator segments, the design of beamline components has been launched or completed. For example, the first prototypes of the focusing quadrupole magnets are expected in 2012 (Figure 6).

The beam dump shielding, which will absorb all the 5.8 GeV electrons generated by SwissFEL, has also been simulated and designed (Figure 7).

SwissFEL Terahertz Source

Substantial progress was achieved in the development of a powerful Terahertz (THz) laser. A novel generation scheme has successfully been pioneered at PSI, which is based on organic nonlinear crystals [2, 3] (Figure 8). When used in combination with a strong near-infrared laser, these organic crystals transfer energy from the fundamental laser into the THz frequency regime, and intense electro-magnetic single-cycle pulses in the Terahertz frequency regime have been demonstrated (Figure 9). These low-frequency fields have a field strength exceeding 1 MV/cm, which is one of the highest values reached by laser-based THz sources. The availability of such strong Terahertz radiation opens up new opportunities, both for scientific applications as well as for the advanced photon diagnostic tools required for SwissFEL. With the help of these THz pulses, the femtosecond X-ray FEL pulses will be characterized shot-by-shot and will provide information about the X-ray temporal pulse shape and pulse arrival time to the users. These two variables are most relevant for experiments in which ultrafast dynamics are being explored.

References:

[1] M. Pedrozzi et al, Proceedings of FEL2011, Shanghai, China, (2011).

[2] C.P. Hauri et al., App. Phys. Lett. **99** 161116 (2011).

[3] C. Ruchert et al., Opt. Lett. **37** 5 (2011).

Science with SwissFEL

Bruce Patterson, Bill Pedrini, Rafael Abela, Luc Patthey and Mirjam van Daalen, *SwissFEL Project, PSI*

Planning of the initial set of experimental stations at the SwissFEL is underway, in close collaboration with the growing user communities. A particularly elegant technique for the structural determination of macromolecules in solution is Cross-Correlation Scattering, and a theoretical framework for this method is being developed and experimentally verified, using artificial nanostructures and synchrotron radiation.

Phase-I Science Facilities at SwissFEL

The first coherent photons from SwissFEL, in the hard X-ray range (2–12 keV), will arrive in the Spring of 2017. At this time, commissioning and pilot experiments will begin at "Phase-I" experimental stations, operated sequentially. These stations are now being defined, based on the SwissFEL Science Case [1] and on discussions with the future users. Regarding the latter, two Workshops on "Hard X-ray Instrumentation at the SwissFEL" were organized at the University of Bern on 12 September and 21 November 2011 and were attended by a total of 120 participants; the result is a booklet [2] containing 35 poster presentations. A series of follow-up, station-specific Workshops [3] has also been scheduled for the first half of 2012. The present state of planning for three Phase-I, hard X-ray, experimental stations – ES-A, ES-B and ES-C – is presented in the following. The placement of these stations in the three hard X-ray experimental SwissFEL hutches is under discussion.

ES-A: General-Purpose Pump-Probe

Station ES-A is foreseen to cover the general themes: liquid-jet serial nanocrystallography, time-resolved chemical spectroscopy and time-resolved scattering on molecules in solution. The design of this station is similar to the "CAMP" chamber [4] at the LCLS in Stanford.

In liquid-jet serial nanocrystallography (see Figure 1), submicrometre crystals, generally proteins, are carried into the evacuated measurement chamber by a micrometre-sized jet of liquid, travelling at a typical velocity of 15 m/s [5]. With a concentration of 10^{10} crystals/ml, an unsynchronized, focused XFEL pulse will hit a crystal with a probability of several percent. This hit rate could be increased by synchronizing the jet and the XFEL, and the SwissFEL team is investigating the possibility of detecting individual incoming crystals and adjusting the timing of the subsequent SwissFEL pulse by ±5 μs to guarantee a hit.

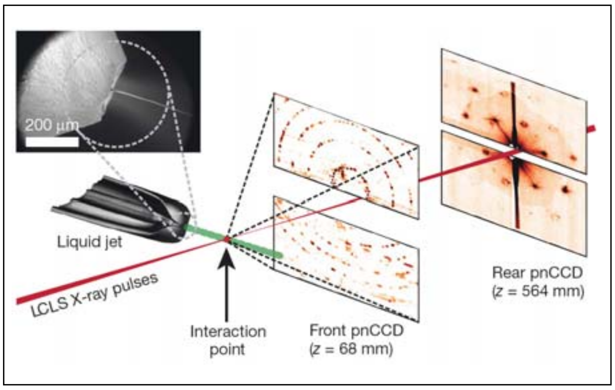


Figure 1: **The liquid-jet serial nanocrystallography setup which is in use at the LCLS XFEL in Stanford [5].**

Photoionization by an XFEL pulse, which carries 0.5 mJ of energy, will destroy the nanocrystal via "Coulomb explosion" [6], but, for XFEL pulses shorter than 50 fs, the inertia of the exploding crystal allows unperturbed scattering data to be collected ("diffract-and-destroy") [7].

An additional possibility is to photo-excite the incoming nanocrystal, e.g. with a sub-ps 800 nm laser pump pulse, and, by varying the pump-probe delay, to build up a dynamic time-sequence of molecular structures.

Time-resolved spectroscopic chemical studies [8] will also be made possible at ES-A. By the inclusion of a downstream spectrometer [9] it will, for example, be possible to perform single-shot X-ray near-edge spectroscopy (XANES) experiments as a function of the pump-probe delay. The SwissFEL machine design will include a special "broadband" mode of operation, with an FWHM bandwidth of up to 4%.

Finally, the same 2D detectors used for nanocrystallography will allow cross-correlation scattering from molecules in solution (see next Section) to be performed, also in a pump-probe scheme. The short XFEL pulses will effectively freeze the molecular motion during each exposure.

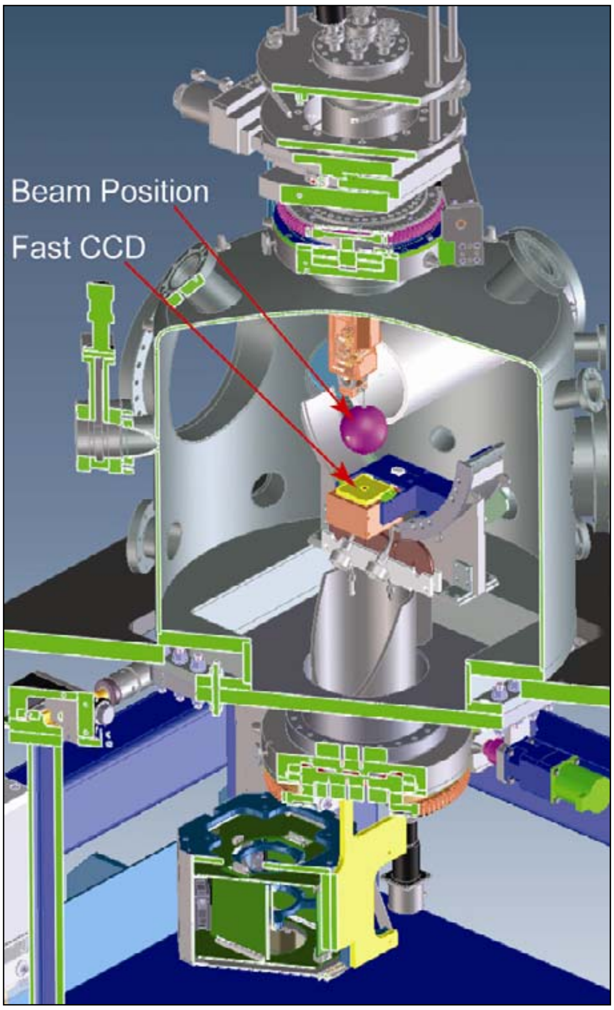


Figure 2: **The Berkeley pump-probe crystallography chamber which is in use at the LCLS [10].**

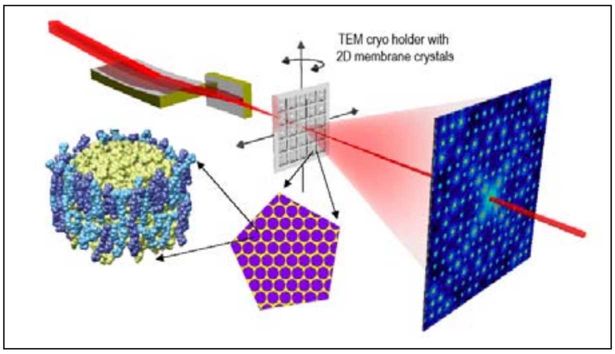


Figure 3: **Conceptual design of a coherent diffraction study of 2D-membrane protein crystals, mounted on a cryo-cooled TEM sample holder [13].**

ES-B: Pump-Probe Crystallography

For performing pump-probe crystallographic studies of large, inorganic samples, station ES-B will be equipped with tilt stages to vary the crystal and 2D-detector orientations. Cooling of the sample with liquid helium will be provided. In order to avoid excessive sample damage, either a strongly attenuated XFEL beam must be used, or the beam must be moved between shots to a fresh spot on the sample. A possible design for ES-B is that of the Berkeley chamber [10] at the LCLS (see Figure 2).

ES-C: Cryogenic Coherent Diffraction

Station ES-C will make use of the high transverse coherence of the SwissFEL pulses to determine the molecular structure of fixed 3D and 2D biocrystals and to image biological tissues at high resolution. This approach, similar to that used in transmission electron microscopy, will be to attach the small samples, perhaps in a regular array, to thin, low-scattering substrates. Cooling to liquid nitrogen temperature will stabilize the sample in vacuum and reduce the effects of accumulated radiation damage.

Crystallography at ES-C will make much more efficient use of scarce bio-material than the liquid-jet approach. It will also be possible at this station to investigate 2D membrane protein crystals (see Figure 3), perhaps taking optimal advantage of the XFEL coherence by using the "ptychography" method [11]. Single-shot "lensless-imaging" exposures [12] of non-crystalline bio-samples should yield a sub-10-nm, resolution, which is competitive with transmission electron microscopy (TEM).

X-ray Cross-Correlation-based 2D structure determination

The cross-correlation method proposed by Kam in 1977 [14] allows 3D structural information of a particle to be assessed by accumulating data extracted from a large set of (noisy) scattering images on single- or multi-particle random configurations. The procedure has been the subject of renewed interest with the advent of X-ray Free-Electron Lasers, which may provide the required photon flux. We performed an analogous 2D pilot experiment, simplified to be feasible at a synchrotron source.

In Coherent X-ray Diffraction Imaging (CDI), the 2D electron density of an object can be reconstructed from its scattering image with a phasing algorithm, provided that the image in reciprocal space is sufficiently oversampled and that a sufficient signal-to-noise ratio is achieved. The cross-correlation method can be applied if such conditions cannot be met, which typically happens when only low-signal random multi-particle scattering images can be acquired. The key point is the accumulation of data from different images to evaluate the cross-correlations. In 2D, the scattering pattern of a single particle is then unambiguously determined. Here, we report on the practical application of the procedure, which culminated in the reconstruction of the 2D electron density of a 350 nm gold nanoparticle exhibiting 4-fold symmetry (see [15] for a similar study).

Methods

The sample for the experiment, prepared at PSI-LMN, consisted of a Si_3N_4 membrane covered by nominally identical 2D gold nanostructures in random position and orientation, as shown in Figure 4. The X-ray data were acquired at the SLS cSAXS beamline. The membrane was scanned, so that a large number of different nanoparticle random configurations were illuminated by the X-ray beam and the corresponding scattering images acquired, thus simulating snapshots of a "2D liquid".

Let $I_\alpha(q,\varphi)$ be the scattering intensity in the α-th image, expressed in polar coordinates (q,φ) around the image centre, and let $I_{\alpha,k}(q)$ be the φ-Fourier components. The first-order cross-correlation, which is equivalent to the particle's powder pattern, was then calculated as

$$C(1)(q) = \langle I_{\alpha,0}(q) \rangle_\alpha ,$$

where $\langle\ldots\rangle_\alpha$ denotes the average over all the images. The second-order cross-correlation was computed following the formula [14]

$$C_k^{(2)}(q_1,q_2) = \langle I_{\alpha,k}(q_1)\, I_{\alpha,k}(q_2)^* \rangle_\alpha$$

for $k \neq 0$. A similar definition holds for the third-order cross-correlation.

The single-particle scattering pattern $S(q,\varphi)$ in 2D reciprocal space, was fixed through its φ-Fourier components $s_k(q)$, derived from the cross-correlator identities

$$C^{(1)}(q) = N\, s_0(q)$$

and

$$C_k^{(2)}(q_1,q_2) = N\, s_k(q_1)\, s_k(q_2)^*$$

(again, a similar identity holds for the third order). N is the average number of illuminated particles, which turned out to be N~20. The 2D electron density ρ was finally recovered using S as input for a phasing algorithm, implementing $|\rho|^2=S$, within a compact support constraint.

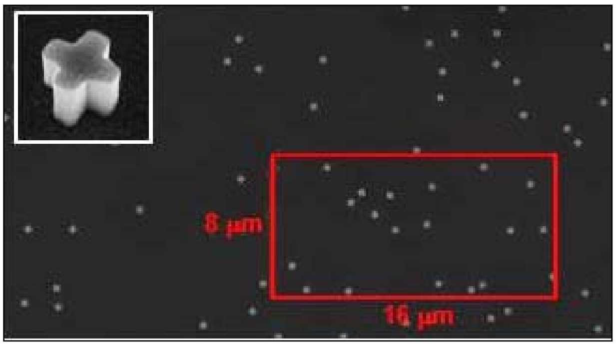


Figure 4: **Small portion of the membrane carrying the gold nanostructures. The red rectangle corresponds to the X-ray beam irradiation area. The inset shows an individual nanoparticle.**

Results

Figure 5a displays an example of a single diffraction image, which shows the weak φ-fluctuations in the intensity $I_\alpha(q,\varphi)$ that contribute to the second- and third-order cross-correlations. Figure 5b presents the calculated single-particle scattering pattern $S(q,\varphi)$, and Figure 5c presents the recovered 2D electron density. The horizontal and vertical sections indicate a resolution of approximately 20 nm.

Discussion

Our results represent first convincing proof of the principle of 2D structure determination based on the cross-correlation method, whereby the crucial features for its successful application are hidden in the technicalities of solving unambiguously the cross-correlation identities to extract the $s_k(q)$ coefficients. The upcoming challenge is to execute the experiment in 3D, which is accompanied by practical and computational complications. Extension to particles in solution will, in addition, require a sufficient number of scattered photons within the rotational correlation time of the particles, which makes it logical to choose the FEL as the X-ray radiation source.

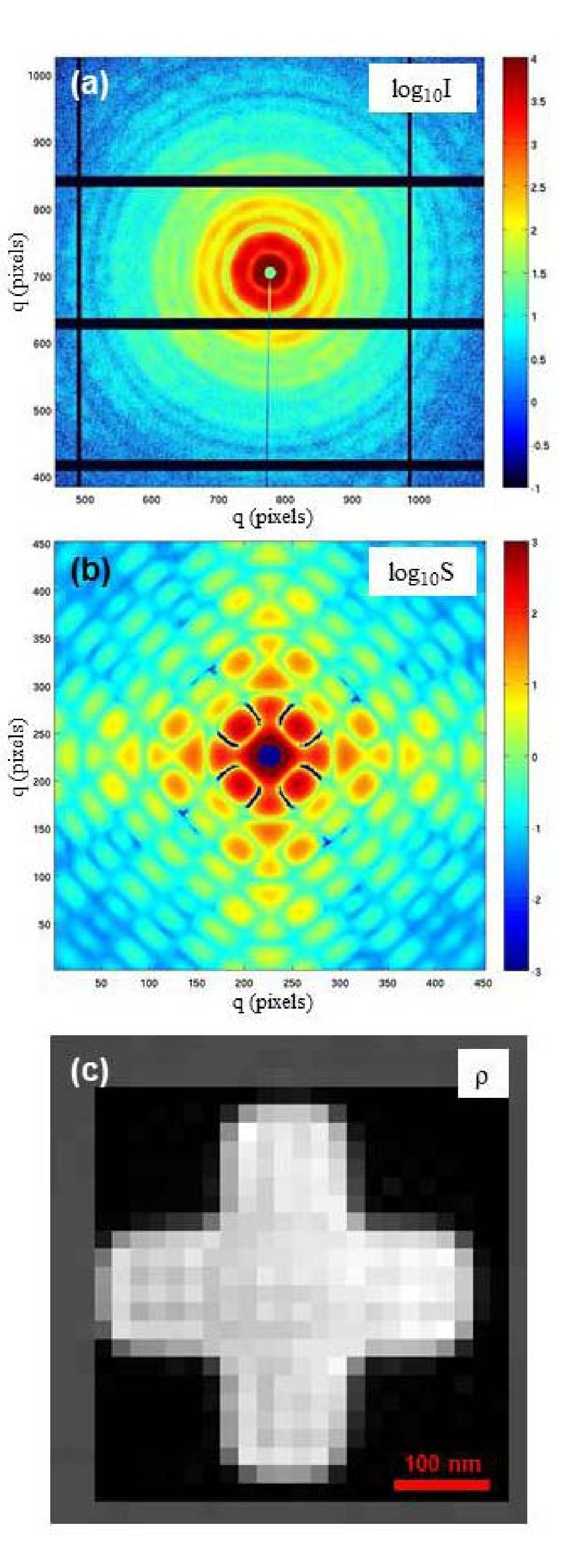


Figure 5: **(a) Example of a multi-particle scattering image. (b) Single-particle scattering pattern $S(q,\varphi)$, reconstructed using the cross-correlation method from 3751 multi-particle scattering images, acquired at different positions of the membrane. (c) 2D charge density ρ, obtained by applying a phasing algorithm to the data of (b).**

References

[1] B.D. Patterson (ed.), *Ultrafast Phenomena at the Nanoscale: the Scientific Case for the SwissFEL X-ray Laser,* PSI Report 09-10 (2009), (available at http://www.psi.ch/swissfel/swissfel).

[2] Poster booklet: Workshops on Hard X-Ray Instrumentation at the SwissFEL (available at http://www.psi.ch/swissfel/swissfel-workshops).

[3] For information on the individual experimental station Workshops, see http://www.psi.ch/swissfel/swissfel-workshops.

[4] L. Strüder et al., Nucl. Instrum. Meth. Phys. Res. A **614** 483 (2010).

[5] H.N. Chapman et al., Nature **470** 73 (2011).

[6] R. Neutze et al., Nature **406** 752 (2000).

[7] A. Barty et al., Nature Photonics, 6, 35 (2012).

[8] B.D. Patterson and R. Abela, Phys. Chem. Chem. Phys. **12** 5647 (2010).

[9] D. Siddons and Z. Zhong, AIP Conf. Proc. **705** 941 (2004).

[10] D. Doering et al., Rev. Sci. Instrum. **82** 073303 (2011).

[11] C.M. Kewish et al., New J. Phys. **12** 035005 (2010).

[12] F. van der Veen and F. Pfeiffer, J. Phys. Condens. Matter **16** 5003 (2004).

[13] F. Pfeiffer and O. Bunk, private communication (2009).

[14] Z. Kam, Macromolecules **10** 927 (1977).

[15] D.K. Saldin et al., Phys. Rev. Lett. **106** 115501 (2011).

Research focus and highlights

◀ **Ahmad Moradi, a PSI user from the University of California in Davis, in front of the Climate Chamber in the experimental hall at SINQ. Plants are raised here under natural conditions before being investigated with neutron tomography (see page 30 for details).**

The following articles briefly describe a large variety of topics investigated at PSI in 2011, including the results of fundamental research and the development or improvement of cutting-edge technology. Most results were obtained at one or more large-scale facilities – at PSI or elsewhere. In biology and medicine, for example, neutrons were used to examine how plants store water around their roots as well as how vesicles containing drugs can be made to release their charge at a well-defined location, while synchrotron light was used to determine in detail the chemical processes taking place when light enters the eye. In materials science, experiments with muons showed that some materials completely change their magnetic properties according to how many crystal layers they are composed of, and synchrotron light helped to improve our understanding of the processes leading to the deactivation of a nickel catalyst in fuel cells. The results of experiments at PSI and at CERN are putting significant constraints on new models and theories of particle physics. Experiments at CERN with PSI as a partner improved our understanding of processes leading to the creation of aerosols in the atmosphere, which is partly triggered by cosmic rays. At the solar tower of the Plataforma Solar de Almería in Spain, PSI scientists successfully demonstrated a process using solar energy to convert organic waste into high-quality synthetic gas – a precursor for fuel production. In the field of nuclear power, experiments on hydrogen stratification at PSI's thermal hydraulics facility PANDA made a significant contribution for validating the computational tools used for assessing nuclear power plant safety. Finally, an example from technological development is the creation of Fresnel lenses that can focus radiation produced by an X-ray free-electron laser without being damaged. Such lenses are essential for many planned experiments at SwissFEL.

10 Years of science at the SLS

Johannes Friso van der Veen,
Synchrotron Radiation and Nanotechnology Department (SYN), PSI, and Department of Physics, ETH Zurich

The average lifespan of synchrotron facilities being twenty-five to thirty years, it might be argued that the Swiss Light Source, after its first ten years of operation, has become middle-aged. Nonetheless, the SLS still shows the character traits of a youngster, thanks to some unique properties of its storage ring and beamlines.

During the first ten years of its existence, the SLS has generated numerous breakthroughs across the natural sciences. Although the SLS has fewer beamlines (18) than most other medium-energy synchrotron sources, its science has remained highly competitive, thanks to a well-trained and motivated staff, continuous upgrades of the beamlines and the extraordinary stability and reliability of the source.

In structural biology, three beamlines have produced, over the years, numerous highlights, including Nobel Prize-winning work on ribosome complexes (V. Ramakrishnan, Nobel Prize in Chemistry 2009). Recently, a facility for combined crystallisation and X-ray diffraction screening of protein crystals has been added to the beamline X06DA (collaboration with PSI's Department Biology and Chemistry). To better serve the users,

Figure 1: **PSI scientist Gerhard Ingold at the FEMTO beamline at the SLS. Here, experiments with very short pulses are performed – partly as a preparation for investigations at the LCLS and SwissFEL X-ray lasers.** (Photo: Scanderbeg Sauer Photography)

Figure 2: **PSI scientist Jacinto Sá at the MicroXAS beamline at the SLS. Novel catalytic materials are one of the topics investigated here.**
(Photo: Scanderbeg Sauer Photography)

a remote access mode is being developed, while on-site industrial services are being provided by both staff and the spin-off company Expose. The beamline X06S is being upgraded to feature a microfocus for protein crystallography.

The SLS facilities for X-ray imaging and tomography have received a sharply increasing number of users. The TOMCAT beamline features a robotized platform for high-throughput tomography and specializes in ultrafast tomographic imaging. Various imaging modes are available, where one of them – differential phase contrast (DPC) – has been adapted to serve in the future in a contrast mode in hospital-based mammography. An article on this promising clinical application is given later on in this report – pp. 20–21.

Materials science and condensed matter physics are covered by several beamlines. The oldest one, the Materials Science beamline X04SA, has been upgraded, with an undulator source replacing the wiggler and with improved optics (this report, pp. 24–25). The new station for soft X-ray angle-resolved photoemission at the ADRESS beamline X03MA produced in 2011 some amazing 3D Fermi surfaces. This station shares beamtime with the RIXS spectrometer, which continues to produce fascinating spectra showing momentum-dependent spin and orbital excitations in correlated electron systems. High-quality dichroic spectra on magnetic systems have been reported by X-Treme at beamline X07MA, and the beamline PEARL (X03DA) has received its first light. Scientific highlights at the beamline for Interface and Surface Microscopy (X11MA) include the observation of 'magnetic monopoles' on nanopatterned 'Kagome' lattices [1].

The chemistry programme of the Laboratory for Catalysis and Sustainable Chemistry (LSK), operated jointly with the General Energy Department (ENE) at PSI, is gaining momentum with in-situ studies of catalysts and with VUV photoionisation studies of gas-phase molecules. Progress has been made on the development of a hard X-ray nanoprobe for chemical imaging (this report, pp. 26–27).

In this report, you will also find contributions on technologies enabling our photon science applications. Internationally acclaimed are our development programmes in the X-ray pixel detector area and in diffractive X-ray optics. Another technology is lithographic nanofabrication in polymers in a joint venture with the University of Applied Sciences Northwestern Switzerland in Windisch (this report, pp. 42–43). The spin-off companies Dectris (Baden) and Eulitha (Windisch) have successfully brought these technologies on the market.

The SLS also serves as a breeding ground for innovative science at our future X-ray free-electron laser, SwissFEL. Our scientific staff are regular users of the laser facility LCLS (at Stanford, California) and its high-brilliance X-ray pulses have been used for time-dependent investigations of the forces driving particular phase transitions in correlated electron systems (this report, pp. 22–23). Other activities include the development of optics for focusing (this report, pp. 40–41) and measuring the wavefronts of coherent X-ray pulses, and the design of undulators and X-ray optics for SwissFEL. R&D is also being pursued on field-emission arrays for the production of low-emittance electron beams for XFELs.

The next ten years of photon science at PSI will offer unique opportunities for multidisciplinary science at both SLS and SwissFEL. For going from one facility to the other, one only has to cross one bridge!

References

[1] E. Mengotti, L.J. Heyderman, A.F. Rodriguez, F. Nolting, R.V. Hugli and H.B. Braun, Nature Physics **7** 68–74 (2011).

Phase-contrast enhanced mammography: A new diagnostic tool for breast imaging

Zhentian Wang[a], Thomas Thüring[a], Christian David[b], Ewald Rössl[c], Mafalda Trippel[d], Rahel A. Kubik-Huch[e], Gad Singer[d], Michael K. Hohl[f], Nik Hauser[f] and Marco Stampanoni[a,g]

[a] *Laboratory for Macromolecules and Bioimaging, PSI;* [b] *Laboratory for Micro and Nanotechnology, PSI;* [c] *Philips Technologie GmbH, Hamburg, Germany;* [d] *Institute of Pathology, Kantonsspital Baden, Baden, Switzerland;* [e] *Department of Radiology, Kantonsspital Baden, Baden, Switzerland;* [f] *Department of Gynecology and Obstetrics, Interdisciplinary Breast Center Baden, Kantonsspital Baden, Baden, Switzerland;* [g] *Institute for Biomedical Engineering, University and ETH Zurich, Switzerland*

Breast cancer is the most common cancer among women and the second leading cause of cancer deaths in the world. By investigating native, non-fixed, whole-breast samples with a grating interferometer operated with a conventional X-ray source, we aim to show the clinical relevance of phase-contrast X-ray imaging, a technique that can potentially revolutionize the field of medical imaging. This novel approach can simultaneously record differential phase and small-angle scattering signals of the specimen, as well as the conventional absorption signal. First results from a few patient cases demonstrate that the complementary information obtained improves the diagnostic process for breast cancer and is able to answer clinically relevant, unresolved questions about cancer-invaded regions within healthy tissue, such as distinguishing between (pre-) malignant tissue and post-operative scars.

Breast cancer is the most common cancer in women and the second leading cause of cancer deaths. International standards for diagnostics and treatment are not stringently followed and it is estimated that 35% of all breast cancer deaths in Europe could be avoided if optimal diagnostic and therapeutic procedures were always applied. During the past few years, phase-contrast and scattering-based (dark-field) X-ray imaging have shown their potential for revolutionizing the radiological approach to breast imaging, because these techniques can detect subtle differences in the electron density of a material and measure the small-angle scattering power generated by the microscopic density fluctuations in the specimen [1–5]. However, studies on the application of such techniques using human specimens have been limited to either formalin-fixed biopsy samples [6, 7] or synchrotron-based approaches [8, 9].

In our work – and for the first time ever – we investigated native, non-fixed whole breast samples with a conventional X-ray source and a Talbot-Lau grating interferometer [10], which can simultaneously record absorption, differential phase and small-angle scattering signals. The demonstrator (see Figure 1), named mammoDPC and designed and constructed at the Paul Scherrer Institute, has been operated according to an imaging protocol as similar as possible to in-vivo situations, to explore the clinical potential of this novel technique as far as possible. In collaboration with the Kantonsspital Baden – the largest hospital in the eastern part of the Swiss canton of Aargau – native breast tissue was obtained directly after mastectomy and mounted into a

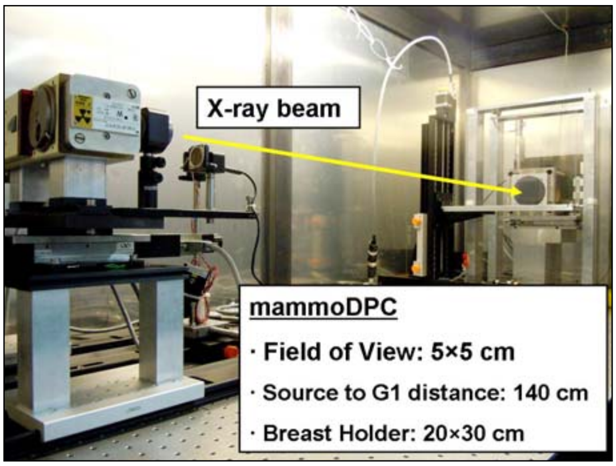


Figure 1: **The mammoDPC demonstrator located at the Paul Scherrer Institute. This system consists of a Seifert X-ray tube operated at 40 kVp and 25 mA, a Hamamatsu Flat Panel CMOS detector and a three-grating interferometer. Breast tissue up to 20×30 cm can be imaged according to a stitching protocol.**

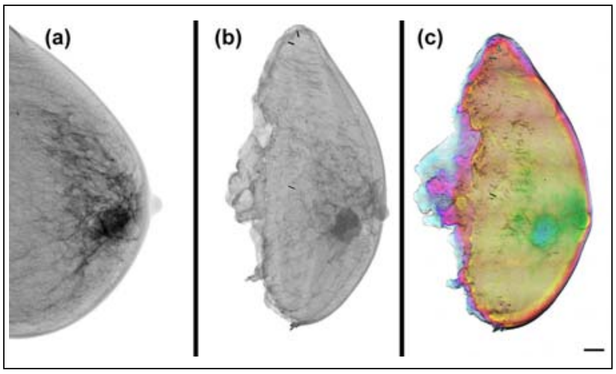


Figure 2: **In vivo mammography (a) showed low-tissue density and a suspicious node that included microcalcifications. It indicated only indirect signs that the tumour infiltrated the skin. Ex vivo mammography (b) of the mastectomy sample did not indicate any skin infiltration. Results of mammoDPC coded into a colour image (c) revealed that it was highly likely that the tumour invasion continued into the skin.**

dedicated, cooled breast-tissue holder designed to provide adequate compression of the tissue compared with the in-vivo situation. Ex-vivo mammograms and mammoDPC imaging were then performed at the hospital and at the Paul Scherrer Institute, respectively. Standard histopathological examination followed the mammoDPC acquisition. All results (MRI, ultrasound, in-vivo and ex-vivo mammograms, and mammoDPC) were then discussed in regularly-scheduled interdisciplinary meetings, including radiologists, pathologists, breast surgeons, and physicists.

In the past year, more than 30 patients were examined with the above protocol, and preliminary clinical results of the first 5 patients have been published [11].

The results indicate that phase-contrast and scattering imaging with an X-ray tube-based configuration have the potential to provide additional and useful information to complement and improve breast cancer diagnostics in the clinical application. Samples with different breast cancer lesions (such as invasive ductal and lobular breast carcinomas) or diagnostically challenging cases (for instance, tumour-invaded scars) have been successfully investigated using the mammoDPC method. Results from this clinical trial show that this novel technique is able to contribute to improved tumour visualization, to the detection of skin invasion (a detailed case is shown in Figure 2) and to better discrimination between scars, inconspicuous breast tissue and invasive tumours.

In summary, for the first time, native breast tissue has been investigated with an emerging differential phase-contrast imaging technique based on a conventional X-ray source. Preliminary results confirm that this new approach can provide improved diagnostic information and therefore presents its potential capability to revolutionize current radiological methods for breast imaging in the near future.

References

[1] R.A. Lewis, *Medical phase contrast x-ray imaging: current status and future prospects.* Phys. Med. Biol. **49** 3573–3583 (2004).

[2] E.F. Donnelly, K.G. Lewis, K.M. Wolske et al., *Characterization of the phase-contrast radiography edge-enhancement effect in a cabinet X-ray system,* Phys. Med. Biol. **51** 21–30 (2006).

[3] G. Margaritondo and R. Meuli, *Synchrotron radiation in radiology: novel X-ray sources,* Eur. Radiol. **13**:2633–2641 (2003).

[4] F. Pfeiffer, M. Bech, O. Bunk et al., *Hard-X-ray dark-field imaging using a grating interferometer.* Nat. Mater. **7** 134–137 (2008).

[5] M. Ando, E. Hashimoto, H. Hashizume et al., *Clinical step onward with X-ray dark-field imaging and perspective view of medical applications of synchrotron radiation in Japan.* Nucl. Instrum. Meth. A **548** 1–16 (2004).

[6] T. Tanaka, C. Honda, S. Matsuo et al., *The first trial of phase-contrast imaging for digital full-field mammography using a practical molybdenum X-ray tube,* Investigative Radiology **40**(7) 385–396 (2005).

[7] T. Donath, F. Pfeiffer, O. Bunk et al., *Toward Clinical X-ray Phase-Contrast CT Demonstration of Enhanced Soft-Tissue Contrast in Human Specimen,* Investigative Radiology **45**(7) 445–452 (2010).

[8] D. Dreossi, A. Abrami, F. Arfelli et al., *The mammography project at the SYRMEP beamline,* Eur. J Radiol. **68** (3 Suppl) S58–62 (2008).

[9] J. Keyrilainen, M. Fernandez, S. Fiedler et al., *Visualisation of calcifications and thin collagen strands in human breast tumour specimens by the diffraction-enhanced imaging technique: a comparison with conventional mammography and histology,* European Journal of Radiology **53**(2) 226–237 (2005).

[10] C. David C, B. Nohammer, H. H. Solak et al., *Differential X-ray phase-contrast imaging using a shearing interferometer,* Appl. Phys. Lett. **81** 3287–3289 (2002).

[11] M. Stampanoni, Z. Wang, T. Thuering et al., *The First Analysis and Clinical Evaluation of Native Breast Tissue Using Differential Phase-Contrast Mammography,* Investigative Radiology **46** (12) 801 (2011).

What drives non-equilibrium phase transitions?

Gerhard Ingold, Urs Staub and Paul Beaud, *Laboratory for Synchrotron Radiation – Condensed Matter (LSC), PSI;*
Steven L. Johnson, *Institute for Quantum Electronics, ETH Zurich*

The coupling between competing electronic and structural orders in strongly correlated electron systems is behind many interesting effects, such as high-Tc superconductivity, colossal magnetoresistance, and multiferroicity. Recently, pump-probe resonant and non-resonant X-ray diffraction have emerged as suitable techniques for studying such systems with atomic resolution on a femtosecond timescale. We have investigated both structural and magnetic order-order phase transitions and found that these transitions can be driven by short-pulse optical excitation. These results may contribute to the development of switching functional properties of solid-state devices by light.

Crystalline solids in which local charges, orbitals and spins are brought into a spatially long-range ordered lattice exhibit rich electronic behaviour due to the complex interplay between single-site electron occupation and nearest-neighbour intersite coupling. Upon external stimuli, such materials can undergo phase transitions which generally involve abrupt changes in the long-range arrangements accompanied by symmetry-breaking effects. The time scale required for this symmetry breaking is determined by an inherently dynamic effect, which should, in principle, limit the speed of such phase transitions, but so far the nature of this limit has not been explored. We have used pump-probe X-ray diffraction with femtosecond time resolution to find evidence that a sudden electronic excitation can, in fact, drive a non-equilibrium, order-order phase transition on sub-picosecond time scales, where both the mother and daughter phases maintain long-range order. In the following, we present two examples.

Structural phase transition

In the first experiment, the structural dynamics of the phase transition in $La_{0.42}Ca_{0.58}MnO_3$ (LCMO) manganite has been studied at the FEMTO slicing source at SLS, using X-ray diffraction with a time resolution of 200 fs [1]. At room temperature, LCMO is paramagnetic, with perovskite structure of orthorhombic *Pbnm* symmetry. Upon cooling, it undergoes a phase transition, at $T_{CO/OO} \approx 240$ K, to a charge (CO) and orbitally (OO) ordered phase, in conjunction with a structural transition where the staggered O-octahedra at the Mn^{3+} sites due to the Jahn-Teller (J-T) distortion induce a doubling of the unit cell. This leads to additional weak superlattice (SL) Bragg peaks. Promotion of e_g electrons at the Mn^{3+} sites by 800 nm laser pulses should trigger a non-thermal melting of the CO-OO order and hence a structural order-order phase transition via relaxation of the J-T distortion. This indeed is supported by our data, shown in Figure 1, where the time dependence of a SL reflection is shown for various fluences. At low excitation fluences, we observe the excitation of a coherent phonon that

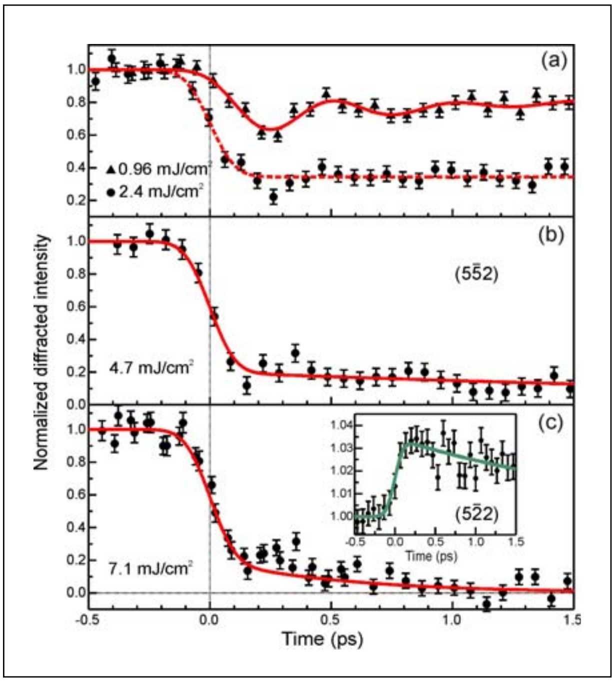


Figure 1: **Laser-induced response of the (5 $\bar{5}$ 2) superlattice and the (5 $\bar{2}$ 2) regular Bragg reflections (insert in c) of charge and orbitally ordered LCMO.**

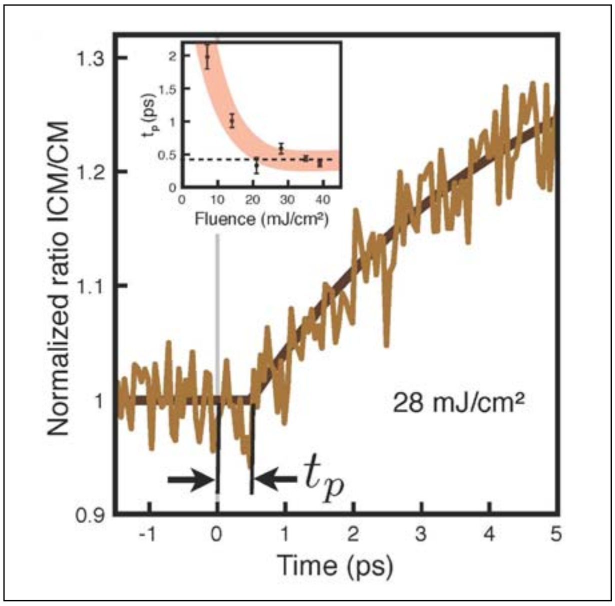


Figure 2: **Relative ICM/CM phase population. The curve is a fit to a delayed biexponential. The inset shows the dependence of the onset time t_p of the phase transition on the excitation fluence. The broad curve drawn here is to guide the eye. The dashed line indicates the time for a ¼ oscillation of a long-wavelength spin excitation in the CM phase (400 fs).**

involves motion of the La/Ca cations. At high fluence, a complete phase transition occurs within ~ 1 ps, demonstrated by the disappearance of the SL reflection. The simultaneous increase of the regular-lattice Bragg intensity is proof that we are observing a structural order-order transition and not a simple laser-induced melting of atomic order. To directly prove that J-T relaxation upon CO-OO melting is driving the transition, a time resolution below 50 fs is needed to measure the coherent phonon modes of the O-octahedra. This could be the dynamical limit for the structural phase transition. Resonant X-ray diffraction can additionally reveal whether the underlying melting of the electronic order happens even faster. We will start this investigation at the LCLS free-electron laser in Stanford, California.

Magnetic phase transition

In the second experiment, the dynamics of the collinear-to-spiral antiferromagnetic (AFM) transition in multiferroic cupric oxide CuO has been studied at the LCLS free-electron laser with a time resolution of 300 fs [2]. Below 213 K, this system shows collinear AFM order commensurate (CM) with the lattice. In the range 213–230 K, the magnetic order becomes non-collinear AFM, with a period incommensurate (ICM) with the lattice. This magnetic order-order transition is triggered by 40 fs optical laser pulses at 800 nm, and fs X-ray pulses tuned near the Cu L_3 edge (930 eV) are then used to monitor the magnetic diffraction peaks that correspond to each phase as a function of time. Over the initial 300 fs, both the CM and ICM peaks show a sudden decrease due to laser-induced magnetic disorder. Afterwards, the phase transition itself starts after an onset time t_p. As shown in Figure 2, this onset time decreases with increasing excitation fluence. At very high excitation levels, the onset time saturates at 400 fs, strongly suggesting that this is a limiting time for the transition. Interestingly, this limiting time scale corresponds to the time required for a ¼ oscillation of a 1.6 ps spin wave as measured by inelastic neutron scattering. This seems to imply that the first step of the transition is limited by dynamics: the fundamental time required for the long-range magnetic ordering to change. This is analogous to the structural phase transition where the minimum time scale is often expected to be a fraction of a phonon period.

Outlook – SwissFEL

Time-resolved X-ray diffraction methods can track the evolution of structural and electronic order in non-equilibrium phase transitions with atomic resolution on a femtosecond time scale. Phases in correlated electron materials can be tuned by varying an external parameter such as temperature, pressure, magnetic field, electric field, or the density of electrons by chemical or photo doping. Flexible pump and probe beams, in terms of energy, polarization and pulse length, will be available at SwissFEL. To take advantage of these advanced features, we propose to construct a dedicated endstation to pursue these experiments with much improved (10 fs) time resolution. The long-term goal is to achieve an understanding similar to that of equilibrium phase transitions, where the type (universality class) of transition is defined by the symmetry of the order parameter, the range of the interaction, and the dimensionality of space.

References

[1] P. Beaud et al., Phys. Rev. Lett. **103** 155703 (2009).

[2] S.L. Johnson et al., Phys. Rev. Lett. **108** 037203 (2012).

The Materials Science Beamline upgrade

Philip Willmott[1], Dominik Meister[1], Michael Lange[1], Antonio Cervellino[1], Steven Leake[1], Marco Calvi[2], Thomas Schmidt[2], Bruno Jakob[2], Xiaoqiang Wang[1], Juraj Krempasky[1], Peter Oberta[1], Sibylle Spielmann-Jaeggi[1] and Uwe Flechsig[1]

[1] *Laboratory for Synchrotron Radiation – Condensed Matter (LSC), PSI*

[2] *Laboratory for Synchrotron Radiation – Macromolecules and Bioimaging (LSB), PSI*

Research at the Materials Science beamline at the SLS is primarily concerned with determining the atomic structures and changes therein of crystalline substances, in particular nanoscale materials, pharmaceutical and catalytical systems, and structures confined to surfaces and interfaces. The MS beamline has undergone a comprehensive upgrade of its X-ray source and optics, leading to a more than thousand-fold increase in X-ray brilliance. It now provides both a smaller (100 × 20 μm²) and a more parallel (160 × 32 μrad²) beam. In addition to significant improvements in the established techniques of powder diffraction and surface diffraction, new opportunities have become possible with regard to experiments with high time resolution and under high applied pressure.

After more than 10 years of very successful operation, the Materials Science (MS) beamline [1] at SLS has been updated with a state-of-the-art undulator source and optics. The new undulator operates in-vacuum and is cryogenically cooled to achieve the high magnetic field necessary for reaching X-ray energies as high as 40 keV on a "medium-energy" storage ring such as the SLS [2].

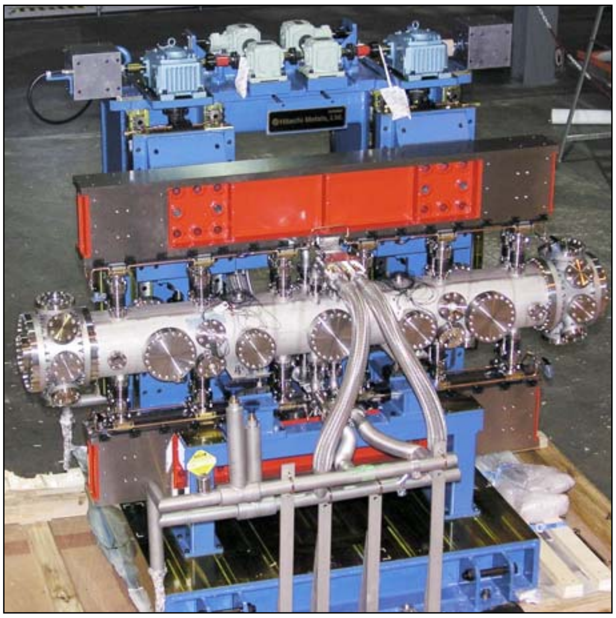


Figure 1: **The cryogenically cooled undulator (U14) of the MS beamline.**

Compared with the previous wiggler, the new undulator has many advantages: It provides a smaller and more parallel beam and produces less heat in the X-ray optics, which in turn results in a better energy resolution; all of these improvements mean that more difficult scientific questions can be answered.

The new undulator

The U14 undulator was developed and designed in collaboration with the Japanese Synchrotron SPring-8 facility and Hitachi Metals (Figure 1). It is the shortest-period undulator manufactured to date in the world, which meant that several new engineering solutions had to be developed for it. These will also be useful for the future SwissFEL undulators.

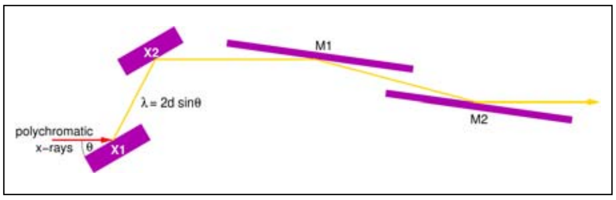


Figure 2: **Schematic of the new optics setup. The first crystal, X1, selects a specific wavelength λ from the incident polychromatic X-ray beam, which is then redirected by X2. Two subsequent mirrors allow focusing of the beam and remove higher-order light.**

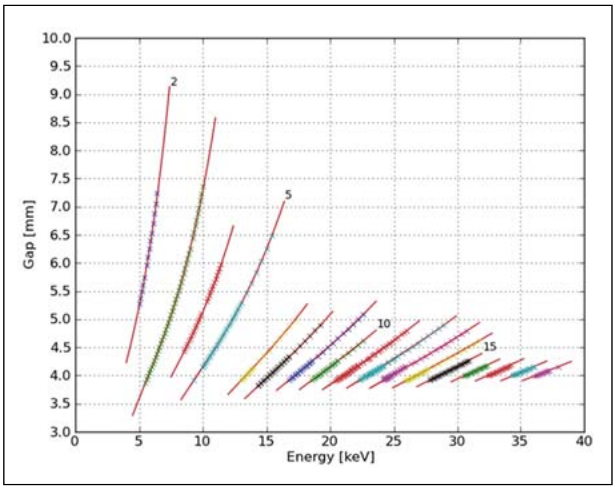


Figure 3: **Energies of the undulator harmonics as a function of gap size of the U14 undulator.**

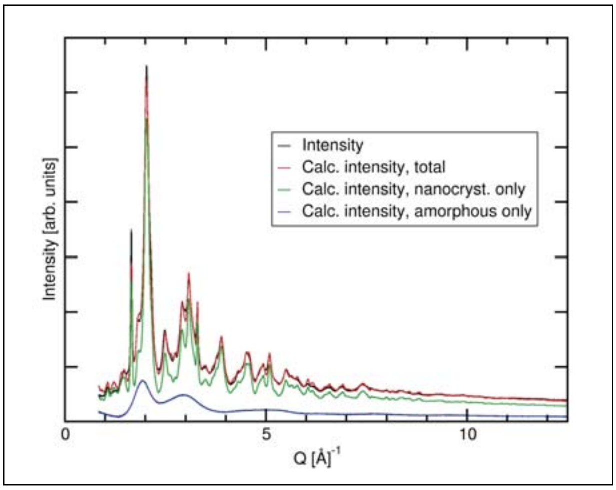


Figure 4: **Total scattering pattern of nanocrystalline hydroxyapatite. The intensity (black curve) was obtained after subtracting artefact signal from air scatter and scatter from the capillary sample holder. The calculated total intensity (red) was corrected for Compton scattering, and could then be separated into true nanocrystalline (green) and amorphous (blue) components. [Courtesy A. Cervellino and A. Guagliardi]**

New source, new optics

Although the new undulator has six times lower total power than the previous wiggler, the power density is 17 times higher, making efficient thermal management necessary.
For these reasons, a new X-ray optics configuration was essential. The new optics are shown schematically in Figure 2. The incident beam is monochromated using a double-crystal monochromator (DCM). Horizontal and vertical focusing is achieved using a sagittal bender mechanism for the second DCM crystal, X2, and dynamic bending of the second mirror, M2, respectively. Mirrors M1 and M2 also remove higher diffraction orders.

Performance

The new undulator produces radiation which agrees well with the predicted values. As an example, the energy of the harmonics is plotted vs. the undulator gap in Figure 3. Harmonics are observed up to $n = 19$, proof that, despite the short period of only 14 mm, the magnetic field is very precisely periodic.

New opportunities

Because the undulator radiation is more parallel and the source size is smaller, the beam can be focused far more tightly on the sample. This means that more photons can be used for an experiment, opening up new vistas in several directions, especially in the fields of time-resolved studies and radiation-sensitive experiments in conjunction with the revolutionary Mythen microstrip detector [3]; in high-pressure studies where the beam has to enter the small diamond aperture of the pressure cell; and in so-called "total-scattering" experiments, which require the recording of a very weak signal at high scattering angles. As an example, we show in Figure 4 a nanocrystalline diffraction pattern of the artificial bone material hydroxyapatite. Because of the more parallel light from the undulator, the diffraction peaks are sharper. This leads to a 10-fold increase in agreement between the modelled and the measured intensities.
We will also exploit the increased coherent flux provided by the undulator source in coherent X-ray diffraction imaging experiments away from the forward scattering direction, thereby complementing the facilities available at the cSAXS beamline of the SLS [4].
This upgrade shows how well-selected investments can result in beamlines which become leaders in the field, despite being a decade or more old. Further such upgrades are planned in a comprehensive upgrade for several SLS beamlines in the future. These will ensure the SLS a leading position in synchrotron instrumentation and science for many years to come, despite the growing competition from more-modern storage rings emerging around the world.

References

[1] B.D. Patterson et al., Nucl. Instrum. Methods A **540** 42 (2005).
[2] *An Introduction to Synchrotron Radiation – Techniques and Applications,* P.R. Willmott, Wiley 2011.
[3] B. Schmitt et al., Nucl. Instrum. Methods A **501** 267 (2003).
[4] J.M. Rodenburg et al., Phys. Rev. Lett. **98** 034801 (2007).

Measuring the fast and the small: New opportunities for structural analysis

Jeroen A. van Bokhoven* and Daniel Grolimund, *Laboratory for Catalysis and Sustainable Chemistry (LSK), PSI, and *Institute for Chemical and Bioengineering, ETH Zurich;*
Christian König, Tilman J. Schildhauer and Maarten Nachtegaal, *Bioenergy and Catalysis Laboratory (LBK), PSI;*
Petri Karvinen and Christian David, *Laboratory for Micro- and Nanotechnology (LMN), PSI;*
Tae-Hyun Yoon, *Hanyang University, Seoul, South Korea*

To achieve sustainability in energy and chemicals production and use, new processes must be developed. Modern catalysis research is characterized by the synthesis of structures that are ordered at multiple length scales. Our research focuses on the synthesis of such structures and their characterization at multiple length and time scales. The development of new methods leads to new opportunities for determining structure at the sub-second timescale and at the nanometre scale. A new analysis scheme of time-resolved X-ray absorption spectra upon cyclic excitation leads to quantitative structure determination in unprecedented detail, enabling the detection of minute structural changes. Design and construction of linear zone plates, including those built into a hard X-ray nano-imaging module, enables the detection of chemical speciation and structure at the nanometre scale, promising three-dimensional structure determination at that length scale.

During the year 2011, the name of the Laboratory for Energy and Environment changed to Laboratory for Catalysis and Sustainable Chemistry (LSK), to better reflect its main research themes. Its main goal is to understand and to learn to control functional materials at all length and time scales, but there is a strong focus on catalysis and environmental science. Many research topics reflect the bridging function between the General Energy (ENE) and Synchrotron Radiation and Nanotechnology (SYN) Departments that the Laboratory has. New synthesis methods for (mainly) heterogeneous catalysts are combined with the development and application of characterization tools at the four beamlines of the Laboratory. In 2011, the upgrade of the VUV beamline was successfully completed, which resulted in reproducible alignment, an increased tuning range, and better failure tolerance. The beamline facility will continue its research into understanding combustion processes and extend into the study of surfaces and surface processes, such as catalysis. PHOENIX I, a new beamline for X-ray absorption spectroscopy in the tender energy range (0.8–8 keV) has started user operation. This beamline is specially designed for in-situ studies. Pilot studies addressed problems relevant to catalysis and environmental and energy research, using chemical reactors and a newly developed liquid microjet.

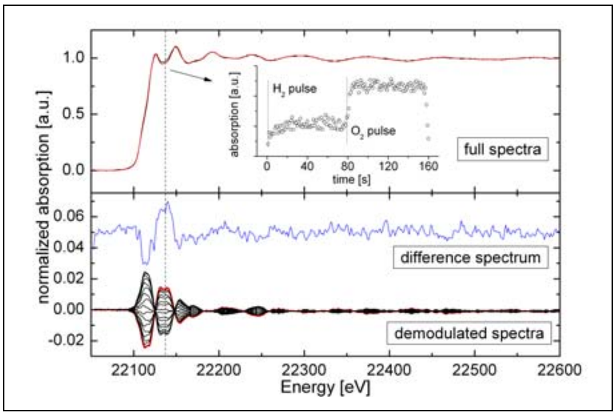


Figure 1: **Top: Quick-XAS spectra at the Ru K edge recorded during cyclic variation between oxidizing and reducing environment of a Ru catalysts. The spectra indicate minute changes in structure, which cannot be analyzed by classical methods. Bottom: Demodulated spectra, for which a new analysis scheme was developed. This enables structural analysis of the minute difference, enabling quantitative structural analysis in unprecedented detail.**

Quantifying the fast

Structural characterization of many processes relevant to energy conversion and storage, catalysis, electronics, and the environment requires sub-second time resolution and analysis at the nanometre scale. X-ray absorption spectroscopy is one of the preferred methods for determining structure. However, traditionally, it has been impossible to determine the structure of minority species in the sub-second time domain accurately.

New method development at the SuperXAS beamline now enables the quantitative structure determination of only minority species in unprecedented detail. An ENE-SYN collaboration has resulted in a new data analysis scheme for modulation-excited, time-resolved XAS data. The periodic variation (modulation excitation) of the gas environment from reducing to oxidizing around a supported Ru catalyst, used in the methanation of syngas and partial oxidation of methane, has led to minute spectral changes (Figure 1). The newly developed analysis scheme is based on treating the demodulated data as difference spectra that are fitted by two states belonging to each of the two gas environments. The major development is the discovery that, even though the fitting of these two individual contributions may not be exact, the difference between the two is reproduced with much higher accuracy than can be obtained through classical XAS data analysis, and often not accessible by other methods. The coordination number can be determined within 1 % and changes in bond distance better than 0.001 Å can be detected and quantified. This breakthrough enables structural determination with extreme accuracy of only that part of a sample, such as catalyst, battery, and energy storage material, that changes. For chemically reproducible systems, such as catalysts, modulation-excitation XAS will allow the quantitative structural analysis of minority species or reaction intermediates that are involved in the reaction under operating conditions, previously thought impossible. The pre-requirement for modulation XAS is the ability to collect XAS spectra with a time resolution in the sub-second range, which is uniquely available at the SuperXAS beamline of the SLS.

Measuring the small

Hard X-ray nanoprobes are very attractive in many fields of science, including physics and chemistry, bio-medicine, materials, geo and environmental sciences, archaeology, and nano-technology. However, micro- and nano-focusing of hard X-rays represents a considerable optical and technical challenge. Collaborative research between the microXAS beamline project and the Laboratory for Micro- and Nanotechnology (LMN) has succeeded in implementing a pilot unit of a hard X-ray nano-imaging module. This novel nano-focusing module is based on newly developed diffractive lenses delivering spatial resolution with a high acceptance and photon flux gain factor. The new optical scheme consists of two independent, linear Fresnel-zone plates mounted in a tilted arrangement (Figure 2) to achieve efficient and symmetric focusing, even at high energies.

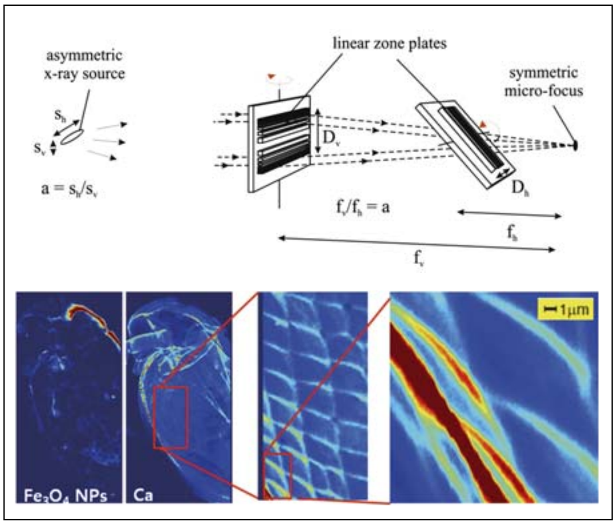


Figure 2: **Top: Two-dimensional focusing of X rays with linear zone plates. Matching the ratio of the focal lengths to the asymmetry of the X-ray source produces a symmetric focus. The free and independent adjustability of each tilt angle allows fast, dynamic optimization of the diffraction efficiency over the entire energy range. Bottom: Chemical nano-imaging based on nano-focused hard X-ray beam of multiple celled D. magna exposed to iron oxide nano-particles. The different zoom-in areas are indicated by the red squares. Ultimate pixel size: 100nm.**

Using a 250 nm X-ray spot, element-specific chemical images based on fluorescence imaging were recorded and two-dimensional nano-diffraction images of 70nm gold structures were pioneered. Element and diffraction imaging of the single-cell organism D. magna exposed to iron-oxide nano-particles identified how chemical transformations occur during digestion of the nano-particles (in collaboration with Hanyang University, Seoul, Korea).

The ability to non-destructively investigate ('image') heterogeneous, nano-structured zones with unprecedented spatial, crystallographic, and chemical sensitivity using hard X-rays between 5 and 20 keV opens up new and unique opportunities for fundamental and applied research, as well as for engineering. A hard X-ray nano-probe user facility at the microXAS beamline, designed to image samples and analyse them spectroscopically at the nanometre scale, over a tuneable range of X-ray wavelengths, can be expected to have a very wide variety of applications.

References

[1] C. Koenig, J.A. van Bokhoven, T.J. Schildhauer and M. Nachtegaal, *Quantitative analysis of modulated-excitation X-ray absorption spectra: Enhanced precision of EXAFS fitting,* submitted to Phys. Chem. Chem. Phys.

[2] D. Grolimund, P. Karvinen, C. David, C. Borca and T.-H. Yoon, *Hard X-ray nanoimaging and microscopy for environmental & biological studies,* in prep.

Dimensional control of electronic properties in atomically-thin metal-oxides

Thomas Prokscha, Elvezio Morenzoni, Zaher Salman and Andreas Suter, *Laboratory for Muon Spin Spectroscopy, PSI;* Alexander Boris, Yulia Matiks, Eva Benckiser, Alex Frano, Paul Popovich, Vladimir Hinkov, Georg Christiani, Hanns-Ulrich Habermeier and Bernhard Keimer, *MPI für Festkörperforschung, Stuttgart, Germany;* Peter Wochner, Miguel Castro-Colin and Eric Detemple, *MPI für Metallforschung, Stuttgart, Germany;* Vivek Malik and Christian Bernhard, *Department of Physics, University of Fribourg, Switzerland*

Contemporary basic research in the field of strongly correlated electron systems aims at identifying new routes towards future generations of electronic devices. Interesting systems are metal-oxide compounds which display a rich variety of electronic properties due to the presence of strong electronic correlations and promise entirely new functionalities. The dimensionality of the electron system in these materials has a large influence on the electronic and magnetic properties. In superlattices of the paramagnetic metal $LaNiO_3$ and the insulator $LaAlO_3$, we found, by optical ellipsometry and low-energy muon spin rotation, a metal-insulator and antiferromagnetic transition in $LaNiO_3$ with a thickness of two unit cells, whereas thicker layers remain metallic and paramagnetic. Metal-oxide superlattices thus allow dimensional control of the electronic properties of correlated electron systems.

The discovery of high-temperature superconductivity two decades ago initiated extensive experimental and theoretical investigations of the quantum physics of strongly correlated electrons in transition metal oxides (TMO) [1]. Several electronic phases exist in these materials, and the systematic control of the competition between these phases offers the potential for a new generation of electronic devices [2]. However, conventional solid-state chemistry provides only limited control; for example, it uses chemical substitution to modify charge-carrier concentrations, thereby altering the local lattice structure and electronic levels in an uncontrolled way. Also, control on dimensionality is limited, because the synthesized phases of *N* consecutive layers often turn out to be unstable. Recent advances in the growth of TMO heterostructures by molecular beam epitaxy (MBE) or pulsed laser deposition (PLD) allow the fabrication of atomically sharp interfaces, indicating a promising route toward control of correlated electron systems [2].

The correlated metal $LaNiO_3$ is an interesting candidate for testing the dimensional control of electronic properties. Bulk $LaNiO_3$ is a three-dimensional Fermi liquid [3], paramagnetic and metallic at all temperatures, whereas other lanthanide nickelates (*R*NiO3) with smaller electronic bandwidth exhibit collective metal-insulator transitions (MIT) [4]. In the insulating low-temperature phase, a periodic superstructure of the valence electron charge and a non-collinear antiferromagnetic ordering of the Ni spins have been inferred [5]. This implies that the itinerant conduction electrons in $LaNiO_3$ are highly correlated on the verge of localization. Experiments on a controlled number of atomically thin $LaNiO_3$ layers separated by the wide-gap insulator $LaAlO_3$ are thus well suited for testing the effect of reduced dimensionality on the electronic phases of $LaNiO_3$.

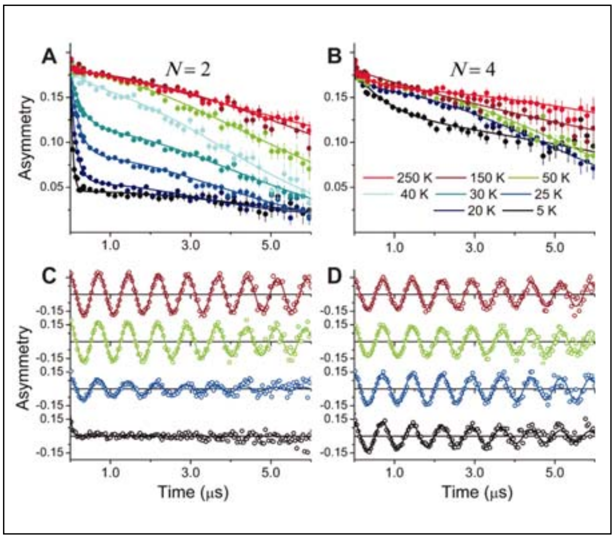


Figure 1: **Time evolution of muon spin polarization in zero field (A+B) and transverse field (10 mT, C+D) for *N*=2 and *N*=4 SLs of $LaNiO_3$/$LaAlO_3$ on $LaSrAlO_4$.**

Superlattices (SLs), 100 nm thick, of N=2 and N=4 consecutive layers of $LaNiO_3$ and $LaAlO_3$ were grown by PLD [6]. Different substrates ($SrTiO_3$, $LaSrAlO_4$) were used to investigate the effect of tensile and compressive strain. The detection of two of the most common collective ordering phenomena, namely charge order and antiferromagnetism, is much more difficult in TMO SLs than, for instance, the detection of ferromagnetism or ferroelectricity, where macroscopic techniques can be applied. Here, the charge transport properties – dynamic electrical conductivity and permittivity – were measured by spectroscopic ellipsometry. Since this technique does not require a continuous current path over macroscopic distances, it is not affected by misfit dislocations and provides much more accurate and reliable results than DC conductivity measurements. For these experiments, a beam of infrared light at the ANKA synchrotron has been used. For the detection of antiferromagnetic order and magnetic volume fractions, muon spin rotation (µSR) is a very powerful tool. The muon, as a local magnetic probe, is extremely sensitive to any magnetic ordering. Usually, muon beams have energies of ~MeV, which is far too high for them to stop in a 100-nm-thick SL. Kinetic energies of only a few keV are required if the positive muons are to be stopped in such a thin layer. At the moment, only the unique low-energy muon beam and low-energy µSR setup at PSI [7, 8] offers the possibility to carry out experiments of this kind. Figure 1 shows the results of the low-energy µSR experiments on SLs with N=2 and N=4 $LaNiO_3$ layers [9]. In A and B, no external field was applied. At $T > 50$ K, a small Gaussian damping of the muon polarization is visible, which is typical for dipolar magnetic fields generated by nuclear moments of La and Al. In the N=2 sample, a fast relaxing component starts to develop at $T < 50$ K, which is absent in the N=4 sample. The observed temperature dependence of the fast component is similar to the behaviour in bulk $NdNiO_3$ and $(Y,Lu)NiO_3$ below the antiferromagnetic transition temperature, T_N, caused by static internal fields from ordered Ni moments. The rate of the fast component of ~17 μs^{-1} reflects a wide field distribution, which, together with the absence of a unique muon precession frequency, originates from several inequivalent muon stopping sites in the alternating magnetic ($LaNiO_3$) and non-magnetic ($LaAlO_3$) layers. The spin structure might be antiferromagnetic and non-collinear, as in bulk nickelates [9]. Ferromagnetic order can be excluded on the basis of an estimate of the ordered moment, which would result in a macroscopically detectable magnetization of the film. Spin-glass behaviour is ruled out as well, as it would cause a different muon depolarization in a zero field [9]. The absence of a fast-relaxing component for N=4 demonstrates that 4 layers of $LaNiO_3$ remain paramagnetic at all temperatures, as in bulk $LaNiO_3$. This is confirmed by the 10 mT transverse field data in Figures 1C and 1D, whereas for N=4 the full precessing amplitude – which is proportional to the paramagnetic volume fraction – is observed down to 5 K; the muon precession signal starts to disappear for $T < 50$ K for N=2 layers, and vanishes at T = 5 K, where 100% of the sample is magnetic, with static local magnetic fields $B_{loc} \gg 10$ mT at the muon site. The ellipsometry data reveal that N=4 layers are metallic at all temperatures, while N=2 layers exhibit a metal-insulator transition at $T > T_N$.

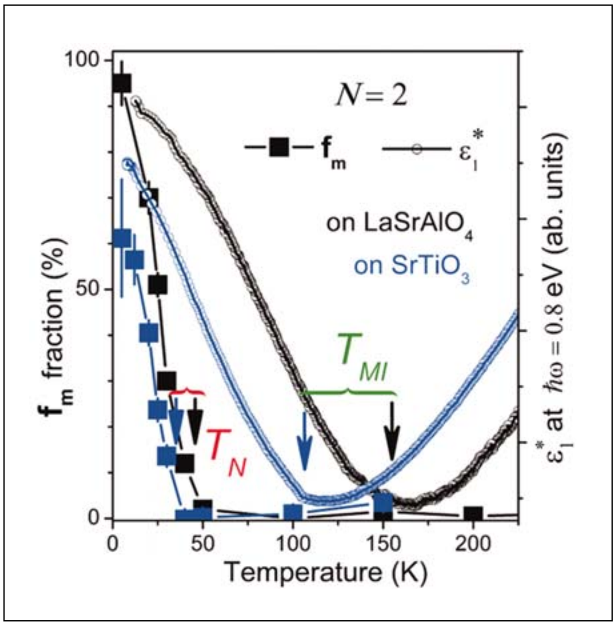


Figure 2: **Magnetic volume fraction f_m and the normalized permittivity ε_1* in the N=2 superlattices on $LaSrAlO_4$ and $SrTiO_3$. The arrows mark magnetic (T_N) and metal-insulator transitions (T_{MI}).**

Figure 2 summarizes the phase behaviour of N=2 SLs, which undergo a sequence of two sharp, collective electronic phase transitions, which correspond to the onset of charge and spin order, regardless of whether the substrate-induced strain is compressive or tensile. These results demonstrate that full dimensionality control of collective instabilities in metal-oxides SLs is possible [9].

References

[1] E. Dagotto, Science **309** 257 (2005).
[2] J. Mannhart and D.G. Schlom, Science **327** 1607 (2010).
[3] R. Eguchi et al., Phys. Rev. B **79** 115122 (2009).
[4] M. Imada et al., Rev. Mod. Phys. **70** 1039 (1998).
[5] V. Scagnoli et al., Phys. Rev. B **77** 115138 (2008).
[6] H.-U. Habermeier, Mater. Today **10** 34 (2007).
[7] T. Prokscha et al., Nucl. Instr. Meth. A **595** 317 (2008).
[8] E. Morenzoni et al., Physica B **289-290** 653 (2000).
[9] A.V. Boris et al., Science **332** 937 (2011).

How neutrons see plant-soil interactions

Eberhard Lehmann, Peter Vontobel and Anders Kaestner, *Spallation Neutron Source Division (ASQ), PSI;*
Sascha E. Oswald, *University of Potsdam, Germany;* Ahmad Moradi, *University of California at Davis, USA;*
Andrea Carminati, *University of Göttingen, Germany*

The water balance between atmosphere and land surface is often dominated by the influence of vegetation, and water is a limiting factor in the cultivation of agricultural crops. However, water uptake by plants and its feedback to soil water is not yet understood in detail. Using neutron imaging of plant roots in soils, it is now possible to gain new insights into root-soil interaction. With this method, a new mechanism was found that allows roots to sustain their water supply during dry conditions, which so far had been missed by other methods less sensitive to water. This is about to change the modelling of water uptake and may lead to the breeding of enhanced plants in the future.

Introduction

Soil constitutes the thin interface between the land and the atmosphere, where the largest part of terrestrial life takes place. Water is the main element needed by all organisms, especially by plants, which are simultaneously the key drivers of water moving back into the atmosphere. Also, water in soil is the main vehicle for the movement of nutrients essential to plants. However, how roots take up water from soil is still not well known.

Models of water and nutrient uptake by roots are based on the concept that water flows from soil to roots down a negative gradient in water potential. As the leaves lose water to the atmosphere, negative water potential develops in them, which then propagates into the stem and roots. This creates a water gradient between soil and roots, driving water into the roots. Because of the radial geometry of the flow towards roots, the models predict that the largest gradients in soil water potential occur in the first few millimetres near the roots, the so-called *rhizosphere*. As plants take up water from soil, the rhizosphere may become so dry that root water uptake is reduced. How easily water flows across the rhizosphere and enters roots depends on the water content in the rhizosphere: a wet rhizosphere will favour water (and nutrient) uptake by roots, whereas a dry rhizosphere may significantly reduce it. But how can the water content in the rhizosphere be measured?

Studying soil-plant interactions has so far been challenging, due to the difficulty of measuring soil water content at distances of less than a few mm around roots without interfering with their function. Due to their high sensitivity to hydrous materials, however, neutron tomography and radiography provide excellent methods for studying the distribution of water in soils and roots in-situ.

Neutron tomography setup

A preceding study had been able to identify a mechanism of increased water content in parts of the rhizosphere [1]. However, only in a very recent investigation [2] with 3D tomography was it possible to prove the presence of high water content in large regions of the rhizosphere for three different plant species.

These measurements were performed at the NEUTRA and ICON beamlines of SINQ, at PSI. We grew different plant species (white lupin, chickpea, and maize) in cylinders (height: 100 mm, diameter: 27 mm) filled with a sandy soil. When the plants were 12 days old, we started to scan the samples. We tomographed the samples over the course of 4 days and monitored the changes in soil water content around the roots as they took up water and dried the soil. Plants were grown near the beamlines under controlled light, humidity and temperature conditions. The objective of the experiment was to generate images of the temporal and spatial dynamics of water depletion around the roots, over a range of soil water content.

The spatial resolutions of the tomograms were 80 μm at NEUTRA and 13 μm at ICON (nominal pixel size). The three-dimensional images were processed as follows: Firstly, roots were segmented from the soil. Secondly, tap and lateral roots

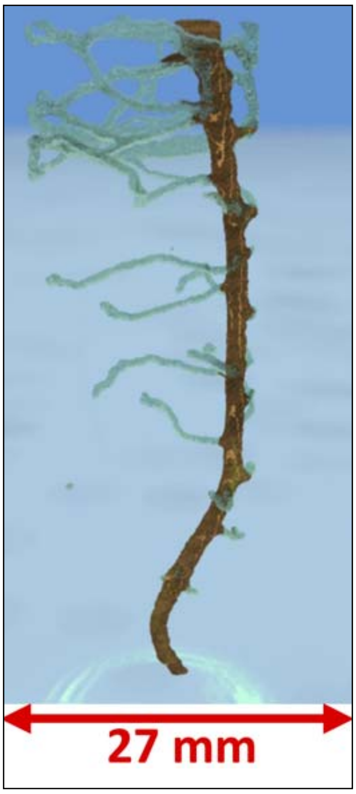


Figure 1: **A 3D representation of the roots of a chickpea plant obtained by neutron tomography, performed at the ICON facility of SINQ [3].**

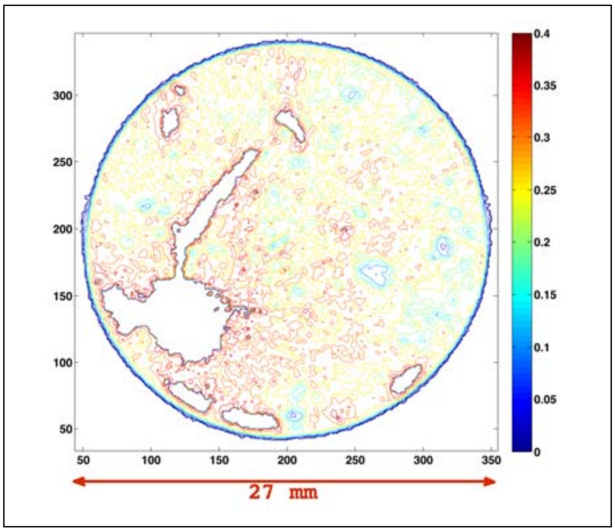


Figure 2: **Measured soil water distribution around the roots of a plant. In this horizontal cross-section, the white zones represent roots, while the regions in colour show how much water is present in the soil – red means a larger amount of water.**

were distinguished according to their different root radii. Finally, we calculated the distance map to the roots and the average water content as a function of distance to the roots.

Results and their implications

Contrary to current models of root water uptake, which predict a drier soil close to roots, we consistently observed higher soil water content closer to roots than far away from them. Since roots take up water from the soil and water must move down a gradient in water potential, the only explanation is that the relationship between water content and water potential in the rhizosphere was different than that in the rest of the soil. In other words, the roots modified the soil in their immediate vicinity, thereby increasing the water-holding capacity of the soil. This means that soil water potential could decrease approaching the root surface, but not necessarily soil water content.

Our results agree with the findings of microbiologists on the difference in the hydraulic properties of the materials exuded by bacteria into their environment. Bacteria are surrounded by extracellular polymeric substances (EPS) that act as a protecting layer against desiccation and fast rewetting. Plant biologists have also reported the presence of similar materials around the roots of plants, commonly referred to as mucilage. We hypothesize that the release of mucilage by roots into the surrounding soil alters the hydraulic properties of the rhizosphere so that it holds more water.

Current models of root water uptake do not account for such distinct hydraulic properties of the rhizosphere. Incorporating these findings could improve the capability of these models in their predictions.

The higher water-holding capacity of the rhizosphere is expected to help roots remain hydraulically connected to the bulk soil, favouring water availability to plants in dry conditions. Our measurements have therefore revealed a new mechanism of how plants modify their environment in order to perceive a “wetter” soil and better tolerate drought.

This study could have potentially important practical applications, two of which are: breeding plants with high tolerance to drought, and optimizing irrigation schedules to maintain optimal hydrated conditions in the rhizosphere.

References

[1] A. Carminati, A. Moradi, D. Vetterlein, P. Vontobel, E. Lehmann, U. Weller, H.-J. Vogel and S.E. Oswald, *Dynamics of soil water content in the rhizosphere,* Plant and Soil **332** 163–176 (2010).

[2] B. Ahmad B. Moradi, A. Carminati, D. Vetterlein, P. Vontobel, E. Lehmann, U. Weller, J. W. Hopmans, H-J. Vogel, and S.E. Oswald, *Three-dimensional visualization and quantification of water content in the rhizosphere,* New Phytologist **192**(3) 653–663 (2011).

[3] A.P. Kaestner, S. Hartmann, G. Kühne, G. Frei, C. Grünzweig, L. Josic, F. Schmid, and E.H. Lehmann, *The ICON beamline – A facility for cold neutron imaging at SINQ,* Nuclear Instruments and Methods in Physics Research Section A: Accelerators, Spectrometers, Detectors and Associated Equipment **659**(1) 387-393 (2011).

Triggered release through Magnetic Actuation of vesicles functionalised with iron-oxide nanoparticles

Esther Amstad, *Laboratory for Surface Science and Technology, ETH, Zurich, now Harvard School of Engineering and Applied Sciences, Cambridge, USA;*
Erik Reimhult, *Laboratory for Surface Science and Technology, ETH, Zurich, now Institute of Nanobiotechnology (NBT), Vienna, Austria;*
Joachim Kohlbrecher, *Laboratory for Neutron Scattering, PSI*

To release drugs from a vesicle carrier, the membrane of the vesicle has been successfully functionalised by small ferromagnetic nanoparticles. These ferromagnetic particles can be used to locally produce heat by applying an external alternating magnetic field in the kHz range. The challenge in functionalising the lipid bilayer with ferromagnetic nanoparticles was mainly to incorporate them without destabilising the vesicle membrane and, secondly, to have a production procedure that was efficient and easy enough to implement.

Nanoscale vesicles have, in the past, attracted the interest of many research groups which tried to use them for ex-vivo encapsulation, delivery, or nanoscale chemistry. However, the problem of externally triggered release of a controlled dose of the encapsulated cargo at a specific time and location has never been convincingly solved. Most studies up until now make use of passive diffusion or response to global environmental changes [2, 3]. The functionality of liposomes makes them one of the most intensively studied delivery vehicles [4]. Liposomes are typically 100 nm in diameter, are biocompatible, and, if appropriately surface modified, have long in vivo circulation times. Furthermore, they can carry hydrophilic cargo in the aqueous lumen and hydrophobic cargo in their lipid membrane [4]. Important for this task is their enhanced permeability around the membrane melting temperature (T_m), which depends on the lipid composition. The cargo can be released by heating the liposome membrane above the melting temperature, T_m. As there has not existed up until now an efficient way to locally heat only the lipid membrane, T_m is typically designed to be close to body temperature, to release cargo at the temperature of pathological tissue such as cancer, which is a few degrees higher. This, however, already results in an inherent leakage of liposomes at body temperature. If T_m is instead chosen to be far above body temperature, then

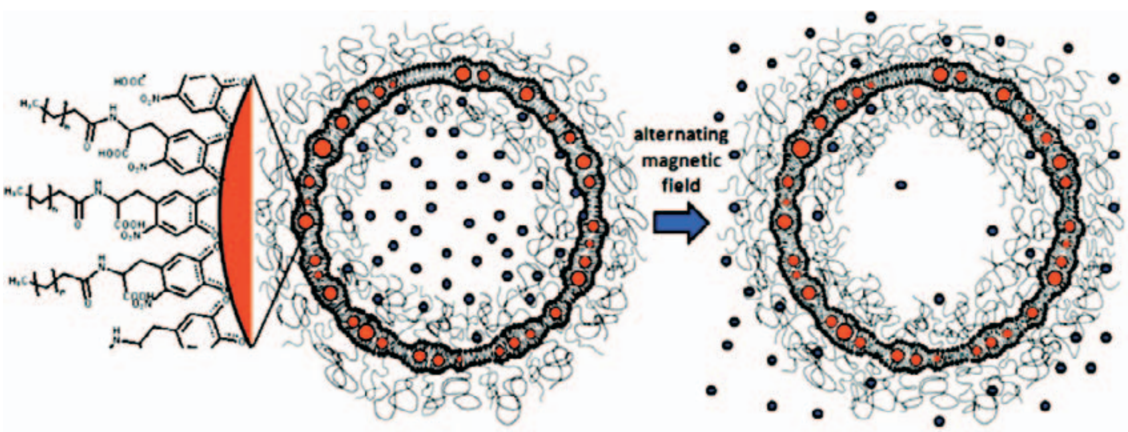


Figure 1: **The perfect nano-containment for any drug delivery vehicle should have two properties: On the one hand, it is desirable to release the drug only at a well-defined location while, on the other hand, the release should also be controlled in time. A team from the ETH Zurich has developed such a system using so-called 'stealth liposomes', which they combined in a clever way with superparamagnetic iron-oxide nanoparticles, which they succeeded in incorporating in the lipid membrane. Alternating magnetic fields were then used to locally heat the membrane and control both timing and dose of the released cargo from such vesicles.**

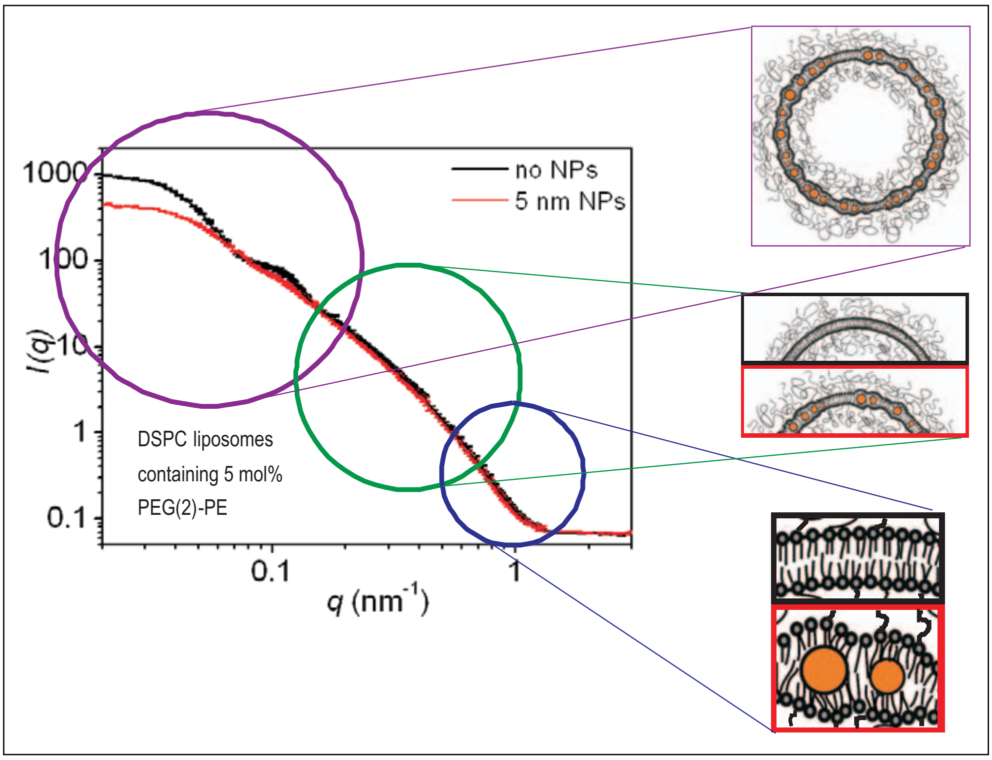


Figure 2: **Small-angle scattering, with both neutrons and X-rays, was used to characterize the different steps in the synthesis. Small-angle neutron scattering could be used to check the stability of the vesicles under different loading conditions, the thickness of the membrane and the influence on the structure of incorporating ferromagnetic nanoparticles. It was also used to characterize pure nanoparticles.**

cargo release is inefficient. To circumvent the conflicting demands of simultaneous high release efficiency and low passive leakage, liposomes have been successfully loaded with magnetic nanoparticles in our research. Via their magnetic properties, cargo release can be triggered by applying high-frequency alternating magnetic fields. These alternating fields are used to locally introduce heat into the system, with the magnetic particles as heat centres. The challenge was then to introduce the magnetic particles efficiently, and in large enough quantities, into the liposome membrane. PEGylated liposomes with T_m far higher than body temperature were used, for which specially stabilized iron oxide nanoparticles were developed. The size of these nanoparticles was fine tuned (diameter < 5.5nm) and they were sterically stabilized with palmityl-nitroDOPA. They therefore spontaneously incorporated into the membranes (Figure 1). These liposomes are colloidally stable and impermeable at body temperature. Repeated application of alternating magnetic fields now allowed the release of cargo to be triggered. These properties were shown to relate directly to the structure and stability of the nanoparticle-lipid assemblies. Because the liposome structure was retained during alternating magnetic field treatment, content could be repeatedly and non-destructively released from liposomes at bulk temperatures significantly below T_m of the liposomes. Consequently, cargo could optionally be released over prolonged times, preventing bursts that would temporarily lead to a local overdose.

To study the nanoparticle-lipid assemblies, several techniques have been applied, such as small-angle neutron and X-ray scattering (SANS, SAXS) (Figure 2), transmission electron microscopy (TEM), differential scanning calorimetry (DSC), thermogravimetry analysis (TGA), dynamic light scattering (DLS) and fluorescence spectroscopy. The combination of all techniques allowed the different steps of the synthesis to be characterised and their functionality regarding the release of a controlled dose of the encapsulated cargo at a specific time and location to be studied.

References

[1] E. Amstad, J. Kohlbrecher, E. Müller, T. Schweizer, M. Textor and E. Reimhult, *Triggered Release from Liposomes through Magnetic Actuation of Iron Oxide Nanoparticle Containing Membranes,* Nano Letters **11** 1664–1670 (2011).

[2] D. Needham and M.W. Dewhirst, Drug Delivery Rev. **53**(3) 285–305 (2001).

[3] A. Rübe, G. Hause, K. Mäder and J. Kohlbrecher, *Core-shell structure of Miglyol/poly(d,l-lactide)/Polo-xamer nanocapsules studied by small-angle neutron scattering,* Journal of Controlled Release **107** 244-252 (2005).

[4] D. Peer, J.M. Karp, S. Hong, O.C. FaroKhzad, R. Margalit and R. Langer, Nat. Nanotechnol. **2**(12) 751–760 (2007).

[5] Y.J. Chen, A. Bose and G.D. Bothun, ACS Nano **4**(6) 3215–3221 (2010).

Complex spin structures in frustrated magnets

Oksana Zaharko, *Laboratory for Neutron Scattering, PSI;* Antonio Cervellino, *Laboratory Condensed Matter Physics, PSI;* Niels B. Christensen, *Materials Research Division, Risø National Laboratory for Sustainable Energy, Denmark;* Vladimir Tsurkan, *Experimental Physics V, University of Augsburg, Germany;* Andrej Maljuk, *Leibniz Institute for Solid State and Materials Research, Germany*

Understanding the diverse ground states, the mechanisms of magnetic ordering and emergent excitations in frustrated magnets is a major focal point of modern condensed matter physics. In a recent study, we combined neutron scattering and Monte-Carlo simulations and identified direct evidence for degenerate ground states in the frustrated diamond lattice antiferromagnet $CoAl_2O_4$. The observed short-range magnetic correlations were explained within a spiral spin-liquid model by the specific shape of the energy landscape of the system due to competition between nearest and next-nearest neighbour exchange interactions.

In a class of magnetic solids known as spin-liquids, there is no unique ground state which the system would attain at zero temperature. Due to the frustrated geometry of the underlying crystalline lattice, competing magnetic exchange interactions or quantum fluctuations, such systems have highly degenerate ground states, i.e. they fluctuate between many low-energy configurations. The best experimental method for probing spin-liquids is neutron scattering, the technique available at the Swiss Spallation Neutron Source, SINQ, at the Paul Scherrer Institute.

A spin-liquid has been predicted theoretically in a classical treatment of frustrated diamond-lattice Heisenberg antiferromagnets [1]. The degenerate ground states in such materials form a set of coplanar spin spirals, which appear as the result of competition between nearest (J_1) and next-nearest neighbour (J_2) exchange couplings.

We have searched for evidence for such a state in the material $CoAl_2O_4$, a member of the spinel family of crystalline compounds [2, 3]. Powder neutron diffraction (Figure 1), analysed using Monte-Carlo simulations, indicates that the system is weakly frustrated, residing in the vicinity of the critical point $J_2/J_1=1/8$, at which the spiral spin-liquid state is predicted to develop. Short-range magnetic correlations observed in a single-crystal neutron diffraction pattern (Figure 2) result from an extremely flat energy minimum around the wave vector $\boldsymbol{q}=0$ and from many low-lying excited spiral states with $\boldsymbol{q}=\langle 111\rangle$.

The magnetic excitations measured using the triple-axis spectrometers TASP and RITA-2 at SINQ are spin waves and were analysed using classical spin-wave theory. Application of a magnetic field significantly perturbs the spiral spin-liquid correlations, and is a topic for our further research.

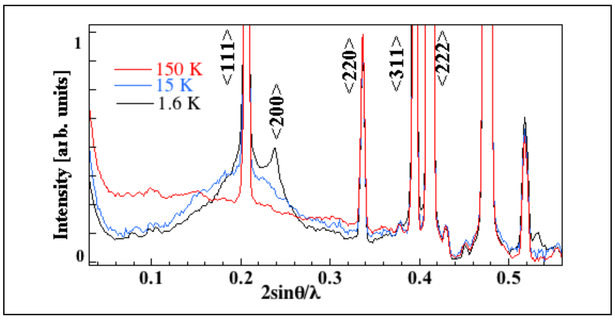


Figure 1: **Powder neutron diffraction patterns of $CoAl_2O_4$ collected on the DMC diffractometer at SINQ. Diffuse scattering below the <111> and <200> Bragg peaks is a signature of the spin-liquid state.**

References

[1] D. Bergman et al., Nature Physics **3** 487 (2007).
[2] O. Zaharko et al., Phys. Rev. B **81** 064416 (2010).
[3] O. Zaharko et al., Phys. Rev. B **84** 094403 (2011).

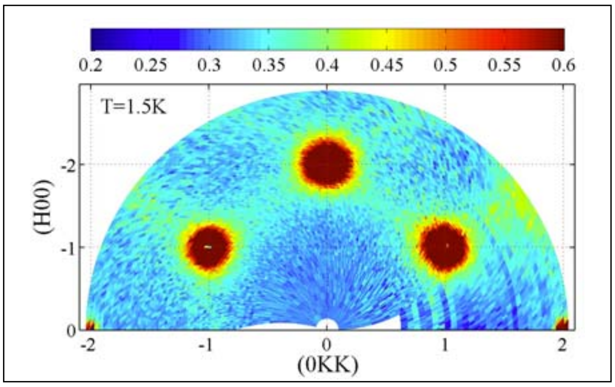


Figure 2: **Single-crystal neutron diffraction pattern obtained on the IN14 spectrometer at ILL, Grenoble. Lorentzian line shapes of magnetic Bragg peaks and diffuse scattering between them indicate the unconventional state.**

Alkali-metal intercalated FeSe superconductors

Anna Krzton-Maziopa, Ekaterina Pomjakushina and Kazimierz Conder, *Laboratory for Developments and Methods;* Zurab Shermadini, Alex Amato, Hubertus Luetkens and R. Khasanov, *Laboratory for Muon Spin Spectroscopy;* Vladimir Pomjakushin and Denis Sheptyakov, *Laboratory for Neutron Scattering; all PSI*

The recent discovery of iron-based high-temperature superconductors has represented a milestone for research on superconductivity. Coming more than 20 years after the discovery of high-temperature superconductivity in cuprates, this has triggered huge interest, as magnetic ions were thought to be antagonistic to the occurrence of superconductivity. In 2011, much effort by many PSI groups was devoted to the question of how magnetic iron ions can coexist with superconductivity and has led, among other fascinating findings, to the discovery of a new superconductor.

Among the iron-based superconductors, iron chalcogenides, as FeSe, have the simplest layered structure. The superconducting transition temperature (T_c) of FeSe is only 8 K, but can be increased up to about 14 K by doping with Te and to over 30 K by applying a high pressure. A large increase of T_c can also be achieved by alkali metal intercalation between the FeSe layers. Following published works on $K_xFe_{2-y}Se_2$, a huge effort on the synthesis of intercalated $A_xFe_{2-y}Se_2$ was started at PSI, leading to the growth of large single-crystals and to the discovery of superconductivity in $Cs_xFe_{2-y}Se_2$ ($T_c \approx 30$ K) [1].

As observed in the cuprates, iron-based superconductors also exhibit interplay between magnetism and superconductivity, suggesting the possible occurrence of unconventional superconducting states. A unique feature of intercalated $A_xFe_{2-y}Se_2$ is the presence of robust antiferromagnetism. The muon-spin spectroscopy technique (μSR) has been instrumental in discovering such a state [2], which is characterized by an extraordinarily high Néel temperature – of the order of 500K.

Another feature of this system is the presence of an iron-vacancy superstructure that, together with antiferromagnetic ordering, has been studied by neutron and synchrotron X-ray diffraction [3].

Hence, by combining the different analysis techniques available at PSI, a comprehensive investigation of the relevant properties of this fascinating new class of superconductors is possible and has been started.

References

[1] A. Krzton-Maziopa et. al., J. Phys. Condens. Matter **23** 052203 (2011).

[2] Z. Shermadini et al., Phys. Rev. Lett. **106** 117602 (2011).

[3] V. Pomjakushin et al., Phys. Rev. B **83** 144410 (2011) and J. Phys. Condens. Matter **23** 15600 (2011).

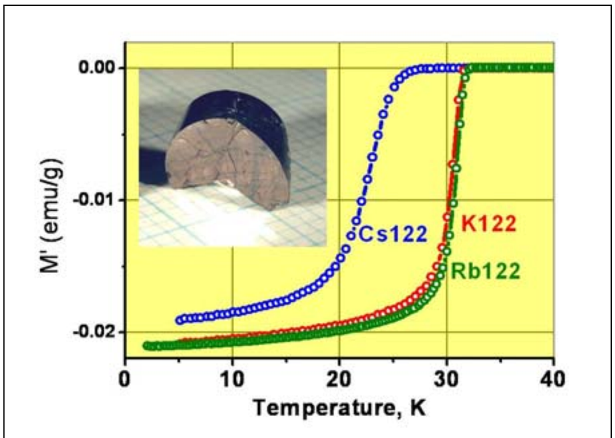


Figure 1: **Magnetisation curves for $A_xFe_{2-y}Se_2$ single crystals, with A=K, Rb and Cs showing clearly the superconducting transitions.**

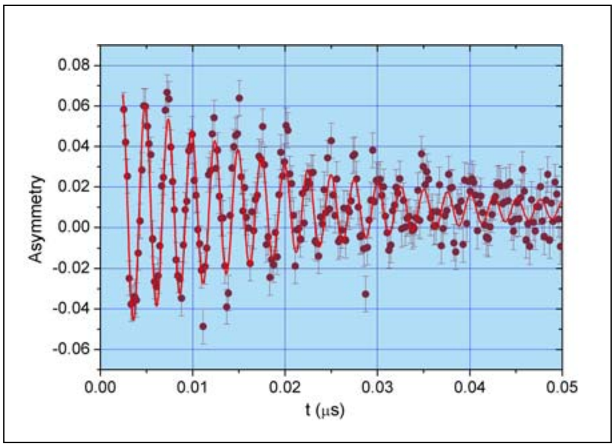


Figure 2: **μSR signal on $Cs_xFe_{2-y}Se_2$ obtained at 10K. Note the clear spontaneous oscillations revealing a magnetically ordered state.**

Higgs physics and rare particle decays

Klaus Kirch, Urs Langenegger, Angela Papa and Michael Spira, *Laboratory for Particle Physics (LTP), PSI*

Particle physics aims at understanding the nature of the most fundamental particles and interactions. The PSI Laboratory for Particle Physics runs a research programme titled "Precision and discovery physics at low and high energies" with theoretical and experimental activities at the forefront of the field. Major contributions to LHC activities at CERN and unique precision physics experiments at PSI test the present Standard Model of particle physics. Here, the theoretical and experimental highlights in Higgs physics and rare B-meson decays at the LHC and those of the MEG experiment at PSI are summarized. All activities rely on a network of national and international collaborations and make optimal use of PSI's strengths in technological development and beams of the highest intensity. The comparison of calculations with new measurement results puts significant constraints on new models and theories of particle physics.

Particle physics seeks to identify the elementary constituents of nature, and to discover the fundamental forces acting between these constituents. Ordinary matter and non-gravitational interactions are described by the Standard Model (SM), which comprises two kinds of matter particles (quarks and leptons), three fundamental forces (the strong, electromagnetic and weak interactions) and the Higgs sector as the origin of mass via spontaneous symmetry breaking. The SM constitutes a quantum field theory valid down to microscopic distances of the order of 10^{-18} m. The only SM particle that has escaped detection so far is the Higgs boson. The search for this is one of the most important endeavours at present and future collider experiments.

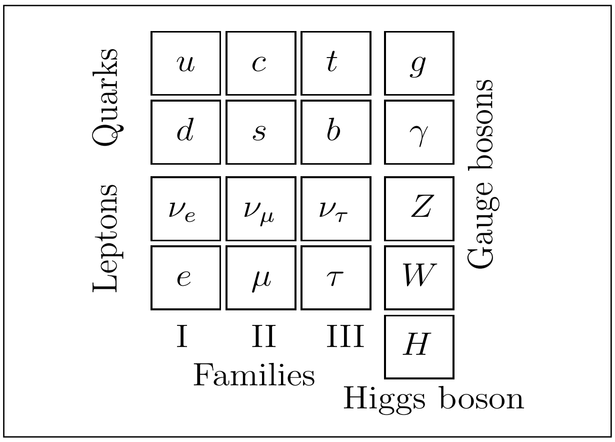


Figure 1: **Particles of the Standard Model grouped into 3 families: quarks and leptons, gauge bosons and the Higgs boson. The quarks and leptons interact electromagnetically, mediated by photon (γ) exchange, and weakly mediated by W- and Z-boson exchange. The quarks interact, in addition, strongly, mediated by gluon (g) exchange. The Higgs boson, H, is responsible for mass generation and has not yet been discovered.**

Quarks and leptons are grouped into three families (see Figure 1). The first family contains the electron and the electrically neutral electron-neutrino as leptons, as well as the up and down quarks. The protons and neutrons are built of up and down quarks and form atomic nuclei as strong-interaction bound states. The electron-neutrino appears as a product of radioactive decays. The second family contains the muon and muon-neutrino as leptons, and the strange and charm quarks. The tau lepton and tau-neutrino joined by the bottom and top quarks belong to the third family.

The fundamental forces, i.e. the strong, electromagnetic and weak interactions, are mediated by the exchange of gauge bosons, which are the basic carriers of the forces and observable as particles in collider experiments. The gauge boson of the electromagnetic interaction is the massless photon, while the massive W- and Z-bosons mediate the weak interactions, with a limited range of about 10^{-18} m. Strong interactions are described by the exchange of gluons between the quarks.

The SM has been extensively tested in experiment and no significant deviation has so far been discovered. Despite the success of the SM, it leaves several questions unanswered and generates several theoretical problems. Some of the latter are deeply rooted in the Higgs sector and can be solved by the introduction of supersymmetry (SUSY). Supersymmetry is a novel symmetry connecting bosons and fermions and has not yet been observed.

Other problems concern the mechanisms behind flavour mixing effects (e.g. mixing of the down and strange quarks) in the

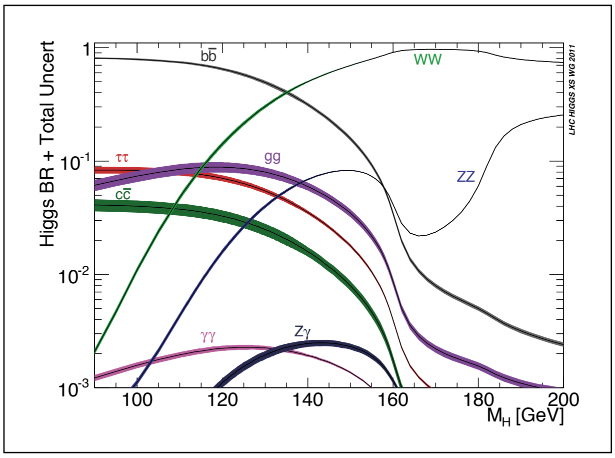


Figure 2: **Higgs boson branching ratios and their uncertainties for the low mass range (taken from Ref. [2]).**

hadronic (among quarks) and the leptonic sectors. The electromagnetic and strong interactions do not induce any flavour transitions, but the weak interactions do. The quark mixing effects are the only known source for CP violation within the SM. The CP quantum number distinguishes particles from antiparticles. CP violation is one of the necessary ingredients to answer the question of why our universe contains matter and almost no antimatter. However, the degree of CP violation within the SM has so far turned out to be insufficient to explain this asymmetry.

An option to test the amount of CP violation in nature is to determine the electric dipole moment of the neutron (nEDM). An observation of this effect in the nEDM experiment at PSI would indicate either new physics beyond the SM or effects from a non-trivial topology of the SM ground state, while a non-observation will impose strong constraints on these models ([1] in this report).

A possibility for solving the puzzle of the matter-antimatter asymmetry of the universe is to introduce lepton-flavour violation (LFV) in the context of Grand Unified Theories, which unify the fundamental forces at very high energies. Since LFV induced by the experimentally established neutrino oscillations is strongly suppressed, new physics models beyond the SM are required. LFV effects can be tested, for example, in the forbidden decays $\mu^+ \to e^+\gamma$. A discovery of this decay in the MEG experiment at PSI would immediately signal new physics. On the other hand, the non-observation of this decay process would imply strong constraints on new-physics models.

Theoretical activities

The big success of the SM to describe the experimental data is significantly based on very involved calculations of quantum corrections to experimentally measured processes. The Theory Group of PSI's Laboratory for Particle Physics (LTP) has been involved in the determination of the best available predictions for the Higgs boson branching ratios with a detailed estimate of the residual uncertainties [2]. The results are shown in Figure 2. Depending on the unknown Higgs boson mass M_H, one can read off the probability of the (unstable) Higgs particle to decay into specific final states, such as two photons ($\gamma\gamma$), and the corresponding uncertainties given by the sizes of the coloured bands. This work has been performed within the LHC Higgs Cross-Section Working Group that was formed in 2010 to provide the most up-to-date predictions of Higgs boson production and decay processes for the searches at the Large Hadron Collider (LHC) experiments at CERN. These calculations and predictions are used by all LHC experiments for the Higgs searches. The observation of the proper branching ratios will be a universal test of any SM Higgs candidates.

The MEG experiment

It is true to say that, over the course of time, the motivation for the search for the $\mu^+ \to e^+\gamma$ decay has changed. Nevertheless, the process itself has always maintained a fundamental role: "Is the electron emitted by the meson with a mean lifetime of about 2.2 microseconds accompanied by a photon of about 50 MeV?", Pontecorvo asked some sixty years ago.

Lepton-flavour violation (LFV) research is currently one of the most exciting branches of particle physics. Flavour-violating processes, such as $\mu^+ \to e^+\gamma$, which are not predicted by the SM, are very sensitive to 'new physics'. Neutrino oscillations are now an established fact, which can be accommodated into the SM by including massive neutrinos and mixing. This modified SM, however, predicts non-measureable branching ratios (BR – fraction of particles decaying in a particular way) for lepton-violating decays. Supersymmetric GUT theories naturally house finite neutrino masses and predict rather large, and measurable, branching ratios for LFV decays, which for $\mu^+ \to e^+\gamma$ is expected to be between ~10^{-14} and 10^{-11} (SU(5) or SO(10) SUSY-GUT models), close to the previous best upper limit set by the MEGA collaboration (BR = 1.2×10^{-11} at 90 C.L.). Evidence for a $\mu^+ \to e^+\gamma$ decay would be an unambiguous signature of new physics, while a more stringent limit would still have an important impact on the validity of various physics scenarios.

The MEG experiment is designed to achieve, as its goal, a single-event sensitivity of ~10^{-13}, two orders of magnitude better than the MEGA experimental limit and within the reach of theoretical predictions.

During 2009 and 2010, a total of 1.8×10^{14} μ^+ were collected. A candidate $\mu^+ \to e^+\gamma$ event is characterized by five measured

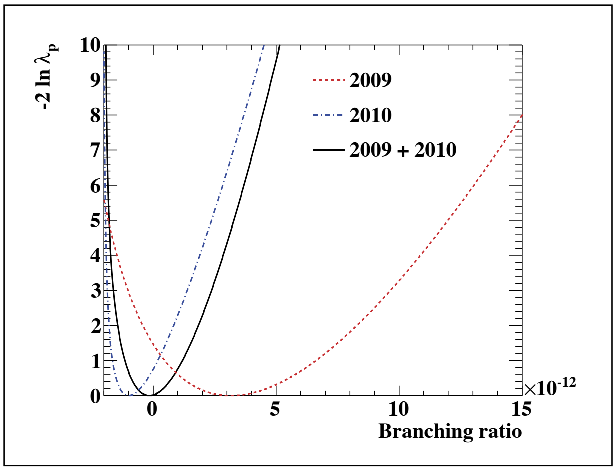


Figure 3: **Profile likelihood ratios as a function of the $\mu^+\to e^+\gamma$ branching ratio for 2009, 2010, and the combined 2009 and 2010 data sample.**

kinematic parameters: positron energy E_e, gamma energy E_γ, relative time between positron and gamma $t_{e\gamma}$ and the opening angles between the two decay particles $\theta_{e\gamma}$ and $\phi_{e\gamma}$.

The data analysis used is based on a likelihood method combined with a blinding procedure. Those events falling into a pre-defined window ('blinding box') containing the signal region for the observables E_γ and t_γ are saved in separate hidden files and opened only when the analysis procedure is completely defined; the $\mu^+\to e^+\gamma$ decay is then searched for within this sample. The other events, outside of this window ('side bands'), are used for optimizing the analysis parameters, studying the background and, finally, constructing the probability density functions (PDFs).

Several improvements were implemented in the 2010 analysis framework and, where possible, were also extended to the 2009 sample. These improvements include a new alignment technique for the drift chamber system and the relative alignment of the photon detector and positron spectrometer, a better understanding of the gradient magnetic field map and an improved spectrometer performance evaluation. A profile likelihood procedure was adopted, with a constraint of the background rates from the side bands being used in the likelihood analysis.

The likelihood function is written in terms of the Signal ($\mu^+\to e^+\gamma$), Radiative decay ($\mu^+\to e^+\nu_e\bar{\nu}_\mu\gamma$) and Accidental background (an e^+ from standard muon decay and a γ from radiative decay or annihilation-in-flight) number of events, weighted by their PDFs. The Signal PDF is the product of the correlated variables E_e, $\theta_{e\gamma}$, $\phi_{e\gamma}$, $t_{e\gamma}$ and the uncorrelated E_γ. The Radiative decay PDF is the product of $t_{e\gamma}$ (which is the same as for the signal) and the other remaining correlated variables folded with the detector response functions. The Accidental PDF is the product of the five measured variables in the side bands.

The confidence interval on the number of $\mu^+\to e^+\gamma$ decays (N_{sig}) is computed based on a frequentist approach, with profile likelihood ratio ordering and converted into a branching ratio value by normalizing N_{sig} to the number of stopped muons.

The observed profile likelihood ratios as a function of the branching ratio for 2009, 2010, and the combined data sample are shown in Figure 3. The analysis of the full data sample gives a 90% C.L. upper limit of 2.4×10^{-12} [3], which constitutes the most stringent limit on the existence of the $\mu^+\to e^+\gamma$ decay, a factor 5 better than the previous best upper limit.

The systematic uncertainties for the parameters of the PDFs and the normalization factor are taken into account in the calculation of the confidence intervals by varying the PDFs according to the uncertainties. The larger contributions to the systematic uncertainty come from the uncertainties of the offsets of the relative angles, the correlations in the positron observables, and the normalization. This amounts to a shift of about 2%, in total, in the branching ratio upper limit.

During 2011, the MEG experiment collected a data sample comparable to the 2009+2010 statistics and plans to continue data-taking with the aim of reaching a branching ratio sensitivity of a few times 10^{-13} during the next few years.

The CMS Experiment

B_s particles are bound states of a bottom and a strange quark. They are produced copiously at the Large Hadron Collider (LHC) – the proton-proton collider at CERN (Geneva). The fraction that subsequently decays (known as the 'branching fraction') into a pair of easily-detected muons is strongly suppressed in the Standard Model (SM) – only about three such decays are expected per billion B_s particles produced. Many extensions of the SM, e.g. supersymmetric models, predict substantial enhancements of this branching fraction, thanks to new particles that would contribute to the decay through virtual quantum fluctuations. Therefore, any enhancement of this branching fraction would be indicative of 'new physics'.

The PSI analysis team has searched with the CMS experiment for the decays of B_s particles (and B^0 particles, the bound state of a bottom and a down quark) to muon pairs using proton-proton collision data collected up to June 2011. A challenging aspect of this search is reducing the very large background from other B-hadron decays or particles misidentified as muons. The pixel detector, designed and built at PSI, is a crucial detector to distinguish between signal candidates and background.

The number of candidate decays observed in the available data sample is so far consistent with Standard Model expectations (including both signal and background). Given the

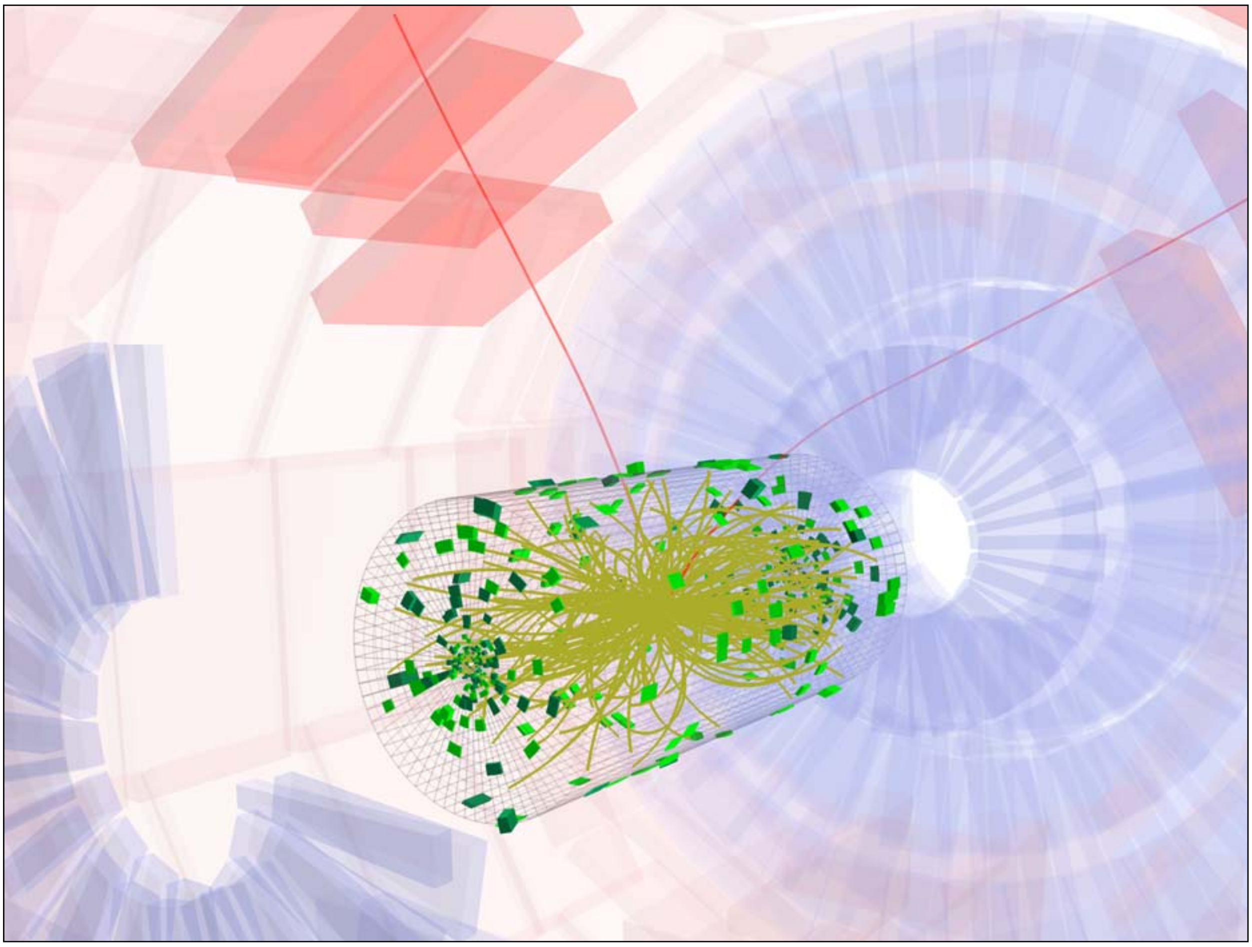


Figure 4: **Illustration of a proton-proton collision event with two muons (red lines) that are consistent with arising from a B_s decay. The green lines indicate the trajectories of charged particles and the green blocks show the energy deposits in the electromagnetic and hadronic calorimeter. The transparent blocks illustrate detector elements of the CMS experiment.**

absence of a significant excess, CMS has excluded (at a 95% confidence level) branching fractions larger than 1.9×10^{-8} and 4.6×10^{-9} for the decay of B_s and B_0 particles, respectively. At the EPS HEP conference (July 2011), this result was combined with the result of the LHCb collaboration to obtain an upper limit of 1.1×10^{-8}. This is particularly interesting because an excess of the decay of a B_s particle into two muons was reported in June 2011 from the CDF experiment at the Tevatron. Results from the LHC experiments CMS [4] and LHCb do not confirm the CDF results.

The data that CMS collected in the remainder of 2011, and the additional data expected to be collected in 2012, will significantly extend the sensitivity down to smaller branching fractions, eventually to the level of the SM expectation of 3×10^{-9}.

Figure 5: **The pixel detector at the centre of the CMS after the installation stage at CERN.** (Photo: H.R. Bramaz)

References

[1] B. Blau, K. Kirch, B. Lauss and Ph. Schmidt-Wellenburg; *The new Ultracold Neutron user facility UCN delivers first neutrons to the nEDM experiment,* This report

[2] A. Denner, S. Heinemeyer, I. Puljak, D. Rebuzzi and M. Spira, Eur. Phys. J. C**71** 1753 (2011).

[3] J. Adam et al. (MEG Collaboration), Phys. Rev. Lett. **107** 171801 (2011).

[4] S. Chatrchyan et al. (CMS Collaboration), Phys. Rev. Lett. **107** 191802 (2011).

Diamonds are Forever – Nanofocusing of hard XFEL radiation

Christian David, Sergey Gorelick, Simon Rutishauser, Petri Karvinen and Vitaliy A. Guzenko, *Laboratory for Micro- and Nanotechnology, PSI,* and Oliver Bunk, *Laboratory for Macromolecules and Bioimaging, PSI;*
Jacek Krzywinski, Marco Cammarata and David M. Fritz, *Stanford Linear Accelerator Laboratory, Menlo Park, USA;*
Liubov Samoylova, Jan Grünert and Harald Sinn, *European XFEL, Hamburg, Germany*

While the X-ray laser SwissFEL is in its planning phase, the development of suitable instrumentation has already started. An international team of researchers, led by PSI, has succeeded in focusing hard XFEL radiation to submicron dimensions. In order to avoid damage by the intense radiation pulses, it was essential to produce novel diffractive lenses from diamond. The unprecedented radiation densities in the focus will enable X-ray scientists and biologists to reveal the interaction mechanisms of complex biomolecules.

At several locations in the world, a new generation of radiation source based on the X-ray free-electron laser (XFEL) principle is emerging. In 2010, the Linac Coherent Light Source, LCLS, at Stanford, USA, started delivering first laser pulses in the hard X-ray range and the SACLA source in Hyogo, Japan, went into operation in 2011. Such sources emit extremely short radiation pulses (typically 100 fs (= 10^{-13} s)), a billion times brighter than conventional synchrotron sources. The SwissFEL facility planned at PSI will have comparable beam properties, and is expected to give new insights in various fields of science, such as atomic physics, condensed matter physics and ultra-fast femtochemistry.

Diffract and destroy

The highest expectations are of the feasibility of imaging single macro-molecules, such as proteins, with atomic resolution, in order to understand their structure and biological functionality. Such experiments are extremely challenging. As the incident radiation will instantly destroy the molecules, it is essential to collect sufficient scattered intensity from single molecules using only a single laser pulse. This way, the relevant image information can be collected with femtosecond exposure, fast enough to outrun the mechanisms of radiation damage – an approach termed “diffract and destroy”. However, as biomolecules are only weakly scattering, it requires focusing of the already extremely bright pulses into the smallest possible spot, in order to reach sufficiently high radiation levels.

Reflection vs. diffraction

The facilities at Stanford and Hyogo intend to use X-ray mirror systems for high-resolution focusing, while we have pursued an alternative approach based on Fresnel lenses. Instead of

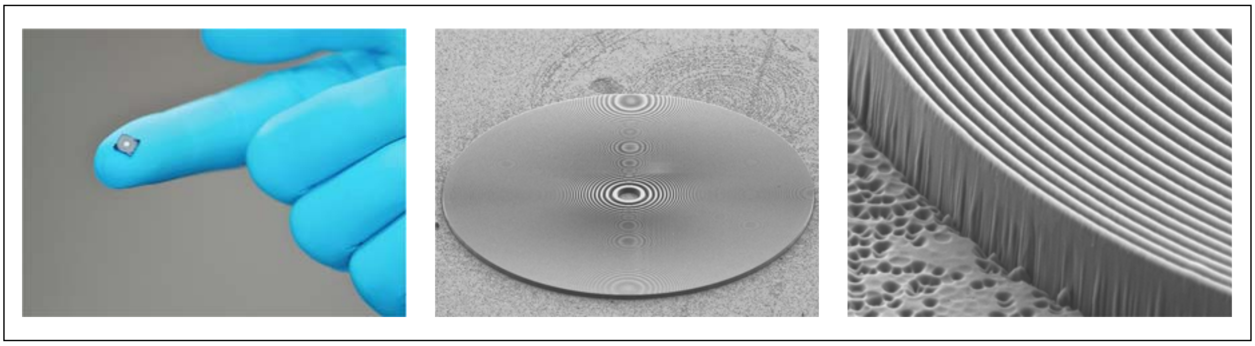


Figure 1: **Fresnel lens made of diamond for the nanofocusing of intense X-ray laser pulses. The lens diameter is 0.5 mm, just large enough to collect the full laser beam. The outer ring structures are 100 nm wide.**

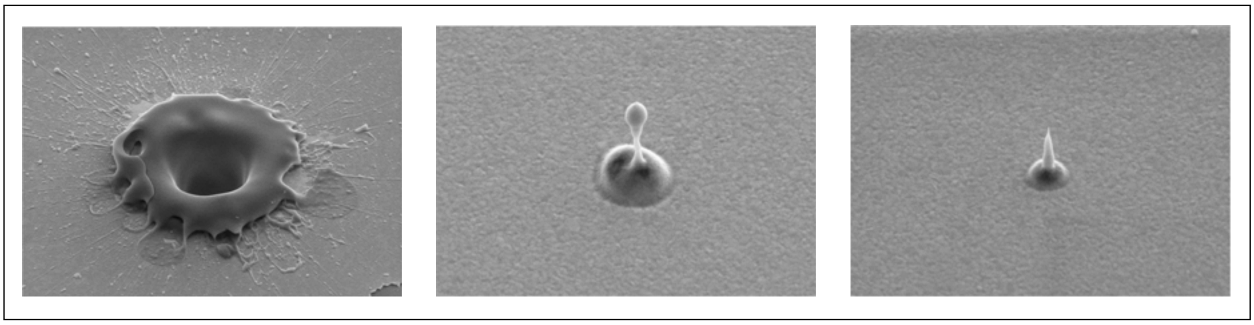


Figure 2: **XFEL pulses focused by a Fresnel zone plate create craters in a metal-coated glass surface by ablation. At full pulse power, the diameter is several micrometers (left). For strongly attenuated pulses, the crater size is reduced to 500 nm (centre) or 200 nm (right). The focal spot size and peak radiation density can be derived from such experiments. Molten glass is ejected from the substrate, sometimes forming sharp tips at the centre of the crater. The photon energy was set to 8 keV.**

reflection, these devices focus X-rays by diffraction by ring-shaped grating structures with dimensions of the order of only 100 nanometres, which are fabricated using high-resolution lithography processes on membranes transparent to X-rays (see Figure 1). Such diffractive lenses are commonly used for high-resolution imaging at synchrotron-based X-ray microscopes. However, their application at X-ray lasers had not previously been seriously considered. It was predicted that the tiny nanostructures would be too fragile to withstand the extremely intense XFEL radiation. Indeed, we confirmed in an experiment at the Stanford X-ray laser that conventional Fresnel lenses made of gold nanostructures melted down within seconds of exposure to the full beam of LCLS.

Diamonds are forever

Diamond provides an ideal alternative, due to its unsurpassed thermal conductivity, temperature stability and low X-ray absorption. However, it had never been used as a material for diffractive X-ray lenses, therefore requiring the development of a dedicated nanofabrication process.
In order to enhance the diffraction efficiency, the diamond structures were filled with Iridium by collaborators at the University of Helsinki. It turned out that this combination of a refractory metal in close thermal contact with a diamond matrix can resist the radiation levels of the Stanford X-ray laser.
To obtain the maximum possible radiation density, it is crucial to concentrate the X-ray photons onto the smallest possible spot. A measurement of the focal size using conventional methods, such as the scanning of a test structure, could not be applied here. The extreme peak power in the focus would have led to the perforation of any object in the beam. Instead, we used this effect during a first experimental run at the Stanford laser by measuring the size of craters created on a sample surface (see Figure 2) at varying levels of beam attenuation. A focal size of 320 nm was derived from these experiments as the best value ever recorded with XFEL radiation.
Moreover, a record-breaking power density of 4×10^{17} W/cm^2 was achieved. For a molecule at the focal point, this corresponds to a dose of about 10,000 X-ray photons per atom.

Room for improvement

It remains to be seen if this is sufficient for solving the structure of single molecules. The performance of the focusing optics can, however, still be significantly improved. The diffraction efficiency has meanwhile been improved from only 10% to above 30% by stacking two Fresnel lenses on top of each other. In addition, the spot size obtained was limited by the inevitable chromatic aberrations of the diffractive optics. The bandwidth of around 0.2% of the LCLS pulses led to an increase of the measured spot size by a factor of 3 compared with the diffraction-limited value. Newer XFELs, such as SwissFEL, will be based on seeded emission with reduced bandwidth, and should thus enable us to reach smaller foci, of the order of only 100 nm. Improved efficiency and a tighter focus will lead to a strong enhancement of the peak dose available for imaging. Values exceeding 10^5 photons per atom in a single femtosecond pulse are within reach.

References

[1] C. David et al., *Nanofocusing of hard X-ray free-electron laser pulses using diamond-based Fresnel zone plates,* Scientific Reports **1** 1–5 (2011).

True 3D nanofabrication in polymers

Helmut Schift and Arne Schleunitz, *Laboratory for Micro- and Nanotechnology, PSI*

Three-dimensional surface topographies have been fabricated using a combination of greyscale electron-beam lithography and thermal reflow. The method is based on the dependence on molecular weight of glass transition temperature variations after exposure and can be used for the fabrication of moulds with both sharp features and continuous profiles. These topographies can be replicated in established mass fabrication processes, such as roll-to-roll and injection moulding. New applications in optical and biotechnology become possible when smooth surfaces with lens- and prism-like shapes are needed.

Current micro- and nanofabrication techniques involve resist patterning methods using photon, X-ray or electron-based lithography. Complex electronic functions can be realized step by step, which is a prerequisite for processors and memory chips in computers and other electronic devices. More and more applications in optics and biotechnology make use of the patterning capabilities of modern lithographic tools, but they are often restricted to the two dimensions given by the 'black and white' masking process (called 'binary').

Simple three-dimensional (3D) shapes, such as lenses or prisms, needed to collect light into the pixels of detector chips in digital cameras, or to direct light into the waveguide of an integrated optical circuit, cannot be fabricated this way. Although modern lithographic tools enable greyscale patterning by dose modulation of the writing beam during exposure, the resulting shapes resemble more closely the continuous step-by-step patterning known from binary lithography than the true 3D patterning needed for prisms and lenses. Thus, alternative technology approaches are required to enable novel products. We have developed a process which enables the fabrication of a variety of true 3D shapes with smooth surfaces (Figure 1) [1, 2]. This is possible because we make use of a physical coincidence in manufacturing which occurs in two fields of patterning techniques for thin polymer films used at PSI: exposure by electron-beam lithography (EBL) and thermal processing by nano-imprint lithography (NIL) [3]. In EBL, the ability of the polymer to be etched by specific solvents when immersed in wet developer solution is highly dependent

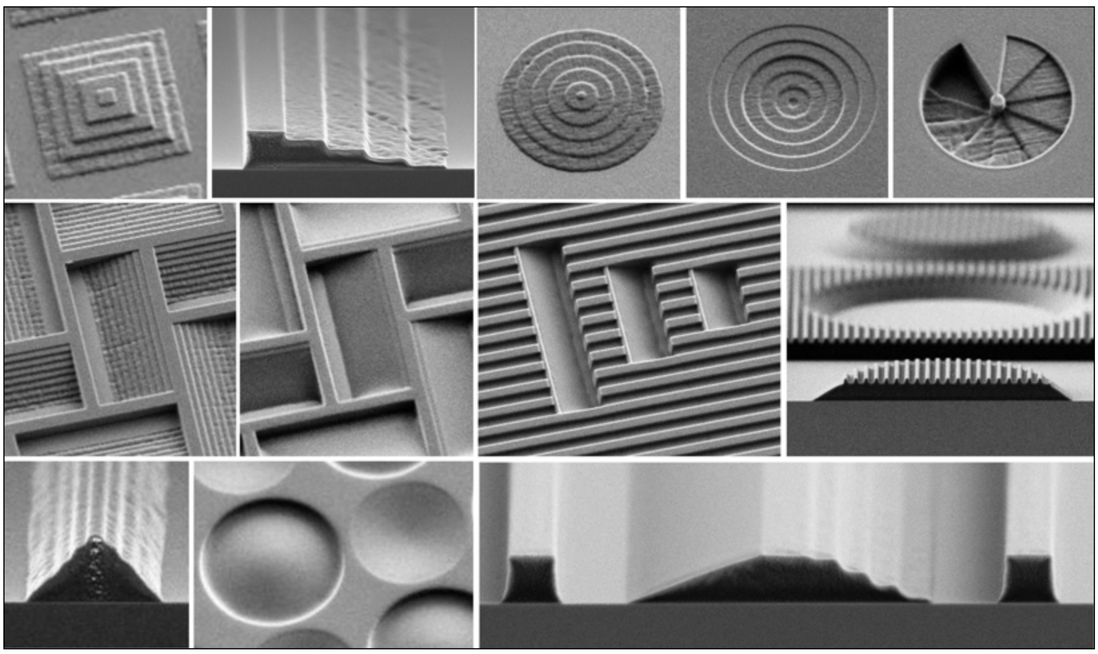


Figure 1: **Scanning electron micrographs of a variety of 3D shapes in resist fabricated by a combination of greyscale electron-beam lithography and selective thermal reflow (typical lengths of slopes are 2 to 5 µm).**

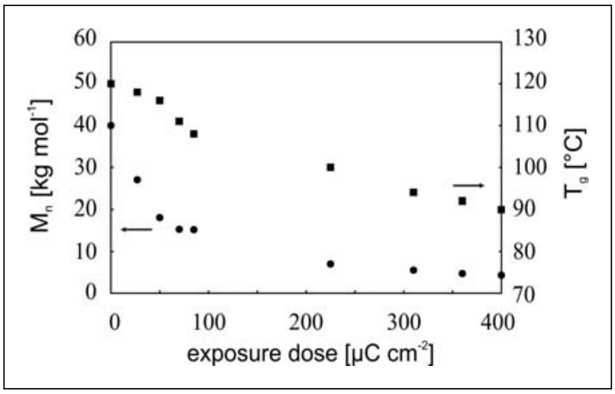


Figure 2: **A molecular weight (M_n) reduction of PMMA resist upon electron-beam exposure results in a reduction of the glass transition temperature, T_g, of almost 30 K, which allows selective reflow.**

on its specific molecular weight, M_n, which corresponds to the length of polymeric chains. Similarly, in NIL, the polymer's ability to move and flow when heated above a specific temperature, characterized by the glass transition temperature T_g, depends on M_n, too.

Because the molecular weight is modified by exposure, we can selectively etch and flow according to a layout. Since we use the same polymer for both processes (poly (methyl methacrylate), also known as PMMA or Plexiglas), we are able to combine these two processes and to generate true 3D structures with a wide range of shapes. Together with experts from polymer science, we have clarified the underlying polymer physics and were able to define processing windows (Figure 2). This way, we can even smoothen out stepped shapes in one area of the masked wafer and leave others unaffected. This is needed by a growing number of research activities emerged from the technology-driven academic community, as well as application-driven industry. Applications include, for example, optical elements for LED backlighting in flat panel displays as well as enhanced micro- and nanofluidics for the life sciences (Figure 3).

3D applications in industry and research

The process was developed and first used by PSI in the framework of NaPANIL (nanopatterning, production and applications based on nanoimprint lithography), a European-funded Large-Scale Project, together with 16 partners from industry, academia and private institutes (2008–2012) [4]. The project aims to create scalable nanomanufacturing processes for arbitrary 3D surfaces with features well below 100 nm, in the fields of optical components and life sciences. Three innovative industrial applications were selected that need advanced processing techniques for devices with 3D surface structures, for which solutions were not known or lacked the design freedom needed to generate optimized shapes according to their function. In this framework, PSI's new capability to fabricate 3D structures via selective reflow has contributed significantly towards achieving this goal. The 3D structures will be used to generate stamps which, in turn, can be used in high-volume production, such as hot embossing, roll-to-roll embossing and injection moulding. We will further exploit the capabilities of the patented process in future collaborations, particularly in the framework of the INKA Institute – a joint venture with the University of Applied Sciences Northwestern Switzerland, in Windisch.

References

[1] A. Schleunitz and H. Schift, *Fabrication of 3-D patterns with vertical and sloped sidewalls by grayscale electron-beam lithography and thermal annealing,* Microelectron. Eng. **88**(8) 2736–2739 (2011).

[2] A. Schleunitz and H. Schift, *Fabrication of 3-D nanoimprint stamps with continuous reliefs using dose-modulated electron beam lithography and thermal reflow,* J. Micromech. Microeng. **20** (2010) 095002.

[3] H. Schift, *Nanoimprint lithography: An old story in modern times? A review,* J. Vac. Sci. Technol. B **26**(2) 458–480 (2008).

[4] NaPANIL Project, http://www.napanil.org/.

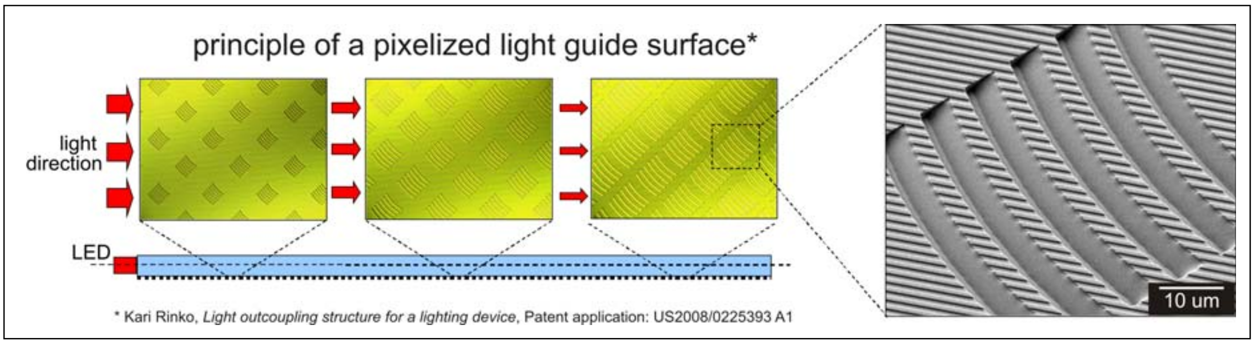


Figure 3: **A backlighting device uses microprism arrays with varying density to enable homogeneous out-coupling of light from a film-like waveguide (the display) that is emitted from diodes (LED) at the side.**

Structure of flagella by cryo-electron tomography

Takashi Ishikawa, *Laboratory of Biomolecular Research, PSI*

Three-dimensional structural analysis is essential for our understanding of biological mechanisms. However, to cover structures at various scales and over different resolution ranges, we need interdisciplinary approaches. In addition to X-ray crystallography and X-ray imaging, biological transmission electron microscopy is starting at PSI. In this article, we want to give an overview of electron microscopy as a method for reconstructing the 3D structure of biological specimens, referring to our recent studies on flagella, which constitute the bending apparatus of eukaryotic cells. They enable cells to swim or cause extracellular fluid to flow through the lung and the kidney.

Visualization of the three-dimensional structure of biological molecules, macromolecular complexes, organelles and cells gives us indispensable information towards understanding the mechanisms of biological functions. Knowledge of a 3D structure also enables us to build strategies for designing drugs. A wide variety of activities for biological structural studies has already been started at PSI, and recently a new methodology was added: cryo-electron microscopy (cryo-EM) and tomography. The possibilities and unique biological insights obtainable by this methodology will be discussed below.

Electron microscopy for biology

X-ray crystallography and NMR (nuclear magnetic resonance spectroscopy) are two major approaches for analyzing the 3D structure of biological molecules and macromolecular complexes. With these methods, atomic structure can be revealed (at 3.5 Å or higher resolution), which gives us precise knowledge about biochemical reactions occurring inside, or between, biological molecules (see [1] in this report). However, for crystallography and NMR, target molecules (proteins or nucleic acids) must be purified. Molecular structures in the cell cannot be seen with these methods. On the contrary, optical microscopy is a powerful technique for visualizing entire cells and, with antibody labelling or fluorescent tags, locating molecules of interest in the cell. However, optical microscopy cannot achieve enough resolution to reveal the 3D conformation of molecules. Recent developments in X-ray microscopy might enable higher resolution, but it will still be difficult to visualize the 3D structure of molecules in cells. Since biological molecules in our body function through complex and dynamic interactions with other molecules inside the same cell, we are keen to see the molecular structure in such an intact state.

Cryo-EM is a suitable technique for analyzing the 3D structure of highly complex biological molecules and their interactions. A biological specimen is embedded in amorphous ice, either by plunge freezing (for a thin sample, such as one composed of molecules or organelles) or by high-pressure freezing (for a thick sample, such as one of eukaryotic cells). Electron micrographs of a frozen sample are obtained from various orientations and merged to form a 3D image of the structure. There are two practical ways of obtaining images from different orientations. When there are many objects which share the identical structure but show different orientations (for example, purified molecules in solution), it is possible to determine view angles by computation (single-particle analysis). When the target is heterogeneous (such as cells) and there are no other objects with identical structure, different views can still be obtained by tilting the specimen in the microscope. This method uses the same principle as computed tomography and is called electron tomography.

Interdisciplinary biological imaging

As mentioned above, X-ray crystallography, NMR, EM as well as X-ray and optical microscopy do not compete with each other; they complement each other. Molecules (proteins, nucleic acids) are solved at atomic resolution by crystallography or NMR. These structures will be fitted to the density map obtained from cryo-EM (or electron tomography) to build the atomic structure of large complexes and organelles.

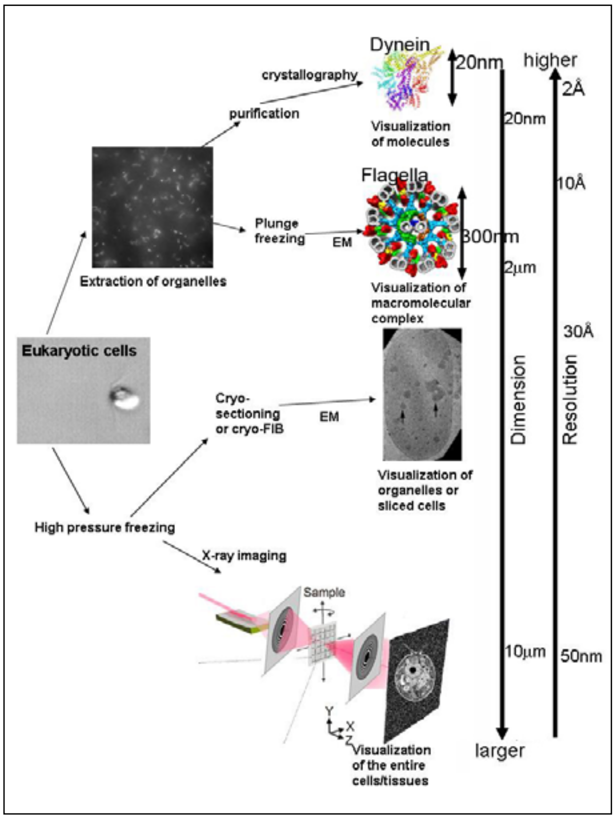


Figure 1: **Diagram of interdisciplinary biological imaging. Top right: Dynein structure by crystallography. Second from top: Flagella structure by cryo-electron tomography.**

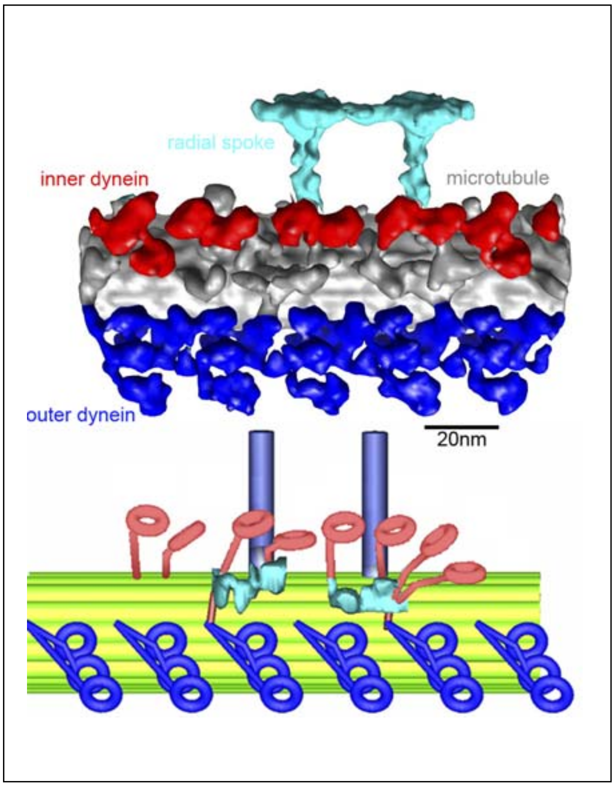


Figure 2: **The 3D structure of one of nine microtubules from flagella revealed by cryo-electron tomography (top) and the molecular architectures of dynein motor proteins (red and blue), with regulators (bottom).**

X-ray and optical microscopy give us a view of entire cells (Figure 1). To understand biological functions, we need to combine a number of methods.

Structure of flagella

We have analyzed the 3D structure of flagella/cilia by cryo-electron tomography. Flagella are bending organelles (~0.3 µm thickness and 5~10 µm length) which enable cells to swim (for example, in sperm) or cause extracellular fluid to flow through the lung and the kidney (in embryo, this fluid determines the right- and left-hand sides of our body). Flagella consist of nine microtubules (components of the skeleton of the cell) surrounding two microtubules. They are connected by regulator complexes called radial spokes [2]. We extract flagella from green algae *Chlamydomonas* (on the left in Figure 1) to make a specimen thin enough for EM. By merging electron micrographs of frozen flagella seen from different orientations, we have obtained the 3D structure of the entire flagellum (second from the top, on the right of Figure 1). From this analysis, the detailed molecular architecture in flagella was revealed. It was known that dynein motor proteins are responsible for flagellar bending motion. Dynein (red in the second diagram from the top, on the right of Figure 1) causes sliding of nine microtubules (grey). Our tomography proved that dyneins form longitudinal arrays (red in Figure 2) and vertical stacks (blue), with the tail oriented towards the tip of the flagella and the head towards its base, to enable regulation of bending and acceleration, respectively [3, 4]. Each dynein consists of a ring-shaped head and a tail, discovered from crystallography by other groups [5, 6]. We have proved that dynein causes reconformation of the tail to shift the ring and generate force [7].

From further analysis by electron tomography, we expect to reveal the mechanism of motility and the regulation of flagella. Combination with X-ray imaging may enable us to visualize the flagella in entire cells.

References

[1] J. Standfuss, X. Deupi and G. Schertler, *The molecular basis of vision,* This report.
[2] G. Pigino et al., J. Cell Biol. **195** 673-687(2011).
[3] K.H. Bui et al., J. Cell Biol. **183** 923-932 (2008).
[4] K.H. Bui et al., J. Cell Biol. **186** 437-446 (2009).
[5] A.P. Carter et al., Science **331** 1159-1165 (2011).
[6] T. Kon et al., Nat. Struct. Mol. Biol. **18** 638-642 (2011).
[7] T. Movassagh et al., Nat. Struct. Mol. Biol. **17** 761-767 (2010).

The molecular basis of vision

Jörg Standfuss, Xavier Deupi and Gebhard F. X. Schertler
Laboratory of Biomolecular Research, PSI

Our visual sense is based on the absorption of light by photosensitive pigments in the retina of the eye. These visual pigments, or rhodopsins, include the Vitamin A derivative retinal as the actual light-sensitive molecule. Absorption of light changes the structure of the retinal molecule from the deactivating, inverse agonist *cis* form to the fully activating agonist *trans* form. This initial step triggers nucleotide exchange in the visual G protein as the next step in the visual cascade. Our recent crystal structures of light-activated rhodopsin containing *trans* retinal provide an important frame to understand the molecular basis of our visual sense. In addition, they provide the most native-like models on which to study conserved features in the activation mechanism of other members of the G protein-coupled receptor (GPCR) family – a large family of membrane proteins mediating messages transported via various mechanisms, including hormones, neurotransmitters and olfactory stimuli.

A structural view of rhodopsin activation

We are studying the structural changes in rhodopsin using stabilized, constitutively active mutants that favour the active conformation of the receptor. Co-crystallization of light-activated mutants with the C-terminus of the catalytic G protein subunit (GαCT), and data collection using the crystallography beamlines at SLS, allowed us to determine X-ray structures of the fully active metarhodopsin-II conformation [1, 2]. Comparison with the structure of dark-adapted rhodopsin provides direct molecular insights into how light-induced isomerisation of retinal translates to the structural changes in the receptor that allow the G protein to bind (Figure 1). Opening of the G protein-binding site is characterized by a displacement of the

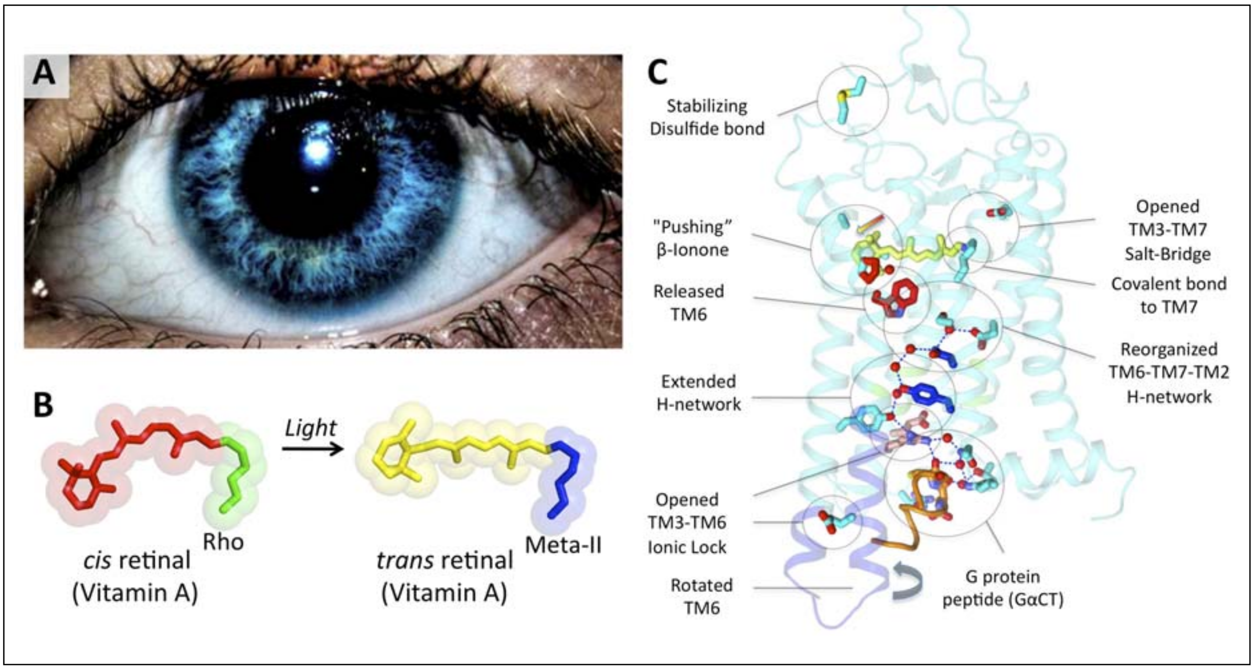


Figure 1: **The human eye (A) contains highly specialized pigments (rhodopsins) that bind retinal as photoactive chromophore. Light-induced isomerization of retinal (B) leads to conformational changes in rhodopsin and the formation of the activated photopigment metarhodopsin-II. The crystal structure of metarhodopsin-II (C) allows exciting insights into the molecular basis of our visual sense.**

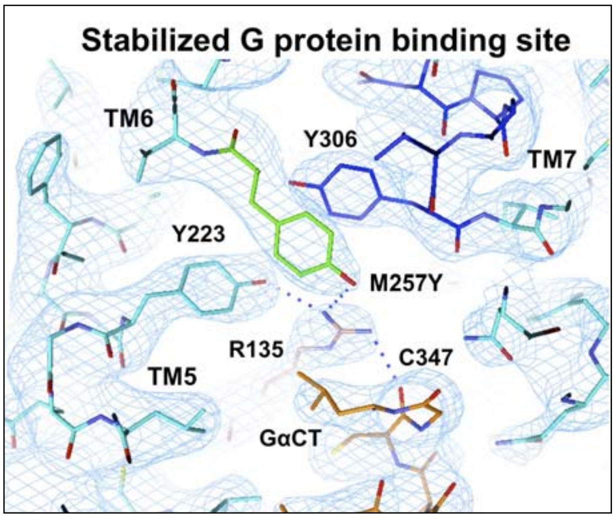


Figure 2: **Stabilizing effect of the constitutively active M257Y mutation. The 2Fo-Fc density map (A, blue mesh, contoured at 1.5σ) obtained by crystallographic analysis of M257Y rhodopsin allows clear positioning of the tyrosine substitution (green) between the highly conserved NPxxY (dark blue) and E(D)RY sequence motifs (salmon) that bind the G protein peptide GαCT (orange).**

cytoplasmic side of TM6 and originates from three intramolecular activation pathways through TM5/TM3, TM6 and TM7/TM2 [3].

Conserved GPCR activation pathways

Besides our visual sense, GPCRs mediate cellular responses to an extensive array of hormones, neurotransmitters and olfactory stimuli. Despite the relevance of these proteins in human physiology and pharmaceutical research, we have only recently started to understand the structural basis of ligand binding and activation. In the period 2008–2011, active-like structures of three GPCRs were solved. Among them, our structure of light-activated metarhodopsin-II represents so far the most native-like model of an active GPCR. As such, it is an important template to understand how agonists activate GPCRs and to what extent this mechanism is conserved throughout the extensive GPCR family [4]. This question is of paramount pharmacological interest, as 30% of all commercially available drugs target the GPCR-mediated signalling gateways for medical intervention.

Constitutive activity as a cause of diseases

Constitutively active mutants are ubiquitously found among GPCRs and are often related to pathologic outcomes. Many wild-type GPCRs have intrinsically high levels of basal activity with important functional implications, for example to GPCR subtype specificity. Our structures of constitutively active mutants help us to understand constitutive activation on a structural level and, by extension, variable basal activity levels among different members of the GPCR family. In many cases, constitutive activity originates from disruptions in helix-helix interactions and a resulting destabilization of the inactive conformation. Our crystal structures provide two examples in which the molecular basis for constitutive activity has other more specific components. In the first case, the effect originates from modifications in the ligand-binding pocket and, in the second case, through a stabilization of the G protein-binding site (Figure 2).

It thus appears necessary to investigate the molecular causes of constitutive activity on a case-to-case basis. This is especially true for rhodopsin mutants that cause hereditary diseases, such as retinitis pigmentosa or congenital stationary night blindness, where specific molecular causes may open up the possibility for directed intervention by small molecular drugs.

References

[1] X. Deupi, P. Edwards, A. Singhal, B. Nickle, D.D. Oprian, G.F. Schertler and J. Standfuss, *Stabilized G protein binding site in the structure of constitutively active metarhodopsin-II,* Proc. Natl. Acad. Sci. USA **109** 119–124 (2011)

[2] J. Standfuss, P.C. Edwards, A. D'Antona, M. Fransen, G. Xie, D.D. Oprian and G.F. Schertler, *The structural basis of agonist-induced activation in constitutively active rhodopsin,* Nature **471** 656–660 (2011).

[3] X. Deupi, J. Standfuss and G.F. Schertler, *Conserved activation pathways in G protein coupled receptors,* Biochemical Society Transactions, in press (2012).

[4] X. Deupi and J. Standfuss, *Structural insights into agonist-induced activation of G-protein-coupled receptors,* Curr. Opin. Struct. Biol. **21** 541–551 (2011).

Haptocorrin-selective Cobalamin derivatives for specific tumour-targeting

Evelyne Furger[1], Dominik Frei[2], Robert Waibel[1], Roger Schibli[1], Andrea Prota[2] and Eliane Fischer[1]
[1] *Center for Radiopharmaceutical Sciences, ETH-PSI-USZ (joint institution of ETH Zurich, PSI and the University Hospital Zurich)*
[2] *Laboratory for Biomolecular Research, PSI*

Cobalamin (Cbl, Vitamin B12) derivatives can be used for tumour targeting, because proliferating cells require high amounts of the vitamin. We recently described novel Cbl derivatives which accumulate in certain tumours by an unknown, alternative mechanism, presumably mediated by the transport protein haptocorrin. We have now analysed the biodistribution of a haptocorrin-selective Cbl derivative in mice with human lung cancer and found specific accumulation at the tumour site. To further study its ligand specificity based on the crystal structure and ligand binding assays, haptocorrin was recombinantly expressed in mammalian cells. Our insights can now be used for future design and evaluation of Cbl-derived conjugates for diagnostic or therapeutic drug delivery to haptocorrin-expressing tumours.

Haptocorrin-selective Cbl-derivatives accumulate in tumours

Haptocorrin-selective cobalamin derivatives specifically accumulate in some tumours, including lung adenocarcinoma and melanoma [1]. We have established a mouse model of human lung adenocarcinoma (HCC827 cells), which is specifically targeted by a ^{99m}Tc-labelled Cbl derivative (^{99m}Tc-PAMA4-Cbl, Figure 1).
In vivo, this derivative travels a different pathway than normal Cbl, because binding to transport proteins, with the exception of haptocorrin, is abolished. This results in favourable tumour targeting properties. Because haptocorrin-selective Cbl derivatives do not accumulate substantially in healthy organs (e.g. kidney or liver), they are promising vehicles to specifically deliver cytotoxic payload to the tumour site. Furthermore, haptocorrin accepts a relatively broad range of Cbl derivatives, and therefore permits functionalisation of Cbl without loss of binding affinity.

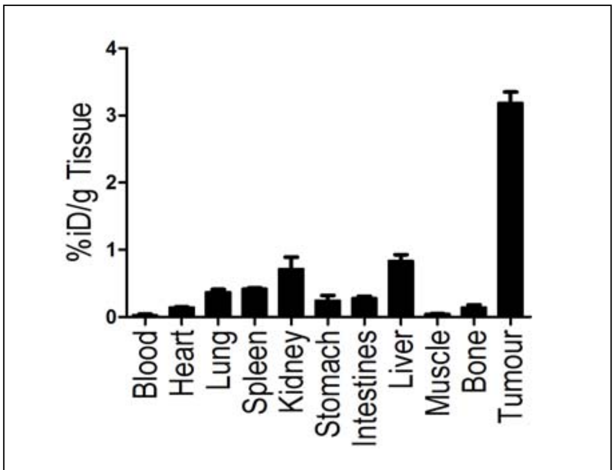


Figure 1: **Biodistribution of the haptocorrin-selective Cbl derivative ^{99m}Tc-PAMA4-Cbl in a nude mouse with xenografted human lung cancer.**

Crystal structure of recombinant haptocorrin

Haptocorrin is a heavily glycosylated protein (40% carbohydrates). Unlike the other two Cbl transport proteins (transcobalamin and intrinsic factor), recombinant expression and crystallisation have not been reported so far. We successfully expressed recombinant human haptocorrin in HEK293-RicR cells and purified it to >98% purity after Ni^{2+} affinity and size-exclusion chromatography. Crystals of the protein were obtained by the sitting-drop vapour diffusion technique. Diffraction data were collected from single crystals at beamline X06SA at the Swiss Light Source and the structure was solved with molecular replacement and refined to a resolution of 2.6 Å.
The overall structure of the protein is very similar to the two other known Cbl transport proteins, with a two-domain architecture and Cbl buried at the interface of the two domains (Figure 2). However, key amino acids in the Cbl-binding site differ among the three proteins and may contribute to ligand selectivity.

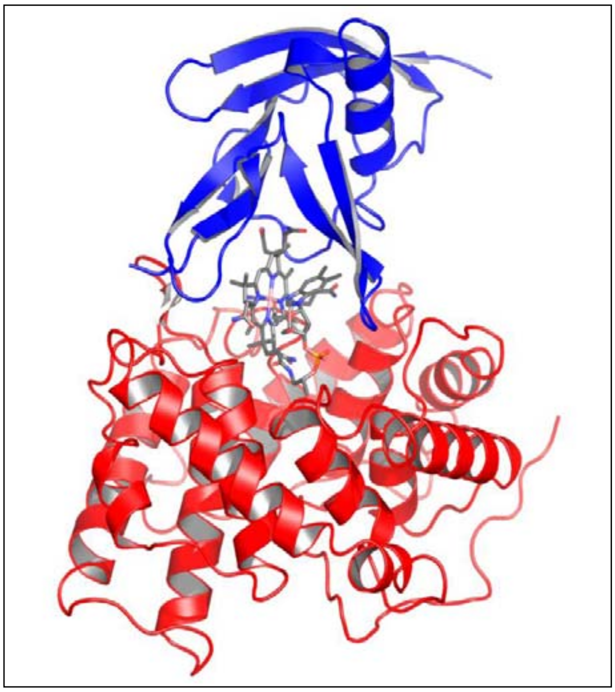


Figure 2: **Structure of haptocorrin-Cbl complex. The ligand Cbl is buried between the two domains of the transport protein.**

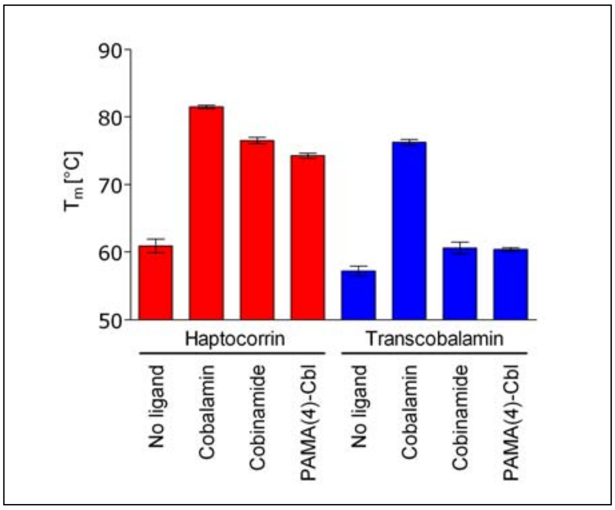


Figure 3: **Melting temperatures of haptocorrin and transcobalamin without ligand and in complex with Cbl-based ligands. Cobinamide and PAMA(4)-Cbl are haptocorrin-selective ligands.**

Evaluation of novel B12-derivatives for tumour targeting

With the crystal structures of all three transport proteins known, specific Cbl derivatives can be designed and further studied *in vitro* and *in vivo*. We used a thermal shift assay to study the binding ability of various Cbl derivatives to the three known transport proteins. Ligand binding to a protein can stabilise its native state and increase the melting temperature, T_m, of the protein-ligand complex when compared with the apo-protein. Binding of Cbl to haptocorrin raises its T_m by around 20°C (Figure 3). This substantial increase in Tm reflects the extremely high affinity of Cbl to haptocorrin (K_D<pM). Most haptocorrin-selective ligands show a slightly lower increase in T_m upon binding. We are currently investigating different novel classes of Cbl derivatives, including Pt(II)-conjugates [2], which could be used to specifically deliver cytotoxic platinum to tumour cells, or Cbl-mimics containing a peptide backbone [3]. Further *in vivo* studies are envisaged, to investigate the therapeutic potential of such new classes of Cbl-based drugs.

Conclusions

We have shown that haptocorrin-selective Cbl derivatives specifically accumulate in a lung carcinoma xenograft. In addition, we were able to express high amounts of pure recombinant haptocorrin and solved its crystal structure. Unique structural features that account for ligand selectivity, together with ligand binding studies, can be used for future design and evaluation of Cbl-derived conjugates for diagnostic or therapeutic drug delivery to haptocorrin-expressing tumours.

References

[1] R. Waibel et al., Cancer Res. **68**(8)2904–2911 (2008).

[2] P. Ruiz-Sanchez et al., J. Biol. Inorg. Chem. **16**(1),33–44 (2011).

[3] K. Zhuo and F. Zelder, Angew. Chem. Int. Ed. **49**(30), 5178-5180 (2010).

Folate Receptor Targeted Radionuclide Tumour Therapy using a novel Folate Radioconjugate

Cristina Müller, Nadja Romano, Harriet Struthers and Roger Schibli
Center for Radiopharmaceutical Sciences ETH-PSI-USZ, Paul Scherrer Institute and Department of Chemistry and Applied Biosciences, ETH Zurich

Targeting the folate receptor (FR) with folate-based radiopharmaceuticals has emerged as a valuable strategy for imaging and therapy of cancer. However, the generally high renal uptake of radiofolates presents a significant drawback for therapeutic application because of potential damage to the kidneys by particle radiation. Herein, we report the design and evaluation of a novel folate radioconjugate with an albumin binding entity, which improves the pharmacokinetic properties significantly, allowing, for the first time, the application of FR-targeted radionuclide therapy in a mouse model with human cancer xenografts.

Background

The folate receptor (FR) has emerged as a valuable tumour marker for nuclear imaging with folate-based radioconjugates [1, 2]. Due to the high frequency of cancer diseases that express the FR (e.g. ovarian, cervical, lung, kidney and colon cancers), a therapeutic application would be of considerable interest [3]. In this respect the generally high renal accumulation of radiofolates presents a significant drawback, because of the risk of damage to the kidneys by therapeutic radiation [4]. Thus, the establishment of a method for increasing the tumour-to-kidney ratio of radioactivity is a prerequisite for a therapeutic application of folate-based radiopharmaceuticals.

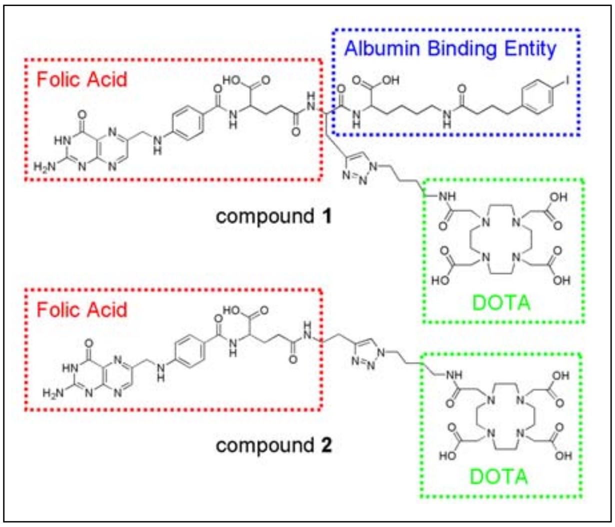


Figure 1: **Chemical structures of the novel DOTA-folate conjugate with an ablumin binding entity (1) and the control compound (2).**

Aim of the study

We hypothesized that increasing the circulation time of a folate radioconjugate would improve the tumour uptake while, at the same time, reducing undesired retention of radioactivity in the kidneys. This goal could potentially be achieved by the installation of an albumin binding entity which interacts with this long-circulating serum protein. The aim of this study was therefore to develop and evaluate a novel folic acid conjugate comprising a small molecular-weight albumin binding entity (Figure 1).

Novel design of a folate radioconjugate

Folic acid was functionalized with a 1,4,7,10-tetraazacyclododecane-1,4,7,10-tetraacetate (DOTA)-chelating system for coordination of radiometals (Compound **2**, Figure 1). The novel folate conjugate **1** comprised, in addition, an albumin binding entity [5] which had previously proved to increase circulation time of small molecules in the blood (Figure 1) [6]. Radiolabelling was performed with lutetium-177 (β^-, $t_{1/2}$ = 6.7d) at a specific activity of 40 MBq/nmol and a radiochemical yield of >98%. Both radiofolates (^{177}Lu-**1** and ^{177}Lu-**2**) were stable (>99%) in human plasma in vitro over several days.
Uptake and internalization of ^{177}Lu-**1** in FR-positive KB tumour cells was high and FR-specific and thus comparable to the control compound ^{177}Lu-**2**. Ultrafiltration of ^{177}Lu-**1** in plasma revealed significant binding to serum proteins compared with unmodified ^{177}Lu-**2**, which did not display albumin binding properties.

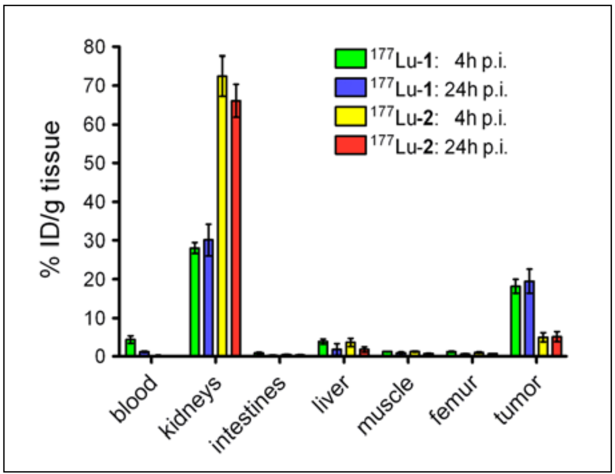


Figure 2: **Biodistribution data of ^{177}Lu-1 and the control compound ^{177}Lu-2.**

In-vivo biodistribution studies

The tissue distribution of the novel ^{177}Lu-DOTA-folate (^{177}Lu-**1**) resulted in an unprecedentedly high tumour uptake (17.56% ID/g, 4h p.i.), which was almost completely retained over at least 72h (Figure 2). In addition, kidney retention was significantly reduced (~28% ID/g, 4h p.i.) compared with previously obtained results with DOTA-folate conjugates [4, 7] and the control compound ^{177}Lu-**2** (~70% ID/g, 4h p.i., Figure 2).

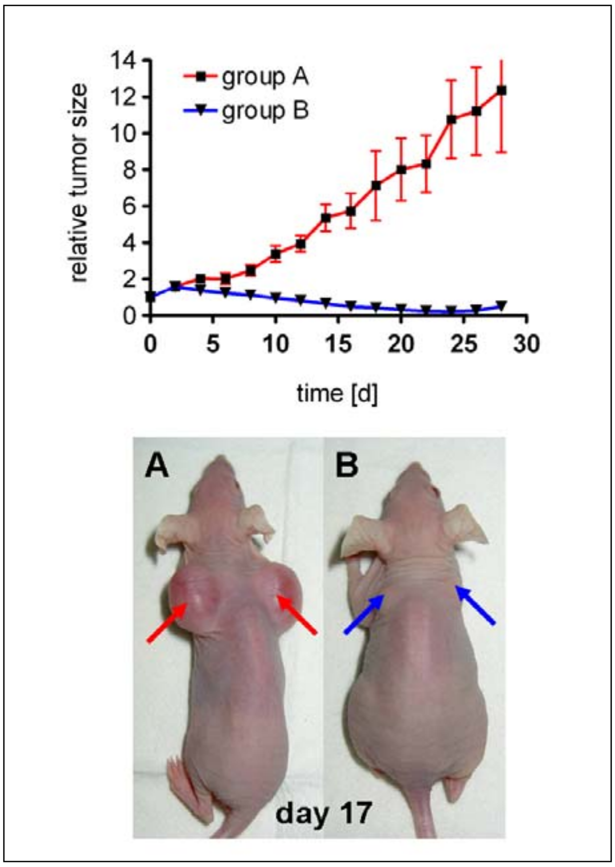


Figure 3: **The graph shows the relative tumour size of untreated control mice (Group A, red) and of treated mice (Group B, blue). The pictures of one representative mouse of each group were taken on Day 17.**

Pilot therapy study in tumour mice

In a pilot radionuclide therapy study, two groups (A and B) of five mice each were injected with either only saline (A), or with 20 MBq of the novel ^{177}Lu-radiolabelled DOTA-folate **1** (B). We observed a significant inhibition of tumour growth in treated mice compared with mice which received only saline (Figure 3).
The difference in tumour size between mice of Group A and mice of Group B is shown in Figure 3, in pictures of one representative mouse of each group taken at Day 17 after therapy. As a consequence of the reduced tumour growth after therapy, survival of the mice in Group B was significantly prolonged (>2-fold) compared with that of the untreated controls (Group A).

Conclusion

Modification of a folate conjugate with an albumin binding entity (compound **1**) had a positive influence on the absolute tumour uptake and on the tumour-to-kidney ratio, which was increased >5-fold. These findings represent a breakthrough in the field of FR-targeting, because they allow, for the first time, the therapeutic application of a folic acid radioconjugate. Preliminary results of a therapy study in KB tumour-bearing nude mice indicate the promising potential of the novel ^{177}Lu-DOTA-folate conjugate (^{177}Lu-**1**) for effective and safe therapeutic application.

Acknowledgments

We gratefully thank Dr. Konstantin Zhernosekov, Alain Blanc, Josefine Reber and Christian Winiger for their technical assistance during this project.

References

[1] C. Müller et al., J. Nucl. Med. **52** 1–4 (2011).
[2] E.I. Sega and P.S. Low, Cancer Metastasis Rev **27** 655–664 (2008).
[3] N. Parker et al., Anal. Biochem. **338** 284–293 (2005).
[4] C. Müller et al., Nucl. Med. Biol. **38** 715–723 (2011).
[5] C.E. Dumelin et al., Angew. Chem. Int.**17** 3196–3201 (2008).
[6] M.S. Dennis et al., Cancer Res. **67** 254–261 (2007).
[7] C. Müller et al., Eur. J. Nucl. Med. **36** 938–946 (2009).

Beam-assisted girder re-alignment at the SLS

Michael Böge, Karsten Dreyer and Andreas Streun, *Department of Large Research Facilities (GFA), PSI;*
Edi Meier, *edi meier + partner AG, Winterthur, Switzerland*

Emittance, the product of particle beam size and divergence, represents to what extent beams can be concentrated and thus defines performance of light sources, colliders or particle factories. In electron storage rings, synchrotron radiation determines emittance. Horizontal emittance is largely specified by beam energy and ring circumference, while the vertical one has an ideally very small natural limit. By March 2011, the vertical emittance at the SLS had already improved to < 2 pm-rad at 2.4 GeV, with the limitation given by spurious vertical dispersion, η_y. Magnet alignment data were analyzed in order to localize the sources of η_y and to eliminate them by re-alignment of the supporting girders. Within seven months in 2011, the girders were adjusted remotely with a stored beam and fast orbit feedback running, which culminated in a world-record emittance of 1 pm-rad being established in December 2011. This result will lead to an improved beam quality for the SLS users.

Introduction

Light sources like PSI's Swiss Light Source (SLS) need well-defined control of the vertical emittance in order to limit particle losses at low-gap in-vacuum insertion devices. Furthermore, hard X-ray beamlines can potentially make use of the very small beam sizes of ≈1 µm RMS (estimated for 1 pm-rad at the centre of the SLS short straight sections). For R&D on this subject, the work package "SLS Vertical Emittance Tuning" (SVET) was included in the project "Test Infrastructure and Accelerator Research Area" (TIARA), which started in January 2011 within the Seventh EU Framework Programme (FP7) [1]. Minimization of the vertical emittance is accomplished by reducing betatron coupling and spurious vertical dispersion to very small values. However, even after excellent (≈5 µm RMS) beam-based alignment (BBA) of beam position monitors (BPMs) with respect to adjacent quadrupoles, mechanical misalignments of the magnets cause orbit deviations in quadrupoles and sextupoles and require excitation of dipolar correctors for orbit correction, thus exciting significant betatron coupling and spurious vertical dispersion, η_y. Correction of this effect requires the introduction of extra skew quadrupoles at dispersive ($\eta_x > 0$) and non-dispersive ($\eta_x = 0$) locations of the lattice in order to control spurious vertical dispersion η_y and betatron coupling. At the SLS, 12 dispersive and 24 non-dispersive skew quadrupoles have been installed for this purpose.

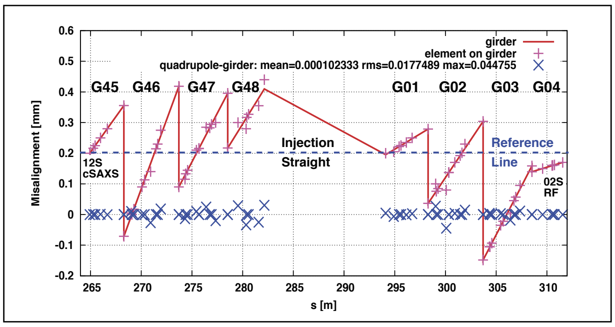


Figure 1: **Quadrupole misalignments (+) in the sectors to left and right of the injection straight. The red line is the corresponding girder fit for eight girders (G45-48, G01-04). The deviation of the individual quadrupole errors from the fit (×) exhibits an RMS of ≈18 µm. The alignment measurement error amounts to ≈10 µm over a distance of 2 m.**

Beam-assisted girder re-alignment

In order to approach the ultimate limit of vertical emittance, which has as its main contribution the present η_y measurement resolution of ≈50 µm, sources of η_y need to be eliminated. After analysing the vertical corrector pattern, girder-to-girder misalignments in the arc centres at the location of the central dipoles were identified to be the major source of η_y. The spatial corrector pattern analysis requires an orbit correction scheme based on singular value decomposition (SVD) or an equivalent technique, utilizing a large number of (or preferably all) eigenvalues in order to localize the girder-to-girder distortions [2]. Analysis of vertical misalignment data taken in 2010 for all

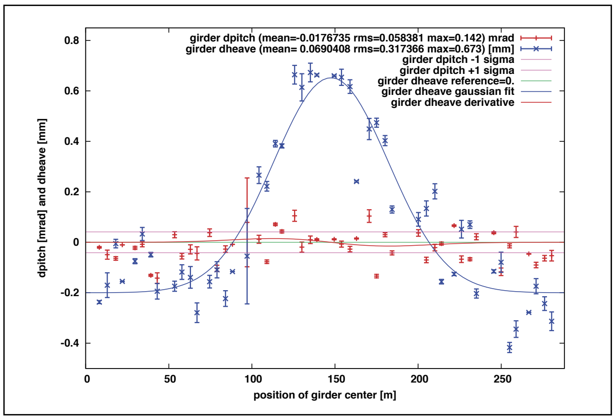


Figure 2: **Proposed pitch (+) and heave (×) changes for all girders, based on the quadrupole alignment survey data taken in 2010. The girders were aligned to a smooth, non-zero reference line (solid blue line).**

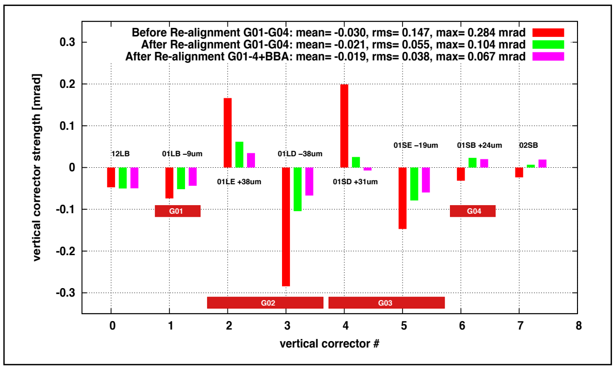


Figure 3: **Vertical corrector strengths in Sector 1, before (red bars) and after re-alignment (green bars), and after successive beam-based alignment (BBA) of six quadrupole/BPM pairs (magenta bars).**

quadrupoles revealed that the corrector settings were closely correlated to the measured vertical quadrupole positions. Furthermore, the misalignments of the 177 quadrupoles are highly correlated, since they are grouped on 49 girders, which turned out to be the main source of the misalignments. As an example, Figure 1 depicts the quadrupole misalignments in the sectors adjacent to the injection straight. The deviation of the individual quadrupole errors from the fit to the girders shows an RMS value of only ≈18 µm, which is ≈10 times smaller than the fitted RMS girder misalignments.

The necessary pitch (vertical angle) and heave (vertical position) changes for all girders are summarized in Figure 2. Since the suggested heave corrections exceed +0.6 mm, a reference line has been defined by the fit of a smooth function to the corrections. The re-alignment of the girders to this non-zero reference line does not affect machine performance, due to its long spatial wavelength.

In April 2011, the re-alignment campaign was launched, based on the 2010 survey data. By the end of November, all girders had been successfully re-aligned. The re-alignment was merely done with a stored beam and running fast orbit feedback, since the girders are remotely controlled [3] and the orbit effects of the proposed girder movements can be dynamically handled by the orbit correction system. This procedure allows very precise control of the re-alignment process, since the corrector variations within the feedback loop directly reflect the girder manipulations. Simultaneously, the movement of the girders is also monitored by the hydrostatic levelling system (HLS) [4], which in most cases confirms the vertical adjustment within a few µm. As an example, the vertical corrector strengths in Sector 1 are shown in Figure 3, before and after re-alignment. It can be seen that the RMS strength has reduced from 147 to 55 µrad. Since the 17 m-long arc vacuum chambers did not follow this movement completely, the successive beam-based alignment of six quadrupole/BPM pairs led to a further reduction to 38 µrad. As a side effect, the reduction in corrector strength allows the current range of the dipolar corrector power supplies to be reduced, resulting in a significant increase in their resolution.

Summary

A complete vertical re-alignment of the SLS was carried out within seven months. The vertical dispersion, η_y, was corrected to 1.3 mm RMS using only half the dispersive skew quadrupole strength with respect to the initial situation in March 2011. The vertical corrector strength was reduced from ≈130 to ≈50 µrad RMS. The procedure was based on the vertical quadrupole alignment survey data taken in 2010 and involved the remotely controlled movement of 49 girders, with circulating beam and running fast orbit feedback. Based on the re-alignment, a world-record emittance of 1 pm-rad [5] was achieved in December 2011. It is foreseen to re-survey the vertical quadrupole positions in order to repeat the beam-assisted re-alignment procedure.

References

[1] TIARA WP6: SVET R&D Infrastructure (http://www.eu-tiara.eu/rtd/index.php?id=42)

[2] M. Böge et al., *SLS Vertical Emittance Tuning,* Proc. of IPAC'11, San Sebastian, September 2011.

[3] S. Zelenika et al., *The SLS storage ring support and alignment systems,* Nucl. Instr. Meth. A **467** 99-102 (2001).

[4] F.Q. Wei et al., *Data Analysis of SLS Hydrostatic Leveling System in 2003,* PSI Scientific and Technical Report 2003 Volume VI, March 2004.

[5] M. Aiba et al., *Ultra Low Vertical Emittance at SLS Through Systematic and Random Walk Optimization,* to be published.

Proton Radiation Therapy at PSI – Patient treatment in a non-hospital environment

Gudrun Goitein *for the Radiation Medicine Team, Center for Proton Therapy at PSI*

The use of charged particles, in particular protons, was first initiated in 1954 to take advantage of the possible reduction of dose to normal tissues that were not affected by a tumorous disease and that had limited tolerance to radiation. This baseline strategy has not changed for almost 60 years, neither for the use of charged particles in medicine nor for conventional radiotherapy. The developing world-wide use of linear accelerators in hospitals, however, has triggered remarkable technical and physical developments that are challenging for existing and planned proton therapy facilities, including those at PSI.

From the design of a prototype to an established medical programme

Since 1997, when PSI had the first full-beam period for proton radiotherapy using its unique spot-scanning gantry, we have annually reported on patient numbers and the performance of the facility. The setting up of the ambulatory therapy installation was initially 'typical' for particle therapy, as all but one of the facilities in the world were located in physics research centres. The only hospital-based proton therapy facility was at the Loma Linda University Medical Center in California, where, since 1990, patients were, and still are, treated using gantries as well as fixed horizontal beamlines. The beam application at Loma Linda was, as in all other facilities, that of passive scattering with the use of field-specific collimators and compensators.

When introducing a new technology into medicine, it is mandatory to define the medical needs and to understand the possibilities and limitations of the technical/physical tool. Using the advanced characteristics of spot-scanning technology, and knowing the technical and physical characteristics that are relevant for defined anatomical regions and situations of disease, influenced the choice of the indications for which pencil beam scanning would be best suited, meaning where scanned protons would be most promising in terms of precise spatial dose distribution.

Deep-seated lesions in the area of the base of skull, meningiomas, sarcomas of soft tissue and bones and low-grade gliomas, as well as paediatric tumours, were chosen – in close collaboration with the Swiss Radiation Oncology Centres – to be the histologies and sites we currently treat at PSI. Remarkable long-term results, reported mainly by the group at the Harvard Cyclotron in collaboration with the Massachusetts General Hospital Boston, had been the basis for our decision. The operating conditions in a physics research institute, the restrictions regarding indications, and the dependence on patient referrals from outside PSI greatly limited the number of treatments, in particular during the first 9 years of the project. However, we used the yearly shut-down months of PSI's main accelerator as important periods to modify and improve our technology, and our procedures with and around the patients, and to analyze treatment outcomes. Spot-scanning beam application was an in-house development of PSI and it had to be proven that it was safe, reliable and patient-friendly. Most importantly, we had to demonstrate that the clinical results met expectations based on published outcomes to date. For example, the challenging treatment of chordomas and chondrosarcomas of the base of skull very soon became the main focus of our activities, and we were able to report 5-year outcomes (for admittedly still small patient numbers) that supported spot-scanning proton radiotherapy as an effective and safe treatment modality.

What could, on the one hand, be perceived as a disadvantage, namely the absence of a hospital environment with supporting medical infrastructure and the possibilities for larger patient throughput, on the other hand provided the necessary time, infrastructure and multi-professional competence of the physics research environment to design and realize the spot-scanning technology with a gantry, including mandatory elements such as a 3D treatment planning program, soft- and hardware for safety and control and many other indispensable components. This process was in line with one of PSI's missions: to translate excellent scientific knowledge and technical know-how into applications beneficial for society.

The medical programme with the prototype gantry providing spot-scanning technology (known as "Gantry 1") would not have grown, or even survived in the long-term, without a dedicated beam source for year-round operation. The positive treatment results allowed us to apply to the Federal Office for Public Health of Switzerland for obligatory coverage of treatment costs, which was the precondition for investment in a dedicated superconducting cyclotron (called COMET) that has now been operational since 2007. This accelerator is again a prototype, the result of close collaboration between industry and research institutes, including PSI. This compact superconducting cyclotron was very soon turned into an industrial product by the company that built it, as international interest in hospital-based proton therapy devices grew.

In 2007, the Division of Radiation Medicine was re-named the Center for Proton Therapy, CPT. Having year-round beam availability for the medical programme allowed us to increase patient numbers and to expand one particular activity that exemplarily represents the medical need for optimized three-dimensional dose conformation: the radiation therapy of paediatric patients. Children are growing organisms and each can be looked at as a single, very radiation-sensitive structure in which the avoidance of dose deposition in healthy organs is mandatory – and is, in general, highly challenging. In 2004, PSI extended the building for medical activities to include space and infrastructure for the anaesthesia of young children. A professional collaboration was established between PSI and the Department of Anesthesiology of the University Children's Hospital of Zurich. This has allowed us to safely perform repeated anaesthesias and to offer the necessary related care. A total of 20 children were treated under sedation during the first two years of this service. The number of patients treated under anaesthesia then grew to a total of over 150 during the years 2007 through 2011.

Paediatric patients are often included in multi-modality treatment protocols with radiotherapy scheduled during fixed time periods. The continuous beam availability made possible by the dedicated cyclotron allowed us to accept children in such protocols and to provide proton therapy without violating the overall treatment protocol. Despite the absence of a hospital infrastructure, the CPT has become the most active paediatric radiation therapy unit within Switzerland, with capacity for up to five children treated under anaesthesia per day. The medical-oncological treatment, care and controls are provided by the University Children's Hospital of Zurich.

Patients are referred through national and international oncology centres and specialists. Patient selection is restricted to the defined indications that are accepted by the Swiss Federal Office of Public Health and, consequently, the Swiss Health Insurance System. Reimbursement is mandatory for Swiss citizens and is also assured for patients of the European Union, based on international contracts for medical care. Close and dedicated collaboration with other medical institutions and hospitals is mandatory for an institution such as the Center for Proton Therapy. Radiological support in individualized and high quality is provided by the nearby Kantonsspital Baden – the largest hospital in the eastern part of the Swiss canton of Aargau. Rarely needed or desired hospitalization is possible in all surrounding hospitals, the nearest being the regional Asana Hospital at Leuggern, only about 6km from PSI. Apart from patient care, scientific interactions and research projects have also grown from these collaborations, proving the closeness and synergy that has developed between the research institute and the clinic.

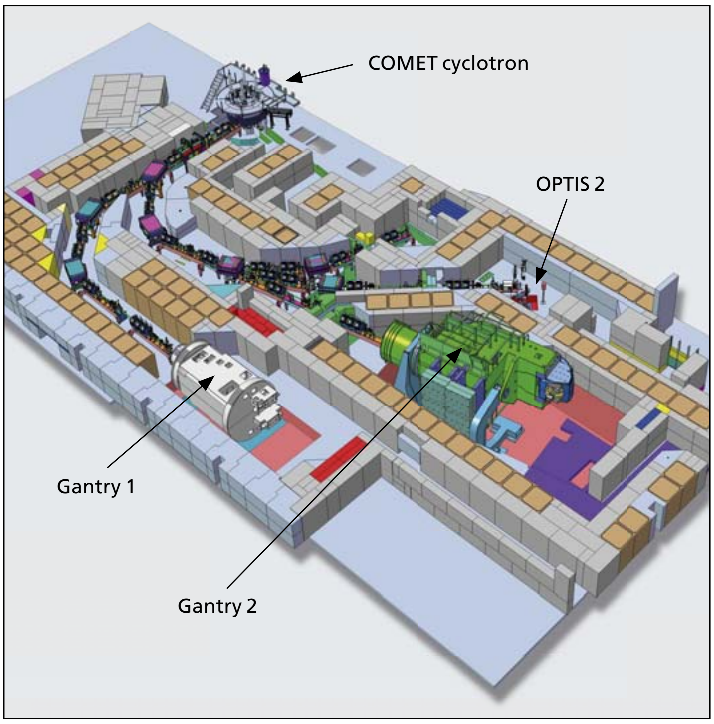


Figure 1: **Layout of the medical facilities at PSI.**

From prototype to leading next-generation technology

Gantry 1 has opened up a new path in proton radiotherapy. Scanning proton beams can produce more conformal dose distributions than passive scattering protons. Scanning is applied without patient-specific individual hardware, such as collimators and compensators. However, scanning beams are, at the same time, very sensitive to organ and target motion. The 3D dose distribution so far calculated and visually represented by the treatment planning program assumes static position and form of the penetrated tissue. However, the motion of organs and targets results in changes of tissue density in the beam path, which consequently can result in incorrect dose deposition in the patient. Gantry 1 delivers

Figure 2: **The Gantry 2 treatment room.**

beam spots with about 50 Hz, which is “too slow” to eliminate the effects of organ motion (e.g. breathing, peristalsis, pulsation). Therefore, we have so far excluded moving targets from our treatments (e.g. lung tumours, intra-abdominal lesions), and thus not offered proton therapy for frequent diseases such as lung cancer. Our novel technology of spot scanning on a gantry, introduced into medical practice 15 years ago, has challenged us, because of these limitations, to design a second-generation gantry with a very high frequency of spot delivery, allowing us to re-scan a moving target fast enough to compensate for motion and its effects. Details of the Gantry 2 system have been described in previous scientific reports and in various publications [e.g. 1, 2].

Since we treated the very first patient on Gantry 1 in December 1996, there has been substantial progress made in hard- and software development, resulting in more versatile, more efficient and more powerful tools that are opening new doors and possibilities. The design of Gantry 2 has, of course, benefited from these developments. However, Gantry 2 is fundamentally a PSI innovation, the philosophy of which was largely developed within the CPT. Based on our extensive experience with Gantry 1, Gantry 2 was conceived in such a way as to provide all the well-proven features of its predecessor as well as introducing technical innovations that overcome the limitations of Gantry 1. A new nozzle design, with integrated Beam’s Eye View X-ray system, new magnet designs, and a new arrangement of sweeper magnets are only a few details of this improvement. Gantry 2’s concept has been described in previous reports. In addition, the medical-technical peripherals that are state of the art in modern photon therapy will also be included in the overall Gantry 2 System, e.g. 4D CT (and later MRI) for the registration of the effects of organ and target motion, requiring adaptation of the treatment planning program to integrate that information. Industrial companies have constructed many of the elements of Gantry 2 to PSI’s design, and it is now assembled in place and is expected to become operational for patient treatment by the end of 2012.

The design of Gantry 1 in the early 1990s, its performance since it began operation, PSI’s use of the system, the medical results it has achieved, and the overall performance of the entire system (Gantry, spot-scanning technology, compact super-conducting cyclotron, beamlines, magnet technology and many more) have all been intensely scrutinized by the international community of experts and centres interested in proton therapy. Largely as a result of this, scanning proton beams are currently the mostly sought-after technology for proton beam therapy. More than half a dozen manufacturers offer proton therapy systems. If one compares their various concepts and the technical systems they offer, one sees that the technology of Gantry 2 remains in the first rank of sophistication and foreseeable performance. The term “fast scanning”, for instance, has been defined by the 200 spots per second that Gantry 2 will deliver to overcome dose imprecision caused by organ motion.

OPTIS – integration into CPT operation

The decision of PSI (the former SIN research centre, at the time) to build a proton therapy installation for the treatment of ocular melanoma in the 1980s was a milestone for later plans and developments of the gantries. A new OPTIS treatment facility – called OPTIS 2 – was developed and connected to the COMET cyclotron in October 2010. Since then, 280 patients have been treated with this new installation, which is, for the most part, again a PSI design.

The overall number of patients who have received proton therapy at PSI for ocular melanomas by the end of 2011 is 5455. This makes PSI’s OPTIS programme the most active in the world. Proton therapy for ocular melanomas is an internationally accepted and reimbursed treatment modality.

The new OPTIS-2 facility, while not fundamentally changing the treatment philosophy, has permitted a substantial change in the way treatment is integrated into the operation of CPT. It is now possible to interleave treatment with that in the gantry and to operate continuously throughout the year, rather than in once-a-month batches.

Though ocular melanomas are not irradiated using scanning beams but, rather, by passively scattered protons, several physical and medical principles have been confirmed: High radiation doses, in particular high single doses, require good spatial dose conformation in order to avoid severe damage to healthy structures; the proton beam penetrates the eye only up to the depth of the tumour location. Structures behind the calculated dose deposition will not be affected; in particular there is no unwanted dose load to the retro-ocular part of the optic nerve.

Tumours that are relatively insensitive to radiation respond “better” to high single doses (hypofractionation); the ocular melanoma is one such example. Four treatment fractions of 15 Gy (RBE) each result in an overall tumour control rate of >95%. (For comparison, a “normal” daily dose of a treatment for a skull base tumour is 1.8 – 2.0 Gy (RBE), delivered up to a total dose of 74 Gy(RBE) in 37 – 41 single treatment fractions.) Good local tumour control leads to high survival rates. Uncontrolled tumours can still metastasize. We see overall 10% tumour-related deaths in patients whose tumour had been controlled = sterilized by proton therapy, whereas the rate of tumour-related deaths rises to 30 – 60 % in patients with uncontrolled tumours.

From technology to oncological concepts and a step into the future

Talking about achievements in design and construction of proton therapy devices at a research institution such as PSI, it must not be forgotten that oncological concepts need to be installed and followed in order to achieve real improvement in cancer therapy.

Installations for radiotherapy, be it photon or particle radiotherapy, are tools that are only as good as their use allows. Protons offer high precision in dose deposition. The medical question is where this precision is wanted or needed. Optimized spatial dose conformation can allow increased target doses without increasing damage to healthy tissues and organs. This concept is useful to treat relatively radiation-resistant tumours. Overcoming inhomogeneity and imprecision in dose deposition caused by organ and/or target motion can be avoided by really fast (re-)scanning, which then allows for efficient irradiation of, for example, lung tumours or lesions in the mobile parts of the abdomen and pelvis. Reduction of unnecessary radiation dose to sensitive anatomical structures or compartments (e.g. the brain, optic nerves, spinal cord, kidneys, etc) is the general aim in any form of radiotherapy. Paediatric treatment is the most demanding in this regard. One important, and probably increasingly important, argument for proton radiotherapy is the reduction of added toxicity in multi-modality cancer treatment. There is unfortunately no efficient therapy for malignant tumours that has no toxicity. Surgery, chemotherapy or other systemic treatments, as well as radiotherapy, do unavoidable harm to healthy, so-called “normal”, tissues. The less “toxic” one of the treatment modalities is, the better is its compatibility with the other modalities. Protons have an important role in this context, as high-dose irradiation can be made more tolerable during the acute phase of treatment, as well as in terms of treatment-related late effects.

The decision of the Canton of Zurich to invest in a third proton gantry at PSI reflects the belief that making better use of protons in modern cancer therapy requires extension of the indications, mainly towards frequent diseases, the conduct of clinical studies and research, all resulting in the need for higher treatment capacity.

References

[1] E. Pedroni et al., *The PSI Gantry 2: a second generation proton scanning gantry,* Z. Med. Phys. **14** 25–34 (2004).

[2] E. Hug et al., *Proton Therapy – Expanding Horizons,* PSI Scientific Report 2010.

Strategy and Highlights of General Energy Research

Alexander Wokaun, *General Energy Research Department (ENE), PSI*

The year 2011 was characterized by disruptive changes in the global energy scene, and by evolutionary progress in research. The General Energy Research Department (ENE) provided conceptual input and technical contributions to the Energy Strategy 2050 of the Swiss Federation, while its research portfolio focused on efficient harvesting and conversion of renewable resources. The biomass value chain is being optimised through the catalytic conversion of waste biomass to methane, low-NO_x combustion of natural gas, and analysis of the consequences of combustion processes on the atmosphere. Aspects of the solar energy value chain covered include the production of solar fuels, the storage of electricity by advanced batteries, and the efficient use of hydrogen from renewable resources for transportation. Issues of systems integration are being pursued in energy systems analysis, and promoted within the Competence Center Energy and Mobility.

Challenges lying ahead of energy research moved into the forefront of societal attention after the disaster at Fukushima in March 2011. Researchers around the world, including those of our Department, engaged in strategic discussion on how research could contribute towards realizing a new and revised energy policy.

Contributions to the Energy Strategy 2050

First documents were already delivered to the Swiss Federal Government in April 2011. Following the decision of the Federal Council in May on the "New Energy Policy", our Institute was asked to coordinate, on behalf of the ETH Domain institutions, a portfolio analysis of ongoing research, an assessment of important and promising technology fields, and an action plan for coordinated energy research in Switzerland. These documents, to be completed early in 2012, will provide input to a Dispatch from the Swiss Federal Council to Parliament later in 2012.

Research portfolio

Energy Research had been persistently working towards these targets during previous years. The portfolio of our programme outlined below continues to focus on:

- Efficiency of conversion (thermal, electrochemical)
- Harvesting of renewable energies (biomass, solar)
- Systems design, analysis, storage and integration

Bioenergy and Catalysis (pp. 60–61)

This Laboratory focuses on the efficient conversion of important biomass resources; in particular, waste biomass. Hydrothermal gasification is pursued as a promising route for producing methane from feedstocks with high water content. Progress was achieved in the recovery of nutrient salts and in the avoidance of undesired coke formation. The SunCHem Project studied the efficiency of harvesting algae for the production of third-generation biofuels.
Competence in the field of energy-related catalysis is a prerequisite for research in these processes, which also focuses on the concomitant reduction of NO_x and soot in combustion devices. This competence is strengthened through a fruitful collaboration with the Laboratory of Catalysis and Sustainable Chemistry.

Catalysis and Sustainable Chemistry

(pp. 26–27, operated jointly by the ENE and SYN Departments)

Analytical tools have been improved for the *in situ* characterization of catalysts by X-ray spectroscopy, at the SuperXAS beamline of SLS. In particular, modulation techniques were successfully established for studying dynamic processes on the catalysts used in biomass conversion.
At the Vacuum Ultraviolet (VUV) beamline of the SLS, optical upgrades were completed and chemical sources are operational to study radicals that are important in combustion processes, such as the ignition of diesel fuel.

Combustion Research (pp. 64–65)

Three major thrusts are pursued in this Laboratory. In preparation for the increased use of natural gas for power generation, options for decarbonisation are being explored, and the characteristics of hydrogen-rich turbulent flames are being investigated using advanced laser diagnostics.
Intense preparatory work is being carried out for the realization of a pilot and demonstration unit ("X-PDU") for the production of "syngas" from biomass, to be further processed by hot-gas cleaning and catalytic conversion to methane.
At the Large Engine Research Facility, an advanced Miller cycle was successfully implemented in a large marine diesel engine, thereby simultaneously increasing the efficiency and reducing the NO_x emissions.

Atmospheric Chemistry (pp. 82–83)

Experimental capabilities for the attribution of aerosols to their sources (including transportation, wood burning, cooking, and biogenic sources) were enhanced by the realization of a mobile "smog chamber". Compound-specific isotope analysis was successfully commissioned to track pathways in plant metabolism and aerosol chemistry.
Nucleation induced by ions from cosmic rays, an issue of the highest relevance for assessing the influence of solar cycles on temperature, was investigated within the CLOUD collaboration at CERN. The results highlighted the previously neglected importance of atmospheric trace gases.

Solar Technology (pp. 62–63)

Two major scale-up projects for the production of "solar fuels" are advancing in the Solar Technology Laboratory. The thermal gasification of carbonaceous wastes was successfully scaled to 200 kW, in collaboration with an industrial partner, reaching an unprecedented solar-to-fuel conversion efficiency of 30%. In the long-term, preparations continued for a demonstration at the 100 kW level of the zinc thermochemical cycle producing hydrogen by solar water splitting, scheduled for mid-2012 at the Odeillo solar tower facility.

Electrochemistry (pp. 66–67)

At the end of 2011, we thanked Günther Scherer, who, after a successful decade of electrochemistry research – including the demonstration of PSI's third fuel-cell hybrid prototype vehicle, in our collaboration with the Belenos Company – handed over leadership to Thomas Schmidt, whom we welcome as the new Head of the Laboratory.

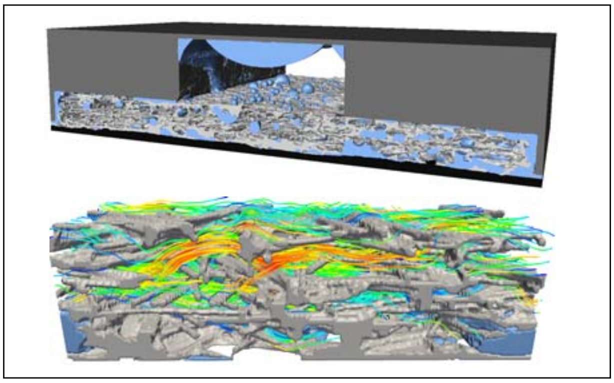


Figure 1: **Water in the porous gas diffusion layer (GDL) of a polymer electrolyte fuel cell. The tomographic image (top) visualizes the distribution of water (blue) in the GDL and gas transport channel. The flow velocity of water through the GDL (from a lattice-Boltzmann simulation) is illustrated at the bottom.**

Understanding of the microscopic phenomena present in polymer electrolyte fuel cells advanced through the use of tomographic analysis at the SLS, with modelling at various scales (Figure 1). Research on lithium ion batteries advanced in a network with industrial partners, focusing on characterization.

Energy Systems Analysis

(pp. 86–87, operated jointly by the NES and ENE Departments)

Based on a study of mobility and its associated fuel demands, scenarios for the global energy system are being developed, including collaboration with the World Energy Council. With the focus on electricity generation in Switzerland, a time-resolved dispatching model will be used to study the impact of intermittent and fluctuating renewables. Systems aspects of the integration of decentralized renewables are also at the focus of a proposal for the National Competence Center for Research (NCCR), prepared jointly by PSI and ETH Zurich.

Competence Center Energy and Mobility

In 2011, several of the projects funded in the first wave of CCEM were finished and their results communicated in workshops and reports. The success of the collaborative efforts is manifested by the fact that several teams decided to continue their joint efforts, and applied for second-generation projects. The progress of the ongoing programme is outlined on pp. 68–69. Several new groupings of ETH Domain researchers joined the CCEM network by applying to the very successful call for proposals in August.
In the CCEM, as well, the end of 2011 marked a change in leadership. We are grateful to Philipp Dietrich, who has advanced the CCEM from its first beginnings but has now taken on a new and challenging position in the directorate staff of PSI, and extend a hearty welcome to Urs Elber, our new Managing Director.

Probing the fate of sulphur in a working Solid-Oxide Fuel Cell anode using S K-edge XAS

Rudolf Struis[1], Gunnar Nurk[2], Artur Braun[3], Thomas Huthwelker[4], Markus Janousch[4], Enn Lust[2] and Christian Ludwig[1]
[1] *Laboratory for Bioenergy and Catalysis (LBK), PSI;* [2] *Institute of Chemistry, University of Tartu, Estonia;*
[3] *Swiss Federal Laboratories for Material Testing & Research (Empa), Dübendorf, Switzerland;*
[4] *Laboratory for Catalysis and Sustainable Chemistry (LSK), PSI*

One of the most targeted problems with solid-oxide fuel cells (SOFC) is the deactivation of catalytically active metal nickel (Ni^0) incorporated with the anode by reaction with sulphur present in the biomass-based fuel gas. Unprecedented sulphur-specific X-ray absorption spectroscopy experiments revealed the formation of new sulphur species from ppm-level H_2S in H_2 fed to the anodic and air to the cathodic side of a working solid-oxide fuel cell (SOFC) (~0.7 V) between *T* = 350 °C–550 °C. Whereas quasi-realistic XPS and Raman studies with anodic material at *T*~500°C failed and thermodynamic software proved inadequate, in situ XAS allows SOFCs to be studied under intermediate temperature-relevant working conditions in step with actual practice.

Motivation

Although expected, the SOFC performance-lowering formation of sulphur monolayers or that of performance-annihilating bulk sulphates with Ni-complemented cermet anodes could neither be detected at *T*~500 °C with Raman microspectroscopy nor did XPS indicate that H_2S would interact at all [1, 2]. Therefore, the anode surface in a SOFC working at intermediate temperatures (IT-SOFC) was monitored in situ using sulphur-specific XAS.

Design of an in situ SOFC–XAS cell

An in situ reaction cell for use with hard X-rays, which had been constructed by PSI following the design of Prof. J.-D. Grunwaldt (KIT, Germany) [3], was adapted by us into a SOFC-dedicated XAS cell suitable for performing X-ray absorption experiments in the fluorescence mode of detection at the S K-edge (*E*~2.5 keV). For this purpose, the cell was furnished with two new gas manifolds for supplying the anodic and cathodic sides of the IT-SOFC [4] pellet with H_2 and O_2, respectively (Figure 1), and windows were installed which were permeable to soft X-rays. The electrolyte-supported IT-SOFC electrochemical element with Ni-gadolinia doped ceria anode (Ni-CGO) was made by the University of Tartu (Estonia) [5]. The electrolyte pellet and the X-ray windows are brittle and have different thermal expansion coefficients; therefore, special steel was used for in situ cell construction and glass/ceramic sealants made the SOFC-XAS cell gas-tight. The cell was mounted on the steel block containing the heating wire. Platinum wires were connected to a potentiostat/galvanostat to monitor cell performance (voltage) under constant current conditions and thermocouples were used to control the temperature in the anodic gas compartment.

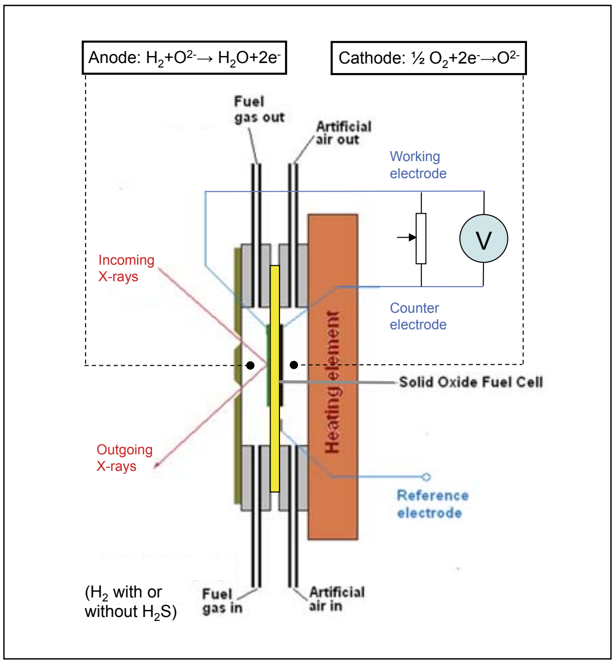


Figure 1: **Layout of the IT-SOFC-dedicated XAS cell and key reactions at the anode and cathode sides.**

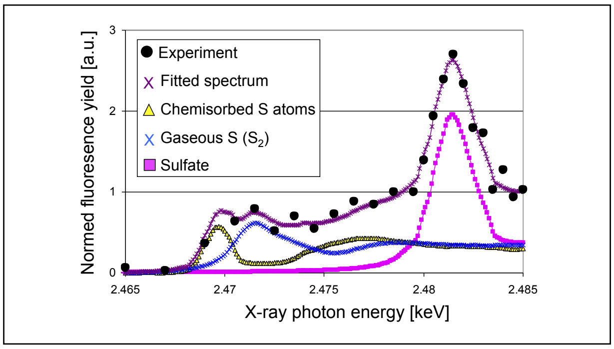


Figure 2: **S K-edge XANES spectrum of the anode in a working SOFC at T=546°C, and fitted constituents.**

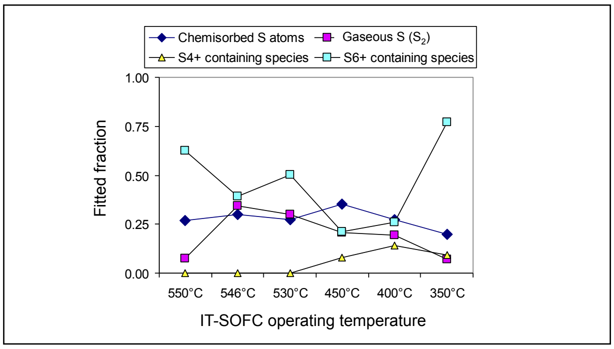


Figure 3: **Sulphur speciation results as a function of the SOFC operating temperature.**

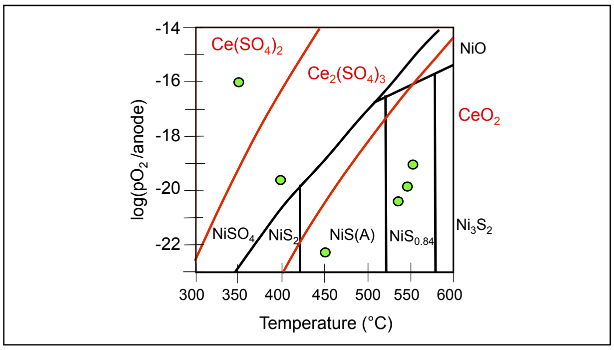


Figure 4: **Overlay of Ce and Ni predominance phases and working points (•) with the XAS spectra.**

Preliminary tests at Empa

Tests of gas leakage, IT-SOFC performance and the influence of H_2S added to H_2 were performed with the SOFC-XAS cell at the Laboratory of High Performance Ceramics at the Empa research institute. It was electrochemically verified that first, reversible poisoning of the Ni-CGO electrode with 5 ppm H_2S/H_2 occurred within five minutes. The influence of the H_2S is moderate, as the SOFC keeps on working, albeit with slightly lower cell potential at constant current conditions. The electrochemical performance recovered up to 90% after the addition of H_2S to the H_2 feed was stopped. Results agreed well with those from other studies and confirmed that our electrodes and test cell functioned correctly.

Results from the Phoenix beamline (SLS)

First S K-edge XANES spectra were recorded using 5 ppm H_2S/H_2 at *T*~550°C. They reflected the presence of several sulphur forms; in particular, S atoms chemisorbed at the Ni^0 surface, gaseous sulphur (such as S_2) and highly oxidised sulphur (S^{6+}) as found with sulphate. The spectra were reproduced well by linear combination of reported, experimental compound spectra (Figure 2). The spectra recorded between *T*=550→350°C showed similar fingerprints, but with varying intensities. Between *T*=450→350°C, small amounts of S^{4+}-containing species (Figure 3) were also found, suggesting the formation of $NiSO_3$ or more likely SO_2 from its decomposition, impeding the building of detrimental bulk sulphate till *T*=350°C.

Comparison with thermodynamic prediction

Figure 4 shows phase diagrams calculated with the HSC software (Outotec Research Oy; Finland) for Ni-O-S and Ce-O-S, as functions of the partial pressure (p) of O_2 at the anode, on a logarithmic scale, log[pO_2/anode], and the temperature, *T*. Five ppm H_2S was defined as $pS_2 = ½pH_2S = 2.5×10^{-6}$. Figure 4 also shows experimental points where the spectra were collected by calculating pO_2/anode with the Nernst equation using recorded temperature, cell potential, and synthetic air as input [2].

For the working points between *T*=450–550°C, from Figure 4 it appears that Ce will mainly be present as CeO_2 and Ni in some form of bulk NiS (NiS(A), $NiO_{0.84}$). However, the SOFC will not function with sulphided Ni, because H_2 needs an Ni^0 surface for adsorption before electrochemical oxidation. In line with this, the speciation (Figure 3) showed some sulphur atoms at the Ni^0 surface, but not clearly visible NiS. All outlined details matter for finding operational hurdles during use. We conclude that in-situ SOFC-XAS is a powerful and indispensable analytical tool for prospective verification studies under practical IT-SOFC working conditions, because it can detect sulphur species independent of long-range structural order or physical state.

References

[1] R.V. Siriwardane, J.A. Poston Jr. and E.P. Fisher, Appl. Surf. Sci. **243** 40–54 (2005).

[2] Z. Cheng and M. Liu, Solid State Ionics **178** 925–935 (2007).

[3] St. Hannemann, Ph. Trüssel, M. Casapu, A. Baiker, J.-D. Grunwaldt, E. Welter and P. Haider, J. Synchrotron Radiat. **14** 345–354 (2007).

[4] D.J.L. Brett, A. Atkinson, N. P. Brandon and S. J. Skinner, Chem. Soc. Rev. **37** 1568–1578 (2008).

[5] R. Küngas, I. Kivi, K. Lust, G. Nurk and E. Lust, J. Electroanal. Chem. **629** 94–101 (2009).

A 200 kW pilot-scale demonstration of solar gasification of carbonaceous feedstocks

Christian Wieckert, *Solar Technology Laboratory, PSI;* Albert Obrist and Peter von Zedtwitz, *Holcim Group Support, Holderbank, Switzerland;* and Aldo Steinfeld, *Department of Mechanical and Process Engineering, ETH Zurich, and Solar Technology Laboratory, PSI*

The thermochemical gasification of carbonaceous materials using concentrated solar energy produces syngas that can be combusted in the main burner of a cement kiln, reducing the consumption of fossil fuel and its concomitant CO_2 emission. A 200 kW solar pilot plant applying this process has been successfully demonstrated at the solar tower of the Plataforma Solar de Almería. Coal, biomass, and carbonaceous wastes with different characteristics, such as tyre chips, plastics, and industrial and sewage sludge, were thermochemically converted to high-quality syngas with a calorific value upgraded over that of the input feedstock.

Introduction

The concept of solar steam gasification of carbonaceous materials is schematically shown in Figure 1 [1]. Concentrated solar energy provides the high-temperature process heat required to thermochemically convert solid carbonaceous feedstocks (e.g. coal, biomass, or carbon-containing wastes) into high-quality synthesis gas (syngas, mainly H_2 and CO). Syngas can be used to produce high-temperature process heat in direct combustion (e.g. in cement kilns), for power generation in efficient combined cycles and fuel cells, or further processed via the Fischer-Tropsch process into liquid hydrocarbon fuels.
Conventional autothermal gasification requires about one-third of the feedstock to be combusted to supply process heat for the endothermic gasification reaction, which inherently decreases coal utilization and contaminates the product gases. In contrast, syngas from solar-driven steam gasification is free of combustion by-products and has a lower CO_2 output, because its calorific value is solar-upgraded over that of the original coal feedstock by an amount equal to the enthalpy change of the reaction. Solar thermochemical gasification is ultimately a means of chemically storing intermittent solar energy in a dispatchable form.

The pilot plant

The solar reactor configuration is shown in Figure 2. It consists of two cavities in series. The upper cavity functions as the solar absorber and contains a windowed aperture to let in concentrated solar radiation. The lower cavity functions as the reaction chamber and contains the packed bed on top of the steam injector. An SiC-coated graphite plate separates both cavities. This arrangement enables the reactor to receive a wide range of feedstock particles sizes. The reactor is operated in batch mode, typically one batch per day, with the packed bed shrinking as the gasification progresses.

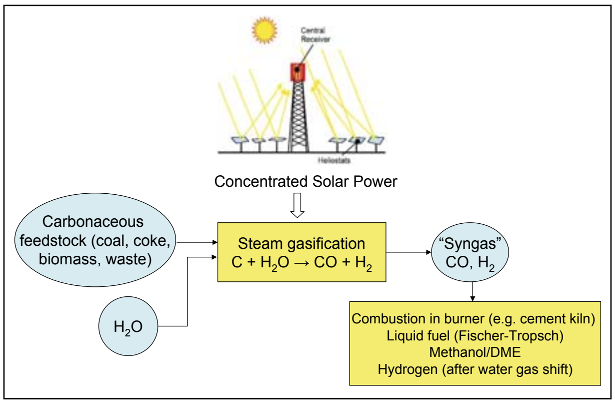


Figure 1: **The solar gasification process: Concentrated solar radiation is used as the energy source of high-temperature process heat to drive the endothermic gasification reactions.**

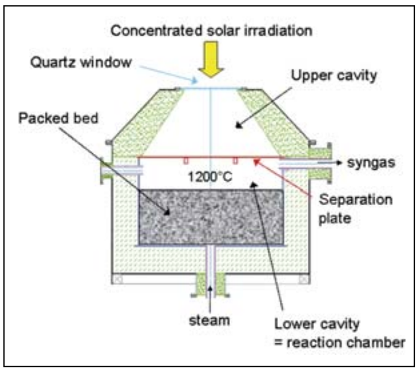


Figure 2: **Schematic of solar reactor configuration.**

Figure 3: **A field of heliostats concentrate solar radiation into the solar gasification reactor located 45m above ground on the solar tower of the Plataforma Solar de Almería, Spain.**

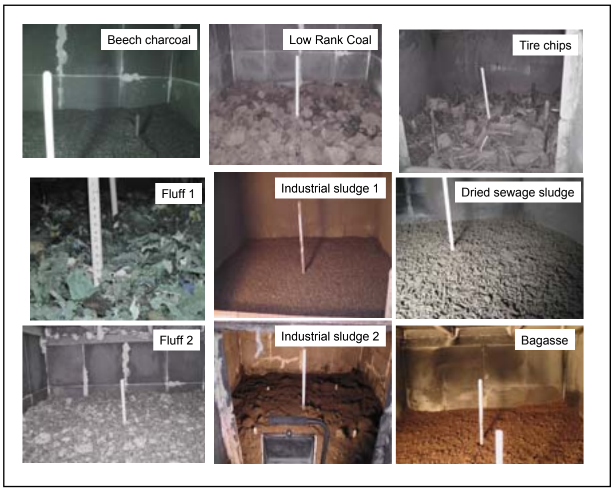


Figure 4: **Packed bed of the 200 kW solar gasification reactor with different feedstocks prior to solar tests.**

Based on laboratory-scale tests at PSI with a 5 kW solar reactor prototype [2], a 200 kW pilot solar reactor for typically 200 kg feedstock capacity (one batch per day) was designed and fabricated. The solar reactor, along with all peripheral equipment, was installed at the solar tower of the Plataforma Solar de Almería in Spain. Concentrated solar radiation collected by about 70 heliostats (Figure 3) was re-directed to power the solar reactor at an operational temperature in the range 1000–1200 °C. The carbonaceous feedstocks tested (Figure 4) are characterized by having a wide range of volatile, ash, fixed carbon and moisture content, elemental composition, as well as particle size and morphology [2].

A typical test: Syngas from low-rank coal

A representative experimental run is described with low-rank (cheap) coal with LHV of 16 MJ/kg, containing about 35% moisture, 32% volatiles, 29% fixed carbon and 4% ash; 180 kg of low-rank coal were loaded into the reactor, forming a 20 cm-high

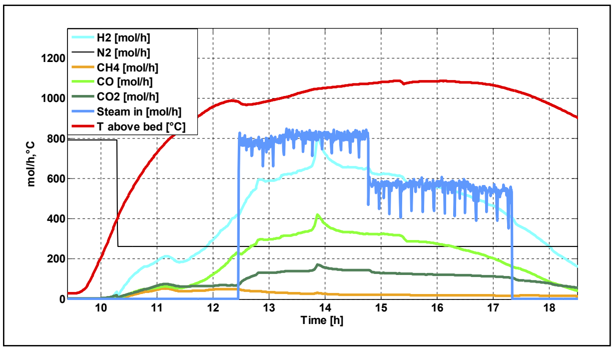


Figure 5: **Packed-bed temperature, steam supply, and synthesis gas composition during the solar gasification of wet low-rank coal.**

packed-bed. Concentrated solar energy with radiative power of 130 kW and flux of 600 kW/m^2 was incident on the reactor's aperture. The packed-bed temperature and gaseous product mass flow rates are shown in Figure 5. A high-quality syngas with H_2/CO molar ratio of about 2 and CO_2/CO molar ratio of 0.4 was produced. The solar-to-fuel energy conversion efficiency – defined as the energy content (on an LHV basis) of the syngas divided by the sum of the input concentrated solar power plus the energy content of the converted coal – reached 30%.

Conclusions

The pioneer demonstration of a solar pilot plant for the gasification of coal, biomass, and carbonaceous waste materials has been accomplished using a robust 200 kW packed-bed solar reactor on top of a solar tower and subjected to solar concentrated radiation from a heliostat field. High-quality syngas with a solar-upgraded calorific value was produced from a variety of feedstocks. The conceptual design of a MW industrial-scale plant is in progress.

Acknowledgements

This project is co-funded by the Swiss Commission for Technology and Innovation (CTI). The contributions of P. Schaller (PSI) and N. Piatkowski (ETH), as well as of A. Vidal (CIEMAT) and the team at the Plataforma Solar de Almería, are gratefully acknowledged.

References

[1] N. Piatkowski, C. Wieckert, A.W. Weimer and A. Steinfeld, *Solar-driven gasification of carbonaceous feedstock – A review,* Energy & Environmental Science **4** 73–82 (2011).

[2] N. Piatkowski, C. Wieckert and A. Steinfeld, *Experimental investigation of a packed-bed solar reactor for the steam-gasification of carbonaceous feedstocks,* Fuel Processing Technology **90** 360–366 (2009).

New combustion concepts for marine diesel engines

Klaus Hoyer, James Mannekutla, Rolf Bombach and Peter Jansohn, *Combustion Research Laboratory, PSI*
Panagiotis Kyrtatos, Peter Obrecht and Konstantinos Boulouchos, *LAV, ETH Zurich*

Diesel engines exhibit very high thermodynamic conversion efficiency, though accompanied by an intrinsically high thermal NO_x formation rate. Within the CCEM, and with support from the EU project "Hercules-β", we are developing new methods for reducing NO_x emissions. We are achieving this through modified charge-air management combining early closure of the intake valves (Miller Timing) with higher-charge air pressure obtained through serial 2-stage turbo charging. The advantages are two-fold: firstly, the reduced end-of-compression temperature leads to lower NO_x formation; and secondly, two-stage compression is more efficient and therefore reduces the specific fuel consumption.

Marine shipping of bulk resources and products is by far the most efficient method of global transport. The total marine transport for 2010 was estimated by the UN Trade Organization UNCTAD at about $33 \cdot 10^9$ ton-miles and this cargo-distance total was primarily achieved by the use of diesel engines. Obviously, this huge transport demand gives ample motivation to reduce the emissions from diesel engines and improve their efficiency, since these advancements will be applicable on a global scale.

Diesel combustion process

The diesel combustion cycle is a fundamentally complex process, since the fuel is introduced to the combustion chamber as a high velocity liquid jet, which *disperses* due to shear forces into a fine fuel droplet spray. The fuel droplets *evaporate* and the fuel vapour *dissociates,* after which *auto-ignition* initiates the combustion process. Once a flame is established, heat release is locally restrained close to the spray surface since the spray core is fuel-rich with little available oxygen, and the charge air is ultra-lean with few available fuel vapour radicals. This means that flame location and its thermal heat release rate is *mixing limited,* since the fuel vapour radicals and the oxygen need to be transported (by convection and diffusion) to where they yield a combustible mixture with the proper air-to-fuel ratio. The *ignition delay* is the time duration between the start of fuel injection to the start of combustion and comprises evaporation and dissociation time scales, both of which are functions of the charge temperature and pressure before fuel injection. There exists a fundamental trade-off between efficiency – favoured by high temperature difference between initial and final process temperatures – and NO_x formation rate – increasing rapidly with rising absolute process temperature. The pathway to reducing the NO_x formation rate and simultaneously increasing the efficiency therefore requires lowering the initial charge temperature while limiting the peak process temperature. However, to ensure stable and uniform auto-ignition, the initial temperature cannot be lowered arbitrarily.

New combustion concept

In the previous Section, the physical foundation needed for the realization of clean and efficient diesel combustion was laid out, i.e. lowering the charge air temperature to the minimum level needed for stable auto-ignition [1]. We achieve this by advancing the inlet valve (IV) closure (called the Miller Timing), thus reducing the in-cylinder compression ratio. This results not only in a reduced temperature rise during the compression stroke but also in reduced in-cylinder compressive work. To keep a similar global air-to-fuel ratio, we also need to raise the charge air pressure so as to introduce the same air mass over the shorter inlet valve open duration. This is achieved with a serial 2-stage turbo charging system (2St-TC), which again allows efficiency improvements, since inter-cooling between the two stages leads to very efficient second-stage compression.

Current achievements

The CCEM supported the realization of the Large Engine Research Facility at PSI, which was commissioned in 2008. Since

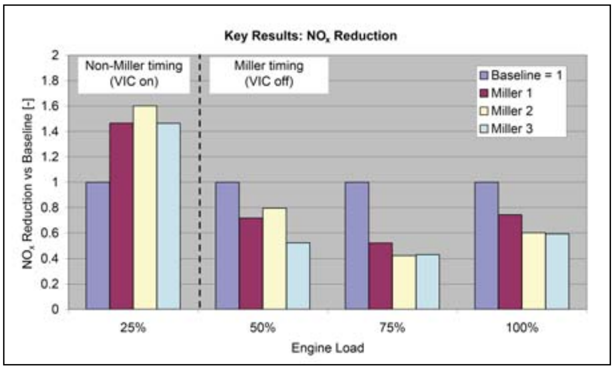


Figure 1: **NO_x reduction vs. Baseline for three different degrees of Miller Timing at different load points.**

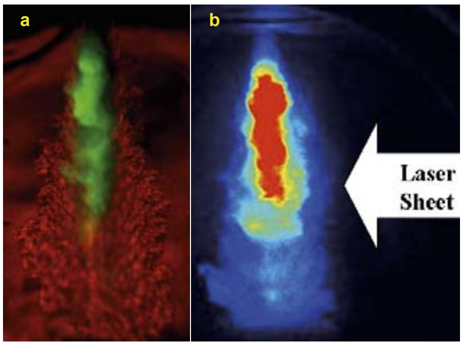


Figure 2: **Spray diagnostics in a non-reacting medium (Nitrogen N_2) applied in a constant-volume combustion cell: a) LIF image (green; liquid jet) combined with Schlieren technique (red; fuel vapour); b) Fuel droplet distribution derived from Diesel fuel fluorescence.**

then, we have converted the standard (baseline) configuration to the modified (Miller with 2St-TC) setup detailed above. The research was supported by the EU (FP 7 Program project: Hercules-β) and proved to be a successful collaboration between industry (Wärtsilä and ABB Turbo Systems) and academic partners (PSI and ETHZ). Using predictive simulation models and engine tests, we have optimized the camshaft profile with respect to IV closure and valve overlap and matched the charging system according to the required boost pressure and mass throughput. On average, a more than 50% reduction in NO_x emission and, at the same time, reduced specific fuel consumption by ~2%, without increasing the soot levels, have been achieved. For start-up and low-load operation, a hydraulic retarder (VIC) allows the Miller timing to be offset by extending the valve opening time, in order to reach auto-ignition temperature when only low boost pressure levels are available. Figure 1 compares different degrees of Miller timing introduced by the different camshaft configurations (M1, M2, M3) tested.

Future work / Challenges ahead

Despite our successful results, a further significant reduction in specific NO_x emissions is needed to meet the strict Tier III limits of 80% NO_x reduction by 2016, put forward by the International Maritime Organization (IMO). As mentioned above, further improvement by “cold” diesel combustion is not possible, because the high ignition delay counteracts the achieved benefits. Future work will therefore focus on combining additional prospective technologies, namely exhaust gas recirculation (EGR) to the charge air. With EGR, we can reduce the available oxygen concentration, directly reducing the NO_x formation rate, and add inert heat capacity in the form of the exhaust gas, thus limiting the peak process temperature. This technology, however, has a drawback with respect to soot oxidation rate, which also depends on the oxygen concentration. Soot production and oxidation is naturally present in spray combustion systems and the amount of soot produced decreases with the fineness of the fuel atomization. The atomization level is governed by maximum fuel injection pressure, a limiting constraint, especially for large injectors. To overcome this classical limit, we plan to apply water-in-fuel emulsions, exploiting the so-called secondary atomization of fuel droplets resulting from rapid water evaporation. This reduces soot production and thus allows complete soot oxidation, even with lower oxygen availability.

Spray combustion diagnostics

As mentioned in the Introduction, diesel spray combustion comprises a multitude of physical phenomena, which are not readily quantifiable within a combustion engine. To gain further insight, we apply laser diagnostics in a constant volume combustion cell, to distinguish between the liquid, vapour and burned gas phases. Here, we use the ExciPlex [2] (excited-state complex) fluorescence technique to determine the distribution between liquid and vapour phases. This technique allows non-intrusive analysis of fuel droplet evaporation prior to ignition. The chosen additives have evaporation properties similar to the fuel and are selected to fluoresce at different wavelengths in liquid and vapour phases when excited by ultra-violet laser light. The measured fluorescence intensity can then be related to the contribution of each phase. This technique requires further development, however, to allow quantitative measurement of evaporating liquid fuel sprays.

References

[1] P. Kyrtatos, P. Obrecht, K. Boulouchos, K. Hoyer and P. Dietrich, *In-Cylinder Measurement Analysis of Diesel Engine Combustion with Miller Valve Timing,* Proceedings of the 13th Conference “The Working Process of the Internal Combustion Engine”, 22/23 September 2011, Graz (2011).

[2] L.A. Melton, Appl. Opt. **22** 2224-2226 (1983).

The Wind of Change – Transitions in the Electrochemistry Laboratory

Günther G. Scherer, Felix N. Büchi, Rüdiger Kötz, Petr Novák and Thomas J. Schmidt, *Electrochemistry Laboratory, PSI;* Philipp Dietrich, *CCEM, PSI*

The past year maintained continuity in, but also brought change to, the Electrochemistry Laboratory. The future Laboratory Head, taking over on 1 January 2012, joined the Laboratory and started activities towards novel research areas. Nine PhD students, more than ever before, successfully finished their dissertations and entered a new phase in their professional careers. Important progress was again made, in particular, in the lead project with our industrial partner Belenos Clean Power AG, and in many areas of electrochemical materials research. Progress was supported by developing characterization methods at PSI's large facilities, and by commissioning powerful analytical equipment.

The year 2011 was an important year for the Electrochemistry Laboratory. In February, Dr. Thomas J. Schmidt, who had been working here during 2001/2002 and later joined the fuel-cell industry, was appointed Professor for Electrochemistry at the Swiss Federal Institute of Technology (ETH), Zurich, and designated future Head of the Electrochemistry Laboratory at the Paul Scherrer Institute, to take on this task on 1 January 2012. This gave the opportunity to provide continuity, on the one hand, as well as to allow a gradual changeover from the outgoing Head of Laboratory to the incoming one. The appointment strongly emphasizes the resurgence of electrochemistry in academia as an important, cross-cutting discipline in chemistry and in energy research in general, as well as in industry, reflecting the fact that many solutions to energy problems may be found through an electrochemical approach.

Change was also evident among the young research staff, as nine PhD students, more than ever before, finished their dissertations during the year and left the Laboratory to enter a new phase in their professional careers. We are proud that all of them achieved smooth transitions into their new environments. In addition, several staff at the post-doc and scientist level moved to industry, reflecting the increased need there for highly-educated electrochemists. Nevertheless, progress occurred in many areas of our work.

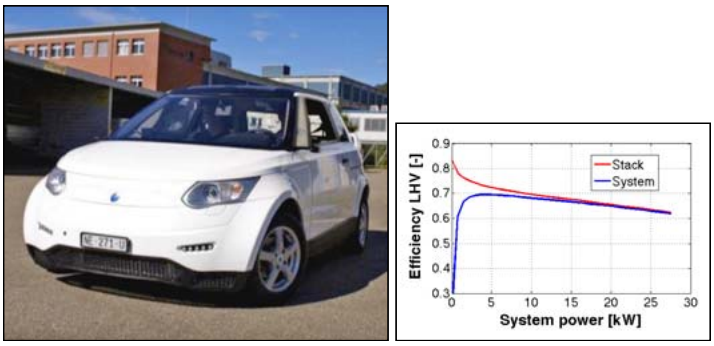


Figure 1: **Left: Car with hybrid H_2/O_2 polymer electrolyte fuel-cell/ battery power train developed in collaboration between PSI and Belenos Clean Power AG, Biel, Switzerland. Right: Efficiency of fuel-cell stack and fuel-cell system for H_2 conversion.**

H_2/O_2 polymer electrolyte fuel cell systems

Our collaboration with Belenos Clean Power Holding resulted in the successful demonstration of a fuel-cell car, powered by a 25 kW H_2/O_2 polymer electrolyte (PEFC) fuel-cell system designed and realized within this collaboration at our laboratory. Furthermore, a 5 kW fuel-cell system for a boat application was operated successfully at the same time.

The clear advantage of fuel-cell technology is shown by the high efficiency of hydrogen conversion to electrical energy for the fuel-cell stack and the fuel-cell system, as displayed in Figure 1.

Materials research for electrochemical devices

Materials research for electrochemical devices, batteries, supercapacitors, and fuel cells continued at an even higher pace. Several important materials characterization methods have been recently implemented and commissioned to service the day-to-day work of the Laboratory, including confocal Raman microscopy combined with infrared microscopy, scan-

Figure 2: **Newly installed X-ray diffractometer for the structural analysis of battery materials.** (Photo: Stefan Rötheli, Appenzell)

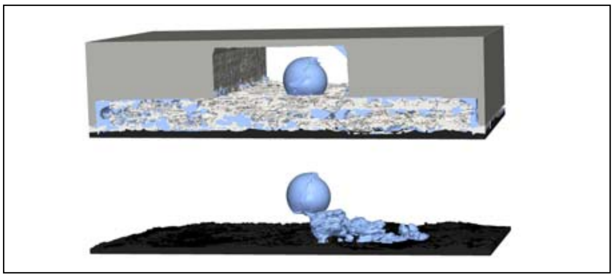


Figure 3: **X-Ray tomographic microscopy image of water in a cathode channel and gas diffusion layer.**

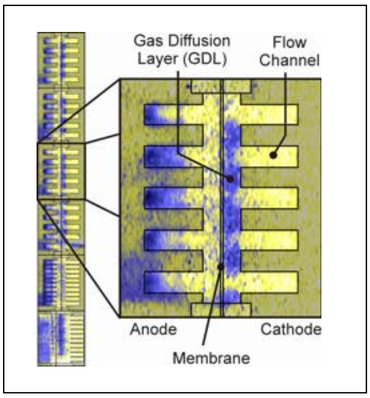


Figure 4: **Simultaneous imaging of the liquid water distribution in six PEFCs with different membrane-electrode assemblies by neutron radiography at SINQ.**

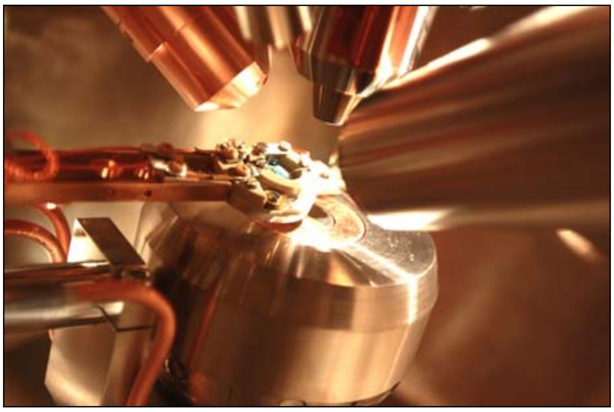


Figure 5: **View into the UHV chamber of the XPS showing the electrochemical cell with IL electrolyte.**

ning electron microscopy with EDX and, very recently, an XRD machine planned to be used both as the work-horse for synthetic material development as well as for the further development of in situ X-ray diffraction methods. The latter is very important, as it will allow us to test electrochemical cells under development in situ before using expensive beam time at the Swiss Light Source (SLS). All available methods will considerably improve our ability to study relevant material properties, in particular with respect to novel battery materials and concepts relevant to our industrial projects in this area.

The use of beamlines at the SLS and the SINQ Neutron Source was continued and extended. One subject addressed in particular is the understanding of the water management of PEFCs [2, 3]. X-Ray Tomography at the SLS (Figure 3), as well as Neutron Imaging at the SINQ (Figure 4), were used to characterize the state of liquid water in the porous nano- and microstructures of a membrane-electrode assembly.

Materials research for supercapacitors was concentrated on the utilization of graphite oxide, a precursor for graphene preparation, and on ionic liquids (ILs) as novel electrolytes. Both approaches aim to increase the energy density of these high-power devices.

Due to the fact that ILs have a negligible vapour pressure, these electrolytes allow electrochemistry to be performed in a vacuum. Thus, surface-analytical tools such as XPS (Figure 5) can be utilized to study the performance of various ILs as electrolytes for supercapacitors or other electrochemical devices.

Conclusion

Based on last year's work, we are proud to report an exceptional output of publications, surpassing the number of 50 peer-reviewed contributions to well-esteemed journals in the field in 2010. In addition to our traditional fields, we have been working in new areas of R&D which are planned to be taken up by the Laboratory in the near future, e.g. high-temperature PEFCs, PE electrolyzers, and other important electrochemical energy-related devices, in order to underline the internationally leading role of our Laboratory in electrochemical energy conversion and storage.

References

[1] J. Bernard et al., J. Power Sources **196** 5867–5872 (2011).
[2] J. Eller et al., J. Electrochem. Soc. **158** B963–B970 (2011).
[3] P. Oberholzer et al., Electrochem. Commun., Submitted for publication (2012).

Competence Center Energy and Mobility, CCEM – CCEM projects in the focus of interest

Philipp Dietrich and Alexander Wokaun, *CCEM*

The Competence Center Energy and Mobility, CCEM, provides support for joint projects run by research institutes within the ETH Domain, with the goal of working towards a more sustainable energy system. The CCEM looks back to a very successful year 2011. Two projects in its portfolio were completed. In parallel, fourteen new proposals were submitted in response to a Call for Proposals, which is the second-largest response after the initial call at the creation of CCEM and a clear sign of the attraction of the inter-institutional collaboration that CCEM can offer. In 2011, after the incident at the Fukushima nuclear plant, the Swiss Government decided to implement a new energy policy, in which the existing nuclear power plants will not be replaced at the end of their operational lives, and the associated electricity production needs to be substituted. CCEM has been asked to support the task force to define the research needs within Switzerland to tackle the challenges of this "New energy strategy 2050".

In 2011, the topic of energy came to the forefront of public awareness and back to the political agenda. The incident in Fukushima triggered intense debate about the energy future of Switzerland. In addition, the World Energy Outlook, published by the International Energy Agency, showed that global emissions are following a trend where it is becoming more and more difficult to achieve the target of global warming not exceeding the level of 2°C.

Energy research has already been intensified in the ETH Domain during the past five years. CCEM was created in 2006 and began to encourage collaborative energy research projects within the Domain. The events of 2011 created the insight that substantially more energy research is needed to tackle the challenges associated with any profound change in our energy supply system.

CCEM is ready to contribute very actively in this long-term process, offering a platform for collaboration among the institutions of the ETH Domain, as well as with the Universities of Applied Sciences and industry. To this end, CCEM strives to foster research activities in the fields of energy provision, conversion, transmission and usage. In addition, CCEM is willing to share its experience and results within the larger context of the Cleantech initiative. Among other measures in 2011, CCEM further strengthened its activities in three major directions to achieve this goal:

- Maintain a transparent and proven process to facilitate interdisciplinary projects, emphasizing high standards of scientific quality
- Concentrate research efforts on dedicated questions in the field of energy
- Provide access to cutting-edge infrastructure for energy research within the ETH Domain and beyond and continuously upgrade such infrastructure for the benefit of facilitating projects

CCEM published a Call for Research Proposals in August 2011. A total of 14 new proposals were submitted, of which two were co-submitted to the CCEM and the Competence Center Environment and Sustainability, CCES. So far, seven projects have been approved, with the evaluation process still ongoing for other projects, in a second round.

The quality of proposals has continuously increased over recent years. In 2011, PSI researchers were particularly successful: Four out of the seven funded projects are headed by PSI-affiliated principal investigators.

In 2011, the energy topic was present in several national calls for programmes such as NCCRs and NFPs. Surveying the submissions shows that collaborations within CCEM have been helpful for several groups in the creation of consortia for joint applications.

Infrastructure in routine operation

The existing infrastructure, which has been supported by CCEM, was complemented by a battery test bench, installed at Empa in Dübendorf. This facility can be used to test full battery packs in charge/discharge cycling. Safety provisions are such that load tests up to the limits of battery specifications can be performed. This test bench is used in two CCEM projects which are currently running, i.e. the COHYB Project, exploring the ideal

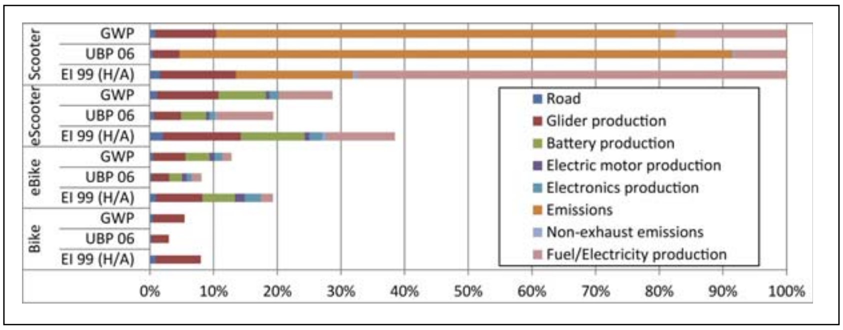


Figure 1: **LCA results comparing the environmental performance of 2-wheelers (Swiss electricity supply mix for usage phase of electric technologies). (Del Duce, 2011).**

internal combustion engine in combination with a battery to form a specific hybrid powertrain concept, and the UFCEV Project, investigating the fast charging process in combination with limited grid access. Also over the next few years, specific additional equipment, required for the research questions being addressed, will be supported by CCEM.

Results of collaborative projects

Until the end of 2011, 15 investment and research projects had been completed within the CCEM framework, of which two ended in 2011. Hydronet investigated questions on the dynamic operation of pumped hydropower plants, and Retrofit explored new system solutions for renovating houses, with the goal of lowering energy consumption. Details are reported in [1].

Groups from PSI, ETH Zurich, and Empa are collaborating in the project "Technology-centred Electric Mobility Assessment" (THELMA), with Stefan Hirschberg, Head of Laboratory for Energy Systems Analysis at PSI, as principal investigator. THELMA is an integrated, technology-based study of the potential for light electric vehicles in Switzerland, assessing their tradeoffs and sustainability compared with other drivetrains and fuels. The environmental, economic and social performances of both current and future vehicles are combined with future transport demand, fleet penetration scenarios and charging patterns, to model changes in Swissgrid's net demand, cost and reliability. Criteria include both direct and indirect effects, e.g. not just exhaust emissions and downwind impacts, as well as upstream fuel-chain effects. These results are used as the basis for national scenarios, supplemented by local community case studies. Analytical results will be integrated using total costs and multi-criteria decision support to form a transparent basis for evaluating sustainability and informing decision makers and stakeholders.

One of the five work packages focuses on life-cycle assessment (LCA). In 2011, the life-cycle inventory was completed for the full range of current vehicles and those foreseen for the immediate future, from e-bikes to small lorries with all relevant drivetrain technologies. Datasets were compiled for two-wheelers, electric drivetrain components, such as magnets and power electronics, fuel cells and future lightweight vehicles. The noise effects of different road vehicles were included and a new framework developed for modelling road transport in the next version (v3) of the ecoinvent database. Entry of the Life Cycle Inventories (LCI) data from THELMA into ecoinvent is on-going.

As an example, the results for e-bikes, and especially scooters, (Figure 1) show that electrification has a huge potential for environmental benefits, due to the current lack of stringent emission standards for two-stroke engines.

Comparing the production and usage of fuel-cell vehicles (FCVs) with battery electric vehicles (BEVs) and conventional internal combustion engine (ICE) vehicles shows a strong dependence on the energy carriers, i.e. the specific production pathways for hydrogen and electricity. Current BEVs are more environmentally friendly than current FCVs, which in turn are more climate-friendly than petrol-driven cars if low-carbon electricity is used for electrolytic hydrogen production. At the same time, limitations with respect to range and refuelling time are more stringent for BEVs than for FCVs.

Interaction with Society

After the incident at Fukushima, the Swiss Government decided to implement a new energy policy, targeting the phasing out of nuclear power at the end of the operational lives of the existing plants. A task force was appointed by the government to define the research effort needed to implement this strategy. CCEM was asked to support the project team in the formulation of an action plan for energy research.

The interested public had the possibility to be informed in several workshops and seminars, specifically in the domain of individual personal mobility, but also in the building sector and the production of electricity.

At the end of 2011, the Chairmanship of novatlantis was handed over from Roland Stulz to Urs Elber, who, at the same time, became the new managing director of CCEM.

References

[1] CCEM Annual Activity Report 2011, (www.ccem.ch).
[2] THELMA Project Website http://www.thelma-emobility.net.

Nuclear Energy and Safety research highlights 2011

Jean-Marc Cavedon, *Nuclear Energy and Safety Department (NES), PSI*

The catastrophic events which took place at the Fukushima-Daiichi nuclear reactor site in Japan in March 2011 had severe repercussions in many countries. As well as assessing these events in detail, we pursued our research into how to improve the safety of plants which already meet existing safety standards. One project which was completed during 2011 was the collection of data at the PANDA facility relating to the hydrogen distribution in a reactor containment vessel. On the analytical front, we have incorporated operator action into our probabilistic safety assessment modelling of nuclear plants. In another study, we investigated a method for mitigating stress corrosion cracking in reactor internals, and in a second project we developed a more robust model for diffusion in the clays being proposed for the Swiss nuclear waste repository. Our continuing monitoring of trends in the nuclear industry enables us to keep abreast of developments and we have maintained our strong education activity for future generations.

Fukushima-Daiichi and its aftermath

The past year will remain a lowlight for nuclear energy operation and research worldwide. An earthquake of historic dimensions, and the tsunami that followed it, hit the north-eastern coast of Japan's main island in March 2011, resulting in a direct toll of nearly 19,000 missing or dead. This event – a once-in-a-millennium occurrence – hit 15 nuclear reactors. At 4 of these, on the Fukushima-Daiichi site, all power supplies, including the emergency ones, were lost, together with access to the indispensable ultimate heat sink. The 3 reactors that were operating at full power unavoidably underwent partial reactor core meltdown. No fatalities were declared in addition to the tsunami toll, but the land lost for use due to contamination is presently comparable to the hundreds of square kilometres directly devastated by the tsunami.

The first lessons to be learnt for nuclear researchers were rapidly clear. Access to a heat sink for removal of the residual heat of a reactor was always deemed to be mandatory for a few hours following an accident, or after a few days in the most modern and resilient reactor types. The lack of resilience to be able to survive for many days resulted in this case from the severe underestimation of the external risk (the height of the coastal waves generated by the tsunami) and from overconfidence in placing almost all emergency power sources at a single location liable to flooding.

The findings in nuclear research at PSI that we are highlighting this year concern ways and means to further increase the safe and reliable operation of plants that are already very reliable, such as the Swiss nuclear power plants. The Swiss and European stress tests that were performed in 2011 showed that basic, as well as state-of-the-art, safety requirements have been fulfilled for a long time in Switzerland. This justifies our commitment to very advanced research topics at the forefront of international development.

Hydrogen stratification

PSI's PANDA large-scale thermal hydraulics facility has a long tradition of providing experimental validation of passive safety concepts for nuclear reactors, such as the ESBWR reactor design equipped with a 72-hour reserve capacity for residual heat removal by means of passive safety systems (i.e. independent of any external power supply). It brought to conclusion in 2011 a set of experiments performed within an international partnership. How hydrogen stratifies in layers within a reactor containment vessel, how these layers are broken up by internal fluid flows and how explosive concentrations may (or may not) be reached was studied in detail, and accurate numerical calculations of the fluid-dynamic flows occurring and the thermal and concentration gradients present were carried out. The positive effects of passive autocatalytic hydrogen recombiners, which avoid hydrogen build-up, were calculated and measured, as well as the adverse thermally-induced local flows produced. These studies enable the optimal placement of these safety devices within the containment. It should be noted that such recombiners were not present in the containments of the ruined Japanese reactors, which underlines the long, and sometimes unsuccessful, path from important research discoveries to their implementation in situ.

Probabilistic Safety Assessment

Potential accident sequences are modelled in order to evaluate their likelihood before an accident would occur. This is the basis of probabilistic safety assessment, the tool with which operators, regulators and researchers identify the best ways and means of further reducing the residual risk during plant operation. We have integrated into this tool the dynamic interplay between the behaviour of a plant and the possible actions taken by its operators, including variation of the timing of such actions. We have shown that this higher fidelity to the unravelling of in situ events improves our estimate of the ability of plants and crew to achieve the desired success criteria in accidental situations.

Mitigation of stress corrosion cracking

The mitigation of stress corrosion cracking in the reactor internals and recirculation pipes of boiling water reactors is the story of one implementation of research findings that has successfully increased the reliability of industrial operation. Here, the noble metal and catalyst platinum is injected into the water coolant flow of the reactor. This results in the efficient recombination into water of the oxygen generated by radiolysis that would otherwise corrode steel. This controls the source of corrosion and thereby the corrosion itself. The present findings show that the continuous and very slow injection of small nanoparticles of a platinum compound safely and indefinitely protects steel components against oxygen, the main cause of stress corrosion cracking. The detailed analysis of material extracted from the reactors cooling circuit in our Hot Laboratory shows that a continuous very slow injection of small nanoparticles of a platinum compound safely and indefinitely protects the steel components against oxygen, the main cause of stress corrosion cracking.

Waste repository diffusion

In underground waste repositories, much confidence is given to the capacity of clay minerals, natural or man-made, to retain radionuclides at their surface and restrict their mobility to a very slow diffusion process. This is the basic function of clay minerals in the safety of nuclear waste repositories. We have been able to reconcile the measured diffusion coefficients of cations in clay with computed values by quantitatively assigning a surface mobility to each cation. This result increases the robustness of the diffusion coefficients that are used to assess the performance of clay-based repositories, and the present Swiss repository concept relies precisely on Opalinus clay as the host rock and on bentonite clay as the filler material in its galleries.

Trends

We have also kept a close watch on the global progress of current and future nuclear technologies. We monitor the downward trend of risk indicators, such as the core damage frequency per reactor and per year, that quantify the constant progression in safety through reactor generations. The correlated increases in kWh production costs are also monitored, together with their sensitivity to major variations of parameters such as loan interest rates or plant construction costs. A set of environmental indicators measures the trend towards sustainability with progressive reactor generations. The burden of use of uranium or thorium resources, the emission of greenhouse gases and the production of radioactive waste are all indicators that are diminishing as nuclear technology matures.
Those findings confirm a message that has been clearly sent out for about a decade: while fossil energy sources face an ecological challenge and new renewable energy sources face an economic one, nuclear energy mainly faces the third challenge – that of public acceptance.

Education and the commitment of our personnel

The Swiss political consensus on the further operation of existing nuclear plants consolidates the need for the safe operation of those plants and the safe management of their waste. Education at the highest international level and state-of-the-art scientific and technical research are the indispensable and interdependent means for further pursuing these tasks. The Nuclear Energy and Safety Department of PSI will continue to devote its skills to maintaining research and education at the high standards reached over the years. The commitment of our personnel to a more reliable, ever safer and more sustainable nuclear energy is our main asset in the pursuit of our national duty.

Impact of dynamics on the Accident Sequence Models of nuclear power plants

Durga Rao Karanki[a], Tae-Wan Kim[b] and Vinh Dang[a]
[a] *Laboratory for Energy Systems Analysis (LEA), PSI*
[b] *Laboratory for Reactor Physics and Systems Behaviour (LRS), PSI*

In the safety analysis of nuclear power plants, the requirements on systems, equipment, and personnel must be identified for diverse accident scenarios. Estimating risk then corresponds to estimating the probability that the requirements are not met and an accident follows. In this work, a dynamic event tree, which is an integrated simulation of physical processes, equipment events and operator events, is applied to support the definition of success criteria. The results show how dynamic event-tree analysis of scenario dynamics provides a better understanding of success criteria and enables improved estimates of risk to be made.

In Probabilistic Safety Assessment (PSA), the high-level tasks include defining success criteria for the accident model and estimating the probability that these requirements are met. These requirements concern how many systems or pieces of equipment must operate, the latest time by which the operators must intervene, and how long the equipment must function. In current PSA practice, detailed plant simulations are performed to define success criteria, while probabilistic models address the probability that these criteria are not met. The challenge for analysis is that the success criteria in a scenario depend on the assumptions made on what has previously occurred. In the present work, an analysis approach that combines plant simulation with sequence modelling is applied. Rather than simulating a single sequence, the Dynamic Event Tree (DET) generates a tree of sequences by treating success and failure events and the alternative event timing [1].

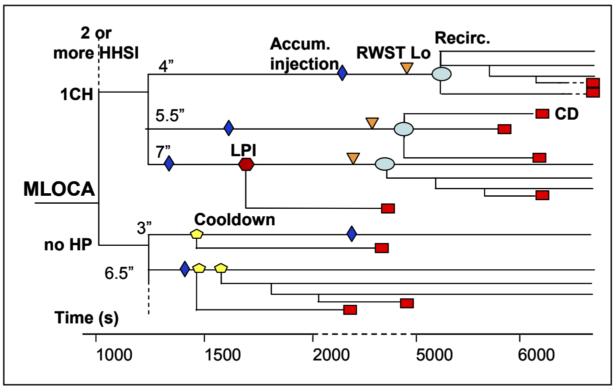


Figure 1: **Medium-break Loss of Coolant Accident (MLOCA) results from dynamic event tree analysis.**

Medium-break Loss of Coolant Accidents (MLOCA) scenarios have been studied, i.e. accidents in which a medium-sized coolant circuit pipework fracture occurs. The main focus of the study was to develop analysis methods that benefit from the DET approach. Consequently, the analysis was performed for a decommissioned Pressurized Water Reactor (PWR) in the U.S., which is frequently used in international studies and allows the results of alternative methods to be compared. The tree resulting from the DET analysis is shown in Figure 1, as illustration.

Medium-break LOCA scenarios in PWRs

In an MLOCA scenario, automatic safety systems will trip the reactor and turbine and will start to inject water into the Reactor Coolant System (RCS), in order to compensate for the loss of coolant. For MLOCAs, High-Pressure Injection (HPI) systems are required initially. Next, the RCS pressure will drop, allowing the accumulators and, finally, the Low-Pressure Injection (LPI) systems to inject. Two manual actions are often considered in MLOCAs: switching HPI or LPI to recirculation when the coolant reserve is low, and, in scenarios in which HPI fails, a rapid cooldown to reduce pressure and allow LPI to inject. The analyses focused on the influence of break size, number of HP pumps, cooldown timing and rate, and recirculation timing.

The DET tool ADS-TRACE, developed in a collaboration between PSI and the University of Maryland, was used for simulating the accident scenario, and about 300 MLOCA scenarios were analyzed. The results suggest that there is not a single most

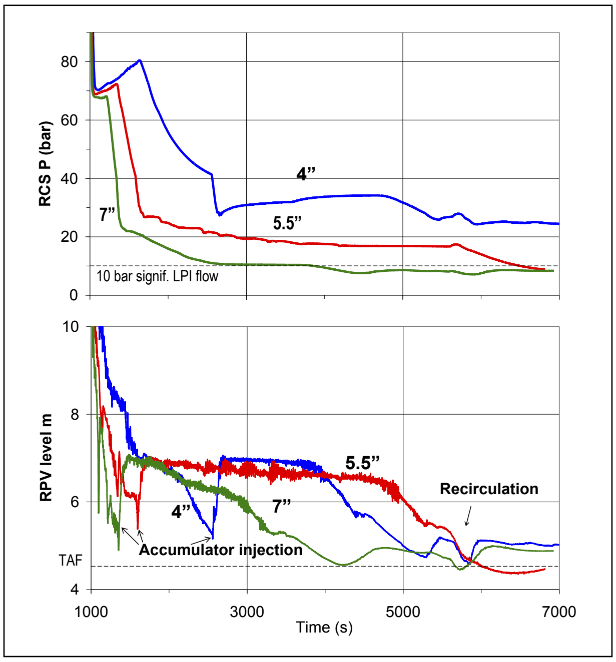


Figure 2: **Sequences with 1 HP pump (a charging pump) available.**

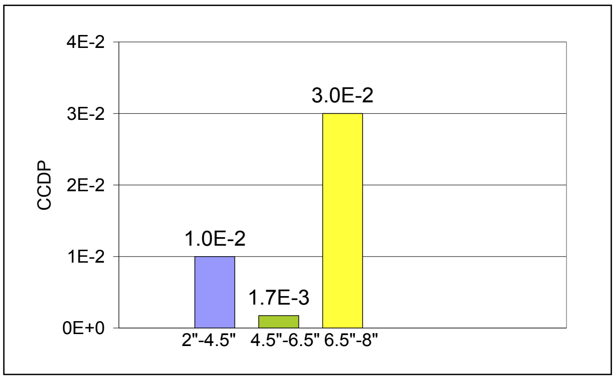


Figure 3: **Conditional Core Damage Probability (CCDP) for MLOCA for the 3 sub-ranges.**

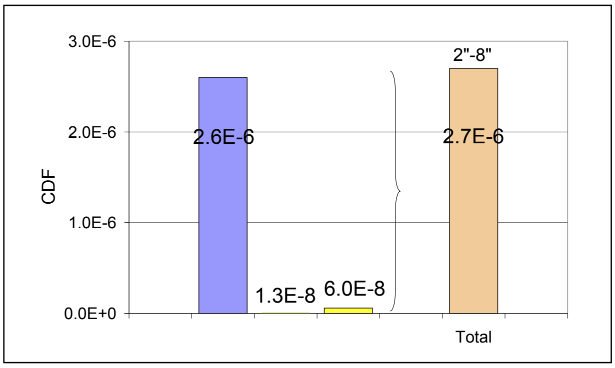


Figure 4: **Core Damage Frequency (CDF) for all MLOCA sub-ranges.**

challenging break size within the MLOCA range. The sequences have diverse requirements for the success of safety systems [2]; for example, the 5.5" break (i.e. a break in the pipework with a fluid-release area equivalent to a hole of diameter 5.5") is the most challenging one for HPI. Figure 2 shows how the pressure in the RCS and the water level in the Reactor Pressure Vessel (RPV) evolve with time (upper and lower diagrams, respectively) with one HP injection line. This information shows that one HP pump is sufficient for 4" and 7" breaks, but not for the 5.5" break. For this intermediate size, the pressure remains too high for LPI. Pressure is even higher for the 4" break case, but here the core level remains above the fuel, because the leak rate is smaller. On the other hand, for sequences with HP failure and rapid cooldown, the 7" break is the most challenging one. Whereas a 100K/h cooldown rate is adequate for the smaller breaks, a faster cooldown rate is required for the 7" break to allow LP injection early enough.
Based on differences in the success criteria requirements, the MLOCA range was divided into three sub-ranges. The results of quantifying the accident sequence models are shown in terms of Conditional Core Damage Probability (CCDP), i.e. the probability given the occurrence of a break, and Core Damage Frequency (CDF), which also incorporates the probability of the breaks occurring (Figures 3 and 4).
The largest CCDP is found for breaks in the range 6.5–8", due to the larger recirculation failure probability. On the other hand, 2–4.5" breaks dominate overall risk (CDF), because small breaks are relatively more likely to occur than large ones. Comparing the 3-subrange model with alternative models with 2 or 4 subranges and with models based on a single limiting break, each with its corresponding success criteria, showed that the 3-subrange model best accounts for both the break frequency and CCDP effects.

Summary

The understanding of accident dynamics produced by DET simulation was shown to improve the identification of PSA success criteria. Probabilistic calculations were then performed to examine the effect of these criteria on the estimated risk. These analyses suggest that detailed dynamic analysis is needed to avoid defining non-optimal success criteria that may distort the risk.

References

[1] D.R. Karanki, T.W. Kim and V.N. Dang, *Impact of Dynamics on Accident Sequence Model using Dynamic Event Tree Analysis – A case study on MLOCA*, Publication in preparation.

[2] D.R. Karanki, V.N. Dang and T.W. Kim, *Discrete dynamic event tree analysis of MLOCA using ADS-TRACE*, PSA 2011 – International Topical Meeting on Probabilistic Safety Assessment and Analysis, 13–17 March, 2011, Wilmington, USA, CD-ROM (2011).

PANDA experimental data for validating computational tools used in nuclear safety analysis

Domenico Paladino and Michele Andreani, *Laboratory for Thermal-Hydraulics, PSI*

The computational tools used for assessing the safety of nuclear power plants must be validated against experimental data before they can be used with confidence for analysing hypothetical accidents. Important contributions to the worldwide effort to generate a comprehensive database have been provided for the last two decades by experiments in PANDA, which is a thermal-hydraulics facility located at PSI. The most recent PANDA experimental programme within the OECD/SETH-2 project was devoted to creating a CFD-grade experimental database for the assessment and validation of such tools.

Introduction

A nuclear power plant containment building is the last barrier for preventing the release of any radiological material to the environment, and therefore plant safety systems must always ensure complete containment integrity.
The analysis of thermal-hydraulic processes occurring in a Light Water Reactor (LWR) containment building under accident conditions is very complex. This complexity arises from the fact that a large number of inter-related variables have to be taken into consideration in the analysis. The performance of active and passive safety systems would depend on the thermal-hydraulic conditions in the containment, and would therefore vary during the evolution of a postulated transient. Complexity lies also in the modelling of the physical phenomena occurring during the evolution of a transient. Advanced Lumped Parameter (LP) and Computational Fluid-Dynamics (CFD) codes are the tools currently being used for LWR safety analysis. Experimental data needed for the validation of such computational tools should preferably be obtained from large-scale tests, minimizing the effect of scaling distortions in the assessment of the code models. Also, "CFD-grade" instrumentation is required for capturing three-dimensional effects [1]. The PANDA facility has been used for many years, within the framework of several international projects (European, OECD/NEA, IAEA, etc.), for investigations devoted to improving nuclear power plant safety analysis [2]. A large number of organizations (research institutions, universities, regulators, vendors, utilities) around the world have used PANDA experimental results for assessing and validating a broad spectrum of computational tools and for licensing advanced passive safety systems for modern nuclear power plants.

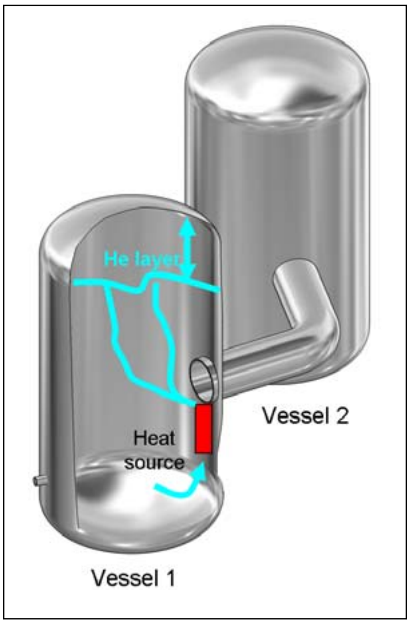


Figure 1: **PANDA schematic for the heat source test.**

In the OECD/NEA (Nuclear Energy Agency)/CSNI (Committee on the Safety of Nuclear Installations)/SETH Projects (Phase 1 and 2), where PSI acted as Operating Agent, PANDA tests were performed to investigate hydrogen behaviour (e.g. transport, mixing, stratification, etc.) in the containment under the effects of basic phenomena (plume and jet) and as the consequence of heat and mass sources created by the activation of active and passive safety systems (spray, cooler, Passive Autocatalytic Recombiner (PAR), rupture disk, etc.). The SETH-2 Analytical Seminar, concluding the OECD/SETH2 Project, took place at the OECD/NEA Headquarters at Issy-les-Moulineaux (France) on 12 and 13 September, 2011, with 22 presentations and more than 50 participants from 15 countries. An example of the use of the SETH-2 PANDA data at PSI for the validation of the codes is given below.

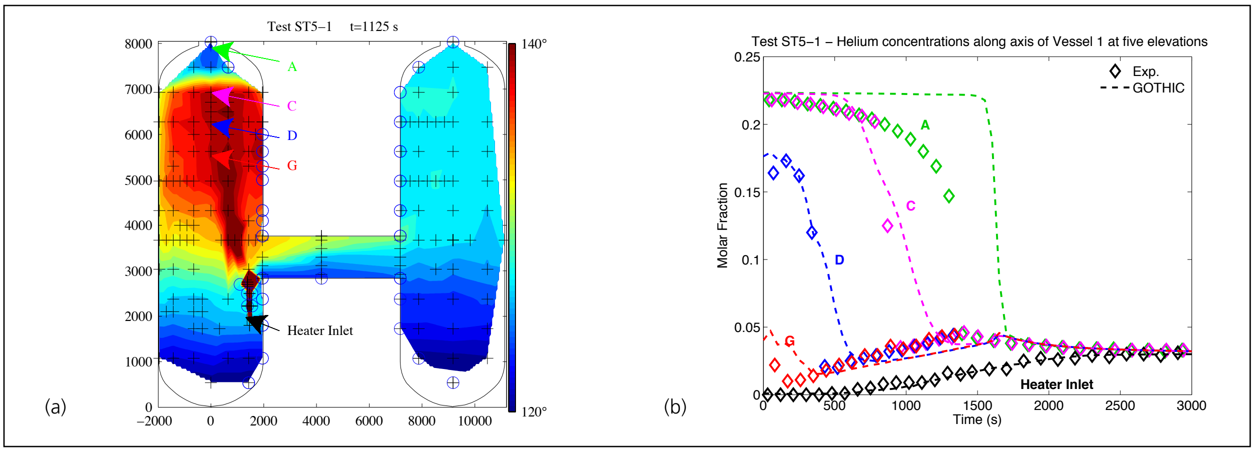


Figure 2: **Experimentally observed thermal plume** (a) **and comparison between calculated and experimental helium concentrations at various elevations along the axis of Vessel 1** (b) **for one OECD/NEA SETH-2 PANDA test.**

Thermal effects of a PAR

One PANDA test series addressed the thermal effects of a PAR, in which the recombination of hydrogen and oxygen during a postulated severe accident is associated with an exothermic reaction. Such a heat source will induce convective flow, which will affect the overall hydrogen distribution in the containment. For the correct positioning of these safety components, computational tools must also be validated with respect to their capability of analyzing the thermal effects of PARs. For this series, only one compartment of the PANDA facility was used, consisting of two inter-connected vessels, each having a diameter of about 4 m and height of around 8 m. Figure 1 shows these two vessels, with the heat source located in the lower region of Vessel 1. At the beginning of the test, a helium-rich layer (helium is lighter than air and steam and was used to simulate hydrogen) existed in the upper part of Vessel 1. Then, due to the effect of flow induced by the heat source, the helium-rich layer mixed with the containment atmosphere beneath. Steam condensation was avoided by choosing the appropriate initial and boundary conditions for the test. Figure 2a shows schematically the temperature contour map on the vertical symmetry plane of the two vessels and the IP for a PANDA test about 1125 seconds after the test started. The hot plume created by the heater is clearly visible. The origin of the horizontal axis is on the symmetry axis of Vessel 1, with distances given in mm and temperatures in degrees Celsius.

Figure 2b shows the comparison of the time histories of the measured helium concentrations at various elevations with those calculated at PSI using the advanced containment code GOTHIC. This code, among its other features, permits the 3-D representation of volumes and includes turbulence modelling. The model contained about 20,000 cells for representing Vessel 1, and the mesh can be considered coarse, at least in comparison with typical meshes used for CFD simulations.

Both experiment and calculations showed that the height of the helium-rich layer (the initial nominal density interface is between Levels C and G) gradually reduced, and within 2000 seconds the fluid in Vessel 1 above the entrance of the heater was well mixed. The code closely predicted the progress of the drop in helium concentration at levels G, D and C, as well as its increase at the entrance of the heater, due to helium transported downwards by the convection loop produced by the thermal plume. The calculated helium concentration drop at the highest elevation occurred with some delay with respect to the experiment, but in general the simulation results were in fairly good agreement with the data.

Conclusions

The information on mesh resolution and turbulent models needed to simulate the thermal effects of PAR in PANDA now allows GOTHIC to be used with more confidence for the simulation of similar effects in a nuclear plant containment. Within the planned OECD/NEA HYMERES (Hydrogen Mitigation, Experiment for Reactor Safety) Project (2012–2015), some PANDA test series will address the thermal effects of PAR in the presence of containment wall condensation, as well as the combined effects of two safety components (e.g two PARs, cooler-spray, etc).

References

[1] D. Paladino, M. Andreani, R. Zboray and J. Dreier, *Toward a CFD-grade database addressing LWR containment phenomena*, Nucl. Eng. Des., In Press (2011), http://dx.doi.org/10.1016/j.nucengdes.2011.08.064

[2] D. Paladino and J. Dreier, *PANDA a Multi Purpose Integral Test Facility*, Science and Technology of Nuclear Installations, Volume 2012 (2012), Article ID 239319, doi:10.1155/2012/239319

How mobile are sorbed cations in clay materials?

Thomas Gimmi, *Laboratory for Waste Management, PSI, and Institute of Geological Sciences, University of Bern*
Georg Kosakowski, *Laboratory for Waste Management, PSI*

Diffusion is the main transport process by which contaminants can move through clay minerals and argillaceous rocks foreseen as barriers in radioactive-waste repository systems. The negatively charged surfaces of clay minerals retain cationic contaminants. Such sorbed cations are commonly considered to be immobile on the surfaces. It has been observed, however, that the diffusive flux of cations is larger than expected when considering sorbed ions as immobile. We have compiled a large quantity of diffusion data and shown that fluxes can be modelled consistently with a surface diffusion model when assigning non-zero mobilities to sorbed cations. The improved diffusion model can be used for more accurate performance assessment of waste repositories.

The low hydraulic conductivities and the large retention capacities for many cationic contaminants make compacted bentonite a highly suitable barrier material in radioactive-waste repositories. For the same reasons, argillaceous rocks are envisaged in many countries as potential host formations for the disposal of radioactive waste. Molecular diffusion is the main transport process in such compact clays, and has been investigated at various scales. Figure 1 shows a schematic representation of diffusion pathways in clays which occur locally in parallel, and on a larger scale also in series. A non-sorbing water tracer, for example tritiated water, is able to diffuse in the water-filled connected pore space that includes the regions near external mineral surfaces and the clay interlayers (internal surfaces), where cations are sorbed. An intriguing observation has been made for many cationic contaminants at trace concentrations: Often, sorbing cations seem to diffuse at rates larger than predicted from their sorption coefficients and from the diffusion coefficients of non-sorbing water tracers. This increased solute flux was often attributed – without proof – to surface diffusion, i.e. the movement of sorbed cations along the clay surfaces. There is, however, no agreement about the existence and the importance of this phenomenon.

A considerable amount of new diffusion data in clay materials has been gathered in recent years, and a new evaluation of the concept of surface diffusion seemed appropriate. We wanted to answer the following questions: (1) Can a simple surface diffusion model describe the general trend in all of the data? (2) Do surface diffusion coefficients depend on the type of clay or the experimental conditions? To answer these questions, we compiled a large quantity of published diffusion data and, by appropriate scaling, integrated them into a single dataset and estimated, for each case, the only remaining free parameter, the surface diffusion coefficient [1].

In our surface diffusion model, we differentiate between just two "states" for cations: sorbed or in solution. This may be

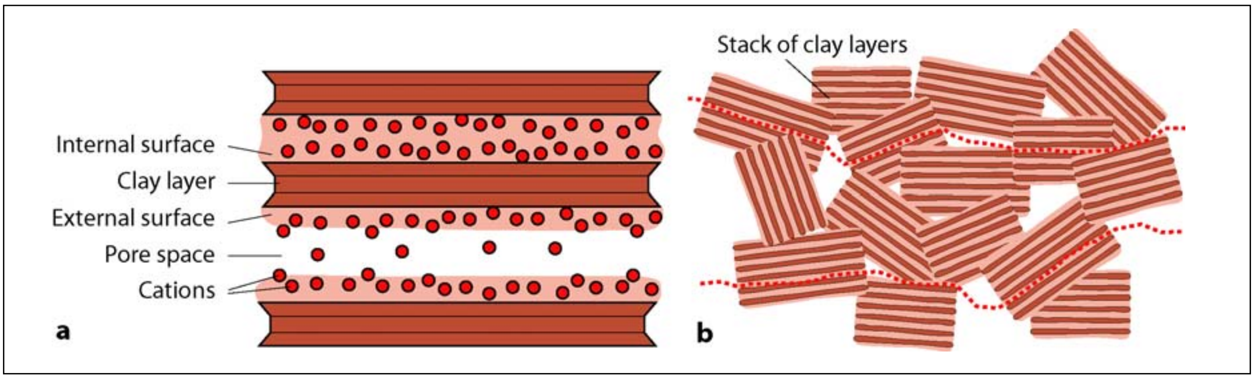


Figure 1: **Schematic representation of the diffusion pathways of tracers through the pore space and (while sorbed) along the surfaces: (a) Parallel diffusion at the local scale; (b) Serial diffusion at the sample scale.**

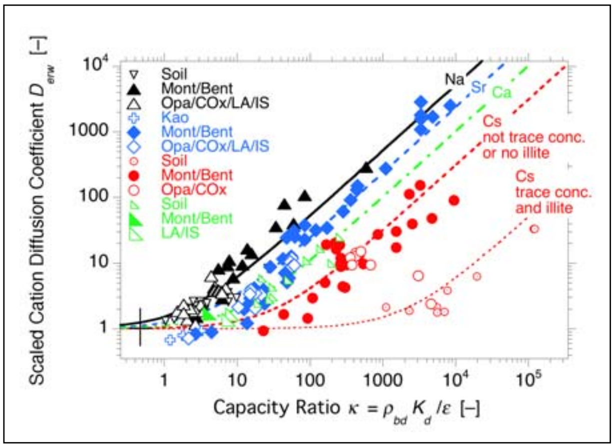


Figure 2: **Scaled diffusion coefficients vs. the capacity ratio κ (amount of tracer in the sorbed state per amount in the pore water). The data for each cation (or for each type of sorption in the case of Cs) show a common trend, independent of the clay material. The cross shows data uncertainties, lines the surface diffusion model with fitted average surface mobilities.**

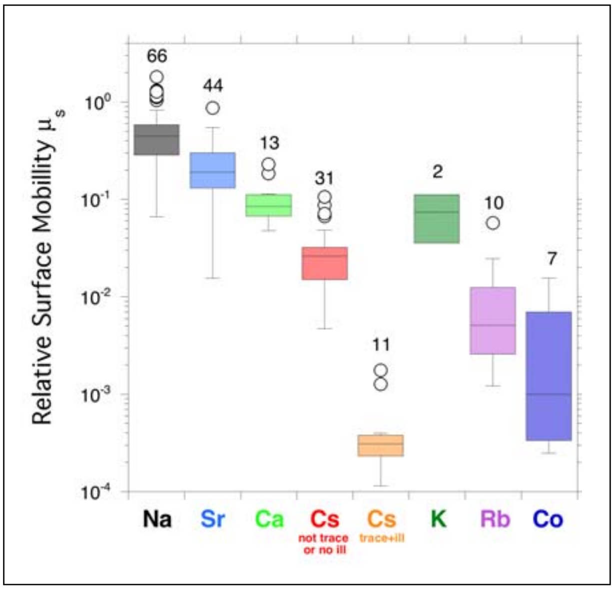


Figure 3: **Box plot showing the distribution of surface mobilities μ_s for different cations, as derived from the scaled diffusion coefficients. Each box encloses 50% of the values with the median of the mobility displayed as a horizontal line. The top and bottom of each box mark the upper and lower quartile, and the vertical lines extend to the minimum and maximum values within a range defined as 1.5 times the box size. Values outside this range are indicated as circles. The numbers indicate the size of each sample population.**

an oversimplification in certain cases, but seems to be justified generally, as has become evident *a posteriori*. In contrast to the standard models, both the dissolved and the sorbed fraction of the tracer are mobile according to the pore and the surface diffusion coefficients, respectively, which include the effects of the tortuosity (a factor accounting for the twisted diffusion pathways in a porous medium). The overall effective diffusion coefficient D_e is then the sum of the two diffusion coefficients, each multiplied by the corresponding tracer mass fraction. With some simplifying assumptions, we can represent D_e as

$$D_e \approx (\varepsilon D_0 / \tau)(1 + \kappa\mu_s) \qquad (1)$$

where ε is the porosity, τ the tortuosity, D_0 the bulk water diffusion coefficient of the cation, κ the amount of sorbed tracer per amount in solution (capacity ratio), and μ_s the surface mobility of the cation (relative mobility on the surface as compared to the mobility in bulk solution). In the traditional approach, sorbed cations have zero surface mobility.

To test this model, all measured effective cation diffusion coefficients were normalised by their D_0 and by the ε and τ of the sample, as derived from the diffusion of a non-sorbing water tracer. Such scaled effective diffusion coefficients should then be equal to $(1 + \kappa\mu_s)$. In Figure 2, the scaled diffusion coefficients are plotted against the capacity ratio κ. The data follow the expected trend, when using a different μ_s for each cation, or for each type of sorption in the case of Cs, where data at trace concentrations in samples with illite behave differently. Figure 3 shows the distribution of all individually calculated surface mobilities. Na has the highest average surface mobility (about 0.5 of the mobility in bulk water), followed by Sr, Ca and Cs, for which different types of sorption seem to have different surface mobilities. Insufficient data were available for K, Rb and Co to reach concrete conclusions. The sequence follows inversely the selectivities of the cations for the sorption sites. A comparison of Figures 2 and 3 shows that effective diffusion coefficients are increased, even for cations with very small surface mobilities, if the number of sorbed cations greatly exceeds the number of cations in solution.

Our study revealed that virtually all the data follow a single pattern that is consistent with a simple surface diffusion model. The model relies on surface mobilities, but these have so far been largely unknown. We have derived average surface mobilities for different cations or types of sorption. These mobilities now allow the prediction of cation diffusion coefficients for any specific clay sample, based only on values for its porosity and tortuosity for a water tracer and on the cation sorption capacity. Such diffusion coefficients can then be used in the performance assessment of waste repositories.

References

[1] T. Gimmi and G. Kosakowski, *How mobile are sorbed cations in clays and clay rocks?* Environ. Sci. Technol. **45** 1443–1449 (2011).

Review of current and future nuclear technologies

Stefan Hirschberg[1], Petrissa Eckle[1], Christian Bauer[1], Warren Schenler[1], Andrew Simons[1]
Oliver Köberl[2], Horst-Michael Prasser[3], Martin Zimmermann[2] and Jörg Dreier[4]
[1] *Laboratory for Energy Systems Analysis, PSI;* [2] *Laboratory for Reactor Physics and Systems Behaviour, PSI;*
[3] *Laboratory for Thermal Hydraulics, PSI, and Laboratory of Nuclear Energy Systems, ETH Zurich;*
[4] *Nuclear Energy and Safety Research Department, PSI*

This work reviews current and future nuclear reactor technologies, with an emphasis on their risk, cost and environmental features. The results are based on the literature and on our own extensive assessments. The evolution of selected, technology-specific indicators is highlighted, showing reduced risks and environmental impacts. Based on the implementations of our interdisciplinary assessment framework within numerous national and international projects, the performance of current and future nuclear technologies in the context of sustainability is briefly addressed.

Worldwide, 433 nuclear power plants, with a total generation capacity of 367 GW, are currently operating in 31 countries. Nuclear energy produces 13.0% of the world's electricity supply. The share in OECD countries is substantially higher, at 21.1%. There are 65 reactors, with a combined generation capacity of 63 GW, currently under construction in 15 countries, and 151 additional reactors are planned in 22 countries.
Following the Fukushima accident, Germany decided to prematurely phase out its nuclear programme by 2022. The continued operation of nuclear power plants in 30 other countries is uncontested. However, political decisions were made in Germany, Switzerland, Italy and Venezuela prohibiting construction of new nuclear power plants, and Japan has scaled back its plans to increase nuclear generation of electricity.

Examples of findings

Our review [1] has addressed specific features of the various generations of nuclear power plants, i.e. GEN II, GEN III/III+ and GEN IV.

Safety and risk aspects – The safety level of GEN II plants around the world is subject to extensive variation and changes over time. The older Swiss plants at Beznau (KKB) and Mühleberg (KKM) have been extensively back-fitted, leading to radical safety improvements. The later plants at Gösgen (KKG) and Leibstadt (KKL) were designed from the beginning to meet increased safety requirements, using higher levels of redundancy and separation. The Core Damage Frequencies (CDFs) and Large Early Release Frequencies (LERFs) for the Swiss plants are shown in Figure 1, along with our estimates for the European Pressurized Reactor (EPR), here representing GEN III/III+ plants. The results are compared with the target values for existing and new plants, established by the IAEA in 1999.

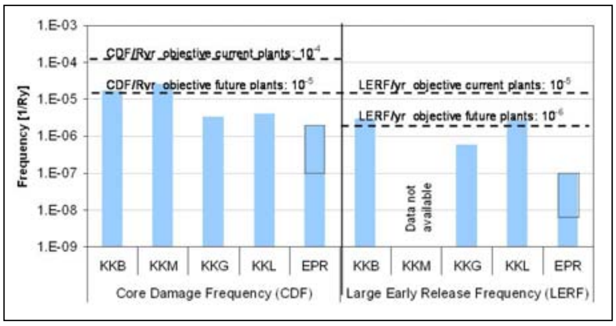


Figure 1: **Risk indicators. For EPR, ranges are provided which primarily depend on the built-in level of protection against seismic hazards.**

The CDFs and LERFs for all operating Swiss plants are clearly below the targets for current plants and below, or slightly to moderately above, the targets for future plants. The expected frequency of accident scenarios with public consequences is typically a factor of 10–100 lower for GEN III plants than for the currently operating top GEN II plants. For some candidate GEN IV designs, there are indications that the maximum credible consequences of hypothetical accidents could be strongly reduced compared with GEN II and GEN III.

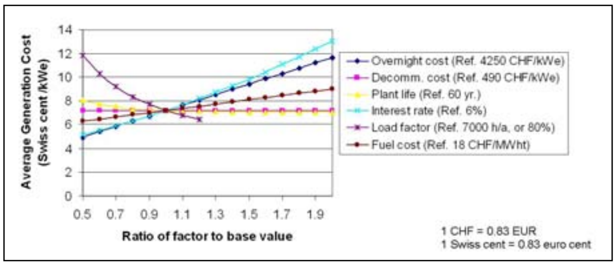


Figure 2: **Cost sensitivity for EPR.**

Costs – Current generation costs of the Swiss nuclear power plants are in the range of 4–6 Swiss cent/kWh (3.3–5.0 euro cent/kWh), with capital costs partially amortized. Based on a review of costs and driving factors, it is PSI's judgment that the cost of a series EPR built between 2020 and 2030 could be between 3500 to 5000 CHF/kWe, with a mid-range value of 4250 CHF/kWe. The estimated production costs are in the range of 6.4–8.0 Swiss cent/kWh (5.3–6.7 euro cent/kWh). Figure 2 shows sensitivity curves for an EPR, varying each parameter from 50% to 200% of the base value shown in the legend.

Environmental impacts – There is a substantially decreasing trend for environmental indicators from Gen II to Gen IV, as shown in Figure 3, with the most pronounced reductions for uranium demand and Greenhouse Gas (GHG) emissions. This improving environmental performance, along with progress in technology development, mainly reflects increased efficiency and reduced demand for fresh uranium.

Innovative designs and fuels – Small Modular Reactors (SMR) and thorium as an alternative fuel have also been considered. There are several dozen SMR designs based on the principle of Pressurized Water Reactor (PWR) and Boiling Water Reactor (BWR) lines and other, non-conventional technologies. The implementation of inherent and passive safety design features can improve defence-in-depth as well as the plant economy,

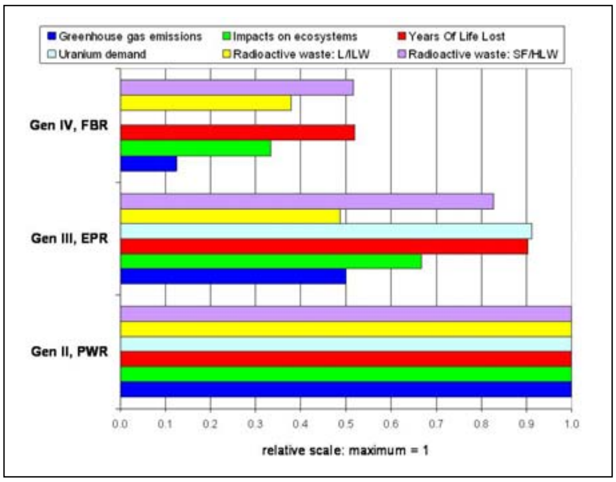


Figure 3: **Relative environmental indicators per kWh generated at Gen II, III, and IV reactors.**

e.g. through reduced design complexity, investment requirements and/or off-site emergency planning. The core damage frequency of SMRs is judged to be comparable to, or lower than, those for state-of-the-art Light Water Reactors (LWRs). The capital investment for a single SMR is much smaller than for a large reactor.

Since the turn of the millennium, there has been a growing interest in the thorium fuel cycle. The use of thorium has several advantages over the established use of uranium, including the avoidance of very long-lived highly radioactive wastes. A final repository is still required, but the necessary confinement time can be significantly reduced. The probability of accidents is mainly influenced by the reactor design and less by the fuel type. Radioactive inventories are significantly smaller in a molten salt reactor and the operating pressure is also lower, leading to a lower expected risk of a major release. This applies both for the use of uranium and thorium. Reliable quantitative estimates of risks and costs are not yet available. Given the need for extensive R&D and stringent regulatory requirements, the commercialisation of the thorium cycle is expected to be highly demanding. In western Europe this would probably take on the order of 30 years.

Nuclear energy and sustainability

As with other electricity generation options, nuclear energy exhibits specific strengths and weaknesses. Under Swiss conditions, the positive features include competitive costs, safe and reliable operation, and favourable performance with regard to impacts on climate, ecosystems and human health. The risks associated with current plants are clearly below the internationally established targets, but the public risk acceptance (which concerns both hypothetical accidents and nuclear wastes) has been strongly affected by the recent Fukushima accident. GEN III/III+ plants offer decisive safety gains with regard to accident prevention and mitigation, as well as minimisation of the residual risk. Nuclear electricity generated by new plants is expected to be economically attractive, in spite of high capital costs, but only under the condition that nuclear projects are implemented as planned and that boundary conditions for operation remain stable for a long time. In order to play a major role in the future improved performance of nuclear energy with regard to the social dimension of sustainability is called for. This is being further pursued in the context of GEN IV developments.

References

[1] S. Hirschberg et al., *Review of current and future nuclear technologies,* PSI Report prepared for the Swiss Federal Office of Energy, (to be published in 2012).

Nanotech and Nuclear – On-Line NobleChem^{TM} Technology for Boiling Water Reactors

Stefan Ritter, Pascal Grundler and Sousan Abolhassani-Dadras, *Laboratory for Nuclear Materials, PSI*
Amuthan Ramar, Ines Günther-Leopold and Niko Kivel, *Hot Laboratory Division, PSI*

Stress corrosion cracking in reactor internals and recirculation pipes is an issue in Boiling Water Reactors. On-Line NobleChem^{TM} is a technology for mitigating this cracking by efficient reduction of the electrochemical corrosion potential, without the negative side-effects of classical hydrogen water chemistry. To achieve this reduction, platinum is injected into the feed water during power operation and is claimed to deposit as metallic nanoparticles on all water-wetted surfaces, and stay electrocatalytic over long periods. To verify this, a research project has been started at PSI to investigate the deposition and distribution behaviour of platinum in Boiling Water Reactors and has already yielded first results on how to optimise the process.

Background and motivation

Under normal water chemistry conditions in a Boiling Water Reactor (BWR), the reactor water is highly oxidising, due to the formation of O_2 and H_2O_2 by radiolysis. This is reflected by the high electrochemical corrosion potentials (ECPs) of the structural materials, a situation which has caused numerous corrosion problems in BWR plants in the past. Intergranular stress corrosion cracking (SCC) in otherwise corrosion-resistant stainless steel and nickel-base alloy components of the primary circuit have led to tremendous capacity losses in BWR plants worldwide over the past three decades, and in some cases even challenged the integrity of the primary coolant circuit [1]. From early laboratory studies, it became clear that SCC susceptibility can be significantly reduced by lowering the ECP of these steels, e.g. by injecting H_2 into the feed water, which reacts with O_2 and H_2O_2 to produce H_2O [2]. To overcome several disadvantages of the injection of high amounts of H_2 (e.g. increase of the main steam line dose rates), On-Line NobleChem^{TM} (OLNC) technology has been developed by General Electric-Hitachi [2]. In this process, very dilute noble metal compounds ($Na_2Pt(OH)_6$), are injected into the feed water, where they quickly decompose. Nano-sized platinum (Pt) particles are formed and are able to deposit on the water-wetted surfaces of the structural materials, where they very efficiently electrocatalyse the recombination of H_2 with O_2 and H_2O_2. With OLNC, the ECPs at all BWR locations with stoichiometric excess of H_2 and a sufficient Pt coverage of the surface can be reduced below the critical threshold value for SCC, with very low feed water H_2 content.

Even though OLNC technology is already being applied in both Swiss BWRs, the detailed mechanism of formation and deposition of the Pt particles is not yet fully understood. Increased knowledge of these mechanisms would help to verify and improve the effectiveness of OLNC in plants. A research project has therefore been started at PSI as a joint programme (NORA, "Noble Metal Deposition Behaviour in BWRs"; for more details, see [3]) along with the Swiss Federal Nuclear Safety Inspectorate (ENSI) and the Swiss nuclear power plants Mühleberg (KKM) and Leibstadt (KKL).

Experimental

To investigate Pt deposition and distribution behaviour, stainless steel (AISI 304L) coupon specimens are exposed to simulated BWR water (high-purity water, T = 280°C, p = 90 bar) in a sophisticated high-temperature water loop with autoclave (Figure 1).

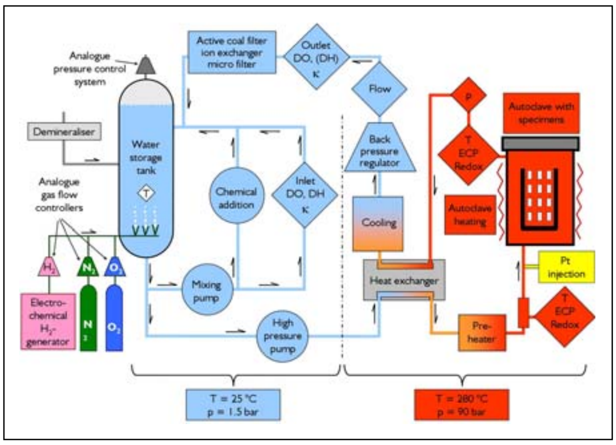


Figure 1: **Schematic of the high-temperature water loop facility.**

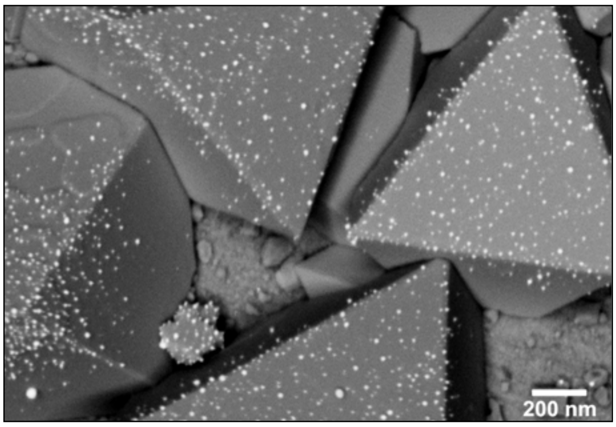


Figure 2: **Example of a SEM micrograph showing Pt distribution (white dots) on the specimen surface (Pt injection rate = 11.6 µg/h, particle size = 12–20 nm).**

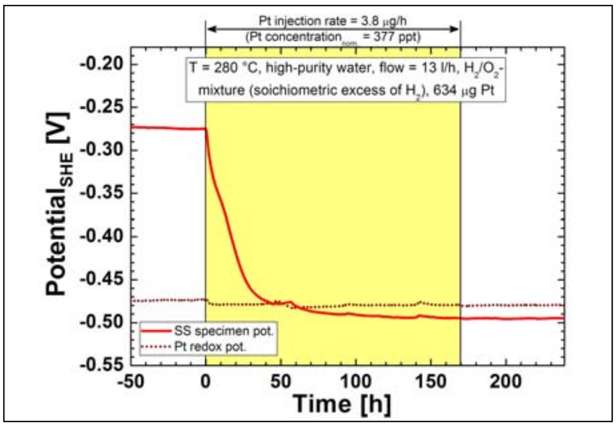


Figure 3: **Evolution of specimen (ECP) and Pt sheet (redox) potentials during a test with Pt injection (SHE = Standard Hydrogen Electrode scale).**

The ECPs of the specimens and the Pt sheet (redox) potential are measured against a reference electrode and a Pt compound ($Na_2Pt(OH)_6$) is injected into the inlet water stream by a high-pressure dosing pump, as in a nuclear power plant.
To study Pt deposition behaviour and assess the effectiveness of OLNC technology under real plant conditions, specimens are also exposed to the reactor water in the KKL plant during actual OLNC applications.
The specimens from the tests and from KKL are analysed at PSI by high-resolution scanning electron microscopy (SEM) and/or by transmission electron microscopy (TEM). The Pt concentration on the surface of the specimens is measured by Laser Ablation-Inductively Coupled Plasma-Mass Spectrometry (LA-ICP-MS).

Results

Some selected results are presented here to show the effect of Pt injection rate on Pt deposition behaviour and ECP reduction. SEM and TEM investigations of specimens from three experiments with different Pt injection rates (0.2, 3.8 and 11.6 µg/h) have revealed Pt particle size distributions on the oxide layer of the specimens of 1–3, 9–15 and 12–20 nm, respectively (see the example in Figure 2).
According to earlier investigations [2], the reduction of the ECP is most effective if a relatively large number of small particles are evenly distributed across the specimen surface, compared with larger, and therefore fewer, particles. For this reason, the slow injection of Pt into the feed water appears to be most effective for the protection of the steels against SCC. These tests also showed that lower Pt injection rates led to an increase in the time required to deposit enough Pt onto the steel surfaces to reduce the ECP sufficiently, which can be a negative feature for a commercial plant. Figure 3 illustrates the reduction of the ECP of a steel specimen directly after starting Pt injection ($t = 0$), down to the level of the Pt redox potential.
Results of analysis of the Pt surface concentration by LA-ICP-MS showed similar values for different Pt injection rates if the total amount of injected Pt was the same.

Conclusions and outlook

Experiments simulating OLNC applications with different Pt injection rates have revealed that the best Pt particle distribution on stainless steel specimens, and therefore best mitigation of SCC, is achieved if the Pt is injected very slowly into the feed water over a long period of time.
However, further tests and a more detailed evaluation of results still have to be performed to confirm this conclusion. Additional parameters (e.g. flow velocity of the high-temperature water across the specimen and specimen surface condition) will be studied to further verify this process and to obtain insights into the mechanism behind it. These investigations will be completed by the analysis of coupon specimens which have been exposed to reactor water in KKL during plant OLNC applications.

References

[1] R. Kilian and A. Roth, Materials and Corrosion **53** 727–739 (2002).
[2] S. Hettiarachchi et al., *Electrochemical Corrosion Potential (ECP) Reduction and Crack Mitigation Experiences with NobleChem^{TM} and On-Line NobleChem^{TM}*, 14th Int. Conf. on Environmental Degradation of Materials in Nuclear Power Systems – Water Reactors, Virginia Beach, USA, 23–27 August (2009).
[3] S. Ritter et al., Power Plant Chemistry **12**(11) 628–635 (2010).

Atmospheric aerosol nucleation and the role of sulphuric acid, ammonia and galactic cosmic rays

Urs Baltensperger, Federico Bianchi, Arnaud P. Praplan, Francesco Riccobono, Josef Dommen and Ernest Weingartner, *Laboratory of Atmospheric Chemistry, PSI;* Hansueli Walther, *Logistics Department, PSI; and the CLOUD collaboration.*

Aerosol particles are liquid or solid particles suspended in the air. They are needed for cloud formation, as all cloud droplets form on aerosol particles (so-called cloud condensation nuclei, CCN). The number of droplets in a cloud has a big effect on its radiative energy balance, and therefore the number concentration of aerosol particles, as well as their formation pathways, need to be known. A large fraction of aerosol particles is not directly emitted as particles, but rather formed by nucleation processes (i.e. formed in the atmosphere from gaseous precursors). The CLOUD experiment at CERN has been designed to resolve this issue, where many processes are still poorly quantified.

Introduction

Based on current model estimates, about 40–70% of cloud droplets in the present-day global atmosphere are formed on aerosol particles that were created through the process of nucleation in the atmosphere, rather than by direct emission of the particles into the atmosphere ([1] and references therein). Thus, nucleation is likely to be a major factor controlling changes in the radiative properties of clouds, which has been identified in assessments by the Intergovernmental Panel on Climate Change (IPCC) as the largest uncertainty in the anthropogenic radiative forcing of climate [2].

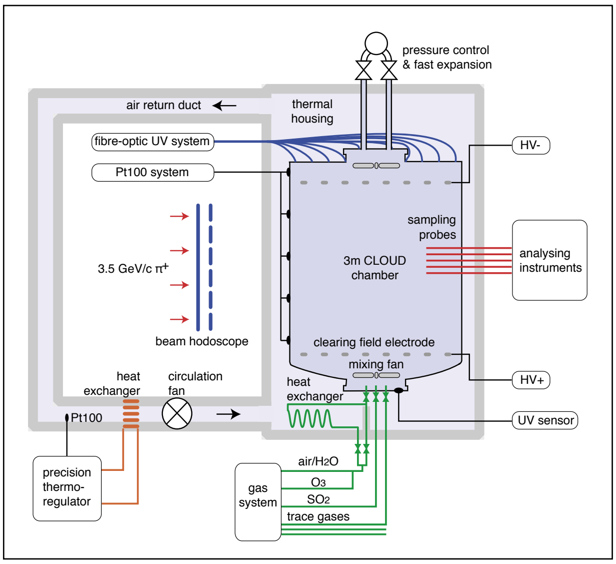


Figure 1: **The CLOUD experiment at CERN. The large volume (26 m³) of the stainless-steel chamber and highly stable gas concentrations allow aerosol nucleation rates to be reliably measured over the full atmospheric range, from 0.001 – 500 cm⁻³ s⁻¹.**

Despite more than 20 years of research on atmospheric nucleation, the physical and chemical mechanisms involved are still not well understood. Laboratory experiments, field studies and theoretical calculations show that nucleation of new particles is influenced by a wide range of anthropogenic and natural chemical species, such as sulphuric acid (H_2SO_4), ammonia, amines and other organic compounds ([1] and references therein). Ions produced by cosmic rays also control nucleation [1], a process that has been proposed to account for correlations between cosmic rays and fluctuations in clouds, weather and climate (e.g. [3]). Furthermore, the fraction of nuclei that grow large enough to seed cloud droplets is determined by the condensation of a range of natural and anthropogenic organic compounds, whose identities and effects are poorly understood.

The CLOUD experiment at CERN

The CLOUD consortium was formed to resolve this highly important issue and is composed of a large international collaboration (see [1]). A dedicated chamber was built (Figure 1) which allows, for the first time, the measurement of nucleation rates with minimal interference of contaminants, and with or without the addition of a pion beam simulating galactic cosmic rays (GCR).

These first quantitative measurements of neutral and ion-induced nucleation at atmospherically relevant concentrations (Figure 2) have a number of important atmospheric implications:

1) At low temperature, H_2SO_4+H_2O (+ ammonia) can explain the atmospheric nucleation and show a rate enhancement by GCR by a factor of ~10;
2) At higher temperature (~20°C), the nucleation rate by H_2SO_4+H_2O (+ ammonia) is a factor of 1000 too low compared with field observations; the nucleation enhancement by GCR is only a factor of ~2;
3) Contaminants are extremely important, indicating that all previous nucleation experiments at low 'pure' H_2SO_4 concentrations were wrong, due to undetected contaminants;
4) In order to mimic the observed atmospheric nucleation rates in the planetary boundary layer, other species in addition to sulphuric acid, water and ammonia are needed, most probably amines and oxidised organic compounds. This confirms previous results from our laboratory experiments (grey lines in Figure 2) showing that oxidised organic compounds were able to substantially enhance the observed nucleation rates [4].

It is important to note that we have not shown yet if, with the addition of organics, the ions produced by GCR induce a similar enhancement of the nucleation rate as in the case of pure ternary nucleation (only sulphuric acid, water and ammonia); in fact, the enhancement is expected to be smaller. In addition, we have not shown a link between ions from GCR and clouds: The enhancement of cloud condensation nuclei (CCN, the fraction of aerosol particles that are able to form a cloud droplet at a certain supersaturation of water) concentrations by GCR is expected to be much smaller than for the nucleation rate, as the newly formed particles need to grow from a few nm to a size of at least 50 nm in order to be able to act as a CCN. The latter process requires, typically, at least 1 day, during which time the particle number concentration is reduced by coagulation with other aerosol particles.

In order to finally resolve the question, a parameterization of the full experimental space is first needed, followed by the appropriate global modelling. This is what we plan to do in the next few years. Ultimately, this will allow us to quantify the impact of nucleation on global aerosol and climate.

Acknowledgments

This work was supported by the European Commission Marie Curie Initial Training Network CLOUD-ITN as well as by the Swiss National Science Foundation.

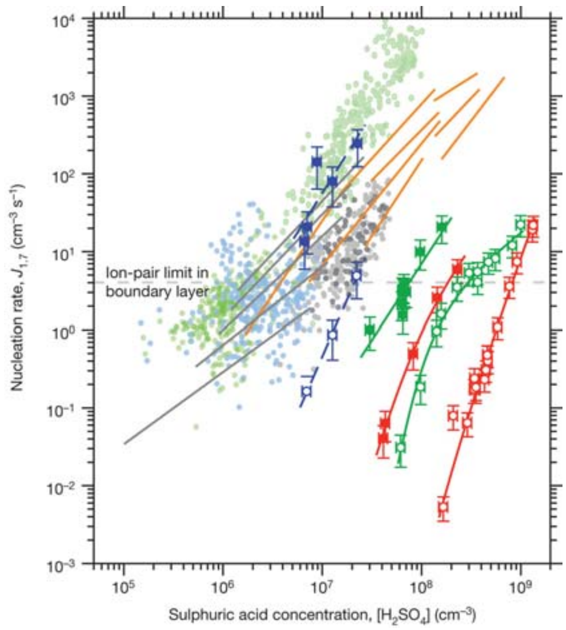


Figure 2: **Results from the CLOUD nucleation rate measurements and comparison with measurements in the atmospheric boundary layer (pale circles) and in the laboratory (grey and orange lines). The CLOUD data (large, darker symbols and lines) show the nucleation rates, $J_{1.7}$ (i.e., the formation rates of particles with a diameter of 1.7 nm), under natural galactic cosmic ray conditions, measured at 248 K (blue), 278 K (green) and 292 K (red) and at NH_3 mixing ratios of <35 pptv (open green and red circles), 50 pptv (open blue circles), 150 pptv (filled blue and green circles) and 190 pptv (filled red circles). The measurements at 278 and 292 K bracket the typical range of boundary layer temperatures, whereas those at 248 K reflect conditions at higher altitudes. Ion-induced nucleation in the boundary layer is limited by the ion-pair production rate to a maximum of about 4 cm^{-3} s^{-1} (from [1]).**

References

[1] J. Kirkby et al., *Role of sulphuric acid, ammonia and galactic cosmic rays in atmospheric aerosol nucleation,* Nature **476** 429 (2011).

[2] IPCC, Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, S. Solomon et al., Eds. (2007).

[3] H. Svensmark and E. Friis-Christensen, *Variation of cosmic ray flux and global cloud coverage: A missing link in solar-climate relationships,* J. Atmos. Sol. Terr. Phys. **59** 1225 (1997).

[4] A. Metzger, B. Verheggen, J. Dommen, J. Duplissy, A.S.H. Prévôt, E. Weingartner, I. Riipinen, M. Kulmala, D.V. Spracklen, K.S. Carslaw and U. Baltensperger, *Evidence for the role of organics in aerosol particle formation under atmospheric conditions,* Proc. Natl Acad. Sci. USA **107** 6646 (2010).

Influence of Black Carbon on recent glacier retreat

Margit Schwikowski and Eva Bühlmann, *Laboratory of Radiochemistry and Environmental Chemistry, PSI;*
Susan D. Kaspari, *Department of Geological Sciences, Central Washington University, Ellensburg, USA;*
Martin Gysel, *Laboratory of Atmospheric Chemistry, PSI;*
Shichang Kang, *Key Laboratory of Tibetan Environmental Changes and Land Surface Processes, Institute of Tibetan Plateau Research, Chinese Academy of Sciences, Beijing, China;*
Paul A. Mayewski, *Climate Change Institute, University of Maine, Orono, Maine, USA*

Glaciers are retreating worldwide in response to climate change. In addition to increasing temperature and changing precipitation patterns, black carbon (BC) may also contribute to this retreat. BC is produced by the incomplete combustion of biomass, coal and diesel fuels, and when deposited on glacier surfaces reduces the surface albedo and enhances melting. BC concentrations in an ice core from Mount Everest showed a threefold increase from 1975–2000 relative to 1860–1975. A pilot study on the Plaine Morte glacier in the Swiss Alps has indicated substantial albedo reductions by BC and dark natural substances deriving from decaying organic matter.

Black carbon (BC, the absorbing component of soot) can significantly contribute to climate change by altering the Earth's radiative balance. BC in the atmosphere absorbs light and causes atmospheric heating, whereas BC deposited on snow and ice can significantly reduce the surface albedo, hasten melting, and trigger albedo feedback [1]. BC is estimated to have 55% of the radiative forcing effect of CO_2 [2], yet BC remains one of the largest sources of uncertainty in analyses of climate change. Records of BC mass concentration and spatial and temporal distribution in the atmosphere are therefore needed to determine the role of BC in climate change. Reconstructing BC concentrations in the Himalayas is particularly important, because this region is influenced by some of the largest BC sources globally, with negative impacts on climate, water resources, agriculture and human health [2].

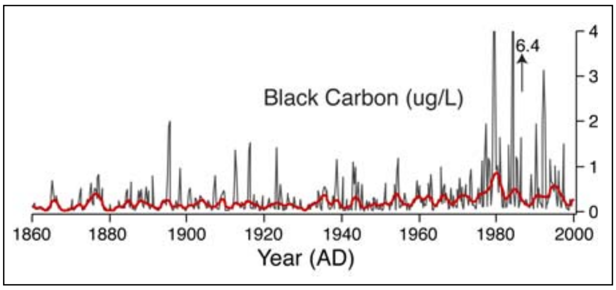


Figure 1: **High-resolution black carbon record from the Everest ice core. Data are re-sampled to 4 samples/year (black), due to differences in sampling resolution over time, and smoothed with a robust spline (red).**

Furthermore, it is estimated that the largest climate forcing from BC in snow occurs over the Himalayas and the Tibetan Plateau.

Here we present a high-resolution BC record from a Mt. Everest ice core covering the period 1860–2000 AD [3] (Figure 1). This provides the first pre-industrial to present-day record of BC concentrations from the Himalayas. The 108 m ice core was collected from the East Rongbuk glacier, located on the northeast ridge of Mt. Everest (28.03 N, 86.96 E, 6518 m), on the north slope of the Himalayas, and was analyzed for BC using a Single-Particle Soot Photometer (SP2, Droplet Measurement Technologies). The SP2 uses laser-induced incandescence to measure the BC mass in individual particles quantitatively and independently of particle morphology and coatings with light scattering material.

The high-resolution BC data demonstrates strong seasonality, with peak concentrations during the winter/spring, when atmospheric circulation is dominated by the Westerlies, and low concentrations during the summer monsoon season, when southerly winds are dominant at the surface. Average BC concentrations from 1860–1975 and 1975–2000 were 0.2 ± 0.3 µg/L and 0.7 ± 1.0 µg/L, respectively, indicating a threefold increase in BC concentrations from pre-industrial to industrial times (BC concentrations reported here represent lower-limit values due to potential particle losses in the nebulizer). Higher BC concentrations in recent decades indicate that BC from anthropogenic sources is being transported to high elevation regions of the Himalayas.

Figure 2: **Picture of a glacial moulin illustrating layers of annual particulate matter deposits within the ice on the Plaine Morte glacier.**

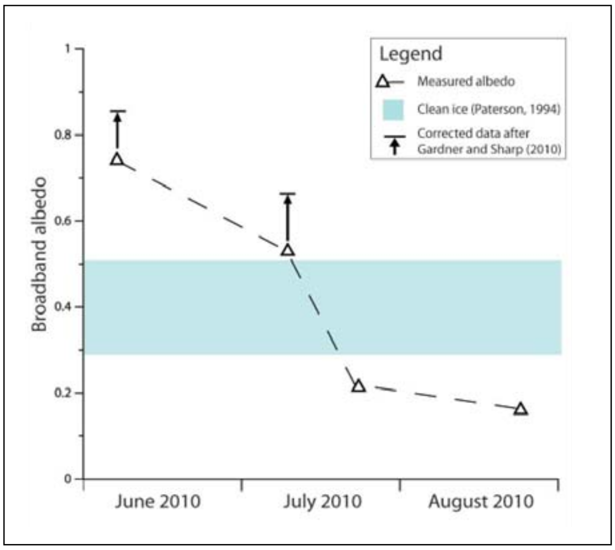


Figure 3: **Broadband albedo reduction from 0.74 to 0.16 on the Plaine Morte Glacier, Switzerland, between 1 June 2010 and 25 August 2010.**

The timing of the increase in BC is consistent with BC emission inventory data from South Asia and the Middle East; however, since 1990 the ice core BC record does not indicate continually increasing BC concentrations. There is no corresponding increasing trend in dust concentrations since 1860, and estimated surface radiative forcing due to BC in snow exceeds that of dust in snow. This suggests that a reduction in BC emissions may be an effective means for reducing the effect of absorbing impurities on snow albedo and melt, which affects Himalayan glaciers and the availability of water resources in major Asian rivers.

Glaciers in the Alps have also shown a significant accumulation of deposited particulate matter. A pilot study was therefore conducted to identify the most relevant biogeochemical components contributing to the observed albedo reduction on the Plaine Morte glacier (46°23'N, 7°29'E, Swiss Alps, Figure 2). In the course of the ablation season in 2010, broadband albedo and spectral reflectance were measured and snow samples, particulate matter and ice samples were collected for biogeochemical analyses. The composition of cryoconite (deposits of airborne particles on the glacier) was analyzed by determining the bulk mineralogy, the organic fraction and the elemental carbon (EC) content. BC and EC are assumed to represent the absorbing and the elemental fractions of soot, respectively. Biogenic matter and microorganisms were additionally assessed qualitatively by microscopic techniques. The cryoconite composition obtained was then related to the observed albedo reduction between June and August 2010 (from 0.74 to 0.16, Figure 3) to quantify the relative contribution of each of the cryoconite compounds.

Cryoconite deposits were found to be heterogeneously distributed on the glacier surface, but showed comparable biogeochemical composition, with the predominant contribution coming from mineral dust of local origin. Due to a lack in accurate albedo models, the relative contribution of cryoconite components to the albedo reduction could only be roughly estimated. However, the results underlined the importance of both EC and humic substances on the absorption properties of cryoconite and indicated a feedback-mechanism involving liquid water. Cryoconite was enriched in organic matter and EC compared with local loose rock, indicating slow removal processes, high biological activity and multiannual accumulation by outcropping of dust layers from melting glacier ice (Figure 2). The overall effect of cryoconite on glacier albedo is expected to become even more important in the future due to enhanced glacier retreat.

References

[1] M.G. Flanner, C.S. Zender, P.G. Hess, N. Mahowald, T. H. Painter, V. Ramanathan and P.J. Rasch, *Springtime warming and reduced snow cover from carbonaceous particles,* Atmos. Chem. Phys. **9** 2481–2497 (2009).

[2] V. Ramanathan and G.R. Carmichael, *Global and regional climate changes due to black carbon,* Nat. Geosci. **1** 221–227 (2008).

[3] S.D. Kaspari, M. Schwikowski, M. Gysel, M.G. Flanner, S. Kang, S. Hou and P.A. Mayewski, *Increase in black carbon concentrations since industrialization from a Mt. Everest ice core,* Geophys. Res. Lett. **38** L04703 (2011).

Swiss energy strategies under nuclear and climate policy constraints

Adriana Marcucci and Hal Turton, *Laboratory for Energy Systems Analysis, PSI*

The Energy Economics Group at PSI is undertaking some of the first integrated analysis of the Swiss energy sector and climate change mitigation strategies under global uncertainties. Nowadays, these global uncertainties include global resource availability, climate policies and, as a consequence of the recent accident in Fukushima, Japan, nuclear policies. We find that the consequences of the nuclear phase-out in Switzerland for the achievement of climate mitigation targets include the need for additional energy efficiency measures, the integration of larger shares of intermittent renewables and trade-offs with electricity independence.

The nuclear accident at Fukushima, Japan, in March 2011, increased worldwide uncertainty regarding nuclear policy. In Switzerland, the Federal Council decided in May 2011 to phase out nuclear power by not replacing existing plants at the ends of their respective lives [1]. In addition, Switzerland has an ambitious target of reducing domestic greenhouse gas emissions by 60% by 2050 (compared with 1990 levels) [2]. Given that nuclear power accounts for around 40% of current Swiss electricity generation, the Council's decision raises important questions concerning alternative technologies and energy-saving measures needed to achieve these targets. Furthermore, available strategies for Switzerland are likely to be affected by global or regional energy-related decisions. In this work, we analyze the possible effect of changes in global and domestic technology preferences after the recent nuclear accident at Fukushima on the development of the Swiss energy system.

Approach and methodology

We address this question by exploring different scenarios of global and regional technology preferences under a stringent climate mitigation policy (a long-term global target for atmospheric CO_2 concentration of 400 ppm, which corresponds, according to the IPCC [3], to a "best estimate" global mean temperature change of 2.4 °C and is consistent with the Swiss domestic target mentioned above). These scenarios are 'what if' analyses – rather than predictions – of the future energy system, which contribute to identifying robust technology pathways and possible challenges associated with climate change and energy policies.
To develop this scenario analysis, we use MERGE-ETL, an integrated assessment model that represents the linkages between the economy, energy sector and climate [4]. We modified the regional definition of the model to better represent geopolitical groups and to distinguish Switzerland, which allows us to study the effects of global factors and policies on technology pathways for the Swiss region. MERGE-ETL includes a range of technologies to supply electricity and non-electric energy, comprising fossil fuel resources, such as oil, coal, gas; nuclear power plants (light water and fast breeder reactors); as well as renewable-based technologies. For some of the less mature technologies, the model accounts for the possibility of technology learning (i.e. improvements to the technology) arising from experience during development, production and use.

Climate and nuclear policy results

Figure 1 compares global and Swiss electricity production with and without a stringent climate target (Clim and BAU, respectively), but with light water reactors available – fast reactors are not considered. The climate policy leads to a decrease in electricity demand, due mainly to the deployment of more-

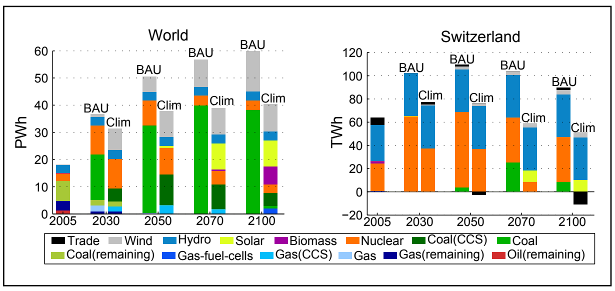


Figure 1: **Electricity production in 'business- as-usual' and climate policy scenarios.**

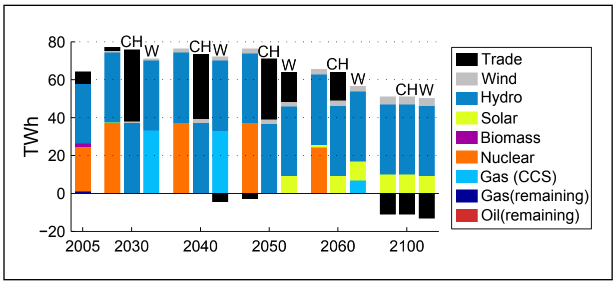


Figure 2: **Swiss electricity production in climate policy scenarios with and without nuclear generation.**

efficient demand-side technologies. Moreover, renewable, nuclear and carbon capture technologies become the preferred options to supply electricity worldwide, replacing the fossil fuel power plants preferred in the absence of climate mitigation policies. Nuclear power makes an important contribution to electricity generation in the first half of the century; however, global depletion of uranium resources leads to a worldwide reduction in the share of nuclear generation after 2050. In Switzerland, the availability of low-carbon hydropower and solar alternatives enables a complete substitution of nuclear after 2070.

Although nuclear energy has the potential to play a major role in the future energy system, whether this potential can be realized has become highly uncertain given recent events in Fukushima. Accordingly, we explored some of the implications of a domestic – in Switzerland and Japan – and a global moratorium on the construction of new nuclear power plants. If only Switzerland and Japan opt for such a policy, the global energy system remains relatively unchanged, while a global no-nuclear policy implies additional electricity efficiency measures and the integration of a large share of intermittent renewables. In Switzerland, Figure 2 shows that the domestic-only moratorium results in a large reliance on imports (in effect, the Swiss reactors shift to the EU). This produces only minimal economic effects, but implies a reduction in self sufficiency that may not be acceptable to Swiss policymakers. In contrast, when the whole world implements the same policy (W in Figure 2), Switzerland's access to cheap low-carbon electricity imports becomes limited, requiring more drastic action, including further reductions in electricity demand, earlier deployment of renewable generation and the use of natural-gas combined-cycle generation with carbon capture as a transition technology.

For Japan, access to electricity imports is limited in all cases, so a domestic phase-out of nuclear power requires significant changes to the energy system, while a global phase-out of nuclear has relatively little additional effect.

The nuclear moratorium has important economic consequences in the realization of the global climate target. Figure 3 presents the GDP losses (compared to the BAU scenario) associated with achieving the climate target for each scenario on nuclear availability. Swiss and global GDP losses in the global no-nuclear scenario increase substantially in the periods when nuclear energy would otherwise be highly competitive, due to earlier investment in solar technologies and additional efficiency measures. However, if only Switzerland and Japan forgo nuclear, global economic costs are similar to the scenario with nuclear and Swiss GDP losses are substantially lower (although reliance on imports is greatly increased). Swiss GDP losses are generally lower than global losses because the Swiss electricity sector is already relatively decarbonized in the BAU scenario.

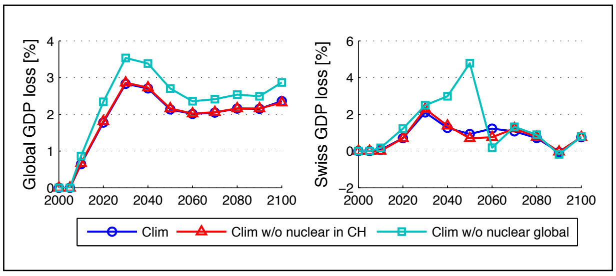


Figure 3: **Economic costs of climate mitigation, global and for Switzerland.**

In summary, the results indicate that stringent mitigation targets under a nuclear moratorium imply important changes to the Swiss and global energy systems, including a larger use of renewables, the deployment of natural gas, with carbon capture as a transition technology, and a considerable reduction in electricity demand, requiring extensive efficiency measures.

This analysis is an extract of the work in Marcucci and Turton [5] funded by NCCR-Climate.

References

[1] Swiss Federal Council, *Federal Council decides to gradually phase out nuclear energy as part of its new energy strategy,* Press release, 25.5.2011 (2011),

[2] *OcCC-Empfehlungen zur Schweizerischen Klimapolitik Post 2012,* OcCC (2007).

[3] IPCC, *Contribution of Working Group III to the fourth Assessment Report,* (2007).

[4] A. Marcucci and H. Turton, *Analyzing energy technology options for Switzerland in the face of global uncertainties: An overview of the MERGE model,* NCCR Climate Research Paper 2011/05 (2011).

[5] A. Marcucci and H. Turton, *Swiss energy strategies under global climate change and nuclear policy uncertainty,* Swiss Journal of Economics and Statistics (to be published).

Aerosol aging caught in the act

Markus Ammann, Sarah Steimer, Goran Grzinic and Markus Lampimäki
Laboratory of Radiochemistry and Environmental Chemistry, PSI

Chemical transformations of atmospheric particles known as aerosol aging are crucial for their effect on human health, climate and atmospheric composition. Kinetic experiments with the short-lived radioactive tracer ^{13}N have provided a snapshot of reactive oxygen intermediates in protein nitration, a potential route to the formation of allergens in biological particles. The longer-term aerosol aging efficiency is strongly linked to the physical state of the particles, specifically to viscosity, which may control chemical reactions. Highly-focused X-rays provide spatially-resolved information about chemical changes within the nanoworld of submicron particles. This information will improve our ability to describe aerosol evolution and to assess their impact on climate and human health.

Introduction

Aerosol aging refers to the mostly oxidative chemical transformations during the lifetime of atmospheric particles. These transformations may generate or degrade toxic compounds, they may change the effect of particles on the radiative budget of the atmosphere, or they may make the particles better cloud condensation nuclei (CCN) and thus influence climate. The efficiency of chemical reactions within the particles themselves strongly depends on the physical state of the particles. Recent research has highlighted that particles may not only be either solid or liquids, as previously thought, but also attain semi-solid or glassy states. We have established tools to capture the physical chemistry of particulate matter at different spatial and temporal scales, to support better assessment of their effects on human health or climate.

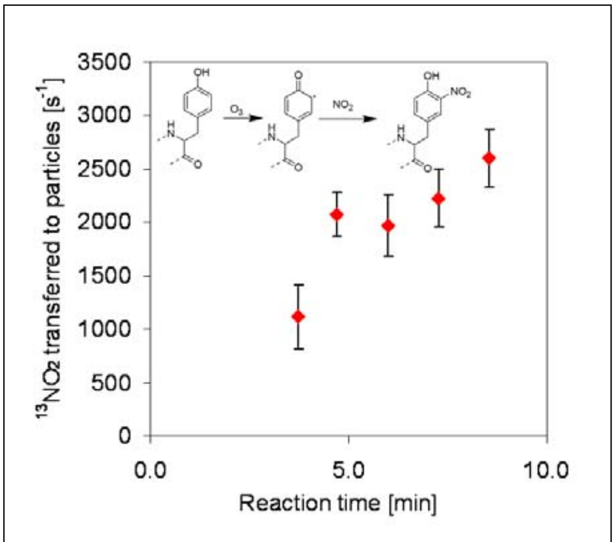


Figure 1: **Formation of nitrated proteins in protein particles exposed to O_3 and ^{13}N-labelled NO_2. The inset shows the suggested mechanism involving tyrosine residues.**

Snapshot of protein nitration

It has been suggested that nitrated proteins are involved in the allergic response of humans to bioparticles, such as pollen. Nitration may occur at the phenolic group of tyrosine, a common amino-acid in proteins. PSI's PROTRAC facility provided the short-lived radioactive tracer ^{13}N to measure nitrate formation in bovum serum albumin (BSA) particles in the presence of NO_2 and O_3 (Figure 1), which involves a reactive oxygen intermediate, a phenoxy type radical [1]. The study also emphasized the wider role of such reactive oxygen intermediates in atmospheric chemistry and, potentially, in the health effects of particulate matter.

Humidity-driven reactivity

Reaction with O_3 is also an important oxidation process for many other organic compounds in atmospheric particles, along with reactions with odd oxygen or halogen radicals that slowly convert the primary particles into more oxidised, and often more soluble and CCN-active, particles. The efficiency of the reaction with O_3 may be strongly linked to the viscosity

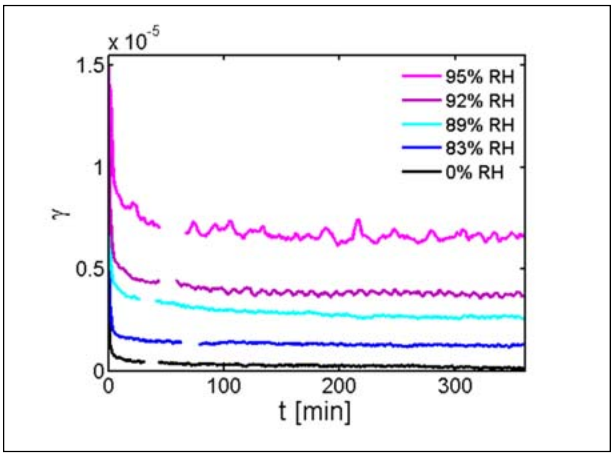


Figure 2: **Uptake coefficient of ozone on a thin film of tannic acid at different relative humidities (solid lines).**

by virtue of the diffusion coefficient [2]. The kinetics of the reaction of O_3 with tannic acid, a proxy for atmospheric polyphenolic compounds, is shown in Figure 2. The uptake coefficient, γ, which is the rate of reaction normalized to the gas kinetic collision rate with the surface, increases by close to two orders of magnitude between 0% and 95% relative humidity (RH). We believe that tannic acid undergoes moisture-induced phase transitions, which explains the changes in viscosity and diffusivity, and thus reactivity. Highly viscous semi-solid or glassy states that are conceivable for many soluble organic compounds lead to extremely long diffusion times, and thus to effective shielding of reactive organic compounds from degradation by atmospheric oxidants.

Nanochemistry in sight

The many important insights obtained so far into the chemistry in atmospheric particles is from observations of the loss of gas-phase species or from bulk (average) chemical analysis of individual, or an ensemble of, particles. We have now embarked on new avenues of interrogating the interior of particles by applying soft X-ray scanning transmission microspectroscopy (STXM) that allows spatially-resolved chemical information to be obtained. We have developed a microreactor for the STXM endstation of the PolLux beamline (SLS) [3, 4] that allows temperature and humidity of particles deposited on a substrate to be controlled, and exposes them to oxidants. As an example, Figure 3 demonstrates the distribution of oxygen in a tannic acid particle swelling due to uptake of water at different relative humidities. Shikimic acid is an important metabolite in plants and has been found in particles from biomass burning. It contains a C=C double bond susceptible to attack by O_3.

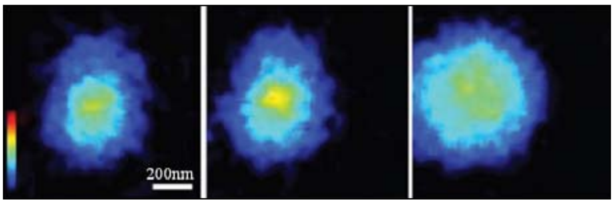


Figure 3: **STXM absorption images of a tannic acid particle exposed to 40 %, 80 % and 90% RH. The images were measured at 560 eV.**

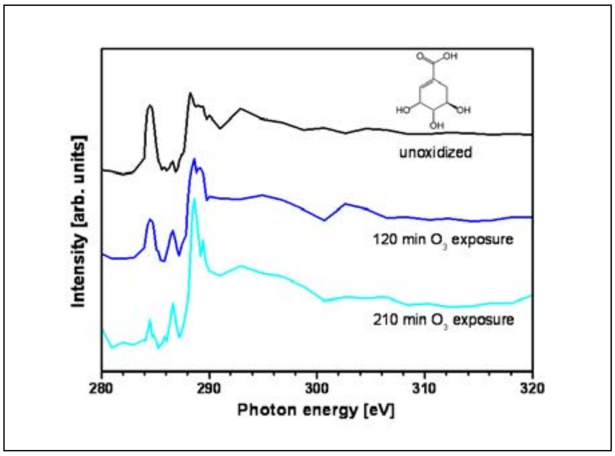


Figure 4: **Carbon K-edge X-ray absorption spectra of a shikimic acid particle before and after exposure to ozone, measured at 85% RH.**

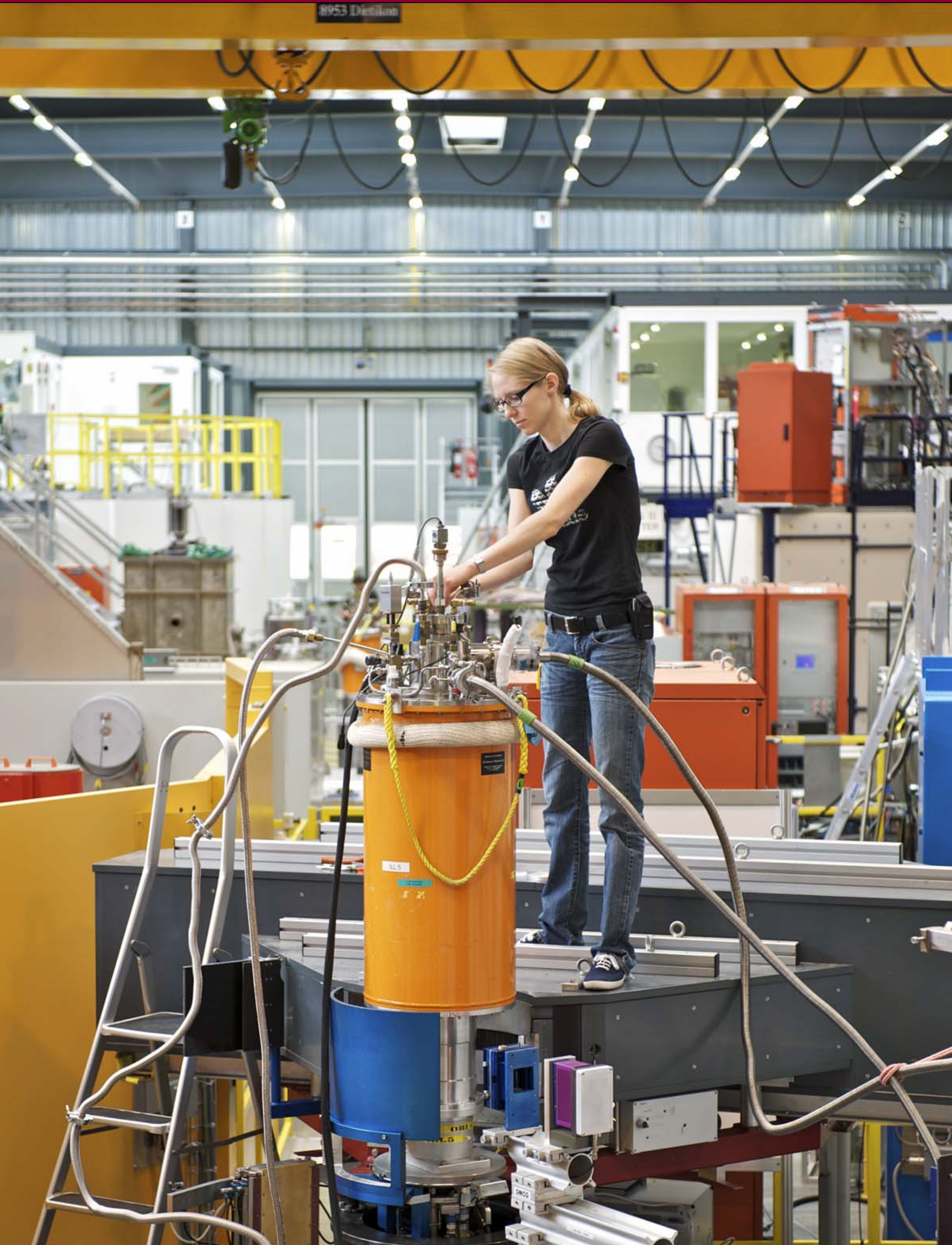
Figure 4 depicts changes in carbon K-edge X-ray absorption spectra from individual shikimic acid particles due to exposure to O_3. Decreasing intensity at 285 eV (C=C double bonds) go along with increasing intensity at 288 eV (carboxylic acids). Such information opens the way for combined chemical and structural information with nanometer resolution.

Acknowledgements

This work was funded by the Swiss National Foundation and the European FP6 and FP7 integrated projects EUCAARI and PEGASOS. The measurements on protein nitration were performed in collaboration with M. Shiraiwa and U. Pöschl (Max Planck Institute of Chemistry, Mainz, Germany).

References

[1] M. Shiraiwa et al., Nature Chem. **3** 291 (2011).
[2] M. Shiraiwa et al., Proc. Natl. Acad. Sci. **108** 11003 (2011).
[3] V. Zelenay et al., J. Aerosol Sci. **42** 38 (2011).
[4] V. Zelenay et al., Env. Chem. **8** 450 (2011).


8953 Dietikon

User facilities

The Paul Scherrer Institute develops, builds and operates Switzerland's complex, large-scale research facilities, serving users from the national and international scientific communities. The research topics under investigation include condensed matter, materials and life sciences, energy and the environment. The facilities available are the SINQ spallation neutron source, the SμS muon source and the SLS synchrotron light source. These provide beams of neutrons, muons and photons, respectively, making PSI one of only two research centres in the world with these three types of complementary research probes on one site.

In elementary particle physics, the studies performed at PSI are complementary to the work carried out at high-energy facilities, such as the LHC at CERN. Concentrating on high beam-intensity experiments with large numbers of particles enables very rare decay events to be detected or particle properties to be determined with great accuracy. Experiments performed at PSI's Ultracold Neutron Source (UCN) will contribute to our knowledge of the fundamental forces of nature by helping determine the properties of the neutron.

All of these facilities are powered by one of the two major accelerators at PSI: the neutron and muon sources by the proton cyclotron, and the synchrotron light source by an electron storage ring. An additional, smaller, proton accelerator is used for the proton therapy facilities. A large number of scientists and technicians work at the accelerators, for the benefit of the users, to ensure smooth operation and continuous improvement in performance.

The next large accelerator-based project, SwissFEL, will provide ultrashort, highly intense X-ray pulses for the investigation of fast processes and the determination of molecular structures. It is planned to begin operation of this facility in 2016.

◀ **PhD student Nikola Egetenmeyer preparing an experiment at PSI's neutron source SINQ.**

Operation of the PSI Accelerator Facilities in 2011

Andreas Lüdeke, Anton C. Mezger, Marco Schippers and Mike Seidel
Department of Large Research Facilities (GFA), PSI

The Department of Large Research Facilities has responsibility for the operation and development of the three accelerator-based user facilities at PSI. These are: the High-Intensity Proton Facility, the Swiss Light Source and the Proscan medical accelerator. This article covers operational aspects of these facilities, as well as performance highlights and new developments achieved in them during 2011.

High-intensity proton accelerator (HIPA)

In 2010, the performance of the Ring cyclotron was severely limited by deformed trim plates. The reduced vertical aperture caused higher extraction losses and a distortion of the electrical symmetry. The trim plates were exchanged during the annual shutdown, and this resulted in very good performance of the Ring cyclotron in 2011. The low beam losses made it possible to achieve a new record beam intensity of 2.4 mA, corresponding to 1.4 MW beam power, during several dedicated shifts.

In the first week of user operation, starting on 12 April, the stability of the facility was still impaired by discharges in the high voltage elements of the Ring cyclotron as well as in the ECR source. Some minor technical problems had still to be resolved in the context of the shutdown. Thus there was a reduced availability of ≈ 80% during the first week of user operation. Over the second week, the beam current could be raised to its nominal value of 2.2 mA, and the beam availability increased to more than 90%. After the May service, a major vacuum leak occurred in the Ring cyclotron, and almost two days were necessary to find and repair the leak, which was in

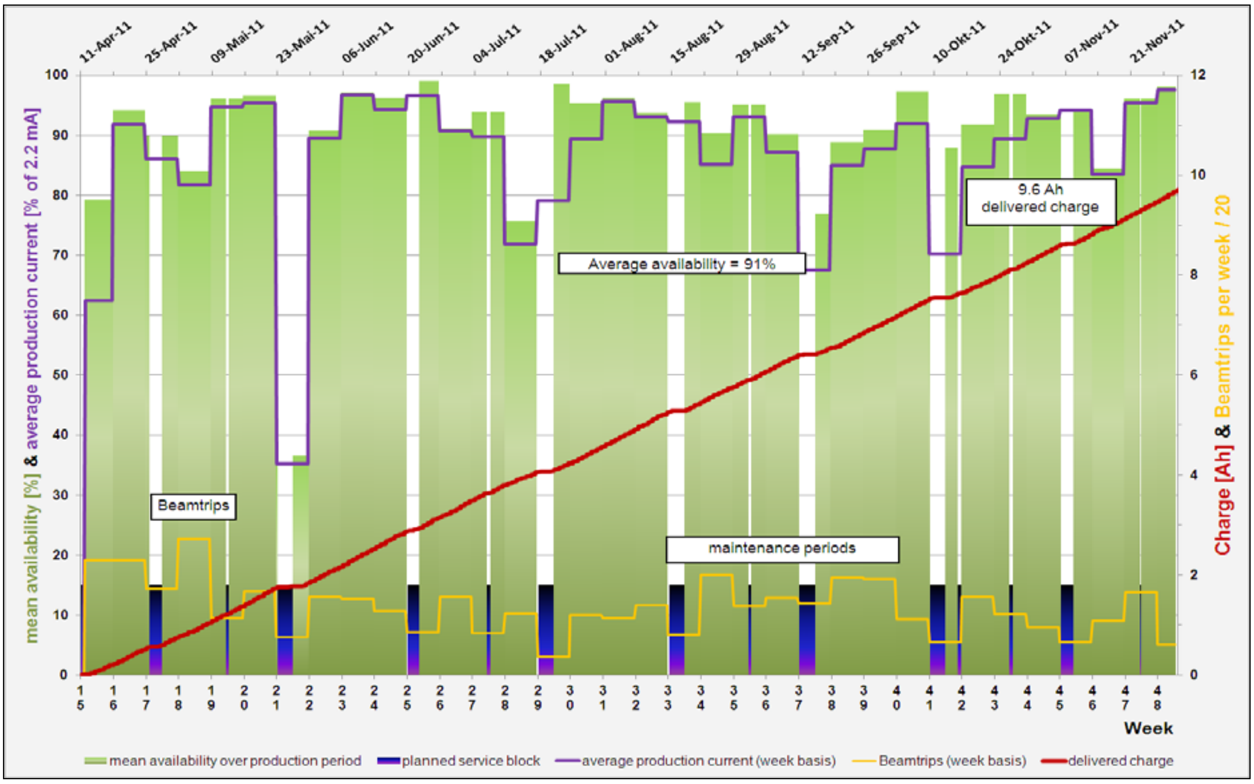


Figure 1: **Operation of the Proton Facility: availability, average current, delivered charge and beam trips.**

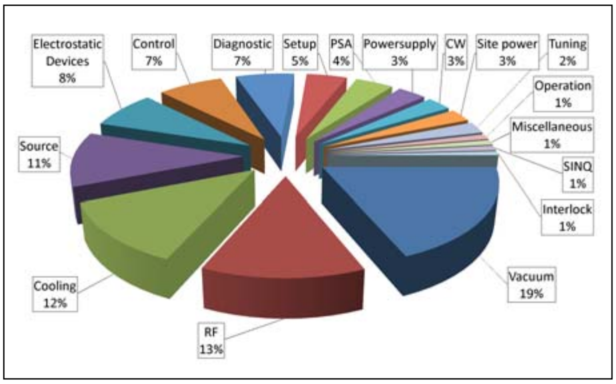


Figure 2: **Downtime characterization for HIPA outages longer then 5 minutes (ca. 340 hours).**

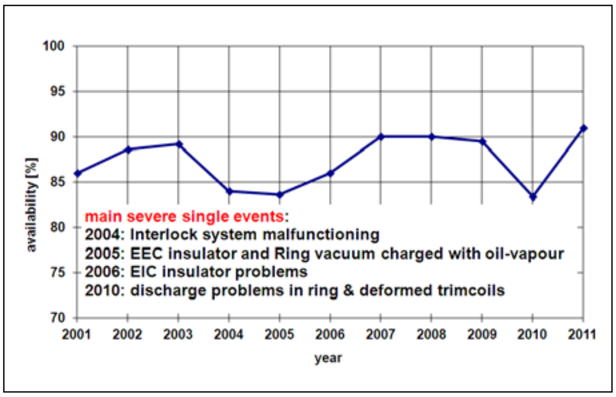


Figure 3: **HIPA availability over the last 10 years.**

Total beam time	
To meson production targets	4952 h
To SINQ	≈ 4850 h
Beam current integral	
To meson production targets	9.6 Ah
To SINQ	6.3 Ah
Outages	
Unscheduled outages > 5 min	333 h
Total outages (current < 1 mA)	445 h
Availability	**91%**

Table 1: **Operational statistics of HIPA.**

an RF pickup. As a consequence, that week showed the lowest availability for the year 2011. Two more weeks had availabilities below 80% (Figure 1). In Week 28, a vacuum leak near the ion source, a defective collimator control module and a short circuit in a switch used by the personnel safety system were the main causes. In Week 37, the ion source extraction element could not be operated at its nominal voltage and had to be replaced. This caused 20 hours of beam interruption. Figure 1 shows the facility availability together with the weekly averaged production current, the charge accumulated on the 4 cm meson production target and the number of beam trips throughout 2011. The overall availability of the facility amounted to 91%, constituting a new record in the history of HIPA. The integrated charge was 9.6 Ah on Target E and 6.3 Ah on the SINQ spallation target (Table 1). The various relative contributions to the downtimes in 2011 are shown in Figure 2. The downtime was dominated by the categories of: vacuum, RF, cooling systems and ion source. Together, these represent more than 50% of the registered downtime. The failures related to RF were mainly caused by the aging amplifier of Resonator 4 in Injector II. Over the full year, the availability was recovered to values obtained in previous years (Figure 3).
The UCN facility was routinely operated during 2011. For this facility, the 590 MeV beam is switched periodically, every twelve minutes, for time intervals of 8 seconds, from the meson production targets towards the UCN target.

PROSCAN

The year 2011 was a very successful year with respect to the operation of the 250 MeV SC cyclotron and the Proton Therapy facility PROSCAN. Figure 5 shows that the number of operational hours (beam available or used) has increased to 7023 hours, with an availability of 98%. Apart from the continuation of Gantry-1 operation, beam time was used by OPTIS2 for the whole year. The Centre for Proton Therapy used 3134 hours and 638 hours were used for irradiations at PIF. About 50 hours of unscheduled downtime were due to failures of new encoders that appeared to be too sensitive to the magnetic field of the cyclotron. About 40 hours were lost due to recurring water leaks in cooling panels of the RF amplifier. To overcome this problem, the RF amplifier has been modified, with an external heat exchanger (Figure 4), so that all components containing water are located outside the racks.
Accelerator developments at PROSCAN were aimed at reducing the frequency of service interventions. The lifetime of the new tungsten puller nose has proven to be more than a year. Improved alignment procedures of the ion source and a new

Figure 4: **New cooling system for the PROSCAN RF amplifier.**

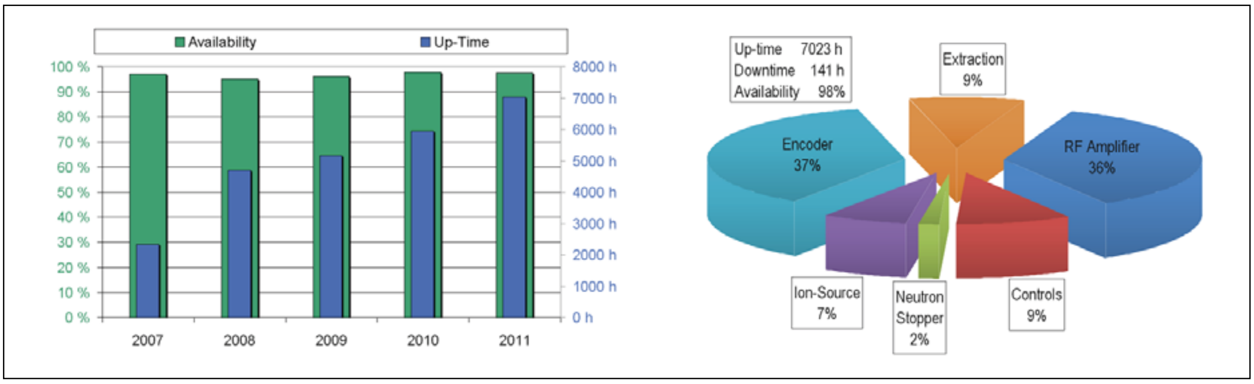


Figure 5: **Operating hours per year, availability of PROSCAN (left) and unscheduled downtime by causes.**

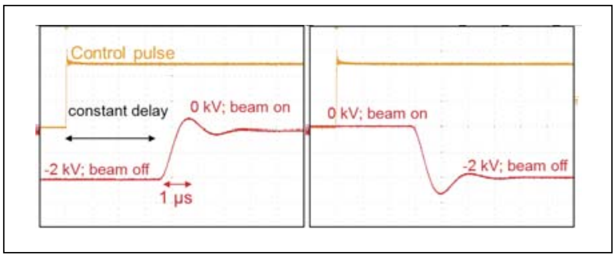


Figure 6: **Voltage pulses on the vertical deflector to modulate the beam with microsecond speed.**

chimney design resulted in a reduced ion source arc current. Due to these measures, the typical time between ion source services has been increased from one to four weeks. A new design of the vertical deflector plates has improved mechanical robustness and service friendliness, which decreased working time and the resulting personnel dose needed for an exchange. A new phase-slit system at 1 MeV is being tested. Compared to the present slits at 10 MeV, this will substantially reduce the activation of the cyclotron. It may also allow regulation of the beam intensity by slight changes in RF power.

It is planned to study this problem with the OPAL beam simulation program, and a model of the cyclotron has been implemented for this code. Initial studies for coupling the cyclotron to a pulsed booster accelerator have been started. Proton beams at higher energy are of interest for applications in proton radiography. In addition, the reduced multiple scatter at higher energy makes it possible to deliver very sharply demarcated dose distributions for patient treatment. A linear accelerator (Linac), accelerating protons from 250 MeV to 350 MeV, would be pulsed at 200 Hz with a pulse width of about 5 µs. In this context, the power supply and connections of the vertical deflector plates in the cyclotron have been modified, to provide the possibility to pulse the cyclotron beam intensity with a rise time of 1 µs (Figure 6). In this way, beam losses between the Linac pulses can be minimized. A design study of a Linac has been started, in collaboration with the TERA foundation at CERN.

Swiss Light Source (SLS)

In September 2011, the Department of Synchrotron Radiation Research celebrated ten years of user operation at the Swiss Light Source. The accelerator crew had reasons to celebrate as well: A new record for the vertical beam emittance [1] was established, and the beam availability in 2011 reached a value of 98.7%. The mean time between failures increased from three days in the two years before to about four days in 2011. The major improvement to reach this outstanding mean time between failures was an upgrade of the arc detectors at the four RF stations of the storage ring. Each station has two arc detectors and, in former years, each detector created several beam trips per year. It was suspected that a large fraction of these arc interlocks had been caused by noise in the detection system and not by real breakdowns. Coincidence arc detectors have now been installed to improve this situation. They only cause an RF interlock if two arc detectors close to each other measure an arc at the same time. Indeed, none of the upgraded detectors did actually measure any arcs in coincidence. Only four arc interlocks occurred in 2011, instead of an average of sixteen interlocks in preceding years. This reduced number of beam trips is clearly visible in the diagram for the cumulative downtime. The event numbers are split into two categories by duration (longer or shorter than five hours, Figure 7). While the total duration of beam outages varied by a factor of four

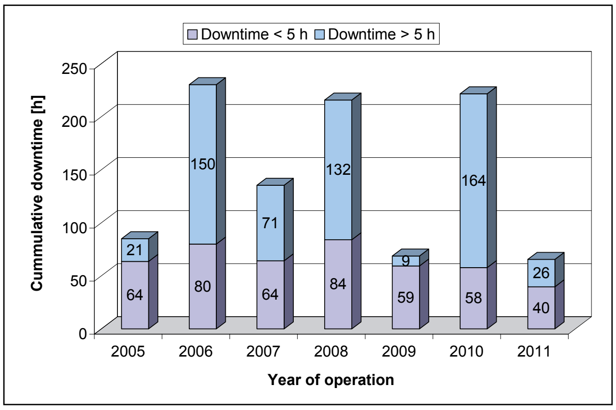


Figure 7: **Downtime totals for long and short events.**

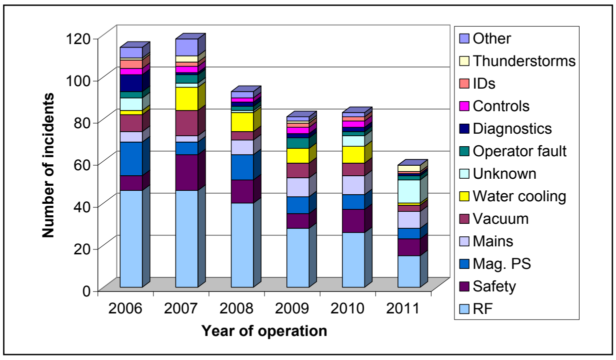


Figure 8: **Beam outage count per failure category.**

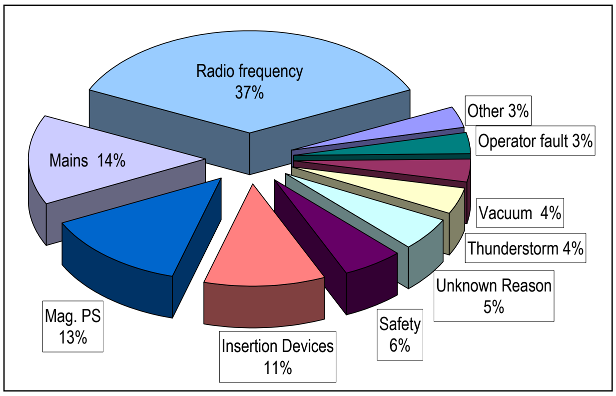


Figure 9: **Beam outages per failure category in 2011.**

Beam Time Statistics	**2011**		**2010**	
Total beam time	6824 h	77.9%	6720 h	76.7%
• User operation	5000 h	57.1%	5191 h	59.3%
- incl. compensation time	160 h	1.8%	227 h	2.5%
• Beamline commissioning	976 h	11.1%	680 h	7.8%
• Setup + beam development	848 h	9.7%	845 h	9.7%
Shutdown	1944 h	22.2%	2048 h	23.3%
User operation downtimes	53		76	
• Unscheduled outage duration	65 h	1.3%	214 h	4.1%
• Injector outage (non top-up)	22 h	0.4%	9 h	0.2%
Total beam integral	2506 Ah		2349 Ah	
Availability	98.7%		95.9%	
Availability after Compensation	101.9%		100.3%	
MTBF	94.3 h		67.4 h	
MTTR (mean time to recover)	1.2 h		2.8 h	

Table 2: **Operational statistics of the SLS.**

over the past few years, the cumulative time of beam trips shorter than five hours always stayed roughly between 60 and 80 hours. This year, short outages caused only a total of 40 hours of downtime. Figure 8 shows the number of beam trips per year split by failure category. The Figure illustrates the reduction of trip numbers in most categories.

The improvement in the number of RF trips is most significant, and this number has been continuously decreasing since 2007. Significant effort from the RF Group was required to identify the reasons for beam trips and to reduce the likelihood of their occurrence. As a side effect, the number of beam outages with unidentified causes is now increasing. In the past, some RF interlocks had been caused by beam loss, either from a sudden change in the beam load or by noise. Those beam losses were then simply accounted for as RF trips, although the real cause was elsewhere. Now, these beam trips have to be examined closely in order to find their true cause. There were just three beam outages longer than five hours in 2011. The new cryo-cooled undulator of the materials science beamline had a trip of the nitrogen liquefier, causing the in-vacuum undulator to warm up. This, in turn, caused a vacuum pressure increase and resulted in a vacuum interlock. It took about seven hours to recover the vacuum conditions to the level which is required to accumulate beam. The diagnostics of the nitrogen cooling loop have now been improved to enable an early reaction to problems with the cooling loop, before the vacuum is affected.

A beam interruption of seven and a half hours was caused by a trip of the helium compressor of the superconducting third-harmonic cavity. Another trip happened later in the year, during a shutdown, and the reason was difficult to diagnose. An auxiliary power supply in the controller electronics of the compressor created a transient glitch, which tripped the compressor. After the replacement of this auxiliary power supply, no further trip occurred. The longest beam outage during user operation in 2011 was caused by a water leak in a storage ring RF klystron. The replacement of the klystron and re-commissioning of the RF station was finished within less than eleven hours. The operational data is summarized in Table 2. Figure 9 shows the beam outage events in 2011, assigned to the different failure categories.

The rate of outages caused by fluctuations of the mains had been increasing during the past few years. These power glitches are caused outside PSI and are beyond our control. A continued effort is undertaken to minimize the effect of those glitches. Even if glitches inevitably result in beam dumps, operational efficiency can be gained by reducing the recovery times of affected accelerator systems.

It is planned to replace the RF cavities in the storage ring. The existing cavities develop cooling water leaks that are very difficult to glue and that cannot be repaired in a timely manner. The new cavities have been ordered and the first one will be installed in January 2013. The plan foresees replacing just one cavity per year. This will allow lengthening of the shutdown period for the installation and commissioning of a new cavity, without affecting the total amount of yearly user beam time.

References

[1] M. Böge, K. Dreyer, A. Streun and E. Meier, *Beam Assisted Girder Re-Alignment at the SLS*, This report.

Tenth anniversary – The Swiss Light Source in 2011

Stefan Müller, Jeroen van Bokhoven, Oliver Bunk, Christoph Quitmann and J. Friso van der Veen,
Synchrotron Radiation and Nanotechnology Department, PSI

In 2011, we celebrated the tenth anniversary of the Swiss Light Source. User operation started in 2001 with just four beamlines. Now the SLS has eighteen beamlines, covering the entire radiation spectrum from the infrared to the hard X-ray range. From day one of its operation, the SLS storage ring featured small-gap in-vacuum undulators in combination with top-up injection. These features, combined with sophisticated beam position monitoring and a feedback system, provided extremely high stability and reliability. The high quality of the instrumentation and excellent support by the SLS staff provide conditions which resulted in more than 2000 publications during the first 10 years of operation. In addition to that, a further increase in the number of new proposals was observed. Public outreach activities included the Joint Users Meeting, international conferences and workshops, as well as the PSI Summer School and the public Visitors Day.

User operation – still going strong after 10 years

Regular user operation at the Swiss Light Source (SLS) started in 2002. In the last decade, the number of submitted proposals has increased steadily and, in 2011, reached, with almost 800 proposals, the highest-ever request for beamtime. The other key figures (Table 1), such as number of user visits, experimental days, and number of experiments are additional proof of the continuing high user demand of the SLS.

	2011	2010	2009
User visits	3338	3221	3145
Experimental days	1787	1496	1778
Number of experiments	1058	1085	1053

Table 1: **SLS key figures for user operation 2009–2011.**

Sixty percent of these visits are by users from outside Switzerland staying more than one day at the facility. On average, each individual user visits the facility twice a year. In general, the three protein crystallography beamlines are visited more often than the other beamlines.

The excellence of our user community and in-house staff is also illustrated by a remarkably high number of user publications in 2011. A total of 482 publications were generated, of which 59 were published in the leading journals Science, Nature, Cell and Phys. Rev. Letters.

Committees – advising for the future and evaluating scientific merit

The Photon Science Advisory Committee (Photon-SAC) met in spring 2011. The committee is headed by Prof. Dr. Gerhard Materlik (Diamond Light Source, Harwell, UK) and advises PSI on the strategy to be followed for the SLS, SwissFEL and their collaborations.

The two Proposal Review Committees (PRCs) evaluated a total of 778 proposals. The non-PX PRC has four sub-committees (HardXAS, SoftXAS, Photoemission/Infrared/RIXS and Diffraction/Tomography) and is chaired by Prof. Dr. Ph. Aebi (University of Fribourg, Switzerland). The PX PRC is chaired by Prof. Dr. Nenad Ban (ETH Zurich).

We would like to thank the chairs and members of these committees for their advice and for the thorough evaluations of the proposals.

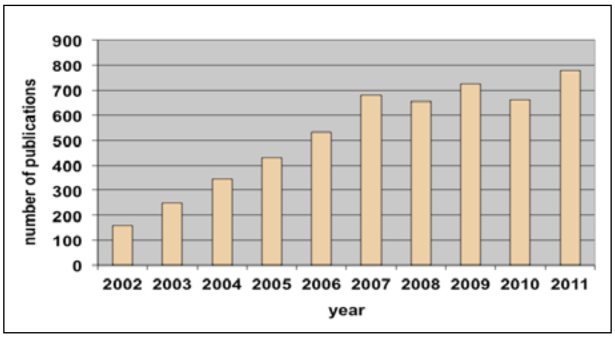


Figure 1: **Number of submitted proposals in the years 2002–2011.**

MS beamline upgrade and new beamlines – investments for our users

The Material Science beamline has undergone a comprehensive upgrade [1]. The wiggler was replaced by a short-period (14 mm), in-vacuum, cryogenically-cooled, permanent-magnet undulator (CPMU, U14), and the front end and optics have been completely redesigned to optimally exploit the characteristics of the new, high brightness source. In addition to providing fundamental improvements for both powder- and surface-XRD experiments, the upgrade will allow new experiments previously not possible. The beamline has received first test users and will be in full user operation in 2012.

The new beamlines NanoXAS and X-Treme received their first light in 2010 and started to host pilot users in 2011. The third new beamline, Phoenix, already started to host regular users in the second half of 2011. Phoenix and X-Treme are both beamlines for X-ray absorption spectroscopy, with Phoenix focusing on environmental and materials research and X-Treme on research of magnetic phenomena in high magnetic fields and at low temperature.

PEARL (Photo-Emission and Atomic Resolution Laboratory) is a new soft X-ray beamline dedicated to surface science. The main synchrotron-based technique is photoelectron diffraction, while scanning tunnelling microscopy provides complementary real-space information. This beamline is co-financed by 4 Swiss institutions and received its first light in December 2011. Commissioning of the optics and installation of the end-station are planned for 2012.

Summer School and Joint Users Meeting – training and knowledge exchange

The PSI Summer School in Condensed Matter Research was established to provide education for PhD students and postdoctoral fellows working in condensed matter physics, materials science and related fields. It enables students to work at the frontiers of science and technology by providing expert training in the use of large-scale facilities, which is not available within the traditional system of graduate and postgraduate education. At the 2011 Summer School, more than 20 world experts introduced the different aspects of phase transitions from experimental and theoretical points of view. The School brought together 96 participants with 20 different nationalities and affiliations (Swiss (55), EU (38), others (3)). Following the school, practical training at PSI allowed 23 students to receive hands-on experience of state-of-the-art instrumentation using photons, neutrons, and muons.

The Joint Users Meeting, JUM@P, is organized jointly by the Muon (SμS), Neutron (SINQ) and X-ray (SLS) facilities to generate synergies between scientists driven by common scientific, rather than technical or method-related, interests. JUM@P’11 consisted of a plenary session on the first day, and seven parallel topical workshops on the second day. During these sessions, a total of 81 oral presentations were given and, in addition, two poster sessions, with a total of 76 poster contributions, were organized. Two hundred participants actively contributed to the meeting, testifying to the great interest of the community. One highlight was the award of the second PSI Thesis Medal to Elena Mengotti for her PhD thesis on *Artificial kagome spin-ice systems*.

Tenth anniversary and scientific highlights

The tenth anniversary was celebrated along with the key people involved in the design, building, and operation of the facility as well as the stakeholders with a special relationship to the facility, including financial partners, key users, staff, neighbors, representatives of Federal and local authorities, and many more. The celebration was a great opportunity to give an overview of the very successful period from the start of the first beamlines up to the full extension of the instrumentation to 18 operational beamlines. The ceremony allowed only a few highlights to be mentioned, selected from the more than 2000 publications, which include life science, physics, chemistry, materials and environmental science. The key role played by the in-house staff and the strong involvement in X-ray instrumentation and detectors was apparent.

We thank all of our users for their loyalty, for the excellent science they brought to the SLS during the past ten years and, last but not least, for their friendly cooperation.

References

[1] Ph. Willmott et al., *The Materials Science Beamline upgrade,* This report.

The Swiss Spallation Neutron Source: SINQ 2011

Stefan Janssen, Christian Rüegg, Werner Wagner and Kurt N. Clausen
Department of Research with Neutrons and Muons (NUM), PSI

The year 2011 was again highly successful regarding both target and user operation at PSI's neutron source SINQ. Thanks also to the excellent performance of the PSI proton accelerator, SINQ received the highest total charge ever. The number of publications produced by SINQ experiments (almost 140) and of new proposals (more than 400) also provided new records in the history of user operation. In the future, users will additionally benefit from the new thermal triple-axis spectrometer EIGER and from the novel setup for differential phase contrast imaging on the ICON beamline.

SINQ target and user operation: A year of records

The year 2011 was outstanding for SINQ with respect to both target and user operation. After the installation of the 8th SINQ target during the spring shutdown (lead in Zircaloy tubes and lead blanket as in the Generation 7 target), the new target received a total charge of 6370 mAh, which clearly exceeded the previous maximum of 6220 mAh from 2009. This is especially remarkable, since the operation period was shorter than usual (no accelerator operation in December). The gain was due to three reasons: (i) the outstanding performance of the proton accelerator, with an availability of 91%; (ii) a further increase in the proton current, with many highly stable periods of 2.2 mA; and (iii) the again outstanding availability of SINQ itself (97%) with respect to the proton accelerator.

These excellent technical boundary conditions allowed almost 440 experiments to be performed on the 12 SINQ instruments which were open for user operation in 2011. The average duration of a SINQ experiment was 4.4 days.

As in previous years, the scientific use of SINQ was dominated by Swiss groups, which used 55% of the available experimental-days. Apart from users affiliated to PSI, most of the Swiss user groups came from ETH Zurich (17%), EPF Lausanne (9%) and Empa (4%). But SINQ is an open-access infrastructure and is fully integrated into the international neutron scattering community: In total, more than 440 different users from 34 countries came to PSI to perform experiments at SINQ in 2011; 32% of the beam time was used by groups from the European Union and 13% from the United States, Japan, India and other countries.

Most users were at the early stages of their careers: 61% were undergraduate students, PhD students or Postdocs and more than 40% were 30 years of age or younger. This fact clearly emphasizes the important role that national user facilities such as SINQ play in scientific education.

More than 400 new proposals

Obviously, the demand for beam time is one of the key figures for demonstrating the attraction of a user facility for the community.

In 2011, the PSI User Office received 403 new SINQ proposals – a value that exceeded the previous record from 2010 by 14% (see Figure 1). Most of the new proposals asked for beam time on the SINQ diffractometers (130), followed by the request for small-angle scattering instruments and reflectometers (113), the spectrometers (91) and the two imaging instruments NEUTRA and ICON (69).

This is a very clear statement by the user community and should augur a bright future for the PSI spallation neutron source!

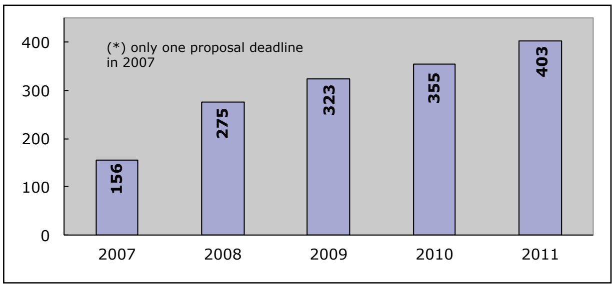


Figure 1: **Number of SINQ proposals submitted in the period 2007–2011.**

Figure 2: **The new EIGER spectrometer. Construction was completed in Nov. 2011 and commissioning will start in 2012.**

Figure 3: **Users from the Institute of Physics (Beijing) at the RITA-2 spectrometer at SINQ, where they are investigating novel superconducting materials.**

Instrumentation and highlights

The construction of the new thermal triple-axis spectrometer EIGER was completed successfully in November 2011 (Figure 2). In 2012, the instrument will be commissioned with first test experiments and, after further optimization, will then enter the user program. The EIGER spectrometer extends the energy range of spectrometers available at SINQ. It offers incident energies of up to 70 meV, in combination with all sample environment devices available at SINQ, which include high-field magnets up to 15 T, high pressures using a Paris-Edinburgh press operating down to 4 K and up to 150 kbar, and ultra-low temperatures down to 50 mK.

Together with the groups of T. Forgan and E. Blackburn from the University of Birmingham, a high-field solenoid magnet (up to 17 T) was tested on the small-angle scattering instruments SANS-I. Studies of flux-line lattices in high-temperature superconductors remain a very strong activity at SINQ. With the new maximum field of 17 T at SINQ, such studies can now be extended to uncharted territory in the phase diagrams of these materials.

The unique possibilities of the SANS-I instrument, allowing high-magnetic fields and ultra-low temperatures, and the use of polarized neutrons as well as of the other instruments at SINQ, led to a continuously high demand for beam time, and consequent overload. Additional days of beam time have been made available in 2011 and 2012 to the user programme, to maximize the number of experiments.

The two facilities for neutron imaging (ICON, NEUTRA) were extremely well used by scientific and industrial users. ICON was upgraded with a permanent setup for differential phase-contrast imaging using the grating interferometry technique and an insert for energy selection (TESI). The highest demand was for high spatial resolution tomography, where we still see a potential for improvement. One of the major successful projects was the non-invasive analysis of diesel particle filters on micro and macro scales.

Materials science remains the main activity of research at SINQ. Materials for energy storage and conversion, for nuclear safety, for future information and other technologies and for health care were intensely studied on all instruments. Examples for the groundbreaking research done at SINQ are presented in this report (e.g. on advanced drug delivery systems [1]). Results were published in almost 140 papers in peer-reviewed journals. Among the highlights are studies of microgels [2], which are model systems of particles with controllable interactions, of self-assembly of members [3], which are investigated by neutron reflectometry, and of novel magnetic materials [4], which reveal their secrets in inelastic neutron scattering experiments using the highest energy resolution available at SINQ on the MARS spectrometer.

Training and education of students remain an important activity at SINQ, with several schools, practical courses and workshops organised every year. Young talent and enthusiasm, together with strong national and international collaborations and new projects on the horizon, such as the European Spallation Neutron Source ESS, make the future appear to be very bright for neutron scattering.

References

[1] E. Amstad, E. Reimhult and J. Kohlbrecher, *Triggered release through Magnetic Actuation of vesicles functionalised with iron-oxide nanoparticles,* This report.

[2] J.J. Liétor-Santos et al., Soft Matter **7** 6370 (2011).

[3] L. De Viguerie et al., Langmuir **27** 8776 (2011)

[4] A. Furrer et al., Phys. Rev. Lett. **107** 115502 (2011)

The new Ultracold Neutron user facility UCN delivers first neutrons to the nEDM experiment

Bertrand Blau, Klaus Kirch, Bernhard Lauss and Philipp Schmidt-Wellenburg,
on behalf of the PSI UCN project team and the nEDM Collaboration,
Spallation Neutron Source Division and Laboratory for Particle Physics, PSI

Approval by the Federal authorities in June 2011 marked the official start-up of operation of the second spallation target station at PSI. The new user facility, UCN, is named after the acronym for the "Ultracold Neutrons" produced there. These very slow neutrons can be used for fundamental particle physics experiments. Soon after start-up, fully-automated UCN fills were being reliably delivered to the two experimental areas. The intensity increase, compared with tests in 2010, yielded UCN densities comparable to previous measurements at the ILL at Grenoble. While improvements are under way, the search for an electric dipole moment of the neutron, nEDM, at PSI has already begun. Finding an nEDM different from zero would help explain the excess of matter over antimatter in the universe.

First operation of the UCN source

After approval for operation given by the Swiss Federal authorities at the end of June 2011, the UCN source [1] started beam operation on 3 August and delivered neutrons up to the accelerator shutdown on 2 December. Over this period, all subsystems were safely operated and studied in some detail. From the beginning, enough neutrons were produced to allow commissioning of the nEDM apparatus along with the UCN source optimization studies, such as shutter timing, beam optics tuning or cryogenic operation sequences. Operation with full proton current was soon standard and many measurements were carried out to better understand the source performance. By November, the UCN intensity delivered (Figure 1) was a factor of 67 higher than the best value obtained during commissioning in December 2010. This can be mainly attributed to a high ortho-concentration of the deuterium (~98%), better crystal quality (now frozen from the liquid state), and higher proton beam intensity.

The large, 30 litre deuterium crystal could be liquefied and re-frozen several times under different conditions to study the effect of the crystallization procedure on the UCN yield (Figure 2). It was found that the process needs to be improved, as control-valve restrictions did not allow sufficiently slow crystallization.

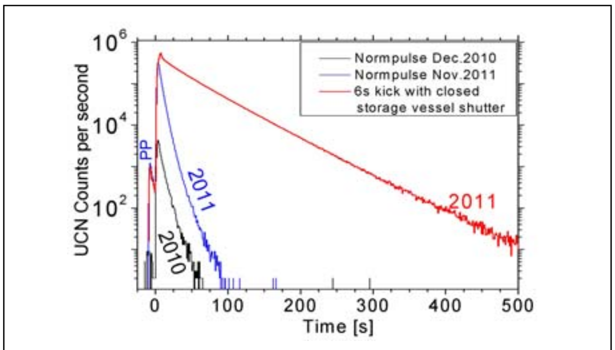


Figure 1: **UCN counts observed in a detector on beamline West after a proton beam pulse. To reliably compare different conditions, pulses of 2 s length (so-called normpulses) with all shutters open are used (black and blue curves). The short, 7 ms pilot pulse (PP) is used for proton beam positioning before the long beam kick. The red curve shows the counts for the case when, after a 6 s beam pulse, the shutter on the storage vessel bottom is closed and UCN are then guided to the detector.**

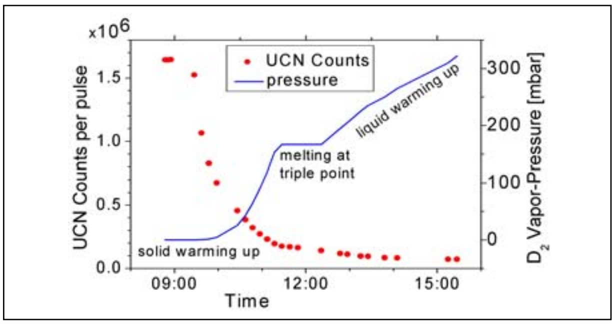


Figure 2: **Liquefaction of a 30 litre solid deuterium crystal monitored with UCN counts. The high initial UCN production in the solid deuterium crystal (red dots show the integrated counts for normpulses) decreases during warm-up, because of increasing crystal temperature. While warming up, the deuterium (D_2) pressure (blue curve) shows an increase up to the triple-point pressure (171 mbar), followed by a constant regime, where the solid-to-liquid phase transition takes place. Further warming vaporizes the liquid and the pressure increases again.**

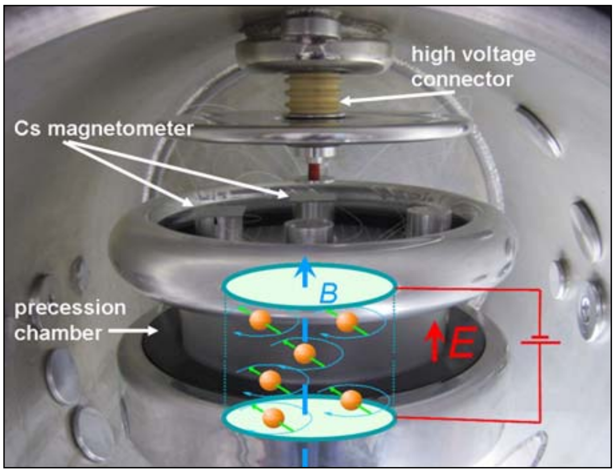


Figure 3: **Neutron precession chamber of the nEDM experiment. Spin-polarized UCN are confined for 150 to 250 s between two electrodes in an electric field up to 130 kV / 10 cm and a homogeneous magnetic field of 1μT. UCN spins precess at about 30 Hz. An electric dipole moment could add a few nHz to this frequency. Detecting this tiny change is the goal of the experiment.**

With fully-automated operation of the proton beam and the UCN source, 15 to 20 million UCN every 480 s could be delivered to the experiments by November.

The search for a permanent electric dipole moment of the neutron (nEDM)

Cosmology and the Standard Model of particle physics (SM) explain an impressive amount of the visible universe with a hitherto unachieved consistency. At the same time, cosmological observations indicate that the Standard Model is not yet complete. One clear hint is the 9 orders of magnitude discrepancy between the observed matter-to-antimatter ratio in the universe and the predictions of SM calculations. In both approaches, mathematical symmetries play an important, unchallenged role in explaining the origin of both matter and the fundamental forces which govern the interaction of matter particles. Fundamental symmetries, such as time reversal symmetry, must be broken [2] to explain the observed predominance of matter in the universe.

The search for an nEDM is a direct search for a violation of time-reversal symmetry indicated by correlation between electric field reversal and change in the measured precession frequency of neutrons in magnetic and electric fields (Figure 3). The discovery, or the exclusion, of an nEDM with increased sensitivity would immediately have a paramount impact on proposed theoretical solutions to the shortcomings of the SM (see also [3] in this report).

During 2011, the international nEDM collaboration [4] made major progress in establishing the required sensitivity of the

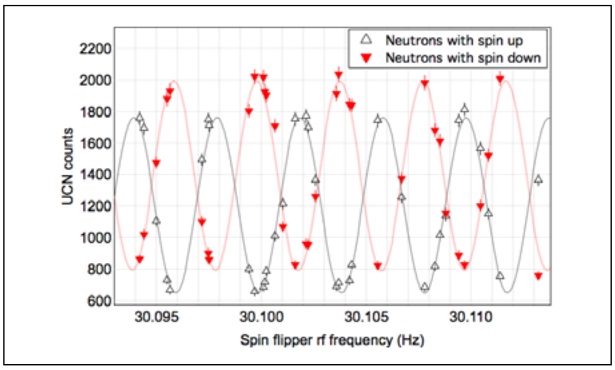


Figure 4: **A *Ramsey Curve,* observed for the first time with UCN at PSI. The relative number of spin-up or spin-down UCN counts observed after a precession time of 250 s depends on the magnetic field and the spin flipper rf frequency; if precession and rf are in phase, all UCN having initially spins-up are turned down; out of phase, many fewer are turned. An additional frequency dependence on the applied electric field would indicate an nEDM.**

improved apparatus originally used to give the present nEDM limit [5]. With the new UCN source, we are anticipating an increase by a factor of 25 in neutron density within our measurement chamber. This increase in statistical sensitivity has to be matched by better understanding and control of systematic effects.

Major sources of systematic effects are magnetic field inhomogeneities and instabilities which could mimic an nEDM signal. As shown in Figure 3, we have now installed a dedicated array of optically-pumped caesium magnetometers [6] for better control of the vertical magnetic field gradients in our apparatus. This allowed, without further fine tuning of magnetic field parameters, neutron properties correlated with magnetic field to be measured very well (Figure 4). Dedicated measurements with our mercury co-magnetometer reduced systematic effects correlated with the reversal of the electric field to a tolerable level. With increased ultracold neutron intensity at PSI, the Collaboration plans to take data for approximately 400 nights over the next few years, to reach a statistical sensitivity of $\sigma(\mathrm{nEDM}) \approx 1.5\times10^{-27}\,e\cdot\mathrm{cm}$, in order to find an nEDM. Together with uncertainties from systematic effects at the same level, this would lead to an upper limit of $|\mathrm{nEDM}|<5\times10^{-27}\,e\cdot\mathrm{cm}$ (95% C.L.) in the case of a null result – compared with $2.9\times10^{-26}\,e\cdot\mathrm{cm}$, which is the best current result (RAL/Sussex Collaboration).

References

[1] ucn.web.psi.ch
[2] A.D. Sakharov, JETP Lett. **5** 24 (1967).
[3] K. Kirch et al., *Higgs physics and rare particle decays,* This report.
[4] nedm.web.psi.ch
[5] C.A. Baker et al., Phys. Rev. Lett. **97** 131801 (2006).
[6] P. Knowles et al., Nucl. Instr. Meth. A **611** 306 (2009).

The Swiss Muon Source SμS in 2011

Elvezio Morenzoni and Robert Scheuermann, *Laboratory for Muon Spin Spectroscopy (LMU);*
Konrad Deiters, *Department of Large Research Facilities (GFA);* Stefan Janssen, *Department of Research with Neutrons and Muons (NUM), all PSI*

The Swiss Muon Source continues to be an intensively requested facility, delivering topical results in magnetism, superconductivity and other topics of materials science. Besides its research activities, a vigorous development programme has allowed substantial progress to be made towards a new high-field, low-temperature instrument and new capabilities for the low-energy muon beamline.

User Laboratory SμS

The Swiss Muon Source, SμS, is one of PSI's highly successful user facilities. In 2011, the facility again welcomed users from all over the world; in total, about 160 different scientists came to perform their muon spin resonance experiments at one of the six available SμS instruments. Almost 700 days were offered on the instruments and more than 220 experiments could be performed.
In 2011, a large share of beam-time was used by Swiss groups, 35% of beam-time was given to users from EU member countries, and another 15% to user groups from other countries, including Japan, Russia, Canada and the US. It is remarkable that the second-largest foreign user group (behind the UK (11%)) came from Japan (8%), followed by Germany and Italy (both 7%). In total, in 2011 users from 19 different countries performed their experiments at SμS, a number that demonstrates the significant role played by the PSI muon facility for the international user community.

Figure 1: **During the autumn of 2011, the PiE3 beam area was extended to deliver a fully polarized muon beam to the High-Field μSR facility. The picture shows the two spin rotators, with a refocusing element in between.**

Research

The papers which appeared in 2011 reflect the scientific relevance of the use of muons in condensed matter research. These include publications in journals with high impact factor, such as Science (1), Nature Journals (3), Journal of the American Chemical Society (1), Physical Review Letters (5) and the 28 papers in Physical Review B. SμS continued to be the leading μSR centre in the world for the investigation of iron-based superconductors. This research has been further stimulated by the synthesis of new superconductors in the crystal growth group of the Department of Research with Neutrons and Muons (NUM). A summary of this research is reported in a separate contribution to this report [1]. The unique depth-dependent magnetic information obtained by low-energy muons has also resulted in several scientific highlights, including the demonstration of dimensional control of electronic properties in oxide superlattices.

Developments

Besides the continuous development of all instruments, a dedicated spin rotator for the low-energy muon facility has been developed and built. This crucial upgrade, which will allow so-called longitudinal field measurements to be performed, is now ready to be installed and put into operation.
Essential progress has been obtained towards the realization

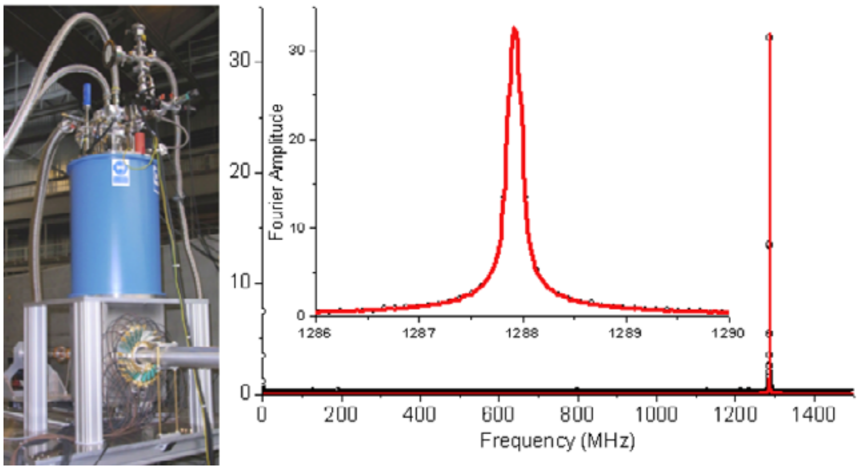


Figure 2: **Left: Magnet with detector system. Right: Fourier transform of the first μSR spectrum obtained from a silver sample at 9.5 T. The narrow line demonstrates its excellent magnetic field homogeneity (better than 10 ppm).**

of the new high-field μSR instrument, currently the major project of the Laboratory for Muon Spin Spectroscopy (LMU). The main components of the new facility were installed towards the end of 2011. The high-field μSR instrument, which is the only one of its type in the world, will allow a previously inaccessible range in the B-T phase diagram of condensed matter to be studied, ranging up to 9.5 T and down to ~20 mK. The facility will make use of a ~28 MeV/c muon beam. For most experiments, the spin of the originally fully longitudinally polarized muon beam must be rotated by 90°. This rotation is achieved by a device called a 'spin-rotator', which provides crossed electric and magnetic fields, both applied perpendicular to each other and to the muon's momentum. In addition to rotating the spin, it also acts as a velocity filter (Wien filter) and separates the muons from other particles contaminating the muon beam (mainly positrons).

The design parameters for the spin-rotator device originate from the preferred properties of the muon beam used to study the properties of the target in the spectrometer. Based on experience with other high-voltage devices at PSI (e.g. for the design of oil-insulated vacuum feedthroughs) and technological standards, the maximum supply voltage for the device was chosen to be ± 200 kV, with an operating voltage of ± 175 kV. The gap between the two electrodes has to be as large as possible for maximum transmission, and the length of the electrodes short. A good compromise was found by choosing distances of 120 mm for the electrode gap and 1800 mm for the effective length. The matching magnetic field for the operating voltage is then ~38 mT. A single device with these parameters leads to a spin rotation of 45°; therefore, two identical devices have been built, and installed in series, with a refocusing quadrupole triplet in between.

Because of the complexity of the system (high-voltage technology, electric and magnetic field matching, vacuum, control system), and in order to ensure compatibility with PSI standards, the decision was made to use in-house expertise and design the whole device at the Institute. Commercially available components were used whenever possible. However, critical parts were manufactured at PSI or specially supplied by Swiss companies. The design of the electrostatic components was checked by means of mathematical simulations using the ANSYS electrostatic module, with an envisaged upper limit of 80 keV/cm for the electric field. The design of the beamline, including the spin rotators and the magnets, was based on simulation of particle transport with the programs Transport and Turtle . Finally spin rotation and transmission efficiencies were optimized by using TRACK and Geant4 Monte Carlo simulations. First measurements demonstrated a beamline performance as expected, with a rate of ca. 5000 $\mu^+/(mA \cdot s \cdot mm^2)$.

The spectrometer magnet is a custom high-homogeneity split-pair recondensing system from Oxford Instruments. Its maximum field is 9.5 T, with a homogeneity of better than 0.1 mT over a centre volume of 10 mm diameter and 4 mm length. The detector system is based on direct readout of fast plastic scintillators (Eljen EJ 232) by Hamamatsu, Multipixel Photon Counters (MPPCs) and front-end electronics developed in-house. The overall time resolution is better than 80 ps (including full DAQ electronics).

To conclude, 2011 was another very successful year for applied muon physics at PSI. This has also been confirmed by an independent panel called in to evaluate the past 5 years of research activity at the Laboratory for Muon Spin Spectroscopy. We are also confident that the important developments which took place during the past year will soon bear scientific fruit and will contribute to maintaining the leading role of the Paul Scherrer Institute in the use of muons for condensed matter research.

References

[1] A. Krzton-Maziopa et al., *Alkali metal intercalated FeSe superconductors,* This report.


INSTRON
2

Technology transfer 105

The design and construction of the large research facilities at the Paul Scherrer Institute constantly require new and innovative solutions at the cutting-edge of current technologies. Both scientists and engineers at the Institute are successfully pushing the limits in various technological fields, from power electronics to precision machining to nanotechnology. Alongside achievements in the various research fields being investigated at PSI, these accomplishments offer outstanding opportunities for commercialization by industrial partners.

The Technology Transfer office at PSI is ready to assist representatives from industry in their search for opportunities and sources of innovation at PSI, or to prepare the way for solutions to their own technological challenges.

The following pages present some promising technologies still to be discovered by our industrial partners.

◀ **PSI scientists Beat Baumgartner and Hans Leber discussing the results of their research on the behaviour of steel under different ambient conditions.**
(Photo: Scanderbeg Sauer Photography)

Technology Transfer: At the gateway between research and industry

Robert Rudolph, *Technology Transfer Office, PSI;* Benjamin Watts, *Laboratory for Condensed Matter, PSI;* Daniele Passerone and Donat Adams, *Empa;* Salvatore Daniele and Peter Jansohn, *Combustion Research Laboratory, PSI;* Salih Guentay, *Laboratory for Thermal-Hydraulics, PSI*

The mission of the Technology Transfer office is to facilitate the transfer from the laboratories to industrial applications of inventions and technologies generated by PSI's broad research activities. Such transfer activity aims to increase the competiveness of PSI's industrial partners in their markets by offering innovations for new products and processes, or opportunities for further developments and improvements. If this economic impact consequently creates new employment and new products that improve everyday lives, the society supporting our Institute benefits from the exploitation of our scientific work.

Technology-transfer projects rely on the quality of the relationships between the persons involved in different aspects with both partners. A major factor shaping these relationships is the layout of the contractual framework and collaboration concept adopted for each transfer project. The greatest task within these boundary conditions is the alignment of the needs and expectations of the industrial and scientific partners.

The most effective way of transferring competencies in technologies and know-how is to "transfer" people, who not only take along additional intangible knowledge to the company but also the enthusiasm to transform their research into industry-standard applications. PSI has experienced the successful "person transfer" of both PhD graduates and senior scientists.

A very useful way of supporting industrial research and development is to make available the instruments and methods used at our large research facilities. As a user lab, PSI develops and operates instruments and equipment for a wide range of applications, from material and structure analysis to imaging. The services offered by PSI include the evaluation of the appropriate measurement configuration, support with data acquisition and expertise in data analysis. The following section showcases the work performed at the Swiss Light Source (SLS) in the context of an industry-sponsored research project on the subject of the molecular orientation of polymer surfaces.

From the economic point of view, the most significant model of technology transfer is to have projects involving intellectual property rights (IPR) generated at PSI. If it is the granting of rights to use PSI-owned IPR, or the transfer of patents, the industrial partner expects a direct economic advantage from applying such protected IPR in their products and is ready to compensate PSI for this advantage. A successful licensing case concerning an invention to retain iodine in aqueous solutions is presented as the second example below.

Research collaborations offer companies the opportunity to tap PSI's know-how and technologies early in the innovation process. Depending on the technological situation and requirements, a collaboration framework will be set up that equally matches the interests of the industrial partner and PSI. An agreement which includes the project plan, provisions on intellectual property and confidentiality is the basis for such collaboration. The Laboratory of Combustion Research at PSI is a leading lab in the research of combustion, in particular for gas turbines. A better understanding of the parameters involved in gas combustion leads to increased fuel efficiency and reduced emissions. The lab has established state-of-the-art infrastructure that can be used in collaboration projects with industry, as presented in the final example given here.

If you are interested in one of the technology transfer models described above, or if you are looking for advice or consultation on a specific topic, the Technology Transfer office is ready to connect you with the matching competencies at PSI.

Molecular order in polymer films

The PolLux beamline enables a powerful combination of high-resolution microscopy and soft X-ray spectroscopy, applicable to a wide variety of scientific studies. One project currently

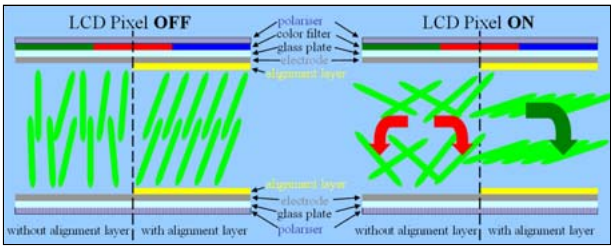


Figure 1: **Schematic of Rolic Technologies Ltd LCMO technology in liquid crystal display.**

being undertaken in collaboration with Rolic Technologies Ltd and Empa (and with additional funding from the Competence Centre for Materials Science and Technology of the ETH Board (CCMX)) involves measuring the molecular orientation of polymer surfaces. This is being performed in order to further understand Rolic's Light Controlled Molecular Orientation (LCMO) technology, which is widely implemented in LCD manufacture to enhance the effectiveness and efficiency of LCD devices. The LCMO technology induces specific orientations in adjacent liquid crystal layers through the ordering and alignment of surface moieties of the polymer that are formed under illumination with polarized UV light.
Near-edge X-ray absorption fine-structure (NEXAFS) spectroscopy experiments have been performed at the PolLux beamline of the SLS to examine the abundance and orientation of various chemical species on the polymer surfaces. NEXAFS spectra are composed of "near-edge" resonances, in which X-ray absorption is enhanced at specific X-ray energies that correspond to electronic transitions from the inner K-shell to unoccupied molecular anti-bonding orbitals. Furthermore, the intensity of these resonances depends on their orientation with respect to the electric field of the linearly polarized X-ray beam probe. Since the energy and orientation of the probed anti-bonding orbitals are closely related to the types of bonds and molecular structures of the sample molecules, NEXAFS spectroscopy can provide information about the orientation of specific parts of the larger polymer molecules and determine the chemical and structural changes that occur via the reactions under UV light in the LCMO technology.
Theoretical calculations of molecular dynamics, as well as IR and NEXAFS spectra, performed at Empa provide comparison to the experiments and insight into the physical and chemical processes occurring on the polymer surface. NEXAFS spectra contain a wealth of information in their closely spaced resonance peaks, and so are difficult to analyze directly. Theoretical calculations, on the other hand, provide details on which molecular shapes, orientations and interactions are possible and what the resulting spectra would look like. Comparison with the experimental spectra then shows which of these possibilities are chosen by nature.

A greater understanding of the LCMO technology will accelerate the development of LCD devices that provide improved brightness and contrast, while at the same time requiring less power for operation and incurring lower manufacturing costs. The project will also benefit other applications of the LCMO technology, such as the optical security elements for bank notes, identity cards and other items requiring high-resolution recognition and authentication, brought to market by Rolic Technologies.

Innovative research to improve nuclear plant safety during a severe accident

Iodine is a fission product which could possibly be released in quantity during a severe accident involving core damage. Due to its readiness to react with other fission products and containment surfaces, and its rather complex chemistry in water, volatile iodine forms can be generated in the containment at high concentrations. Its release into the environment above a certain amount might cause health problems due to inhalation. Although huge efforts have been made in the last three decades, the chemistry leading to the formation of gaseous species of iodine is still not well understood. In addition, filtration technologies already developed are not sufficiently effective at filtering gaseous iodine species and retaining them in the filter system to be able to prevent their release into the environment.
Since the early 1990s, many nuclear power plants in the world have been backfitted with containment venting filter systems, to eliminate containment failure at high pressure by venting as well as to limit activity release during venting by filtering. However, none of the systems available on the market have demonstrated the ability to effectively filter highly volatile iodine gaseous species, such as organic iodides, and to prevent the further release of captured iodine.

Figure 2: **In-situ irradiation test facility.**

PSI has developed a unique chemical process to efficiently and effectively scrub volatile iodine species from gas flow in a water pool, and also retain all iodine species, by eliminating thermal and radiolytic oxidation by binding iodine with the simultaneous use of a reducing agent and a co-additive. The co-additive catalyses the reaction of the reducing agent with gaseous iodine species, elemental iodine and methyl iodide, and at the same time binds the iodine into a stable form in the presence of thermal and radiation fields. Over one thousand experiments in specially developed facilities (Figure 2) have proved the effectiveness of the process and provided a sound data base for the implementation of the process in a containment venting filter system.
PSI provided support to the company IMI/CCI AG in the development of a containment venting filter in the late 1980s, and later conducted a qualification programme for aerosol retention in the early 1990s, and for iodine in the early 2000s. The resulting CCI-Filters have already been installed in three Swiss nuclear power plants.
CCI AG has shown interest in improving the filtration efficiency of its first-generation containment venting filter system by incorporating PSI's iodine management process, which will lead to a second-generation containment venting filter system. Through a licensing contract, the technology developed at PSI is currently being transferred to CCI, which is working hard to broaden the marketing possibilities for this second-generation version of its filter system.

Turbulent premixed combustion at high pressure

Lean premixed combustion is considered to be the state of the art technology for high efficiency and low-emission power generation in stationary gas turbines. One of the most important parameters for stable and safe combustion is the turbulent burning speed, S_T. This describes the specific fuel consumption rate and is an indispensable design parameter for all combustion devices. Despite intensive research in premixed combustion, there are still many open questions that call for pressing answers (e.g. how to achieve ultra-low NO_x emission). To address these issues, PSI can offer the proper experimental infrastructure and measurement techniques.

Experimental Capabilities

Combustion experiments can be carried out in the facility depicted in Figure 3. This test rig delivers a maximum thermal power of 1 MW, reaching pressures and preheating temperatures up to 30 bar and 750°C, respectively.
The combustor can be operated with a variety of fuels, ranging from methane (CH_4) to higher hydrocarbons (e.g. propane C_3H_8), and from syngas (H_2-CO mixtures) to pure H_2. The fuel and oxidizer can contain various amounts of diluent species (H_2O, CO_2 and N_2).

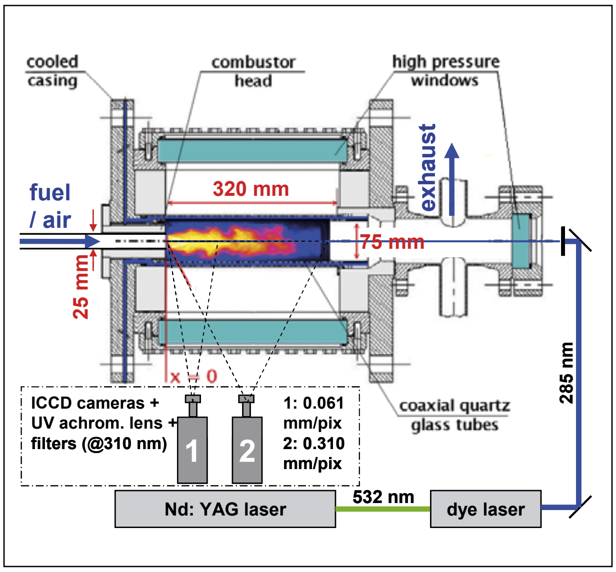


Figure 3: **Experimental setup.**

Turbulent flame speed

Turbulent flame speed can be investigated with two laser diagnostic techniques: Laser-Induced Fluorescence (LIF, see setup in Figure 3) and Particle Image Velocimetry (PIV). These techniques provide raw data which lead to S_T values of global and local fuel consumption by applying the mass continuity equation, fractal analysis and local velocity balances. The shape of the flame front is resolved by LIF imaging, as shown in Figure 4. More details on the evaluation of turbulent flame speed can be found in [1, 2]

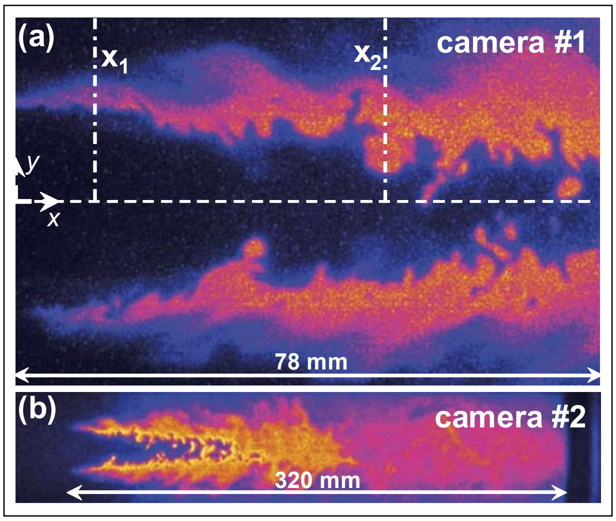


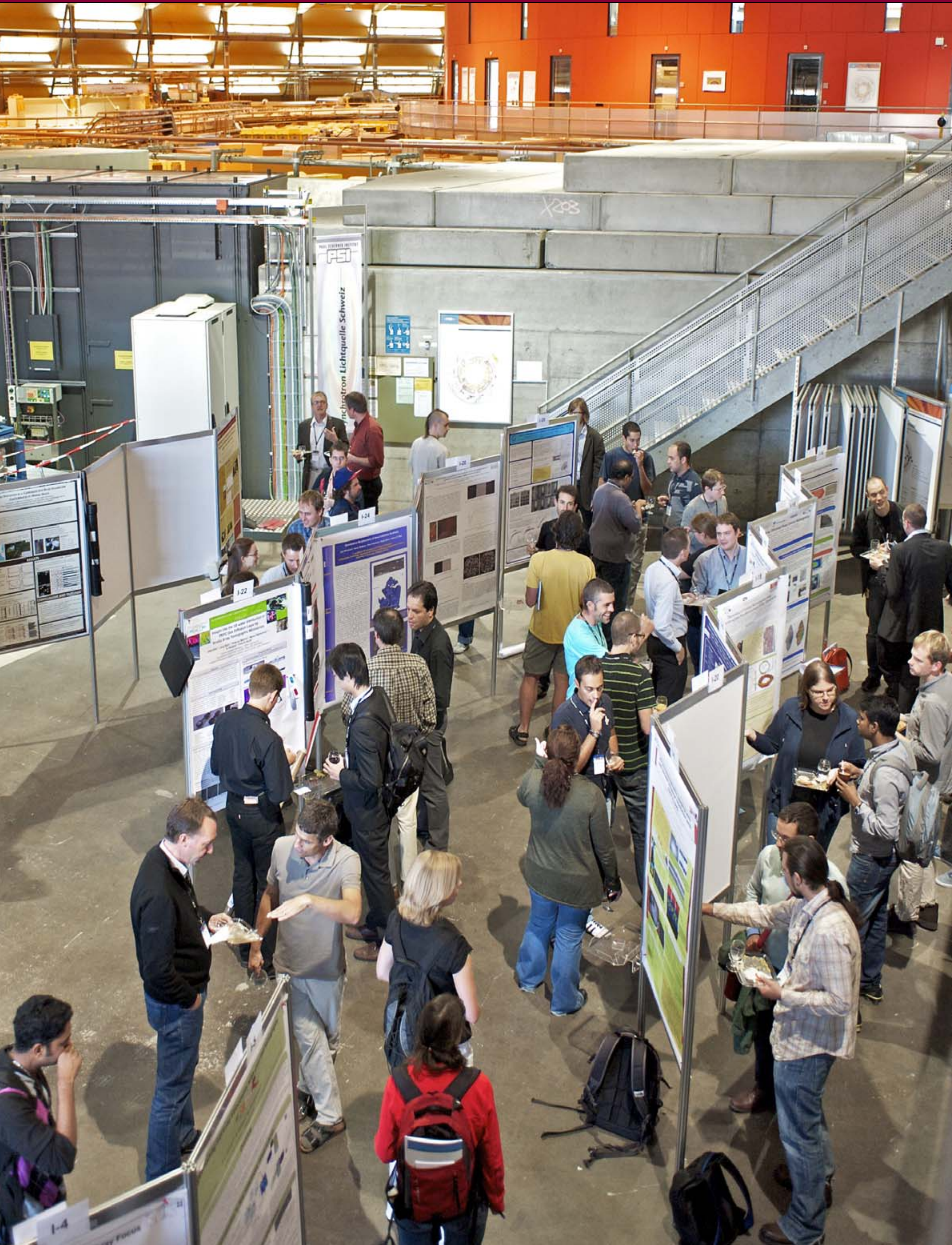
Figure 4: **Time-resolved individual LIF pictures of the reaction zone in the combustor: (a) zoomed-in picture of the flame zone near the combustor inlet; (b) overview picture of the complete combustion chamber.**

NO_x Emission

The concentration of the main species (CO, CO_2, O_2, NO_x, UHC) in the flue gas can be measured with the aid of a specifically-designed water-cooled gas probe located at the exit of the combustor and conventional exhaust gas analyzer. Among these species, the NO_x emission is of particular interest, since the lean premixed combustion of gaseous fuels is currently one of the most important low-NO_x technologies in the power generation sector using fossil fuels. Emission characteristics of different fuels and operating conditions can be derived from these experiments. It has been observed that syngas mixtures (CO-H_2 mixtures, e.g. derived from the gasification of solid feedstock such as coal and biomass) produce higher NO_x emissions than natural gas under the same combustion conditions [3].
The underlying reason can be elucidated via a reaction-path analysis based on detailed chemical-kinetic calculations, as detailed in [3].

References:

[1] S. Daniele, P. Jansohn and K. Boulouchos, *Flame front characteristic and turbulent flame speed of lean premixed syngas combustion at gas turbine relevant conditions,* Proc. ASME Turbo Expo 2009.
[2] S. Daniele, P. Jansohn, J. Mantzaras and K. Boulouchos, Proc. Combust. Inst. **33** 2937–2944 (2011).
[3] Y.-C. Lin, S. Daniele, P. Jansohn and K. Boulouchos, *Combustion Characteristics and NO_X Emission of Hydrogen-Rich Fuel Gases at Gas Turbine Relevant Conditions,* Proc. ASME Turbo Expo 2012.


PSI
Lichtquelle Schweiz

Facts and figures

The research and development described in this annual review, as well as the many other projects and activities which have been performed but are not mentioned, requires the engagement of scientists, technologists, computing specialists and administrators in many different areas. All of these are essential for the running of a large and complex institute such as PSI, with its varied research interests, its design, construction and operation of large-scale, high-performance facilities, its commitment to education and its maintenance of a User Service for the benefit of scientists from across the world who come to perform experiments here.

The following breakdown of finances, staffing distribution, education and User Service activities, and composition of advisory bodies guiding the research shows the balance which existed in 2011 across the diverse fields of activities pursued by PSI. More than two-thirds of all financing was provided by the Swiss government and the remainder from a variety of third-party sources. The staffing figures reflect the importance of technical staff for operating the large-scale facilities.

The educational activities of PSI are expanding, at secondary-school, graduate and post-graduate levels, and the User Service again received more proposals for experiments than it could accommodate. Finally, to maintain its position as one of the leading research centres in the world in the fields in which it specialises, PSI continued to be guided by a number of advisory boards, consisting of scientists of high standing invited from around the world, many of who have close connection with the Institute through their own research.

◀ **Poster session at the second Joint User Meeting of SINQ, SLS and SμS in September 2011.**

PSI in 2011 – an overview

Finances

PSI expenditure in 2011 totalled CHF 364.8 million, of which the Swiss government provided 75.6%, i.e. CHF 275.8 million, with 68.2% (CHF 248.8 million) allocated to basic financing and 7.4% (CHF 27.0 million) specifically provided for the SwissFEL project. External second- and third-party funding added up to CHF 89.0 million (24.4% of total expenditure). Third-party revenue totalled CHF 94.8 million, with 41.2% coming from private industry, 27.6% from Swiss federal research programmes, 7.4% from EU programmes and 23.8% from other sources. This breakdown is listed in Table 1 and the budget distribution across the Research Departments is given in Figure 1.

PSI Financial Statement (in CHF millions)		
	2011	
Expenditure		
Operations	302.4	82.9%
Investments	62.4	17.1%
Total*	**364.8**	**100.0%**
Expenditure according to source of income		
Federal funding (basic)	248.8	68.2%
Federal funding for SwissFEL	27.0	7.4%
Second- and third-party funds	89.0	24.4%
Total	**364.8**	**100.0%**
Third-party revenue		
Private industry	39.0	41.2 %
Federal research funding	26.2	27.6 %
EU programmes	7.0	7.4 %
Other (incl. scientific services)	22.6	23.8 %
Total	**94.8**	**100.0 %**

* Including personnel costs of CHF 215.6 million (corresponding to 59.1% of total expenditure); not including internally produced and capitalized assets.

Table 1: **PSI finances in 2011.**

Staffing

At the end of 2011, slightly more than 1500 full-time equivalent staff positions were occupied at PSI. The distribution of staffing according to fields of activity can be seen in Figure 2. Of the total PSI staff, 24% were women and 44% were non-Swiss citizens.

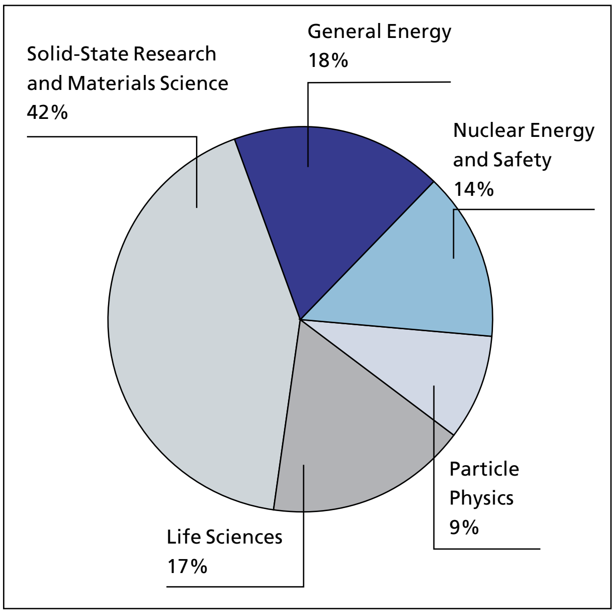


Figure 1: **Total budget distribution for 2011 across PSI Research Fields.** Research facilities are allocated to the appropriate fields

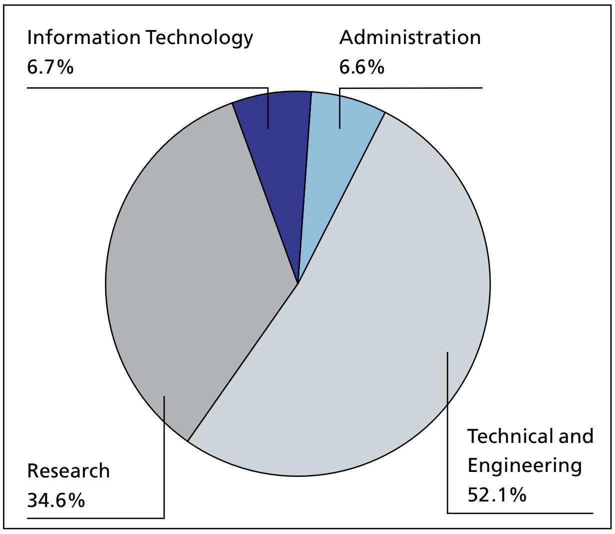


Figure 2: **The staffing structure of the Paul Scherrer Institute reflects the importance of technical staff for running the institute's complex experimental facilities.**

Education

Besides research, education at various levels is also a central priority for the Institute. Research opportunities are provided for students preparing their Masters or PhD theses, with more than 300 PhD students currently at PSI, including about 200 actually employed by the Institute. The remainder are financed by other institutions or universities, but perform a substantial part of their experimental work at PSI's laboratories or large-scale facilities. The opportunity to work at PSI as trainees for a shorter period of time, to gather work experience in scientific research as well as in administrative or organizational tasks, was taken by more than 100 other young people – secondary-school graduates and university students. Almost 90 young people were actively engaged in vocational training, in 13 different professions. In addition, PSI offered courses in radiation protection and reactor technology, for internal staff as well as for external groups.

The school lab (iLAB) provided pupils undergoing secondary education with the opportunity to perform various physics experiments and thus obtain a first-hand impression of scientific research. The iLAB was visited during 2011 by 192 classes, from different schools – a further increase compared with the 180 classes which came in 2010 and the 105 classes in 2009. PSI scientists were also active as educators outside the Institute, with about 100 staff giving lecture courses at universities and universities of applied sciences.

User Service

In 2011, PSI maintained its position as an attractive User Lab for scientists from all over the world (see Table 2). More than 2300 users visited the Institute and performed over 1700 experiments at the 38 beamlines available at the large-scale facilities. The continually increasing interest in performing experiments at PSI is reflected in the growing number of proposals submitted to the user service, which reached an all-time high of 1378 in 2011 (see Figure 3). The total number of users who come to participate in experiments also reached its highest value ever – 2336 – and the overall number of peer-reviewed publications based on research performed at the SLS, SINQ and SμS large-scale facilities exceeded 650.

User Lab 2011						
	SLS	SINQ	SμS	Particle physics	PSI total 2011	PSI total 2010
Number of beamlines / instruments	16	12	6	4	**38**	**38**
Number of experiments	1058	439	226	4	**1727**	**1759**
Number of user visits	3338	826	319	594	**5077**	**5108**
Number of individual users	1565	441	160	240	**2336**	**2221**
Number of new proposals	778	403	196	1	**1378**	**1218**

Table 2: **PSI user service in numbers.**

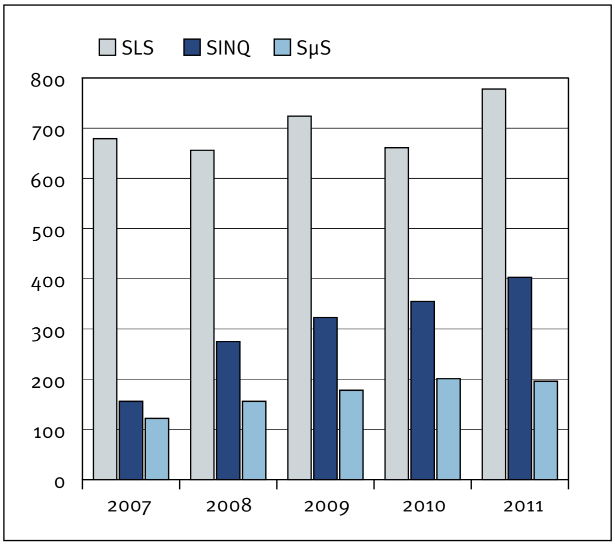


Figure 3: **Numbers of proposals submitted to SLS, SINQ (only one proposal deadline in 2007) and SμS. The total number of new proposals reached an all-time high in 2011, reflecting the increasing interest amongst scientists in performing experiments at PSI.**

The User Service at PSI's large-scale facilities also makes an important contribution to the education of future generations of scientists, which can be seen from the large number of young scientists among the users.

Advisory Board and Research Committees

The Advisory Board's main task is to advise the Directorate on the development of long-term research programmes and to evaluate the quality of past and planned research activities. The Board meets once or twice a year and consists of 11 scientists of high scientific standing, from Switzerland and abroad. The Research Committee of the Paul Scherrer Institute consists of 13 members selected from the various PSI Departments and advises the Directorate on decisions related to the scientific research carried out at the Institute. It evaluates proposed new projects and applications for financial support from external agencies, assesses ongoing projects and helps define appropriate new research topics for the Institute. An additional 8 Committees, with members from Switzerland and abroad, assess and advise the various large-scale facilities and the Research Departments on their past, present and future research activities and programmes.

Advisory Board and Research Committees

Advisory Board

Prof. Dr. Ø. Fischer, President	Department of Condensed Matter, University of Geneva, CH
Prof. Dr. G. Aeppli	London Centre for Nanotechnology, University College, London, UK
Prof. Dr. F. Carré	CEA, Saclay, Gif-sur-Yvette, FR
Prof. Dr. H.H. Coenen	Institute for Nuclear Chemistry, Forschungszentrum Jülich, DE
Prof. Dr. R.W. Falcone	ALS, Lawrence Berkeley National Laboratory, Berkeley, USA
Prof. Dr. R. Klanner	Institute for Experimental Physics, University of Hamburg, DE
Prof. Dr. S. Larsen	Department of Chemistry, University of Copenhagen, DK
Prof. Dr. T. Mason	Oak Ridge National Laboratory, USA
Prof. Dr. J. Rossbach	Institute for Experimental Physics, University of Hamburg, DE
Prof. Dr. Th. Sattelmayer	Chair of Thermodynamics, TU München, Garching, DE
Prof. Dr. E. Umbach	Karlsruhe Institute of Technology (KIT), DE

Research Committee

Prof. Dr. R. Horisberger, President	Research with Neutrons and Muons (NUM)
Dr. M. Ammann	Biology and Chemistry (BIO)
Dr. B. Delley	Research with Neutrons and Muons (NUM)
Dr. R. Eichler	Biology and Chemistry (BIO)
Dr. L. Heyderman	Synchrotron Radiation and Nanotechnology (SYN)
Dr. I. Mantzaras	General Energy (ENE)
Dr. W. Pfingsten	Nuclear Energy and Safety (NES)
Dr. T. Schietinger	Large Research Facilities (GFA)
Dr. M. Steinmetz	Biology and Chemistry (BIO)
Prof. Dr. H. Van Swygenhoven	Research with Neutrons and Muons (NUM)
Dr. F. Vogel	General Energy (ENE)
Prof. Dr. P. Willmott	Synchrotron Radiation and Nanotechnology (SYN)
Dr. P. Hasler, Secretary	Biology and Chemistry (BIO)

Research Committees for specific research areas

SwissFEL
SwissFEL Free Electron Laser Advisory Committee (FLAC)

Prof. Dr. J. Rossbach, Chair
DESY, Hamburg, DE

Dr. J. Bahrdt
HZB, Berlin, DE

Dr. P. Emma
SLAC, Stanford, USA

Dr. M. Ferrario
INFN-LNF, Rome, IT

Dr. O. Groening
Empa, Dübendorf, CH

Dr. A. Grudiev
CERN, Geneva, CH

Dr. H.Schlarb
DESY, Hamburg, DE

Dr. M. Svandrlik
ELETTRA, Trieste, IT

Dr. M. Yabashi
RIKEN-SPring-8, Hyogo, JP

Synchrotron Radiation SYN
Scientific Advisory Committee (SAC)

Prof. Dr. G. Materlik, Chair
Diamond Light Source, Didcot, UK

Prof. Dr. G.-L. Bona
Empa Dübendorf, CH

Prof. Dr. H. Brune
EPFL, Lausanne, CH

Prof. Dr. R. Claessen
University of Würzburg, DE

Prof. Dr. K. Diederichs
University of Konstanz, DE

Prof. Dr. J. Evans
University of Southampton, UK

Dr. J. Feldhaus
DESY, Hamburg, DE

Prof. Dr. J. Hastings
Stanford Linear Accelerator Center, Menlo Park, CA, USA

Prof. Dr. C.-C. Kao,
Stanford Linear Accelerator Center, Menlo Park, CA, USA

Dr. P. Lagarde
Synchrotron Soleil, Gif-sur-Yvette, FR

Prof. Dr. J. Marangos
Imperial College, London, UK

Prof. Dr. G. Margaritondo
EPFL, Lausanne, CH

Prof. F. Parmigiani
Free Electron Laser project-FERMI@Elettra, Trieste, IT

Prof. Dr. E. Rühl
Freie Universität Berlin, DE

Prof. Dr. B. Schönfeld
ETH Zurich, CH

Research with Neutrons and Muons NUM
SINQ Scientific Advisory Committee

Prof. Dr. A. T. Boothroyd, Chairman
University of Oxford, UK

Dr. L Arleth,
University of Copenhagen, DK

Dr. M. Balasko
KFKI Atomic Energy Research Inst., Budapest, HU

Dr. Th. J. Bücherl
TU München, DE

Dr. N. B. Christensen
Risø National Lab., DK

Dr. T. Keller
TU München, DE

Dr. K. Krämer
University of Bern, CH

Dr. M. Meven
TU München, DE

Prof. Dr. M. Müller
Helmholtz-Zentrum Geesthacht, DE

Prof. Dr. U. Olsson
University of Lund, SE

Prof. Dr. C. Pfleiderer
TU München, DE

Prof. Dr. B. Schönfeld
ETH Zurich, CH

Prof. Dr. W. Treimer
Beuth University of Applied Sciences, DE

Dr. M. Wörle
Swiss National Museum, Zurich, CH

SμS Scientific Advisory Committee

Prof. Dr. C. Bernhard, President
University of Fribourg, CH

Prof. Dr. E. Bauer
Vienna University of Technology, AT

Prof. Dr. S. J. Blundell
University of Oxford, UK

Prof. Dr. J.M.S. Campos Gil
University of Coimbra, PT

Prof. Dr. K. Chow
Univ. Alberta, CDN

Prof. Dr. R. De Renzi
University of Parma, IT

Prof. Dr. A. de Visser
University of Amsterdam, NL

Prof. Dr. Ph. Mendels
Univ. Paris XI, FR

Prof. Dr. D. Pavuna
EPFL Lausanne, CH

Particle Physics at the Ring Cyclotron

Dr. C. Hoffman, President
LAMPF, Los Alamos, USA

Prof. Dr. A. B. Blondel
University of Geneva, CH

Dr. D. Bryman
TRIUMF, Vancouver, CDN

Dr. A. Ceccucci
CERN, CH

Prof. Dr. G. Colangelo
University of Bern, CH

Prof. Dr. B. Filippone
California Institute of Technology, USA

Prof. St. Passaggio
I.N.F.N. Genova, IT

Prof. Dr. M. Pendlebury
University of Sussex, UK

Prof. Dr. M. Pohl
University of Geneva, CH

Prof. Dr. M. Ramsey-Musolf
University of Wisconsin-Madison, USA

Dr. M. Spira, committee secretary
PSI, CH

Prof. Dr. U. Straumann
University of Zürich, CH

Biology and Chemistry BIO

Prof. Dr. D. Neri, President
ETH Zurich, CH

Prof. Dr. M. Grütter
University of Zurich, CH

Prof. Dr. Ch. W. Müller
EMBL, Heidelberg, DE

Prof. Dr. P. Nordlund
Karolinska Institutet, Stockholm, SE

Prof. Dr. S. Werner
ETH Zurich, CH

Nuclear Energy and Safety NES

Dr. H. Forsström, President
Bromma, SE

Prof. Dr. M. Giot
Université Catholique de Louvin, BE

Dr. P. Miazza
Nuclear Power Plant Mühleberg, CH

Prof. Dr. K. L. Peddicord
Texas A&M University, College Station, USA

Dr. M. Plaschy
Alpiq, Olten, CH

Dr. J.-B. Thomas
CEA-Saclay, Gif-sur-Yvette, FR

Prof. Dr. S. Virtanen
University of Erlangen-Nürnberg, DE

Dr. H. Wanner
ENSI, Brugg, CH

Dr. P. Zuidema
Nagra, Wettingen, CH

General Energy ENE

Prof. Dr. T. Peter, President
ETH Zurich, CH

Prof. Dr. G.-L. Bona
Empa, Dübendorf, CH

Dr. T. Kaiser
Consenec AG, Baden-Dättwil, CH

Prof. Dr. R. Pitz-Paal
DLR, Cologne, DE

Prof. Dr. Ph. R. von Rohr
ETH Zurich, CH

Prof. Dr. A. Voss
University of Stuttgart, DE

Dr. R. Schmitz
Swiss Federal Office of Energy, Berne, CH

Organizational Structure (as of January 2012)

Research Committee
Prof. Dr. Roland Horisberger

Large Project SwissFEL
Dr. Hans-Heinrich Braun/Dr. Rafael Abela

Center for Proton Therapy
Gudrun Goitein a.i.

Director:
Prof. Dr. Joël Mesot

Members of the board of directors:
Martin Jermann, Head of Staff*
Dr. Kurt N. Clausen
Prof. Dr. J. Friso van der Veen*
Prof. Dr. Alexander Wokaun*
Dr. Jean-Marc Cavedon
Prof. Dr. Gebhard Schertler
Prof. Dr. Leonid Rivkin
Dr. Peter Allenspach

Human Resources
Karsten Bugmann

Safety
Dr. Werner Roser

Industry, Financing and Operations
Dr. Philipp Dietrich

Science
Dr. Thierry Strässle

Communications
Dagmar Baroke

Technology Transfer
Robert Rudolf

Research Department **Research with Neutrons and Muons (NUM)** Dr. Kurt N. Clausen	Particle Physics	Prof. Dr. Klaus Kirch
	Neutron Scattering	Dr. Christian Rüegg
	Spallation Neutron Source Division	Dr. Werner Wagner
	Muon Spin Spectroscopy	Prof. Dr. Elvezio Morenzoni
	Development and Methods	Dr. Michel Kenzelmann
Research Department **Synchrotron Radiation and Nanotechnology (SYN)** Prof. Dr. J. Friso van der Veen	Macromolecules and Bioimaging	Dr. Oliver Bunk
	Condensed Matter and Materials Science	Dr. Christoph Quitmann
	Micro- and Nanotechnology	Prof. Dr. Jens Gobrecht
Research Department **General Energy (ENE)** Prof. Dr. Alexander Wokaun	Bioenergy and Catalysis	Dr. Oliver Kröcher
	Solar Technology	Prof. Dr. Aldo Steinfeld
	Combustion Research	Dr. Peter Jansohn
	Electrochemistry	Prof. Dr. Thomas J. Schmidt
	Atmospheric Chemistry	Prof. Dr. Urs Baltensperger
Competence Center for Energy and Mobility (CCEM)		Urs Elber
Research Department **Nuclear Energy and Safety (NES)** Dr. Jean-Marc Cavedon	Reactor Physics and Systems Behaviour	Martin Zimmermann a.i.
	Thermal Hydraulics	Prof. Dr. Horst-Michael Prasser
	Hot Laboratory	Dr. Didier Gavillet
	Waste Management	Dr. Michael Bradbury
	Nuclear Materials	Hans-Peter Seifert a.i.
Research Department **Biology and Chemistry (BIO)** Prof. Dr. Gebhard Schertler	Center for Radiopharmaceutical Sciences	Prof. Dr. Roger Schibli
	Biomolecular Research	Prof. Dr. Gebhard Schertler i.P.
	Radiochemistry and Environmental Chemistry	Prof. Dr. Andreas Türler
Department **Large Research Facilities (GFA)** Prof. Dr. Leonid Rivkin	Accelerator/Concepts and Development	Dr. Terence Garvey
	Accelerator/Operation and Development	Dr. Mike Seidel
	Technical Support, Co-ordination and Operation	Jürgen Duppich
Department **Logistics (LOG)** Dr. Peter Allenspach	Finance and Administrative Services	Karlheinz Falk
	Buildings and Services	Lilian Jakob
	Infrastructure and Electrical Engineering	Max Huser
	Mechanical Engineering Sciences	Dr. Urs Ellenberger
	Information Technology	Dr. Stephan Egli
	Radiation Safety and Security	Christian Wernli
	Communications	Dagmar Baroke

Catalysis and Sustainable Chemistry
Prof. Dr. Jeroen van Bokhoven

Energy Systems Analysis
Dr. Stefan Hirschberg

* Executive Committee / Deputy Directors

Where to find what

On CD and online

The publication lists for all PSI Departments can be found on the CD version of this report, which can be ordered at www.psi.ch (Information Material) or by phone +41 56 310 21 11.

The lists include the following:

- Peer-reviewed publications
- Invited talks
- Dissertations
- Conference Proceedings
- Lectures

Links to other research, not featured here, can be found on our website: www.psi.ch (Scientists & Users).

Publications CPT 2011

Peer reviewed papers

Albertini, F., Hug, E.B., Lomax, A.J. *Is it necessary to plan with safety margins for actively scanned proton therapy?* Phys Med Biol 56 (2011) 4399-4413

Albertini, F., Casiraghi, M., Lorentini, S., Rombi, B., Lomax, A.J. *Experimental verification of IMPT treatment plans in an anthropomorphic phantom in the presence of delivery uncertainties.* Phys Med Biol 56 (2011) 4415-4431

Fava, G., Widesott, L., Fellin, F., Amichetti, M., Viesi, V., Lomax, A.J., Lederer, L., Fiorino, C., Schwarz, M. *In gantry or remote patient positioning? Monte Carlo simulations for proton therapy centres of different sizes.* Accepted for publication in Radiother. Oncol. October 2011

Knopf, A-C., Hong, T.S., Lomax, A.J., *Scanned proton radiotherapy for mobile targets – The effectiveness of re-scanning in the context of different treatment planning approaches and for different motion characteristics*. Phys. Med. Biol. 56 (2011) 7257-7271

Pedroni, E., Meer, D., Bula, C., Safai, S., Zenklusen, S. *The Pencil beam characteristics of the next-generation proton scanning gantry of PSI: design issues and initial commissioning results.* European Physical Journal Plus 2011 126: 66

Schneider, U., Pedroni, E., Hartmann, M., Besserer, J., Lomax, A.J., *Spatial resoltuion of proton tomography: methods, initial phase space and object thickness.* Z Med Phys, 2011 Jul 20 [Epub ahead of publishing]

Schippers, J.M., Lomax, A.J. *Emerging technologies in proton therapy.* Acta. Oncol. 50 (2011) 838-850

Staab, A., Rutz, H.P., Ares, C., Timmermann, B., Schneider, R., Bolsi, A., Lomax, A.J., Goitein, G., Hug, E.B. *Spot-scanning-based proton therapy for extracranial chordoma.* Int J Radiat Oncol Biol Phys. 81 (2011) 489-496

Van der Water, T.A., Lomax, A.J., Bijl, H.P., Schilstra, C., Hug, E.B., Langendijk, J.A., *Using a reduced spot size for Intensity Modulated Proton Therapy potentially improves salivary gland sparing in oropharyngeal cancer.* Int J Radiat Oncol Biol Phys. 2011 Jun 25. [Epub ahead of print]

Zenklusen, S.M., Pedroni, E., Meer, D., Bula, C., Safai, S. *Preliminary investigations for the option to use fast uniform scanning with compensators on a gantry designed for IMPT.* Medical Physics 2011 Sep;38(9):5208-16

LIST OF PUBLICATIONS 2011

Synchrotron Radiation and Nanotechnology SYN

UNIVERSITY LEVEL AND OTHER TEACHING

A. Balan, A. Farhan, F. Nolting
X-ray Microscopy
Blockkurs Nanoscience, University of Basel, carried out at PSI, 06-10.06. 2011

C. David
Diffractive X-ray Optics: Applications at hard XFEL radiation sources
10th Research Course on X-Ray Science, Hamburg, Germany, 30.03.2011

Y. Ekinci
Micro and nanostructured metallic systems
Summer semester, Department of Materials, ETH Zurich

T. Glatzel, T. A. Jung, A. Romanyuk
Herstellung von Nanostrukturen: Techniken und Methoden 2 KP
Departement Physik der Universität Basel (Herbstsemester 2011)

J. Gobrecht, H. Schift
Nanotechnologie für Ingenieure
Fachhochschule Nordwestschweiz (FHNW), Windisch, HS 2011/12 (Bachelorstudiengang)

F. Gozzo
Synchrotron X-Ray Powder Diffraction
"The Power of Powder Diffraction", the 44th Crystallographic Course at the Ettore Majorana Centre, ERICE, Italy, 02-12.06.2011

T. A. Jung, D. Zumbühl
Einführung in die Physik I für Studierende der Biologie, Geowissenschaften und Pharmazeutische Wissenschaften 6 KP
Departement Physik der Universität Basel (Herbstsemester 2011)

M. Nachtegaal, M. Janousch
Cook and Look: Synchrotron Techniques'. In Master's Program, 'Biogeochemistry and Pollution Dynamics
ETH Zürich, Switzerland. 20.06.-01.07.2011

M. Nachtegaal
Practical Summer School on Functional Materials
PSI, Switzerland, 20-22.08.2011

M. Nachtegaal, M. Janousch
701-1336-00L Cook and Look: Synchroton Techniques
ETH Zürich, Frühjahrssemester 2011

L. Quaroni
Training of PhD intern from the University of Jena
Training of graduate Summer intern from the University of Birmingham

T. Ivas, S. Nowakowska, S. Martens, A. Shchyrba, C. Wäckerlin, J. Nowakowski, T.A. Jung
Seminar Oberflächenphysik 4KP
Departement Physik der Universität Basel (Herbstsemester 2011)

H. Schift
Polymer flow and stamp bending in nanoimprint lithography
Training course (Masterstudiengang) in Advanced Nanolithography at the Danish Technical University (DTU), Kongens Lyngby, DK, 07.06.2011

H. Schift
Grundlagen zu strukturierten Oberflächen
Zürcher Fachhochschule für Angewandte Wissenschaften (ZHAW), Material und Verfahrens-technik, Winterthur, HS 2011 (Bachelorstudiengang) 22.12.2011

M. Stampanoni
Micro and Nano-Tomography of Biological Tissues
227-0965-00L ETH Zürich

M. Stampanoni
Research Topics in Biomedical Engineering
227-0970-00L ETH Zürich

M. Stampanoni
CIMST Interdisciplinary Summer School on Bio-Medical Imaging
551-1316-00L ETH Zürich

M. Stampanoni
Elements of Microscopy
227-0390-00L ETH Zürich

P. Urwyler
Materials selection in implant design
University of Bern, Material Science and Biomaterials, Basel, HS 2011 (Masterstudiengang Biomedical Engineering), 12.12.2011

J.A. van Bokhoven
Catalysis
529-0502-00L ETH Zurich

J.A. van Bokhoven
Characterization of Catalysts and Surfaces
529-0611-00L ETH Zurich

J.F. van der Veen,
Materials research using synchrotron radiation
Masters course ETH Zürich, 402-0313-00, HS1

C. Wäckerlin, J. Girovsky, K. Landheer, T.A.. Jung
Blockkurse Nanowissenschaften *24KP – Practical courses in Surface Science in Basel and at PSI*
Departement Physik der Universität Basel (Jahreskurs: HS 2010 – FS 2011)

C. Wäckerlin, J. Girovsky, T. Hählen, K. Landheer, N. Ballav, T. A. Jung
Oberflächenphysik mit Übungen 4KP
Departement Physik der Universität Basel (Frühjahrsemester 2011)

P.R. Willmott
Introduction to Synchrotron Radiation – Techniques and Applications
Physikalisch-Chemisches Institut, Universität Zürich, HS 2011

PUBLICATIONS WITH SYN AUTHOR(S) AND DESCRIBING AN SLS EXPERIMENT

Aagesen LK, Fife JL, Lauridsen EM, Voorhees PW
The evolution of interfacial morphology during coarsening: A comparison between 4D experiments and phase-field simulations
SCRIPTA MATERIALIA 64, 394 (2011)

Aagesen LK, Johnson AE, Fife JL, Voorhees PW, Miksis MJ, Poulsen SO, Lauridsen EM, Marone F, Stampanoni M
Pinch-off of rods by bulk diffusion
ACTA MATERIALIA 59, 4922 (2011)

Albert S, Albert KK, Lerch P, Quack M
Synchrotron-based highest resolution Fourier transform infrared spectroscopy of naphthalene (C10H8) and indole (C8H7N) and its application to astrophysical problems
FARADAY DISCUSSIONS 150, 71 (2011)

Albert S, K Albert K, Lerch P, Quack M
Discussion replies on synchrotron based high resolution Fourier Transform Spectroscopy
FARADAY DISCUSSIONS 150, 146 (2011)

Albert S, K Albert K, Lerch P, Quack M
On the high resolution FTIR spectroscopy of phenol and torsional tunneling
FARADAY DISCUSSIONS 150, 517 (2011)

Albert S, Keppler Albert K, Lerch PH, Quack M
Synchrotron-based highest resolution Fourier transform spectroscopy of naphtalene (C10H8) and indole (C8H7N) and its application to astrophysical problems
FARADAY DISCUSSIONS 150, 1 (2011)

Alwmark C, Schmitz B, Holm S, Marone F, Stampanoni M
3-d imaging of mineral inclusions in extraterrestrial chromite using synchrotron radiation x-ray tomographic microscopy
METEORITICS & PLANETARY SCIENCE 46, A8 (2011)

Alwmark C, Schmitz B, Holm S, Marone F, Stampanoni M
A 3-D study of mineral inclusions in chromite from ordinary chondrites using synchrotron radiation X-ray tomographic microscopy-Method and applications
METEORITICS & PLANETARY SCIENCE 46, 1071 (2011)

Arhammar C, Pietzsch A, Bock N, Holmstrom E, Araujo CM, Grasjo J, Zhao SX, Green S, Peery T, Hennies F, Amerioun S, Fohlisch A, Schlappa J, Schmitt T, Strocov VN, Niklasson GA, Wallace DC, Rubensson JE, Johansson B, Ahuja R
Unveiling the complex electronic structure of amorphous metal oxides
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 108, 6355 (2011)

Baer T, Guerrero A, Davalos JZ, Bodi A
Dissociation of energy selected Sn(CH3)(4)(+), Sn(CH3)(3)Cl+, and Sn(CH3)(3)Br+ ions: evidence for isolated excited state dynamics
PHYSICAL CHEMISTRY CHEMICAL PHYSICS 13, 17791 (2011)

Bartlett SA, Wells PP, Nachtegaal M, Dent AJ, Cibin G, Reid G, Evans J, Tromp M
Insights in the mechanism of selective olefin oligomerisation catalysis using stopped-flow freeze-quench techniques: A Mo K-edge QEXAFS study
JOURNAL OF CATALYSIS 284, 247 (2011)

Beaud P, Johnson SL, Vorobeva E, Milne CJ, Caviezel A, Mariager SO, De Souza RA, Staub U, Ingold G
Ultrafast Structural Dynamics in Condensed Matter
CHIMIA 65, 308 (2011)

Bennett TD, Simoncic P, Moggach SA, Gozzo F, Macchi P, Keen DA, Tan JC, Cheetham AK
Reversible pressure-induced amorphization of a zeolitic imidazolate framework (ZIF-4)
CHEMICAL COMMUNICATIONS 47, 7983 (2011)

Bergamaschi A, Dinapoli R, Henrich B, Johnson I, Mozzanica A, Shi X, Schmitt B
Beyond single photon counting X-ray detectors
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT 628, 238 (2011)

Bingel-Erlenmeyer R, Olieric V, Grimshaw JPA, Gabadinho J, Wang X, Ebner SG, Isenegger A, Schneider R, Schneider J, Glettig W, Pradervand C, Panepucci EH, Tomizaki T, Wang M, Schulze-Briese C
SLS Crystallization Platform at Beamline X06DA-A Fully Automated Pipeline Enabling in Situ X-ray Diffraction Screening
CRYSTAL GROWTH & DESIGN 11, 916 (2011)

Bodenthin Y, Staub U, Piamonteze C, Garcia-Fernandez M, Martinez-Lope MJ, Alonso JA
Magnetic and electronic properties of RNiO3 (R = Pr, Nd, Eu, Ho and Y) perovskites studied by resonant soft x-ray magnetic powder diffraction
JOURNAL OF PHYSICS-CONDENSED MATTER 23, 036002 (2011)

Bodi A, Stevens WR, Baer T

Understanding the Complex Dissociation Dynamics of Energy Selected Dichloroethylene Ions: Neutral Isomerization Energies and Heats of Formation by Imaging Photoelectron-Photoion Coincidence
JOURNAL OF PHYSICAL CHEMISTRY A 115, 726 (2011)

Borkar S, Sztaray B, Bodi A
Dissociative photoionization mechanism of methanol isotopologues (CH3OH, CD3OH, CH3OD and CD3OD) by iPEPICO: energetics, statistical and non-statistical kinetics and isotope effects
PHYSICAL CHEMISTRY CHEMICAL PHYSICS 13, 13009 (2011)

Brown MA, Seidel R, Thuermer S, Faubel M, Hemminger JC, van Bokhoven JA, Winter B, Sterrer M
Electronic structure of sub-10 nm colloidal silica nanoparticles measured by in situ photoelectron spectroscopy at the aqueous-solid interface
PHYSICAL CHEMISTRY CHEMICAL PHYSICS 13, 12720 (2011)

Bruni G, Gozzo F, Capsoni D, Bini M, Macchi P, Simoncic P
Thermal, Spectroscopic, and Ab Initio Structural Characterization of Carfrofen Polymorphs
JOURNAL OF PHARMACEUTICAL SCIENCES 100(6), 2321 (2011)

Buey RM, Mohan R, Leslie K, Walzthoeni T, Missimer JH, Menzel A, Bjelic S, Bargsten K, Grigoriev I, Smal I, Meijering E, Aebersold R, Akhmanova A, Steinmetz MO
Insights into EB1 structure and the role of its C-terminal domain for discriminating microtubule tips from the lattice
MOLECULAR BIOLOGY OF THE CELL 22, 2912 (2011)

C Schittny J, F Barre S, Mokso R, Haberthur D, Semmler-Behnke M, G Kreyling W, Tsuda A, Stampanoni M
High-Resolution Phase-Contrast Imaging of Submicron Particles in Unstained Lung Tissue
AIP CONFERENCE PROCEEDINGS 1365, 384 (2011)

Cancellieri C, Fontaine D, Gariglio S, Reyren N, Caviglia A, Fete A, Leake S, Pauli S, Willmott P, Stengel M, Ghosez P, Triscone J
Electrostriction at the LaAlO3/SrTiO3 Interface
PHYSICAL REVIEW LETTERS 107, 056102 (2011)

Carroll L, Friedli P, Lerch P, Schneider J, Treyer D, Hunziker S, Stutz S, Sigg H
Ultra-broadband infrared pump-probe spectroscopy using synchrotron radiation and a tuneable pump
REVIEW OF SCIENTIFIC INSTRUMENTS 82, 063101 (2011)

Cernuto G, Galli S, Trudu F, Colonna GM, Masciocchi N, Cervellino A, Guagliardi A
Investigating the Amorphous-Crystalline Interplay in SiO2/TiO2 Nanocomposites by Total Scattering Methods
ANGEWANDTE CHEMIE-INTERNATIONAL EDITION 50, 10828 (2011)

Cernuto G, Masciocchi N, Cervellino A, Colonna GM, Guagliardi A
Size and Shape Dependence of the Photocatalytic Activity of TiO2 Nanocrystals: A Total Scattering Debye Function Study
JOURNAL OF THE AMERICAN CHEMICAL SOCIETY 133, 3114 (2011)

Chylarecka D, Kim TK, Tarafder K, Muller K, Godel K, Czekaj I, Wackerlin C, Cinchetti M, Ali ME, Piamonteze C, Schmitt F, Wustenberg JP, Ziegler C, Nolting F, Aeschlimann M, Oppeneer PM, Ballav N, Jung TA
Indirect Magnetic Coupling of Manganese Porphyrin to a Ferromagnetic Cobalt Substrate
JOURNAL OF PHYSICAL CHEMISTRY C 115, 1295 (2011)

Cormier L, Dargaud O, Menguy N, Henderson GS, Guignard M, Trcera N, Watts B
Investigation of the Role of Nucleating Agents in MgO-SiO2-Al2O3-SiO2-TiO2 Glasses and Glass-Ceramics: A XANES Study at the Ti K- and L-2,L-3-Edges
CRYSTAL GROWTH & DESIGN 11, 311 (2011)

Cui S, Wang J, Fan TT, Qin B, Guo L, Lei XB, Wang JW, Wang MT, Jin Q
Crystal Structure of Human Enterovirus 71 3C Protease

JOURNAL OF MOLECULAR BIOLOGY 408, 449 (2011)

Cunningham J, Thomas CW, Bengtson S, Marone F, Stampanoni M, Turner R, Bailey J, Raff R, Raff B, Donoghue P
Experimental taphonomy of giant sulphur bacteria: implications for the interpretation of the embryo-like Ediacaran oushantuo fossils
PROCEEDINGS OF THE ROYAL SOCIETY OF LONDON SERIES B-BIOLOGICAL SCIENCES 279, online (2011)

Danzenbacher S, V Vyalikh D, Kummer K, Krellner C, Holder M, Hoppner M, Kucherenko YU, Geibel C, Shi M, Patthey L, L Molodtsov S, Laubschat C
Insight into the f-Derived Fermi Surface of the Heavy-Fermion Compound YbRh2Si2
PHYSICAL REVIEW LETTERS 107, 267601 (2011)

Degueldre C, Martin M, Kuri G, Grolimund D, Borca C
Plutonium-uranium mixed oxide characterization by coupling micro-X-ray diffraction and absorption investigations
JOURNAL OF NUCLEAR MATERIALS 416, 142 (2011)

de Souza RA, Staub U, Scagnoli V, Garganourakis M, Bodenthin Y, Berger H
Origin of the anomalous low-temperature phase transition in BaVS3
PHYSICAL REVIEW B 84, 014409 (2011)

de Souza RA, Staub U, Scagnoli V, Garganourakis M, Bodenthin Y, Huang SW, Garcia-Fernandez M, Ji S, Lee SH, Park S, Cheong SW
Magnetic structure and electric field effects in multiferroic YMn2O5
PHYSICAL REVIEW B 84, 104416 (2011)

Dinapoli R, Bergamaschi A, Henrich B, Horisberger R, Johnson I, Mozzanica A, Schmid E, Schmitt B, Schreiber A, Shi XT, Theidel G
EIGER: Next generation single photon counting detector for X-ray applications
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT 650, 79 (2011)

Eller J, Rosen T, Marone F, Stampanoni M, Wokaun A, Buchi FN
Progress in In Situ X-Ray Tomographic Microscopy of Liquid Water in Gas Diffusion Layers of PEFC
JOURNAL OF THE ELECTROCHEMICAL SOCIETY 158, B963 (2011)

Eller J, Roth J, Marone F, Stampanoni M, Wokaun A, Buechi F
Towards ultra-fast X-ray Tomographic Microscopy of Liquid Water in PEFC
ECS TRANSACTIONS 41, 387 (2011)

Enzmann F, Miedaner MM, Kersten M, von Blohn N, Diehl K, Borrmann S, Stampanoni M, Ammann M, Huthwelker T
3-D imaging and quantification of graupel porosity by synchrotron-based micro-tomography
ATMOSPHERIC MEASUREMENT TECHNIQUES 4, 2225 (2011)

Eyssler A, Kleymenov E, Kupferschmid A, Nachtegaal M, Kumar MS, Hug P, Weidenkaff A, Ferri D
Improvement of Catalytic Activity of LaFe0.95Pd0.05O3 for Methane Oxidation under Transient Conditions
JOURNAL OF PHYSICAL CHEMISTRY C 115, 1231 (2011)

Faro AR, Carpentier P, Jonasson G, Pompidor G, Arcizett D, Demachy I, Bourgeois D
Low-Temperature Chromophore Isomerization Reveals the Photoswitching Mechanism of the Fluorescent Protein Padron
JOURNAL OF THE AMERICAN CHEMICAL SOCIETY 133, 16362 (2011)

Fischer KH, Fischer I, Bodi A
Threshold Photoelectron Spectrum of Isolated NTCDA
ZEITSCHRIFT FUR PHYSIKALISCHE CHEMIE-INTERNATIONAL JOURNAL OF RESEARCH IN PHYSICAL CHEMISTRY & CHEMICAL PHYSICS 225, 715 (2011)

Flechsig U, Huthwelker T, Spielmann S, Krempasky J
LTP-V with EPICS controls system for efficient quality assessment of KB-bender systems
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT 635, S64 (2011)

Fluckiger R, Marone F, Stampanoni M, Wokaun A, Buchi FN
Investigation of liquid water in gas diffusion layers of polymer electrolyte fuel cells using X-ray tomographic microscopy
ELECTROCHIMICA ACTA 56, 2254 (2011)

Fonin M, Hartung C, Rudiger U, Backes D, Heyderman L, Nolting F, Rodriguez AF, Klaui M
Formation of magnetic domains and domain walls in epitaxial Fe3O4(100) elements (invited)
JOURNAL OF APPLIED PHYSICS 109, 07D315 (2011)

Fottinger K, van Bokhoven JA, Nachtegaal M, Rupprechter G
Dynamic Structure of a Working Methanol Steam Reforming Catalyst: In Situ Quick-EXAFS on Pd/ZnO Nanoparticles
JOURNAL OF PHYSICAL CHEMISTRY LETTERS 2, 428 (2011)

Gai ZK, Donoghue PCJ, Zhu M, Janvier P, Stampanoni M
Fossil jawless fish from China foreshadows early jawed vertebrate anatomy
NATURE 476, 324 (2011)

Ghahari SM, Davenport AJ, Rayment T, Suter T, Tinnes JP, Padovani C, Hammons JA, Stampanoni M, Marone F, Mokso R
In situ synchrotron X-ray micro-tomography study of pitting corrosion in stainless steel
CORROSION SCIENCE 53, 2684 (2011)

Ghahari SM, Krouse DP, Laycock NJ, Rayment T, Padovani C, Suter T, Mokso R, Marone F, Stampanoni M, Monir M, Davenport AJ
Pitting corrosion of stainless steel: measuring and modelling pit propagation in support of damage prediction for radioactive waste containers
CORROSION ENGINEERING SCIENCE AND TECHNOLOGY 46, 205 (2011)

Gierz I, Meier F, Dil JH, Kern K, Ast CR
Tuning the spin texture in binary and ternary surface alloys on Ag(111)
PHYSICAL REVIEW B 83, 195122 (2011)

Glawion S, Heidler J, Haverkort MW, Duda LC, Schmitt T, Strocov VN, Monney C, Zhou K, Ruff A, Sing M, Claessen R
Two-Spinon and Orbital Excitations of the Spin-Peierls System TiOCl
PHYSICAL REVIEW LETTERS 107, 107402 (2011)

Gorelick S, Vila-Comamala J, Guzenko VA, Barrett R, Salome M, David C
High-efficiency Fresnel zone plates for hard X-rays by 100 keV e-beam lithography and electroplating
JOURNAL OF SYNCHROTRON RADIATION 18, 442 (2011)

Gorelick S, Vila-Comamala J, Guzenko VA, David C
High aspect ratio nanostructuring by high energy electrons and electroplating
MICROELECTRONIC ENGINEERING 88, 2259 (2011)

Gorelick S, Vila-Comamala J, Guzenko VA, Barrett R, Salome M, David C
High-Efficiency Gold Fresnel Zone Plates for Multi-keV X-rays
AIP CONFERENCE PROCEEDINGS 1365, 88 (2011)

Grolimund D, Berger D, Schreyer SB, Borca CN, Hartmann S, Muller F, Hovind J, Hunger K, Lehmann EH, Vontobel P, Wang HAO
Combined neutron and synchrotron X-ray microprobe analysis: attempt to disclose 3600 years-old secrets of a unique bronze age metal artifact
JOURNAL OF ANALYTICAL ATOMIC SPECTROMETRY 26, 1012 (2011)

Guizar-Sicairos M, Diaz A, Holler M, Lucas MS, Menzel A, Wepf RA, Bunk O
Phase tomography from x-ray coherent diffractive imaging projections

OPTICS EXPRESS 19, 21345 (2011)

Guizar-Sicairos M, Diaz A, Menzel A, Bunk O
X-ray phase nanotomography through ptychographic coherent lensless imaging
PROCEEDINGS OF THE SPIE - THE INTERNATIONAL SOCIETY FOR OPTICAL ENGINEERING 8011, 80118F (2011)

Guzenko VA, Romijn J, Vila-Comamala J, Gorelick S, David C
Efficient E-Beam Lithography Exposure Strategies for Diffractive X-ray Optics
AIP CONFERENCE PROCEEDINGS 1365, 92 (2011)

Harb M, Jurgilaitis A, Enquist H, Nuske R, Schmising CV, Gaudin J, Johnson SL, Milne CJ, Beaud P, Vorobeva E, Caviezel A, Mariager SO, Ingold G, Larsson J
Picosecond dynamics of laser-induced strain in graphite
PHYSICAL REVIEW B 84, 045435 (2011)

Herzog M, Leitenberger W, Shayduk R, van der Veen RM, Milne CJ, Johnson SL, Vrejoiu I, Alexe M, Hesse D, Bargheer M
Transient X-ray Reflectivity of Epitaxial Oxide Superlattices Investigated by Femtosecond X-ray Diffraction
in ULTRAFAST PHENOMENA XVII, Oxford University Press, 290-292 (2011)

Huldtgren T, Cunningham JA, Yin CY, Stampanoni M, Marone F, Donoghue PCJ, Bengtson S
Fossilized Nuclei and Germination Structures Identify Ediacaran "Animal Embryos" as Encysting Protists
SCIENCE 334, 1696 (2011)

Idhil A, Borca CN, Uldry A-C, Victoria M, Samaras M
Investigating the structure of iron-chromium alloys using synchrotron based X-ray microanalysis
JOURNAL OF NUCLEAR MATERIALS 416, 65 (2011)

Jensen TH, Bech M, Bunk O, Menzel A, Bouchet A, Duc GL, Feidenhans'l R, Pfeiffer F
Molecular X-ray computed tomography of myelin in a rat brain
NEUROIMAGE 57, 124 (2011)

Jensen TH, Bech M, Bunk O, Thomsen M, Menzel A, Bouchet A, Le Duc G, Feidenhans'l R, Pfeiffer F
Brain tumor imaging using small-angle x-ray scattering tomography
PHYSICS IN MEDICINE AND BIOLOGY 56, 1717 (2011)

King PDC, Hatch RC, Bianchi M, Ovsyannikov R, Lupulescu C, Landolt G, Slomski B, Dil JH, Guan D, Mi JL, Rienks EDL, Fink J, Lindblad A, Svensson S, Bao S, Balakrishnan G, Iversen BB, Osterwalder J, Eberhardt W, Baumberger F, Hofmann P
Large Tunable Rashba Spin Splitting of a Two-Dimensional Electron Gas in Bi2Se3
PHYSICAL REVIEW LETTERS 107, 096802 (2011)

Kisko K, Brozzo MS, Missimer J, Schleier T, Menzel A, Leppanen VM, Alitalo K, Walzthoeni T, Aebersold R, Ballmer-Hofer K
Structural analysis of vascular endothelial growth factor receptor-2/ligand complexes by small-angle X-ray solution scattering
FASEB JOURNAL 25, 2980 (2011)

Kitagawa D, Vakonakis I, Olieric N, Hilbert M, Keller D, Olieric V, Bortfeld M, Erat MC, Fluckiger I, Gonczy P, Steinmetz MO
Structural Basis of the 9-Fold Symmetry of Centrioles
CELL 144, 364 (2011)

Kleymenov E, van Bokhoven JA, David C, Glatzel P, Janousch M, Alonso-Mori R, Studer M, Willimann M, Bergamaschi A, Henrich B, Nachtegaal M
Five-element Johann-type x-ray emission spectrometer with a single-photon-counting pixel detector
REVIEW OF SCIENTIFIC INSTRUMENTS 82, 065107 (2011)

Krempasky J, Follath R, Strocov VN, Schmitt T, Flechsig U
Heydemann interpolation correction for energy linearization of soft X-ray monochromators.

ADVANCES IN X-RAY/EUV OPTICS AND COMPONENTS VI 8139, 81390K (2011)

Kuch W, Fukumoto K, Wang J, Nolting F, Quitmann C, Ramsvik T
Thermal melting of magnetic stripe domains
PHYSICAL REVIEW B 83, 172406 (2011)

Lafleur JP, Snakenborg D, Nielsen SS, Moller M, Toft KN, Menzel A, Jacobsen JK, Vestergaard B, Arleth L, Kutter JP
Automated microfluidic sample-preparation platform for high-throughput structural investigation of proteins by small-angle X-ray scattering
JOURNAL OF APPLIED CRYSTALLOGRAPHY 44, 1090 (2011)

Le Tacon M, Ghiringhelli G, Chaloupka J, Sala MM, Hinkov V, Haverkort MW, Minola M, Bakr M, Zhou KJ, Blanco-Canosa S, Monney C, Song YT, Sun GL, Lin CT, De Luca GM, Salluzzo M, Khaliullin G, Schmitt T, Braicovich L, Keimer B
Intense paramagnon excitations in a large family of high-temperature superconductors
NATURE PHYSICS 7, 725 (2011)

Lima FA, Milne CJ, Amarasinghe DCV, Rittmann-Frank MH, van der Veen RM, Reinhard M, Pham VT, Karlsson S, Johnson SL, Grolimund D, Borca C, Huthwelker T, Janousch M, van Mourik F, Abela R, Chergui M
A high-repetition rate scheme for synchrotron-based picosecond laser pump/x-ray probe experiments on chemical and biological systems in solution
REVIEW OF SCIENTIFIC INSTRUMENTS 82, 063111 (2011)

Lubashevsky Y, Garg A, Sassa Y, Shi M, Kanigel A
Insensitivity of the Superconducting Gap to Variations in the Critical Temperature of Zn-Substituted Bi2Sr2CaCu2O8+delta Superconductors
PHYSICAL REVIEW LETTERS 106, 047002 (2011)

Mader K, Marone F, Hintermuller C, Mikuljan G, Isenegger A, Stampanoni M
High-throughput full-automatic synchrotron-based tomographic microscopy
JOURNAL OF SYNCHROTRON RADIATION 18, 117 (2011)

Malavasi L, Tealdi C, Ritter C, Pomjakushin V, Gozzo F, Diaz-Fernandez Y
Combined Neutron and Synchotron X-ray Diffraction Investigation of the BaCe0.85-xZrY0.15O3-d Proton Conductors
CHEMISTRY OF MATERIALS 23, 1323-1330 (2011)

Malfait WJ, Sanchez-Valle C, Ardia P, Medard E, Lerch P
Compositional dependent compressibility of dissolved water in silicate glasses
AMERICAN MINERALOGIST 96, 1402 (2011)

Marelli E, Casati N, Gozzo F, Macchi P, Simoncic P, Sironi A
High pressure modification of organic NLO materials: large conformational re-arrangement of 4-aminobenzophenone
CRYSTENGCOMM 13, 6845 (2011)

Marone F, Mokso R, Fife JL, Irvine S, Modregger P, Pinzer BR, Mader K, Isenegger A, Mikuljan G, Stampanoni M
Synchrotron-based X-ray Tomographic Microscopy at the Swiss Light Source for Industrial Applications
SYNCHROTRON RADIATION NEWS 24, 24 (2011)

Marone F, Mokso R, Modregger P, Fife J, Pinzer B, Thuring T, Mader K, Mikuljan G, Isenegger A, Stampanoni M
Present and Future X-ray Tomographic Microscopy at TOMCAT
AIP CONFERENCE PROCEEDINGS 1365, 116 (2011)

Massee F, de Jong S, Huang Y, Siu W, Santoso I, Mans A, Boothroyd A, Prabhakaran D, Follath R, Varykhalov A, Patthey L, Shi M, Goedkoop J; Golden M
Bilayer manganites reveal polarons in the midst of a metallic breakdown
NATURE PHYSICS 7, 978 (2011)

Maus S, Muller S, Buttner J, Brutsch S, Huthwelker T, Schwikowski M, Enzmann F, Vahatolo A

Ion fractionation in young sea ice from Kongsfjorden, Svalbard
ANNALS OF GLACIOLOGY 52, 301 (2011)

Mayer PM, Blanchet V, Joblin C
Threshold photoelectron study of naphthalene, anthracene, pyrene, 1,2-dihydronaphthalene, and 9,10-dihydroanthracene
JOURNAL OF CHEMICAL PHYSICS 134, 244312 (2011)

McDonald SA, Marone F, Hintermuller C, Mikuljan G, David C, Stampanoni M
Phase Contrast X-Ray Tomographic Microscopy for Biological and Materials Science Applications
ADVANCED ENGINEERING MATERIALS 13, 116 (2011)

Meier F, Petrov V, Mirhosseini H, Patthey L, Henk J, Osterwalder J, Dil JH
Interference of spin states in photoemission from Sb/Ag(111) surface alloys
JOURNAL OF PHYSICS-CONDENSED MATTER 23, 072207 (2011)

Meier R, Schindler M, Muller-Buschbaum P, Watts B
Residual solvent content in conducting polymer-blend films mapped with scanning transmission x-ray microscopy
PHYSICAL REVIEW B 84, 174205 (2011)

Mengotti E, Heyderman LJ, Rodriguez AF, Nolting F, Hugli RV, Braun HB
Real-space observation of emergent magnetic monopoles and associated Dirac strings in artificial kagome spin ice
NATURE PHYSICS 7, 68 (2011)

Milne CJ, Van der Veen RM, Pham VT, Lima FA, Rittmann-Frank H, Reinhard M, van Mourik F, Karlsson S, Penfold TJ, Chergui M
Ultrafast X-ray Absorption Studies of the Structural Dynamics of Molecular and Biological Systems in Solution
CHIMIA 65, 303 (2011)

Modregger P, Pinzer BR, Thuring T, Rutishauser S, David C, Stampanoni M
Sensitivity of X-ray grating interferometry
OPTICS EXPRESS 19, 18324 (2011)

Modregger P, Wang Z, Thuering T, Pinzer B, Stampanoni M
Artifacts in X-ray Dark-Field Tomography
AIP CONFERENCE PROCEEDINGS 1365, 269 (2011)

Mohr-Vorobeva E, Johnson SL, Beaud P, Staub U, De Souza R, Milne C, Ingold G, Demsar J, Schaefer H, Titov A
Nonthermal Melting of a Charge Density Wave in TiSe2
PHYSICAL REVIEW LETTERS 107, 036403 (2011)

Moitzi C, Menzel A, Schurtenberger P, Stradner A
The pH Induced Sol-Gel Transition in Skim Milk Revisited. A Detailed Study Using Time-Resolved Light and X-ray Scattering Experiments
LANGMUIR 27, 2195 (2011)

Mokso R, Marone F, Haberthur D, C Schittny J, Mikuljan G, Isenegger A, Stampanoni M
Following Dynamic Processes by X-ray Tomographic Microscopy with Sub-second Temporal Resolution
AIP CONFERENCE PROCEEDINGS 1365, 38 (2011)

Moore JR, Albert-Seifried S, Rao A, Massip S, Watts B, Morgan DJ, Friend RH, McNeill CR, Sirringhaus H
Polymer Blend Solar Cells Based on a High-Mobility Naphthalenediimide-Based Polymer Acceptor: Device Physics, Photophysics and Morphology
ADVANCED ENERGY MATERIALS 1, 230 (2011)

Morscher M, Nolting F, Brugger T, Greber T
Resonant photoelectron diffraction with circularly polarized light
PHYSICAL REVIEW B 84, 140406 (2011)

Nellen U, Dietrich J, Helden L, Chodankar S, Nygard K, van der Veen JF, Bechinger C
Salt-induced changes of colloidal interactions in critical mixtures
SOFT MATTER 7, 5360-5364 (2011)

Oberta P, Flechsig U, Muntwiler M, Quitmann C
Optical design study of the PEARL beamline at SLS
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT 635, 116 (2011)

Olliges S, Frank S, Gruber PA, Auzelyte V, Solak H, Spolenak R
Thermo mechanical properties and plastic deformation of gold nanolines and gold thin films
MATERIALS SCIENCE AND ENGINEERING A-STRUCTURAL MATERIALS PROPERTIES MICROSTRUCTURE AND PROCESSING 528, 6203 (2011)

Ono K, Araki T, Yano M, Miyamoto N, Shoji T, Kato A, Manabe A, Nozaki H, Ostendorp T, Diez J, Heizmann CW, Fritz G
The crystal structures of human S100B in the zinc- and calcium-loaded state at three pH values reveal zinc ligand swapping
BIOCHIMICA ET BIOPHYSICA ACTA-MOLECULAR CELL RESEARCH 1813, 1083 (2011)

Kaneko Y, Raabe J
Element-Specific Magnetic Domain Imaging of (Nd, Dy)-Fe-B Sintered Magnets Using Scanning Transmission X-Ray Microscopy
IEEE TRANSACTIONS ON MAGNETICS 47, 2672 (2011)

Pacile D, Meyer JC, Rodriguez AF, Papagno M, Gomez-Navarro C, Sundaram RS, Burghard M, Kern K, Carbone C, Kaiser U
Electronic properties and atomic structure of graphene oxide membranes
CARBON 49, 966 (2011)

Paivanranta B, Langner A, Kirk E, David C, Ekinci Y
Sub-10 nm patterning using EUV interference lithography
NANOTECHNOLOGY 22, 375302 (2011)

Paivanranta B, Merbold H, Giannini R, Buchi L, Gorelick S, David C, Loffler JF, Feurer T, Ekinci Y
High Aspect Ratio Plasmonic Nanostructures for Sensing Applications
ACS NANO 5, 6374 (2011)

Paivanranta B, Sahoo PK, Tocce E, Auzelyte V, Ekinci Y, Solak HH, Liu CC, Stuen KO, Nealey PF, David C
Nanofabrication of Broad-Band Antireflective Surfaces Using Self-Assembly of Block Copolymers
ACS NANO 5, 1860 (2011)

Park J, Lee SH, Lee S, Gozzo F, Kimura H, Noda Y, Choi YJ, Kiryukhin V, Cheong SW, Jo Y, Choi ES, Balicas L, Jeon GS, Park JG
Magnetoelectric Feedback among Magnetic Order, Polarization, and Lattice in Multiferroic BiFeO3
JOURNAL OF THE PHYSICAL SOCIETY OF JAPAN 80, 114714 (2011)

Pauli SA, Leake SJ, Delley B, Bjorck M, Schneider CW, Schleputz CM, Martoccia D, Paetel S, Mannhart J, Willmott PR
Evolution of the Interfacial Structure of LaAlO3 on SrTiO3
PHYSICAL REVIEW LETTERS 106, 036101 (2011)

Pauluhn A, Pradervand C, Rossetti D, Salathe M, Schulze-Briese C
Automatic loop centring with a high-precision goniometer head at the SLS macromolecular crystallography beamlines
JOURNAL OF SYNCHROTRON RADIATION 18, 595 (2011)

Petri M, Menzel A, Bunk O, Busse G, Techert S
Concentration Effects on the Dynamics of Liquid Crystalline Self-Assembly: Time-Resolved X-

ray Scattering Studies
JOURNAL OF PHYSICAL CHEMISTRY A 115, 2176 (2011)

Pham VT, Penfold TJ, van der Veen RM, Lima F, El Nahhas A, Johnson SL, Beaud P, Abela R, Bressler C, Tavernelli I, Milne CJ, Chergui M
Probing the Transition from Hydrophilic to Hydrophobic Solvation with Atomic Scale Resolution
JOURNAL OF THE AMERICAN CHEMICAL SOCIETY 133, 12740 (2011)

Pietzsch A, Sun YP, Hennies F, Rinkevicius Z, Karlsson HO, Schmitt T, Strocov VN, Andersson J, Kennedy B, Schlappa J, Fohlisch A, Rubensson JE, Gel'mukhanov F
Spatial Quantum Beats in Vibrational Resonant Inelastic Soft X-Ray Scattering at Dissociating States in Oxygen
PHYSICAL REVIEW LETTERS 106, 153004 (2011)

Princep AJ, Mulders AM, Staub U, Scagnoli V, Nakamura T, Kikkawa A, Lovesey SW, Balcar E
Triakontadipole and high-order dysprosium multipoles in the antiferromagnetic phase of DyB2C2
JOURNAL OF PHYSICS-CONDENSED MATTER 23, 266002 (2011)

Quaroni L, Zlateva T
Infrared spectromicroscopy of biochemistry in functional single cells
ANALYST 136, 3219 (2011)

Quaroni L, Zlateva T, Normand E
Detection of weak absorption changes from molecular events in time-resolved FTIR spectromicroscopy measurements of single functional cells
ANALYTICAL CHEMISTRY 83, 7371-7380 (2011)

Rajendran C, Dworkowski FSN, Wang MT, Schulze-Briese C
Radiation damage in room-temperature data acquisition with the PILATUS 6M pixel detector
JOURNAL OF SYNCHROTRON RADIATION 18, 318 (2011)

Rausch SMK, Haberthuer D, Stampanoni M, Schittny JC, Wall WA
Local Strain Distribution in Real Three-Dimensional Alveolar Geometries
ANNALS OF BIOMEDICAL ENGINEERING 39, 2835 – 2843 (2011)

Reinhard M, Lima FA, El nahhas A, Milne C, Pham VT, Van Der Veen RM, Amarasinghe DCV, Johnson SL, Beaud P, Grolimund D, Borca CN, Abela R, Ingold G, Bressler C, Chergui M
Solvation dynamics using ultrafast x-ray absorption spectroscopy
BIOPHOTONICS: SPECTROSCOPY, IMAGING, SENSING, AND MANIPULATION Part 3, 381 (2011)

Rutishauser S, Donath T, David C, Pfeiffer F, Marone F, Modregger P, Stampanoni M
A tilted grating interferometer for full vector field differential x-ray phase contrast tomography
OPTICS EXPRESS 19, 24890 (2011)

Sa J, Goguet A, Taylor SFR, Tiruvalam R, Kiely CJ, Nachtegaal M, Hutchings GJ, Hardacre C
Influence of Methyl Halide Treatment on Gold Nanoparticles Supported on Activated Carbon
ANGEWANDTE CHEMIE-INTERNATIONAL EDITION 50, 8912 (2011)

Sa J, Kartusch C, Makosch M, Paun C, van Bokhoven JA, Kleymenov E, Szlachetko J, Nachtegaal M, Manyar HG, Hardacre C
Evaluation of Pt and Re oxidation state in a pressurized reactor: difference in reduction between gas and liquid phase
CHEMICAL COMMUNICATIONS 47, 6590 (2011)

Saerbeck T, Loh N, Lott D, Toperverg B, Mulders A, Fraile Rodriguez A, Freeland J, Ali M, Hickey B, Stampfl A, Klose F, Stamps R
Spatial Fluctuations of Loose Spin Coupling in CuMn/Co Multilayers
PHYSICAL REVIEW LETTERS 107, 127201 (2011)

Sala MM, Bisogni V, Aruta C, Balestrino G, Berger H, Brookes NB, de Luca GM, Di Castro D, Grioni M, Guarise M, Medaglia PG, Granozio FM, Minola M, Perna P, Radovic M, Salluzzo M, Schmitt T, Zhou KJ, Braicovich L, Ghiringhelli G
Energy and symmetry of dd excitations in undoped layered cuprates measured by Cu L-3

resonant inelastic x-ray scattering
NEW JOURNAL OF PHYSICS 13, 043026 (2011)

Salman Z, Smadella M, Macfarlane W, Patterson B, Willmott P, Chow K, Hossain M, Saadaoui H, Wang D, Kiefl R
Depth dependence of the structural phase transition of SrTiO3 studied with beta-NMR and grazing incidence x-ray diffraction
PHYSICAL REVIEW B 83, 224112 (2011)

Sarkar SS, Solak HH, Saidani M, David C, van der Veen JF
High-resolution Fresnel zone plate fabrication by achromatic spatial frequency multiplication with extreme ultraviolet radiation
OPTICS LETTERS 36, 1860 (2011)

Sassa Y, Radovic M, Mansson M, Razzoli E, Cui XY, Pailhes S, Guerrero S, Shi M, Willmott PR, Granozio FM, Mesot J, Norman MR, Patthey L
Ortho-II band folding in YBa2Cu3O7-delta films revealed by angle-resolved photoemission
PHYSICAL REVIEW B 83, 140511 (2011)

Scagnoli V, Staub U, Bodenthin Y, de Souza RA, Garcia-Fernandez M, Garganourakis M, Boothroyd AT, Prabhakaran D, Lovesey SW
Observation of Orbital Currents in CuO
SCIENCE 332, 696 (2011)

Schellenberger P, Demangeat G, Lemaire O, Ritzenthaler C, Bergdoll M, Olieric V, Sauter C, Lorber B
Strategies for the crystallization of viruses: Using phase diagrams and gels to produce 3D crystals of Grapevine fanleaf virus
JOURNAL OF STRUCTURAL BIOLOGY 174, 344 (2011)

Schlepuetz CM, Mariager SO, Pauli SA, Feidenhansl R, Willmott PR
Angle calculations for a (2+3)-type diffractometer: focus on area detectors
JOURNAL OF APPLIED CRYSTALLOGRAPHY 44, 73 (2011)

Schmid I, Raabe J, Wenzel S, Fink R, Hug H, Quitmann C
NanoXAS - The in situ Combination of Scanning Transmission X-ray and Scanning Probe Microscopy
10TH INTERNATIONAL CONFERENCE ON X-RAY MICROSCOPY, AIP CONFERENCE PROCEEDINGS, 1365, 449 (2011)

Schneider Y, Soppa E, Kohler C, Mokso R, Roos E
Numerical and experimental investigations of the global and local behaviour of an Al(6061)/Al2O3 metal matrix composite under low cycle fatigue
PROCEDIA ENGINEERING 10, 1515 (2011)

Sciascia C, Martino N, Schuettfort T, Watts B, Grancini G, Antognazza MR, Zavelani-Rossi M, McNeill CR, Caironi M
Sub-Micrometer Charge Modulation Microscopy of a High Mobility Polymeric n-Channel Field-Effect Transistor
ADVANCED MATERIALS 23, 5086 (2011)

Sebastian A, Pauza A, Rossel C, Shelby RM, Rodriguez AF, Pozidis H, Eleftheriou E
Resistance switching at the nanometre scale in amorphous carbon
NEW JOURNAL OF PHYSICS 13, 013020 (2011)

Siegfried T, Ekinci Y, H Solak H, J F Martin O, Sigg H
Fabrication of sub-10 nm gap arrays over large areas for plasmonic sensors
APPLIED PHYSICS LETTERS 99, 263302 (2011)

Sitar T, Gallinger J, Ducka AM, Ikonen TP, Wohlhoefler M, Schmoller KM, Bausch AR, Joel P, Trybus KM, Noegel AA, Schleicher M, Huber R, Holak TA
Molecular architecture of the Spire-actin nucleus and its implication for actin filament assembly
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 108, 19575 (2011)

Slomski B, Meier F, Osterwalder J, Dil JH
Controlling the effective mass of quantum well states in Pb/Si(111) by interface engineering
PHYSICAL REVIEW B 83, 035409 (2011)

Slomski B, Landolt G, Meier F, Patthey L, Bihlmayer G, Osterwalder J, Dil JH
Manipulating the Rashba-type spin splitting and spin texture of Pb quantum well states
PHYSICAL REVIEW B 84, 193406 (2011)

Smeulders MJ, Barends TRM, Pol A, Scherer A, Zandvoort MH, Udvarhelyi A, Khadem AF, Menzel A, Hermans J, Shoeman RL, Wessels HJCT, van den Heuvel LP, Russ L, Schlichting I, Jetten MSM, den Camp HJMO
Evolution of a new enzyme for carbon disulphide conversion by an acidothermophilic archaeon
NATURE 478, 412 (2011)

Soman MR, Hall DJ, Tutt JH, Murray NJ, Holland AD, Schmitt T, Raabe J, Schmitt B
Improving the spatial resolution of a soft X-ray Charge Coupled Device used for Resonant Inelastic X-ray Scattering
JOURNAL OF INSTRUMENTATION 6, C11021 (2011)

Stampanoni M, Marone F, Vila-Comamala J, Gorelick S, David C, Trtik P, Jefimovs K, Mokso R
Hard X-ray Phase-Contrast Tomographic Nanoimaging
AIP CONFERENCE PROCEEDINGS 1365, 239 (2011)

Steinbauer M, Hemberger P, Fischer I, Bodi A
Photoionization of C7H6 and C7H5: Observation of the Fulvenallenyl Radical
CHEMPHYSCHEM 12, 1795 (2011)

Strocov VN, Schmitt T, Flechsig U, Patthey L, Chiuzbaian GS
Numerical optimization of spherical variable-line-spacing grating X-ray spectrometers
JOURNAL OF SYNCHROTRON RADIATION 18, 134 (2011)

Sun Y-P, Pietzsch A, Hennies F, Rinkevicius Z, O Karlsson H, Schmitt T, Strocov V, Andersson J, Kennedy B, Schlappa J, Foehlisch A, Gel'mukhanov F, Rubensson J-E
Internal symmetry and selection rules in resonant inelastic soft x-ray scattering
JOURNAL OF PHYSICS B-ATOMIC MOLECULAR AND OPTICAL PHYSICS 44, 161002 (2011)

Sun YP, Hennies F, Pietzsch A, Kennedy B, Schmitt T, Strocov VN, Andersson J, Berglund M, Rubensson JE, Aidas K, Gel'mukhanov F, Odelius M, Foehlisch A
Intramolecular soft modes and intermolecular interactions in liquid acetone
PHYSICAL REVIEW B 84, 132202 (2011)

Terhalle B, Langner A, Paeivaeranta B, Ekinci Y
Advanced holographic methods in extreme ultraviolet interference lithography
PROCEEDINGS OF THE SPIE - THE INTERNATIONAL SOCIETY FOR OPTICAL ENGINEERING 8102, 81020V (2011)

Terhalle B, Langner A, Paivanranta B, Guzenko VA, David C, Ekinci Y
Generation of extreme ultraviolet vortex beams using computer generated holograms
OPTICS LETTERS 36, 4143 (2011)

Tew MW, Emerich H, van Bokhoven JA
Formation and Characterization of PdZn Alloy: A Very Selective Catalyst for Alkyne Semihydrogenation
JOURNAL OF PHYSICAL CHEMISTRY C 115, 8457 (2011)

Tew MW, Janousch M, Huthwelker T, van Bokhoven JA
The roles of carbide and hydride in oxide-supported palladium nanoparticles for alkyne hydrogenation
JOURNAL OF CATALYSIS 283, 45 (2011)

Thuering T, Modregger P, Pinzer BR, Wang Z, Stampanoni M
Non-linear regularized phase retrieval for unidirectional X-ray differential phase contrast radiography
OPTICS EXPRESS 19, 25545 (2011)

Troyanchuk IO, V Karpinsky D, V Bushinsky M, Sikolenko V, Efimov V, Cervellino A
The low-temperature macroscopic phase separation in La0.5Ba0.5CoO3-d cobaltite
JETP LETTERS 93, 149 (2011)

Trtik P, Soos M, Munch B, Lamprou A, Mokso R, Stampanoni M
Quantification of a Single Aggregate Inner Porosity and Pore Accessibility Using Hard X-ray Phase-Contrast Nanotomography
LANGMUIR 27, 12788 (2011)

van der Vaart B, Manatschal C, Grigoriev I, Olieric V, Gouveia SM, Bjelic S, Demmers J, Vorobjev I, Hoogenraad CC, Steinmetz MO, Akhmanova A
SLAIN2 links microtubule plus end-tracking proteins and controls microtubule growth in interphase
JOURNAL OF CELL BIOLOGY 193, 1083 (2011)

van Heumen E, Vuorinen J, Koepernik K, Massee F, Huang YK, Shi M, Klei J, Goedkoop J, Lindroos M, van den Brink J, Golden MS
Existence, Character, and Origin of Surface-Related Bands in the High Temperature Iron Pnictide Superconductor BaFe(2-x)Co(x)As2
PHYSICAL REVIEW LETTERS 106, 027002 (2011)

Vankó G, Glatzel P, Pham VT, Abela R, Grolimund D, Borca CN, Johnson SL, Milne CJ, Gawelda W, Galler A, Bressler C
Time Resolved X-ray Emission Spectroscopy
in ULTRAFAST PHENOMENA XVII, Oxford University Press, 766-768 (2011)

Vaz CAF, Rhensius J, Heidler J, Wohlhuter P, Bisig A, Korner HS, Mentes TO, Locatelli A, Le Guyader L, Nolting F, Graf T, Felser C, Heyderman LJ, Klaui M
Spin configurations in Co2FeAl0.4Si0.6 Heusler alloy thin film elements
APPLIED PHYSICS LETTERS 99, 182510 (2011)

Vila-Comamala J, Diaz A, Guizar-Sicairos M, Gorelick S, Guzenko VA, Karvinen P, Kewish CM, Farm E, Ritala M, Mantion A, Bunk O, Menzel A, David C
Characterization of a 20-nm hard x-ray focus by ptychographic coherent diffractive imaging
ADVANCES IN X-RAY/EUV OPTICS AND COMPONENTS VI, PROCEEDINGS OF SPIE, 8139, 81390E (2011)

Vila-Comamala J, Diaz A, Guizar-Sicairos M, Mantion A, Kewish CM, Menzel A, Bunk O, David C
Characterization of high-resolution diffractive X-ray optics by ptychographic coherent diffractive imaging
OPTICS EXPRESS 19, 21333 (2011)

Vila-Comamala J, Gorelick S, Farm E, Kewish CM, Diaz A, Barrett R, Guzenko VA, Ritala M, David C
Ultra-high resolution zone-doubled diffractive X-ray optics for the multi-keV regime
OPTICS EXPRESS 19, 175 (2011)

Vila-Comamala J, Gorelick S, Farm E, Kewish CM, Diaz A, Guzenko VA, Barrett R, Raabe J, Menzel A, Bunk O, Ritala M, David C
Zone-Doubled Fresnel Zone Plates for Scanning Transmission X-ray Microscopy
10TH INTERNATIONAL CONFERENCE ON X-RAY MICROSCOPY, AIP CONFERENCE PROCEEDINGS, 1365, 192 (2011)

Voide R, Schneider P, Stauber M, van Lenthe GH, Stampanoni M, Mueller R
The importance of murine cortical bone microstructure for microcrack initiation and propagation
BONE 49, 1186 – 1193 (2011)

Vorobeva E, Johnson SL, Beaud P, Staub U, de Souza R, Milne CJ, Demsar J, H, Schäfer H, Titov A, Ingold G
Femtosecond laser-induced CDW melting in $TiSe_2$
ULTRAFAST PHENOMENA XVII, Oxford University Press, 164-166 (2011)

Wang HA, Grolimund D, Van Loon LR, Barmettler K, Borca CN, Aeschlimann B, Guenther D
Quantitative chemical imaging of element diffusion into heterogeneous media using laser

ablation inductively coupled plasma mass spectrometry, synchrotron micro-X-ray fluorescence, and extended X-ray absorption fine structure spectroscopy
ANALYTICAL CHEMISTRY 83, 6259 (2011)

Wang J, Fan TT, Yao X, Wu ZQ, Guo L, Lei XB, Wang JW, Wang MT, Jin Q, Cui S
Crystal Structures of Enterovirus 71 3C Protease Complexed with Rupintrivir Reveal the Roles of Catalytically Important Residues
JOURNAL OF VIROLOGY 85, 10021 (2011)

Wang Z, Huang Z, Chen Z, Zhang LI, Jiang X, Kang K, Yin H, Wang Z, Stampanoni M
Low-dose multiple-information retrieval algorithm for X-ray grating-based imaging
NUCLEAR INSTRUMENTS AND METHODS IN PHYSICS RESEARCH A 635, 103 – 107 (2011)

Wang Z, Zhifeng H, Li Z, Zhiqiang C, Kejun K, Hongxia Y, Zhenchang W, Stampanoni M
Low dose reconstruction algorithm for differential phase contrast imaging
JOURNAL OF X-RAY SCIENCE AND TECHNOLOGY 19, 403 (2011)

Watts B, Schuettfort T, McNeill CR
Mapping of Domain Orientation and Molecular Order in Polycrystalline Semiconducting Polymer Films with Soft X-Ray Microscopy
ADVANCED FUNCTIONAL MATERIALS 21, 1122 (2011)

Weber B, Schoenauer R, Papadopulos F, Modregger P, Peter S, Stampanoni M, Mauri A, Mazza E, Gorelik J, Agarkova I, Frese L, Breymann C, Kretschmar O, Hoerstrup S
Engineering of living autologous human umbilical cord cell-based septal occluder membranes using composite PGA-P4HB matrices
BIOMATERIALS 32, 9630 (2011)

Welch MD, Montgomery W, Balan E, Lerch P
Insights into the high-pressure behavior of kaolinite from infrared spectroscopy and quantum-mechanical calculations
PHYSICS AND CHEMISTRY OF MINERALS 39, 143 (2011)

Wintz S, Strache T, Korner M, Fritzsche M, Marko D, Monch I, Mattheis R, Raabe J, Quitmann C, McCord J, Erbe A, Fassbender J
Direct observation of antiferromagnetically oriented spin vortex states in magnetic multilayer elements
APPLIED PHYSICS LETTERS 98, 232511 (2011); Erratum: 99, 149901 (2011)

Wolff P, Olieric V, Briand JP, Chaoin O, Dejaegere A, Dumas P, Ennifar E, Guichard G, Wagner J, Burnouf DY
Structure-Based Design of Short Peptide Ligands Binding onto the E. coli Processivity Ring
JOURNAL OF MEDICINAL CHEMISTRY 54, 4627 (2011)

Xu SY, Xia Y, Wray LA, Jia S, Meier F, Dil JH, Osterwalder J, Slomski B, Bansil A, Lin H, Cava RJ, Hasan MZ
Topological Phase Transition and Texture Inversion in a Tunable Topological Insulator
SCIENCE 332, 560 (2011)

Xu YM, Huang YB, Cui XY, Razzoli E, Radovic M, Shi M, Chen GF, Zheng P, Wang NL, Zhang CL, Dai PC, Hu JP, Wang Z, Ding H
Observation of a ubiquitous three-dimensional superconducting gap function in optimally doped Ba0.6K0.4Fe2As2
NATURE PHYSICS 7, 198 (2011)

Zelenay V, Ammann M, Krepelova A, Birrer M, Tzvetkov G, Vernooij MGC, Raabe J, Huthwelker T
Direct observation of water uptake and release in individual submicrometer sized ammonium sulfate and ammonium sulfate/adipic acid particles using X-ray microspectroscopy
JOURNAL OF AEROSOL SCIENCE 42, 38 (2011)

Zelenay V, Huthwelker T, Krepelova A, Rudich Y, Ammann M
Humidity driven nanoscale chemical separation in complex organic matter

ENVIRONMENTAL CHEMISTRY 8, 450 (2011)

Zelenay V, Monge ME, D'Anna B, George C, Styler SA, Huthwelker T, Ammann M
Increased steady state uptake of ozone on soot due to UV/Vis radiation
JOURNAL OF GEOPHYSICAL RESEARCH-ATMOSPHERES 116, D11301 (2011)

Zelenay V, Mooser R, Tritscher T, Krepelova A, Heringa MF, Chirico R, Prevot ASH, Weingartner E, Baltensperger U, Dommen J, Watts B, Raabe J, Huthwelker T, Ammann M
Aging induced changes on NEXAFS fingerprints in individual combustion particles
ATMOSPHERIC CHEMISTRY AND PHYSICS 11, 11777 (2011)

Zhang K, Hong YL, Zhu PP, Yuan QX, Huang WX, Wang ZL, Chu SQ, McDonald SA, Marone F, Stampanoni M, Wu ZY
Study of OSEM with different subsets in grating-based X-ray differential phase-contrast imaging
ANALYTICAL AND BIOANALYTICAL CHEMISTRY 401, 837 (2011)

Zhou KJ, Radovic M, Schlappa J, Strocov V, Frison R, Mesot J, Patthey L, Schmitt T
Localized and delocalized Ti 3d carriers in LaAlO3/SrTiO3 superlattices revealed by resonant inelastic x-ray scattering
PHYSICAL REVIEW B 83, 201402 (2011)

Zimmer D, Kruse J, Baum C, Borca C, Laue M, Hause G, Meissner R, Leinweber P
Spatial distribution of arsenic and heavy metals in willow roots from a contaminated floodplain soil measured by X-ray fluorescence spectroscopy
SCIENCE OF THE TOTAL ENVIRONMENT 409, 4094 (2011)

PUBLICATIONS WITHOUT SYN AUTHOR(S) AND DESCRIBING AN SLS EXPERIMENT

Abskharon RNN, Soror SH, Pardon E, El Hassan H, Legname G, Steyaert J, Wohlkonig A
Combining in-situ proteolysis and microseed matrix screening to promote crystallization of PrPc-nanobody complexes
PROTEIN ENGINEERING DESIGN & SELECTION 24, 737 (2011)

Akdemir A, Rucktooa P, Jongejan A, van Elk R, Bertrand S, Sixma TK, Bertrand D, Smit AB, Leurs R, de Graaf C, de Esch IJP
Acetylcholine binding protein (AChBP) as template for hierarchical in silico screening procedures to identify structurally novel ligands for the nicotinic receptors
BIOORGANIC & MEDICINAL CHEMISTRY 19, 6107 (2011)

Alagaratnam S, Meeuwenoord NJ, Navarro JA, Hervas M, De la Rosa MA, Hoffmann M, Einsle O, Ubbink M, Canters GW
Probing the reactivity of different forms of azurin by flavin photoreduction
FEBS JOURNAL 278, 1506 (2011)

Albrecht R, Zeth K
Structural Basis of Outer Membrane Protein Biogenesis in Bacteria
JOURNAL OF BIOLOGICAL CHEMISTRY 286, 27792 (2011)

Amato F, Viana M, Richard A, Furger M, Prevot ASH, Nava S, Lucarelli F, Bukowiecki N, Alastuey A, Reche C, Moreno T, Pandolfi M, Pey J, Querol X
Size and time-resolved roadside enrichment of atmospheric particulate pollutants
ATMOSPHERIC CHEMISTRY AND PHYSICS 11, 2917 (2011)

Amstad E, Gehring AU, Fischer H, Nagaiyanallur VV, Hahner G, Textor M, Reimhult E
Influence of Electronegative Substituents on the Binding Affinity of Catechol-Derived Anchors to Fe3O4 Nanoparticles
JOURNAL OF PHYSICAL CHEMISTRY C 115, 683 (2011)

Andersen JL, Gourdon P, Moller JV, Morth JP, Nissen P
Crystallization and preliminary structural analysis of the Listeria monocytogenes Ca2+-ATPase LMCA1
ACTA CRYSTALLOGRAPHICA SECTION F-STRUCTURAL BIOLOGY AND CRYSTALLIZATION COMMUNICATIONS 67, 718 (2011)

Antonyuk SV, Hough MA
Monitoring and validating active site redox states in protein crystals
BIOCHIMICA ET BIOPHYSICA ACTA-PROTEINS AND PROTEOMICS 1814, 778 (2011)

Antonyuk SV, Rustage N, Petersen CA, Arnst JL, Heyes DJ, Sharma R, Berry NG, Scrutton NS, Eady RR, Andrew CR, Hasnain SS
Carbon monoxide poisoning is prevented by the energy costs of conformational changes in gas-binding haemproteins
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 108, 15780 (2011)

Apostol MI, Wiltzius JJW, Sawaya MR, Cascio D, Eisenberg D
Atomic Structures Suggest Determinants of Transmission Barriers in Mammalian Prion Disease
BIOCHEMISTRY 50, 2456 (2011)

Babault N, Cordier F, Lafage M, Cockburn J, Haouz A, Prehaud C, Rey FA, Delepierre M, Buc H, Lafon M, Wolff N
Peptides Targeting the PDZ Domain of PTPN4 Are Efficient Inducers of Glioblastoma Cell Death
STRUCTURE 19, 1518 (2011)

Baerlocher C, Weber T, McCusker LB, Palatinus L, Zones SI
Unraveling the Perplexing Structure of the Zeolite SSZ-57
SCIENCE 333, 1134 (2011)

Bai L, Baker DR, Polacci M, Hill RJ
In-situ degassing study on crystal-bearing Stromboli basaltic magmas: Implications for Stromboli explosions
GEOPHYSICAL RESEARCH LETTERS 38, L17309 (2011)

Ballandras A, Moreau K, Robert X, Confort MP, Merceron R, Haser R, Ronfort C, Gouet P
A Crystal Structure of the Catalytic Core Domain of an Avian Sarcoma and Leukemia Virus Integrase Suggests an Alternate Dimeric Assembly
PLOS ONE 6, e23032 (2011)

Balsera M, Buey RM, Li XD
Quaternary Structure of the Oxaloacetate Decarboxylase Membrane Complex and Mechanistic Relationships to Pyruvate Carboxylases
JOURNAL OF BIOLOGICAL CHEMISTRY 286, 9457 (2011)

Baranova EV, Weeks SD, Beelen S, Bukach OV, Gusev NB, Strelkov SV
Three-Dimensional Structure of alpha-Crystallin Domain Dimers of Human Small Heat Shock Proteins HSPB1 and HSPB6
JOURNAL OF MOLECULAR BIOLOGY 411, 110 (2011)

Baron R, Binda C, Tortorici M, McCammon JA, Mattevi A
Molecular Mimicry and Ligand Recognition in Binding and Catalysis by the Histone Demethylase LSD1-CoREST Complex
STRUCTURE 19, 212 (2011)

Behrendt CT, Kunfermann A, Illarionova V, Matheeussen A, Pein MK, Grawert T, Kaiser J, Bacher A, Eisenreich W, Illarionov B, Fischer M, Maes L, Groll M, Kurz T
Reverse Fosmidomycin Derivatives against the Antimalarial Drug Target IspC (Dxr)
JOURNAL OF MEDICINAL CHEMISTRY 54, 6796 (2011)

Belousoff MJ, Shapira T, Bashan A, Zimmerman E, Rozenberg H, Arakawa K, Kinashi H, Yonath A
Crystal structure of the synergistic antibiotic pair, lankamycin and lankacidin, in complex with the large ribosomal subunit
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 108, 2717 (2011)

Bendounan A, Ait-Mansour K, Braun J, Minar J, Bornemann S, Fasel R, Groening O, Sirotti F, Ebert H
Evolution of the Rashba spin-orbit-split Shockley state on Ag/Pt(111)

PHYSICAL REVIEW B 83, 195427 (2011)

Ben-Shem A, de Loubresse NG, Melnikov S, Jenner L, Yusupova G, Yusupov M
The Structure of the Eukaryotic Ribosome at 3.0 angstrom Resolution
SCIENCE 334, 1524 (2011)

Berntsson RPA, Thunnissen AMWH, Poolman B, Slotboom DJ
Importance of a Hydrophobic Pocket for Peptide Binding in Lactococcal OppA
JOURNAL OF BACTERIOLOGY 193, 4254 (2011)

Bezencenet O, Bonamy D, Belkhou R, Ohresser P, Barbier A
Origin and Tailoring of the Antiferromagnetic Domain Structure in alpha-Fe2O3 Thin Films
PHYSICAL REVIEW LETTERS 106, 107201 (2011)

Bhogaraju S, Taschner M, Morawetz M, Basquin C, Lorentzen E
Crystal structure of the intraflagellar transport complex 25/27
EMBO JOURNAL 30, 1907 (2011)

Bigalke JM, Dames SA, Blankenfeldt W, Grzesiek S, Geyer M
Structure and Dynamics of a Stabilized Coiled-Coil Domain in the P-TEFb Regulator Hexim1
JOURNAL OF MOLECULAR BIOLOGY 414, 639 (2011)

Blackwood JK, Rzechorzek NJ, Abrams AS, Maman JD, Pellegrini L, Robinson NP
Structural and functional insights into DNA-end processing by the archaeal HerA helicase-NurA nuclease complex
NUCLEIC ACIDS RESEARCH 0, 0 (2011)

Blanco FJ, Montoya G
Transient DNA/RNA-protein interactions
FEBS JOURNAL 278, 1643 (2011)

Blasco B, Stenta M, Alonso-Sarduy L, Dietler G, Dal Peraro M, Cole ST, Pojer F
Atypical DNA recognition mechanism used by the EspR virulence regulator of Mycobacterium tuberculosis
MOLECULAR MICROBIOLOGY 82, 251 (2011)

Blattner C, Jennebach S, Herzog F, Mayer A, Cheung ACM, Witte G, Lorenzen K, Hopfner KP, Heck AJR, Aebersold R, Cramer P
Molecular basis of Rrn3-regulated RNA polymerase I initiation and cell growth
GENES & DEVELOPMENT 25, 2093 (2011)

Boland A, Huntzinger E, Schmidt S, Izaurralde E, Weichenrieder O
Crystal structure of the MID-PIWI lobe of a eukaryotic Argonaute protein
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 108, 10466 (2011)

Bon RS, Guo Z, Stigter EA, Wetzel S, Menninger S, Wolf A, Choidas A, Alexandrov K, Blankenfeldt W, Goody RS, Waldmann H
Structure-Guided Development of Selective RabGGTase Inhibitors
ANGEWANDTE CHEMIE-INTERNATIONAL EDITION 50, 4957 (2011)

Bonnefond L, Schellenberger P, Basquin J, Demangeat G, Ritzenthaler C, Chenevert R, Balg C, Frugier M, Rudinger-Thirion J, Giege R, Lorber B, Sauter C
Exploiting Protein Engineering and Crystal Polymorphism for Successful X-ray Structure Determination
CRYSTAL GROWTH & DESIGN 11, 4334 (2011)

Bottcher J, Jestel A, Kiefersauer R, Krapp S, Nagel S, Steinbacher S, Steuber H
Key factors for successful generation of protein-fragment structures: requirement on protein, crystals, and technology
FRAGMENT-BASED DRUG DESIGN: TOOLS, PRACTICAL APPROACHES, AND EXAMPLES 493, 61 (2011)

Bourquin F, Capitani G, Grutter MG
PLP-dependent enzymes as entry and exit gates of sphingolipid metabolism

PROTEIN SCIENCE 20, 1492 (2011)

Bracher A, Kozany C, Thost AK, Hausch F
Structural characterization of the PPIase domain of FKBP51, a cochaperone of human Hsp90
ACTA CRYSTALLOGRAPHICA SECTION D-BIOLOGICAL CRYSTALLOGRAPHY 67, 549 (2011)

Brandenberger S, Krocher O, Casapu M, Tissler A, Althoff R
Hydrothermal deactivation of Fe-ZSM-5 catalysts for the selective catalytic reduction of NO with NH3
APPLIED CATALYSIS B-ENVIRONMENTAL 101, 649 (2011)

Brennich ME, Nolting J, Dammann C, Noeding B, Bauch S, Herrmann H, Pfohl T, Koester S
Dynamics of intermediate filament assembly followed in micro-flow by small angle x-ray scattering
LAB ON A CHIP 11, 708 (2011)

Bretschneider T, Zocher G, Unger M, Scherlach K, Stehle T, Hertweck C
A ketosynthase homolog uses malonyl units to form esters in cervimycin biosynthesis
NATURE CELL BIOLOGY 8, 154 (2011)

Breuer S, Schievink SI, Schulte A, Blankenfeldt W, Fackler OT, Geyer M
Molecular Design, Functional Characterization and Structural Basis of a Protein Inhibitor Against the HIV-1 Pathogenicity Factor Nef
PLOS ONE 6, e20033 (2011)

Buck J, Wacker A, Warkentin E, Wohnert J, Wirmer-Bartoschek J, Schwalbe H
Influence of ground-state structure and Mg2+ binding on folding kinetics of the guanine-sensing riboswitch aptamer domain
NUCLEIC ACIDS RESEARCH 39, 9768 (2011)

Burger M, Zimmermann TJ, Kondoh Y, Stege P, Watanabe N, Osada H, Waldmann H, Vetter IR
Crystal structure of the predicted phospholipase LYPLAL1 reveals unexpected functional plasticity in spite of close relationship to acyl protein thioesterases
JOURNAL OF LIPID RESEARCH 0, 0 (2011)

Caricchi L, Pommier A, Pistone M, Castro J, Burgisser A, Perugini D
Strain-induced magma degassing: insights from simple-shear experiments on bubble bearing melts
BULLETIN OF VOLCANOLOGY 73, 1245 (2011)

Cerny R, Penin N, D'Anna V, Hagemann H, Durand E, Ruzicka J
MgxMn(1-x)(BH4)(2) (x=0-0.8), a cation solid solution in a bimetallic borohydride
ACTA MATERIALIA 59, 5171 (2011)

Chakrabarti S, Jayachandran U, Bonneau F, Fiorini F, Basquin C, Domcke S, Le Hir H, Conti E
Molecular Mechanisms for the RNA-Dependent ATPase Activity of Upf1 and Its Regulation by Upf2
MOLECULAR CELL 41, 693 (2011)

Charmetant J, Moreau K, Gallay K, Ballandras A, Gouet P, Ronfort C
Functional analyses of mutants of the central core domain of an Avian Sarcoma/Leukemia Virus integrase
VIROLOGY 421, 42 (2011)

Cheung ACM, Cramer P
Structural basis of RNA polymerase II backtracking, arrest and reactivation
NATURE 471, 249 (2011)

Cheung ACM, Sainsbury S, Cramer P
Structural basis of initial RNA polymerase II transcription
EMBO JOURNAL 30, 4755 (2011)

Civril F, Bennett M, Moldt M, Deimling T, Witte G, Schiesser S, Carell T, Hopfner KP
The RIG-I ATPase domain structure reveals insights into ATP-dependent antiviral signalling

EMBO REPORTS 12, 1127 (2011)

Cryle MJ, Staaden J, Schlichting I
Structural characterization of CYP165D3, a cytochrome P450 involved in phenolic coupling in teicoplanin biosynthesis
ARCHIVES OF BIOCHEMISTRY AND BIOPHYSICS 507, 163 (2011)

da Silva G, Trevitt AJ, Steinbauer M, Hemberger P
Pyrolysis of fulvenallene (C7H6) and fulvenallenyl (C7H5): Theoretical kinetics and experimental product detection
CHEMICAL PHYSICS LETTERS 517, 144 (2011)

Degueldre C, Bertsch J, Kuri G, Martin M
Nuclear fuel in generation II and III reactors: research issues related to high burn-up
ENERGY & ENVIRONMENTAL SCIENCE 4, 1651 (2011)

Dekker C, Roe SM, Mccormack EA, Beuron F, Pearl LH, Willison KR
The crystal structure of yeast CCT reveals intrinsic asymmetry of eukaryotic cytosolic chaperonins.
EMBO JOURNAL 30(15), 3078 (2011)

Derome D, Griffa M, Koebel M, Carmeliet J
Hysteretic swelling of wood at cellular scale probed by phase contrast X-ray tomography
JOURNAL OF STRUCTURAL BIOLOGY 173, 180 (2011)

Dhillon A, Schneider P, Kuhn G, Reinwald Y, White LJ, Levchuk A, Rose FRAJ, Mueller R, Shakesheff KM, Hunter CV
Analysis of sintered polymer scaffolds using concomitant synchrotron computed tomography and in situ mechanical testing
JOURNAL OF MATERIALS SCIENCE-MATERIALS IN MEDICINE in press, - (2011)

Di Bartolo ND, Hvorup RN, Locher KP, Booth PJ
In Vitro Folding and Assembly of the Escherichia coli ATP-binding Cassette Transporter, BtuCD
JOURNAL OF BIOLOGICAL CHEMISTRY 286, 18807 (2011)

Dias MVB, Snee WC, Bromfield KM, Payne RJ, Palaninathan SK, Ciulli A, Howard NI, Abell C, Sacchettini JC, Blundell TL
Structural investigation of inhibitor designs targeting 3-dehydroquinate dehydratase from the shikimate pathway of Mycobacterium tuberculosis
BIOCHEMICAL JOURNAL 436, 729 (2011)

Doguzhaeva LA, Bengtson S
The capsule: an organic skeletal structure in the late cretaceous belemnite gonioteuthis from north-west Germany
PALAEONTOLOGY 54, 397 (2011)

Du J, Say RF, Lu W, Fuchs G, Einsle O
Active-site remodelling in the bifunctional fructose-1,6-bisphosphate aldolase/phosphatase
NATURE 478, 534 (2011)

Duany YD, Klostermeier D, Rudolph MG
The Conformational Flexibility of the Helicase-like Domain from Thermotoga maritima Reverse Gyrase Is Restricted by the Topoisomerase Domain
BIOCHEMISTRY 50, 5816 (2011)

Duduta M, Ho B, Wood VC, Limthongkul P, Brunini VE, Carter WC, Chiang YM
Semi-Solid Lithium Rechargeable Flow Battery
ADVANCED ENERGY MATERIALS 1, 511 (2011)

Durrenberger M, Heinisch T, Wilson YM, Rossel T, Nogueira E, Knorr L, Mutschler A, Kersten K, Zimbron MJ, Pierron J, Schirmer T, Ward TR
Artificial Transfer Hydrogenases for the Enantioselective Reduction of Cyclic Imines
ANGEWANDTE CHEMIE-INTERNATIONAL EDITION 50, 3026 (2011)

Edink E, Rucktooa P, Retra K, Akdemir A, Nahar T, Zuiderveld O, van Elk R, Janssen E, van

Nierop P, van Muijlwijk-Koezen J, Smit AB, Sixma TK, Leurs R, de Esch IJP
Fragment Growing Induces Conformational Changes in Acetylcholine-Binding Protein: A Structural and Thermodynamic Analysis
JOURNAL OF THE AMERICAN CHEMICAL SOCIETY 133, 5363 (2011)

Efremov RG, Sazanov LA
Structure of the membrane domain of respiratory complex I
NATURE 476, 414 (2011)

Einsle O
Structure and function of formate-dependent cytochrome c nitrite reductase, NRFA
METHODS IN ENZYMOLOGY, VOL 46: RESEARCH ON NITRIFICATION AND RELATED PROCESSES, PT B 496, 399 (2011)

El Hammi E, Warkentin E, Demmer U, Limam F, Marzouki NM, Ermler U, Baciou L
Structure of Ralstonia eutropha Flavohemoglobin in Complex with Three Antibiotic Azole Compounds
BIOCHEMISTRY 50, 1255 (2011)

Ellermann M, Paulini R, Jakob-Roetne R, Lerner C, Borroni E, Roth D, Ehler A, Schweizer WB, Schlatter D, Rudolph MG, Diederich F
Molecular Recognition at the Active Site of Catechol-O-methyltransferase (COMT): Adenine Replacements in Bisubstrate Inhibitors
CHEMISTRY-A EUROPEAN JOURNAL 17, 6369 (2011)

Ellis KE, Seidel J, Einsle O, Elliott SJ
Geobacter sulfurreducens Cytochrome c Peroxidases: Electrochemical Classification of Catalytic Mechanisms
BIOCHEMISTRY 50, 4513 (2011)

Emtsev KV, Zakharov A, Coletti C, Forti S, Starke U
Ambipolar doping in quasi-free epitaxial graphene on SiC(0001) controlled by Ge intercalation
PHYSICAL REVIEW B 84, 125423 (2011)

Erkens GB, Berntsson RPA, Fulyani F, Majsnerowska M, Vujicic-Zagar A, ter Beek J, Poolman B, Slotboom DJ
The structural basis of modularity in ECF-type ABC transporters
NATURE STRUCTURAL & MOLECULAR BIOLOGY 18, 755 (2011)

Fabian L, Hamill N, Eccles KS, Moynihan HA, Maguire AR, McCausland L, Lawrence SE
Cocrystals of Fenamic Acids with Nicotinamide
CRYSTAL GROWTH & DESIGN 11, 3522 (2011)

Faesen AC, Dirac AMG, Shanmugham A, Ovaa H, Perrakis A, Sixma TK
Mechanism of USP7/HAUSP Activation by Its C-Terminal Ubiquitin-like Domain and Allosteric Regulation by GMP-Synthetase
MOLECULAR CELL 44, 147 (2011)

Farenc C, Celie PHN, Tensen CP, de Esch IJP, Siegal G
Crystal structure of the EphA4 protein tyrosine kinase domain in the apo- and dasatinib-bound state
FEBS LETTERS 585, 3593 (2011)

Fedosov SN, Ruetz M, Gruber K, Fedosova NU, Krautler B
A Blue Corrinoid from Partial Degradation of Vitamin B-12 in Aqueous Bicarbonate: Spectra, Structure, and Interaction with Proteins of B-12 Transport
BIOCHEMISTRY 50, 8090 (2011)

Fenn S, Breitsprecher D, Gerhold CB, Witte G, Faix J, Hopfner KP
Structural biochemistry of nuclear actin-related proteins 4 and 8 reveals their interaction with actin
EMBO JOURNAL 30, 2153 (2011)

Ferrara C, Grau S, Jager C, Sondermann P, Brunker P, Waldhauer I, Hennig M, Ruf A, Rufer AC, Stihle M, Umana P, Benz J

Unique carbohydrate-carbohydrate interactions are required for high affinity binding between Fc gamma RIII and antibodies lacking core fucose
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 108, 12669 (2011)

Ferris HU, Dunin-Horkawicz S, Mondejar LG, Hulko M, Hantke K, Martin J, Schultz JE, Zeth K, Lupas AN, Coles M
The Mechanisms of HAMP-Mediated Signaling in Transmembrane Receptors
STRUCTURE 19, 378 (2011)

Fielding AJ, Kovaleva EG, Farquhar ER, Lipscomb JD, Que L
A hyperactive cobalt-substituted extradiol-cleaving catechol dioxygenase
JOURNAL OF BIOLOGICAL INORGANIC CHEMISTRY 16, 341355 (2011)

Fischer ES, Scrima A, Bohm K, Matsumoto S, Lingaraju GM, Faty M, Yasuda T, Cavadini S, Wakasugi M, Hanaoka F, Iwai S, Gut H, Sugasawa K, Thoma NH
The Molecular Basis of CRL4(DDB2/CSA) Ubiquitin Ligase Architecture, Targeting, and Activation
CELL 147, 1024 (2011)

Fliegel D, Wirth R, Simonetti A, Schreiber A, Furnes H, Muehlenbachs K
Tubular textures in pillow lavas from a Caledonian west Norwegian ophiolite: A combined TEM, LA-ICP-MS, and STXM study
GEOCHEMISTRY GEOPHYSICS GEOSYSTEMS 12, Q02010 (2011)

Flipo M, Desroses M, Lecat-Guillet N, Dirie B, Carette X, Leroux F, Piveteau C, Demirkaya F, Lens Z, Rucktooa P, Villeret V, Christophe T, Jeon HK, Locht C, Brodin P, Deprez B, Baulard AR, Willand N
Ethionamide Boosters: Synthesis, Biological Activity, and Structure-Activity Relationships of a Series of 1,2,4-Oxadiazole EthR Inhibitors
JOURNAL OF MEDICINAL CHEMISTRY 54, 2994 (2011)

Forti S, Emtsev K, Coletti C, Zakharov A, Riedl C, Starke U
Large area homogeneous quasi-free standing epitaxial graphene on SiC(0001): Electronic and structural characterization.
PHYSICAL REVIEW B 84, 125449 (2011)

Friis EM, Crane PR, Pedersen KR
The Early Flowers and Angiosperm Evolution
Cambridge University Press 1, 600 (2011)

Friis EM, Pedersen KR
Canrightia resinifera gen. et sp. nov., a new extinct angiosperm with Retimonocolpites-type pollen from the Early Cretaceous of Portugal: missing link in the eumagnoliid tree?
GRANA 50, 3 (2011)

Fritz-Wolf K, Kehr S, Stumpf M, Rahlfs S, Becker K
Crystal structure of the human thioredoxin reductase-thioredoxin complex
NATURE COMMUNICATIONS 2, 383 (2011)

Ganesan R, Jelakovic S, Mittl PRE, Caflisch A, Grutter MG
In silico identification and crystal structure validation of caspase-3 inhibitors without a P1 aspartic acid moiety
ACTA CRYSTALLOGRAPHICA SECTION F-STRUCTURAL BIOLOGY AND CRYSTALLIZATION COMMUNICATIONS 67, 842 (2011)

Ganguly A, Duany YD, Rudolph MG, Klostermeier D
The latch modulates nucleotide and DNA binding to the helicase-like domain of Thermotoga maritima reverse gyrase and is required for positive DNA supercoiling
NUCLEIC ACIDS RESEARCH 39, 1789 (2011)

Geiger SR, Bottcher T, Sieber SA, Cramer P
A Conformational Switch Underlies ClpP Protease Function
ANGEWANDTE CHEMIE-INTERNATIONAL EDITION 50, 5748 (2011)

Gerritz SW, Cianci C, Kim S, Pearce BC, Deminie C, Discotto L, McAuliffe B, Minassian BF, Shi SH, Zhu SR, Zhai WX, Pendri A, Li G, Poss MA, Edavettal S, McDonnell PA, Lewis HA, Maskos K, Mortl M, Kiefersauer R, Steinbacher S, Baldwin ET, Metzler W, Bryson J, Healy MD, Philip T, Zoeckler M, Schartman R, Sinz M, Leyva-Grado VH, Hoffmann HH, Langley DR, Meanwell NA, Krystal M
Inhibition of influenza virus replication via small molecules that induce the formation of higher-order nucleoprotein oligomers
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 108, 15366 (2011)

Ghugare SV, Chiessi E, Fink R, Gerelli Y, Scotti A, Deriu A, Carrot G, Paradossi G
Structural Investigation on Thermoresponsive PVA/Poly(methacrylate-co-N-isopropylacrylamide) Microgels across the Volume Phase Transition
MACROMOLECULES 44, 4470 (2011)

Gieseking S, Bergen K, Di Pasquale F, Diederichs K, Welte W, Marx A
Human DNA Polymerase beta Mutations Allowing Efficient Abasic Site Bypass
JOURNAL OF BIOLOGICAL CHEMISTRY 286, 4011 (2011)

Gourdon P, Andersen JL, Hein KL, Bublitz M, Pedersen BP, Liu XY, Yatime L, Nyblom M, Nielsen TT, Olesen C, Moller JV, Nissen P, Morth JP
HiLiDe-Systematic Approach to Membrane Protein Crystallization in Lipid and Detergent
CRYSTAL GROWTH & DESIGN 11, 2098 (2011)

Godbole VA, Colin JF, Novak P
Study of Overcharge Behavior of Li1+x(Ni1/3Mn1/3Co1/3)(1-x)O-2 Using In Situ and Ex Situ X-ray Synchrotron Diffraction
JOURNAL OF THE ELECTROCHEMICAL SOCIETY 158, A1005 (2011)

Gourdon P, Liu XY, Skjorringe T, Morth JP, Moller LB, Pedersen BP, Nissen P
Crystal structure of a copper-transporting PIB-type ATPase
NATURE 475, 59 (2011)

Graber M, Janczyk W, Sperl B, Elumalai N, Kozany C, Hausch F, Holak TA, Berg T
Selective Targeting of Disease-Relevant Protein Binding Domains by O-Phosphorylated Natural Product Derivatives
ACS CHEMICAL BIOLOGY 6, 1008 (2011)

Graf-Zeiler B, Fink RH, Tzvetkov G
In Situ Synchrotron Radiation X-Ray Microspectroscopy of Polymer Microcontainers
CHEMPHYSCHEM 12, 3503 (2011)

Grawert T, Groll M, Rohdich F, Bacher A, Eisenreich W
Biochemistry of the non-mevalonate isoprenoid pathway
CELLULAR AND MOLECULAR LIFE SCIENCES 68, 3797 (2011)

Griese JJ, Hopfner KP
Structure and DNA-binding activity of the Pyrococcus furiosus SMC protein hinge domain
PROTEINS-STRUCTURE FUNCTION AND BIOINFORMATICS 79, 558 (2011)

Gruene T, Cho MK, Karyagina I, Kim HY, Grosse C, Giller K, Zweckstetter M, Becker S
Integrated analysis of the conformation of a protein-linked spin label by crystallography, EPR and NMR spectroscopy
JOURNAL OF BIOMOLECULAR NMR 49, 111 (2011)

Grunwald M, Bono F
Structure of Importin13-Ubc9 complex: nuclear import and release of a key regulator of sumoylation
EMBO JOURNAL 30, 427 (2011)

Guttenberg G, Papatheodorou P, Genisyuerek S, Lu W, Einsle O, Aktories K
Clostridial glucosylating toxins: Inositol hexakisphosphate-dependent processing of Clostridium sordellii lethal toxin and Clostridium novyi alpha-toxin
NAUNYN-SCHMIEDEBERGS ARCHIVES OF PHARMACOLOGY 383, 84 (2011)

Guttenberg G, Papatheodorou P, Genisyuerek S, Lu W, Jank T, Einsle O, Aktories K
Inositol Hexakisphosphate-dependent Processing of Clostridium sordellii Lethal Toxin and Clostridium novyi alpha-Toxin
JOURNAL OF BIOLOGICAL CHEMISTRY 286, 14779 (2011)

Hagel M, Niu DQ, St Martin T, Sheets MP, Qiao LX, Bernard H, Karp RM, Zhu ZD, Labenski MT, Chaturvedi P, Nacht M, Westlin WF, Petter RC, Singh J
Selective irreversible inhibition of a protease by targeting a noncatalytic cysteine
NATURE CHEMICAL BIOLOGY 7, 22 (2011)

Hardegger LA, Kuhn B, Spinnler B, Anselm L, Ecabert R, Stihle M, Gsell B, Thoma R, Diez J, Benz J, Plancher JM, Hartmann G, Banner DW, Haap W, Diederich F
Systematic Investigation of Halogen Bonding in Protein-Ligand Interactions
ANGEWANDTE CHEMIE-INTERNATIONAL EDITION 50, 314 (2011)

Hardegger LA, Kuhn B, Spinnler B, Anselm L, Ecabert R, Stihle M, Gsell B, Thoma R, Diez J, Benz J, Plancher JM, Hartmann G, Isshiki Y, Morikami K, Shimma N, Haap W, Banner DW, Diederich F
Halogen Bonding at the Active Sites of Human Cathepsin L and MEK1 Kinase: Efficient Interactions in Different Environments
CHEMMEDCHEM 6, 2048 (2011)

Hausmann J, Kamtekar S, Christodoulou E, Day JE, Wu T, Fulkerson Z, Albers HMHG, van Meeteren LA, Houben AJS, van Zeijl L, Jansen S, Andries M, Hall T, Pegg LE, Benson TE, Kasiem M, Harlos K, Kooi CWV, Smyth SS, Ovaa H, Bollen M, Morris AJ, Moolenaar WH, Perrakis A
Structural basis of substrate discrimination and integrin binding by autotaxin
NATURE STRUCTURAL & MOLECULAR BIOLOGY 18, 198 (2011)

Hebeisen P, Haap W, Kuhn B, Mohr P, Wessel HP, Zutter U, Kirchner S, Ruf A, Benz J, Joseph C, Alvarez-Sanchez R, Gubler M, Schott B, Benardeau A, Tozzo E, Kitas E
Orally active aminopyridines as inhibitors of tetrameric fructose-1,6-bisphosphatase
BIOORGANIC & MEDICINAL CHEMISTRY LETTERS 21, 3237 (2011)

Heidebrecht T, Christodoulou E, Chalmers MJ, Jan S, Ter Riet B, Grover RK, Joosten RP, Littler D, van Luenen H, Griffin PR, Wentworth P, Borst P, Perrakis A
The structural basis for recognition of base J containing DNA by a novel DNA binding domain in JBP1
NUCLEIC ACIDS RESEARCH 39, 5715 (2011)

Heil K, Kneuttinger AC, Schneider S, Lischke U, Carell T
Crystal Structures and Repair Studies Reveal the Identity and the Base-Pairing Properties of the UV-Induced Spore Photoproduct DNA Lesion
CHEMISTRY-A EUROPEAN JOURNAL 17, 9651 (2011)

Helbig S, Patzer SI, Schiene-Fischer C, Zeth K, Braun V
Activation of Colicin M by the FkpA Prolyl Cis-Trans Isomerase/Chaperone
JOURNAL OF BIOLOGICAL CHEMISTRY 286, 6280 (2011)

Hermanova Z, Kvacek J, Friis EM
Budvaricarpus Serialis Knobloch and Mai, An Unusual New Member of the Normapolles Complex from the Late Cretaceous of the Czech Republic
INTERNATIONAL JOURNAL OF PLANT SCIENCES 172, 285 (2011)

Hersleth HP, Andersson KK
How different oxidation states of crystalline myoglobin are influenced by X-rays
BIOCHIMICA ET BIOPHYSICA ACTA-PROTEINS AND PROTEOMICS 1814, 785 (2011)

Hersleth HP, Zhao X, Magliozzo RS, Andersson KK
Combining X-Ray Diffraction and in-situ Spectroscopy to Study Haem Proteins
ACTA CRYSTALLOGRAPHICA SECTION A 67 Suppl., C159-C160 (2011)

Hinterstein M, Rouquette J, Haines J, Papet PH, Knapp M, Glaum J, Fuess H
Structural Description of the Macroscopic Piezo- and Ferroelectric Properties of Lead Zirconate

Titanate
PHYSICAL REVIEW LETTERS 107, 077602 (2011)

Horenkamp FA, Breuer S, Schulte A, Lulf S, Weyand M, Saksela K, Geyer M
Conformation of the Dileucine-Based Sorting Motif in HIV-1 Nef Revealed by Intermolecular Domain Assembly
TRAFFIC 12, 867 (2011)

Hou XM, Hagemann N, Schoebel S, Blankenfeldt W, Goody RS, Erdmann KS, Itzen A
A structural basis for Lowe syndrome caused by mutations in the Rab-binding domain of OCRL1
EMBO JOURNAL 30, 1659 (2011)

Hough MA, Antonyuk SV, Barbieri S, Rustage N, McKay AL, Servid AE, Eady RR, Andrew CR, Hasnain SS
Distal-to-Proximal NO Conversion in Hemoproteins: The Role of the Proximal Pocket
JOURNAL OF MOLECULAR BIOLOGY 405, 395 (2011)

Hyun JK, Accurso C, Hijnen M, Schult P, Pettikiriarachchi A, Mitra AK, Coulibaly F
Membrane Remodeling by the Double-Barrel Scaffolding Protein of Poxvirus
PLOS PATHOGENS 7, e1002239 (2011)

Iacovache I, Degiacomi MT, Pernot L, Ho S, Schiltz M, Dal Peraro M, van der Goot FG
Dual Chaperone Role of the C-Terminal Propeptide in Folding and Oligomerization of the Pore-Forming Toxin Aerolysin
PLOS PATHOGENS 7, e1002135 (2011)

Ibrahimkutty S, Kim J, Cammarata M, Ewald F, Choi J, Ihee H, Plech A
Ultrafast Structural Dynamics of the Photocleavage of Protein Hybrid Nanoparticles
ACS NANO 5, 3788 (2011)

Igonet S, Vaney MC, Vonhrein C, Bricogne G, Stura EA, Hengartner H, Eschli B, Rey FA
X-ray structure of the arenavirus glycoprotein GP2 in its postfusion hairpin conformation
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 108, 19967 (2011)

Ismail SA, Chen YX, Rusinova A, Chandra A, Bierbaum M, Gremer L, Triola G, Waldmann H, Bastiaens PIH, Wittinghofer A
Arl2-GTP and Arl3-GTP regulate a GDI-like transport system for farnesylated cargo
NATURE CHEMICAL BIOLOGY 7, 942 (2011)

Jaenicke E, Buchler K, Decker H, Markl J, Schroder GF
The Refined Structure of Functional Unit h of Keyhole Limpet Hemocyanin (KLH1-h) Reveals Disulfide Bridges
IUBMB LIFE 63, 183 (2011)

Jebors S, Tauran Y, Aghajari N, Boudebbouze S, Maguin E, Haser R, Coleman AW, Rhimi M
Supramolecular stabilization of acid tolerant L-arabinose isomerase from Lactobacillus sakei
CHEMICAL COMMUNICATIONS 47, 12307 (2011)

Jensen JK, Thompson LC, Bucci JC, Nissen P, Gettins PGW, Peterson CB, Andrease PA, Morth JP
Crystal Structure of Plasminogen Activator Inhibitor-1 in an Active Conformation with Normal Thermodynamic Stability
JOURNAL OF BIOLOGICAL CHEMISTRY 286, 29709 (2011)

Jeyaprakash AA, Basquin C, Jayachandran U, Conti E
Structural Basis for the Recognition of Phosphorylated Histone H3 by the Survivin Subunit of the Chromosomal Passenger Complex
STRUCTURE 19, 1625 (2011)

Jin H, Kelley AC, Ramakrishnan V
Crystal structure of the hybrid state of ribosome in complex with the guanosine triphosphatase release factor 3
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES

OF AMERICA 108, 15798 (2011)

Kaan HYK, Hackney DD, Kozielski F
The Structure of the Kinesin-1 Motor-Tail Complex Reveals the Mechanism of Autoinhibition
SCIENCE 333, 883 (2011)

Kadam RU, Bergmann M, Hurley M, Garg D, Cacciarini M, Swiderska MA, Nativi C, Sattler M, Smyth AR, Williams P, Camara M, Stocker A, Darbre T, Reymond JL
A Glycopeptide Dendrimer Inhibitor of the Galactose-Specific Lectin LecA and of Pseudomonas aeruginosa Biofilms
ANGEWANDTE CHEMIE-INTERNATIONAL EDITION 50, 10631 (2011)

Kaegi R, Voegelin A, Sinnet B, Zuleeg S, Hagendorfer H, Burkhardt M, Siegrist H
Behavior of Metallic Silver Nanoparticles in a Pilot Wastewater Treatment Plant
ENVIRONMENTAL SCIENCE & TECHNOLOGY 45, 3902 (2011)

Kapinos LE, Burkhard P, Herrmann H, Aebi U, Strelkov SV
Simultaneous Formation of Right- and Left-handed Anti-parallel Coiled-coil Interfaces by a Coil2 Fragment of Human Lamin A
JOURNAL OF MOLECULAR BIOLOGY 408, 135 (2011)

Kaul C, Muller M, Wagner M, Schneider S, Carell T
Reversible bond formation enables the replication and amplification of a crosslinking salen complex as an orthogonal base pair
NATURE CHEMISTRY 3, 794 (2011)

Khazina E, Truffault V, Buttner R, Schmidt S, Coles M, Weichenrieder O
Trimeric structure and flexibility of the L1ORF1 protein in human L1 retrotransposition
NATURE STRUCTURAL & MOLECULAR BIOLOGY 18, 1006 (2011)

Klinge S, Voigts-Hoffmann F, Leibundgut M, Arpagaus S, Ban N
Crystal Structure of the Eukaryotic 60S Ribosomal Subunit in Complex with Initiation Factor 6
SCIENCE 334, 941 (2011)

Koch C, Heine A, Klebe G
Radiation damage reveals promising interaction position
JOURNAL OF SYNCHROTRON RADIATION 18, 782 (2011)

Koeberle SC, Romir J, Fischer S, Koeberle A, Schattel V, Albrecht W, Grutter C, Werz O, Rauh D, Stehle T, Laufer SA
Skepinone-L is a selective p38 mitogen-activated protein kinase inhibitor
NATURE CHEMICAL BIOLOGY 8, 141 (2011)

Koller M, Lingenhoehl K, Schmutz M, Vranesic IT, Kallen J, Auberson YP, Carcache DA, Mattes H, Ofner S, Orain D, Urwyler S
Quinazolinedione sulfonamides: A novel class of competitive AMPA receptor antagonists with oral activity
BIOORGANIC & MEDICINAL CHEMISTRY LETTERS 21, 3358 (2011)

Kouchinsky A, Bengtson S, Clausen S, Gubanov A, Malinky JM, Peel JS
A middle Cambrian fauna of skeletal fossils from the Kuonamka Formation, northern Siberia
ALCHERINGA 35, 123 (2011)

Kopacz MM, Rovida S, van Duijn E, Fraaije MW, Mattevi A
Structure-Based Redesign of Cofactor Binding in Putrescine Oxidase
BIOCHEMISTRY 50, 4209 (2011)

Koschubs T, Dengl S, Duerr H, Kaluza K, Georges G, Hartl C, Jennewein S, Lanzendoerfer M, Auer J, Stern A, Huang KS, Packman K, Gubler U, Kostrewa D, Ries S, Hansen S, Kohnert U, Cramer P, Mundigl O
Allosteric antibody inhibition of human Hepsin protease
BIOCHEMICAL JOURNAL 0, 0 (2011)

Koster S, Pavkov-Keller T, Kuhlbrandtt W, Yildiz O
Structure of Human Na+/H+ Exchanger NHE1 Regulatory Region in Complex with Calmodulin

and Ca2+
JOURNAL OF BIOLOGICAL CHEMISTRY 286, 40954 (2011)

Kowalczyk L, Ratera M, Paladino A, Bartoccioni P, Errasti-Murugarren E, Valencia E, Portella G, Bial S, Zorzano A, Fita I, Orozco M, Carpena X, Vazquez-Ibar JL, Palacin M
Molecular basis of substrate-induced permeation by an amino acid antiporter
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 108, 3935 (2011)

Koziej D, Rossell DM, Ludi B, Hintennach A, Novak P, Grunwaldt J-D, Niederberger M
Interplay between size and crystal structure of molybdenum dioxide nanoparticles: synthesis, growth mechanism, and electrochemical performance
SMALL 7, 377 (2011)

Kryshtafovych A, Moult J, Bartual SG, Bazan JF, Berman H, Casteel DE, Christodoulou E, Everett JK, Hausmann J, Heidebrecht T, Hills T, Hui R, Hunt JF, Seetharaman J, Joachimiak A, Kennedy MA, Kim C, Lingel A, Michalska K, Montelione GT, Otero JM, Perrakis A, Pizarro JC, van Raaij MJ, Ramelot TA, Rousseau F, Tong L, Wernimont AK, Young J, Schwede T
Target highlights in CASP9: Experimental target structures for the critical assessment of techniques for protein structure prediction
PROTEINS-STRUCTURE FUNCTION AND BIOINFORMATICS 79, 6 (2011)

Kuepper K, Taubitz C, Taubitz D, Wiedwald U, Scheurer A, Sperner S, Saafrank RW, Kappler JP, Joly L, Ziemann P, Neumann M
Magnetic Ground-State and Systematic X-ray Photoreduction Studies of an Iron-Based Star-Shaped Complex
JOURNAL OF PHYSICAL CHEMISTRY LETTERS 2, 1491 (2011)

Kuettel S, Greenwald J, Kostrewa D, Ahmed S, Scapozza L, Perozzo R
Crystal Structures of T. b. rhodesiense Adenosine Kinase Complexed with Inhibitor and Activator: Implications for Catalysis and Hyperactivation
PLOS NEGLECTED TROPICAL DISEASES 5, e1164 (2011)

Kuglstatter A, Mueller F, Kusznir E, Gsell B, Stihle M, Thoma R, Benz J, Aspeslet L, Freitag D, Hennig M
Structural basis for the cyclophilin A binding affinity and immunosuppressive potency of E-ISA247 (voclosporin)
ACTA CRYSTALLOGRAPHICA SECTION D-BIOLOGICAL CRYSTALLOGRAPHY 67, 119 (2011)

Kuhnel K, Diezmann D
Crystal Structure of the Autochaperone Region from the Shigella flexneri Autotransporter IcsA.
JOURNAL OF BACTERIOLOGY 193, 2042 (2011)

Lai JF, Niks D, Wang YC, Domratcheva T, Barends TRM, Schwarz F, Olsen RA, Elliott DW, Fatmi MQ, Chang CEA, Schlichting I, Dunn MF, Mueller LJ
X-ray and NMR Crystallography in an Enzyme Active Site: The Indoline Quinonoid Intermediate in Tryptophan Synthase
JOURNAL OF THE AMERICAN CHEMICAL SOCIETY 133, 4 (2011)

Lambertz C, Leidel N, Havelius KGV, Noth J, Chernev P, Winkler M, Happe T, Haumann M
O-2 Reactions at the Six-iron Active Site (H-cluster) in [FeFe]-Hydrogenase
JOURNAL OF BIOLOGICAL CHEMISTRY 286, 40614 (2011)

Lammens K, Bemeleit DJ, Mockel C, Clausing E, Schele A, Hartung S, Schiller CB, Lucas M, Angermuller C, Soding J, Strasser K, Hopfner KP
The Mre11:Rad50 Structure Shows an ATP-Dependent Molecular Clamp in DNA Double-Strand Break Repair
CELL 145, 54 (2011)

Lammens W, Le Roy K, Yuan S, Vergauwen R, Rabijns A, Van Laere A, Strelkov SV, Van den Ende W
Crystal structure of 6-SST/6-SFT from Pachysandra terminalis, a plant fructan biosynthesizing enzyme in complex with its acceptor substrate 6-kestose

PLANT JOURNAL 0, 0 (2011)

Lee EF, Dewson G, Smith BJ, Evangelista M, Pettikiriarachchi A, Dogovski C, Perugini MA, Colman PM, Fairlie WD
Crystal Structure of a BCL-W Domain-Swapped Dimer: Implications for the Function of BCL-2 Family Proteins
STRUCTURE 19, 1467 (2011)

Leo JC, Lyskowski A, Hattula K, Hartmann MD, Schwarz H, Butcher SJ, Linke D, Lupas AN, Goldman A
The Structure of E. coil IgG-Binding Protein D Suggests a General Model for Bending and Binding in Trimeric Autotransporter Adhesins
STRUCTURE 19, 1021 (2011)

Leppanen VM, Jeltsch M, Anisimov A, Tvorogov D, Aho K, Kalkkinen N, Toivanen P, Yla-Herttuala S, Ballmer-Hofer K, Alitalo K
Structural determinants of vascular endothelial growth factor-D receptor binding and specificity
BLOOD 117, 1507 (2011)

Leysen S, Van Herreweghe JM, Callewaert L, Heirbaut M, Buntinx P, Michiels CW, Strelkov SV
Molecular Basis of Bacterial Defense against Host Lysozymes: X-ray Structures of Periplasmic Lysozyme Inhibitors PliI and PliC
JOURNAL OF MOLECULAR BIOLOGY 405, 1233 (2011)

Li QA, Mavrodi DV, Thomashow LS, Roessle M, Blankenfeldt W
Ligand Binding Induces an Ammonia Channel in 2-Amino-2-desoxyisochorismate (ADIC) Synthase PhzE
JOURNAL OF BIOLOGICAL CHEMISTRY 286, 18213 (2011)

Lim SP, Sonntag LS, Noble C, Nilar SH, Ng RH, Zou G, Monaghan P, Chung KY, Dong HP, Liu BP, Bodenreider C, Lee G, Ding M, Chan WL, Wang G, Jian YL, Chao AT, Lescar J, Yin Z, Vedananda TR, Keller TH, Shi PY
Small Molecule Inhibitors That Selectively Block Dengue Virus Methyltransferase
JOURNAL OF BIOLOGICAL CHEMISTRY 286, 6233 (2011)

Linkner J, Witte G, Stradal T, Curth U, Faix J
High-Resolution X-Ray Structure of the Trimeric Scar/WAVE-Complex Precursor Brk1
PLOS ONE 6, e21327 (2011)

Litz C, Helfmann S, Gerhardt S, Andrade SLA
Structure of GlnK1, a signalling protein from Archaeoglobus fulgidus
ACTA CRYSTALLOGRAPHICA SECTION F-STRUCTURAL BIOLOGY AND CRYSTALLIZATION COMMUNICATIONS 67, 178 (2011)

Liu SB, Ghalei H, Luhrmann R, Wahl MC
Structural basis for the dual U4 and U4atac snRNA-binding specificity of spliceosomal protein hPrp31
RNA-A PUBLICATION OF THE RNA SOCIETY 17, 1655 (2011)

Lizak C, Gerber S, Numao S, Aebi M, Locher KP
X-ray structure of a bacterial oligosaccharyltransferase
NATURE 474, 350 (2011)

Lomb L, Barends TRM, Kassemeyer S, Aquila A, Epp SW, Erk B, Foucar L, Hartmann R, Rudek B, Rolles D, Rudenko A, Shoeman RL, Andreasson J, Bajt S, Barthelmess M, Barty A, Bogan MJ, Bostedt C, Bozek JD, Caleman C, Coffee R, Coppola N, DePonte DP, Doak RB, Ekeberg T, Fleckenstein H, Fromme P, Gebhardt M, Graafsma H, Gumprecht L, Hampton CY, Hartmann A, Hauser G, Hirsemann H, Holl P, Holton JM, Hunter MS, Kabsch W, Kimmel N, Kirian RA, Liang MN, Maia FRNC, Meinhart A, Marchesini S, Martin AV, Nass K, Reich C, Schulz J, Seibert MM, Sierra R, Soltau H, et al.
Radiation damage in protein serial femtosecond crystallography using an x-ray free-electron laser
PHYSICAL REVIEW B 84, 214111 (2011)

Lopez-Garcia LA, Schulze JO, Frohner W, Zhang H, Suss E, Weber N, Navratil J, Amon S, Hindie V, Zeuzem S, Jorgensen TJD, Alzari PM, Neimanis S, Engel M, Biondi RM
Allosteric Regulation of Protein Kinase PKC zeta by the N-Terminal C1 Domain and Small Compounds to the PIF-Pocket
CHEMISTRY & BIOLOGY 18, 1463 (2011)

Lu W, Du JA, Wacker T, Gerbig-Smentek E, Andrade SLA, Einsle O
pH-Dependent Gating in a FocA Formate Channel
SCIENCE 332, 352 (2011)

Luckhurst CA, Stein LA, Furber M, Webb N, Ratcliffe MJ, Allenby G, Botterell S, Tomlinson W, Martin B, Walding A
Discovery of isoindoline and tetrahydroisoquinoline derivatives as potent, selective PPAR delta agonists
BIOORGANIC & MEDICINAL CHEMISTRY LETTERS 21, 492 (2011)

Lunde BM, Horner M, Meinhart A
Structural insights into cis element recognition of non-polyadenylated RNAs by the Nab3-RRM
NUCLEIC ACIDS RESEARCH 39, 337 (2011)

Macieira S, Zhang J, Buckel W, Messerschmidt A
Crystal structure of the complex between 4-hydroxybutyrate CoA-transferase from Clostridium aminobutyricum and CoA
ARCHIVES OF MICROBIOLOGY 0, 0 (2011)

MacKenzie R, Fraschina C, Sannomiya T, Voros J
Controlled in situ nanoscale enhancement of gold nanowire arrays with plasmonics
NANOTECHNOLOGY 22, 055203 (2011)

Maier S, Schleberger P, Lu W, Wacker T, Pfluger T, Litz C, Andrade SLA
Mechanism of Disruption of the Amt-GlnK Complex by P-II-Mediated Sensing of 2-Oxoglutarate
PLOS ONE 6, e26327 (2011)

Marcaillou C, Munoz M, Vidal O, Parra T, Harfouche M
Mineralogical evidence for H-2 degassing during serpentinization at 300 degrees C/300 bar
EARTH AND PLANETARY SCIENCE LETTERS 303, 281 (2011)

Martic M, Pernot L, Westermaier Y, Perozzo R, Kraljevic TG, Kristafor S, Raic-Malic S, Scapozza L, Ametamey S
Synthesis, Crystal Structure, and in Vitro Biological Evaluation of C-6 Pyrimidine Derivatives: New Lead Structures for Monitoring Gene Expression in Vivo
NUCLEOSIDES NUCLEOTIDES & NUCLEIC ACIDS 30, 293 (2011)

Martinez-Rucobo FW, Sainsbury S, Cheung ACM, Cramer P
Architecture of the RNA polymerase-Spt4/5 complex and basis of universal transcription processivity
EMBO JOURNAL 30, 1302 (2011)

Marton Z, Rhimi M, Lallemand P, Jordheim LP, Dumontet C, Aghajari N, Lionne C, Peyrottes S, Chaloin L
Virtual screening for the discovery of authentic inhibitors against cytosolic 5 '-nucleotidase II: therapeutic use and benefit in cancer treatment
EUROPEAN BIOPHYSICS JOURNAL WITH BIOPHYSICS LETTERS 40, 41 (2011)

Matar-Merheb R, Rhimi M, Leydier A, Huche F, Galian C, Desuzinges-Mandon E, Ficheux D, Flot D, Aghajari N, Kahn R, Di Pietro A, Jault JM, Coleman AW, Falson P
Structuring Detergents for Extracting and Stabilizing Functional Membrane Proteins
PLOS ONE 6, e18036 (2011)

Meevasana W, King PDC, He RH, Mo S-K, Hashimoto M, Tamai A, Songsiriritthigul P, Baumberger F, Shen Z-X
Creation and control of a two-dimensional electron liquid at the bare SrTiO3 surface
NATURE MATERIALS 10, 114 (2011)

Merkul E, Klukas F, Dorsch D, Gradler U, Greiner HE, Muller TJJ

Rapid preparation of triazolyl substituted NH-heterocyclic kinase inhibitors via one-pot Sonogashira coupling-TMS-deprotection-CuAAC sequence
ORGANIC & BIOMOLECULAR CHEMISTRY 9, 5129 (2011)

Metz S, Haas AK, Daub K, Croasdale R, Stracke J, Lau WM, Georges G, Josel HP, Dziadek S, Hopfner KP, Lammens A, Scheuer W, Hoffmann E, Mundigl O, Brinkmann U
Bispecific digoxigenin-binding antibodies for targeted payload delivery
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 108, 8194 (2011)

Miertzschke M, Koerner C, Vetter IR, Keilberg D, Hot E, Leonardy S, Sogaard-Andersen L, Wittinghofer A
Structural analysis of the Ras-like G protein MglA and its cognate GAP MglB and implications for bacterial polarity
EMBO JOURNAL 30, 4185 (2011)

Mir-Montazeri B, Ammelburg M, Forouzan D, Lupas AN, Hartmann MD
Crystal structure of a dimeric archaeal Cleavage and Polyadenylation Specificity Factor
JOURNAL OF STRUCTURAL BIOLOGY 173, 191 (2011)

Miura T, Fukami TA, Hasegawa K, Ono N, Suda A, Shindo H, Yoon DO, Kim SJ, Na YJ, Aoki Y, Shimma N, Tsukuda T, Shiratori Y
Lead generation of heat shock protein 90 inhibitors by a combination of fragment-based approach, virtual screening, and structure-based drug design
BIOORGANIC & MEDICINAL CHEMISTRY LETTERS 21, 5778 (2011)

Monroe N, Sennhauser G, Seeger MA, Briand C, Grutter MG
Designed ankyrin repeat protein binders for the crystallization of AcrB: Plasticity of the dominant interface
JOURNAL OF STRUCTURAL BIOLOGY 174, 269 (2011)

Moreno T, Querol X, Alastuey A, Reche C, Cusack M, Amato F, Pandolfi M, Pey J, Richard A, Prevot ASH, Furger M, Gibbons W
Variations in time and space of trace metal aerosol concentrations in urban areas and their surroundings
ATMOSPHERIC CHEMISTRY AND PHYSICS 11, 9415 (2011)

Morishita EC, Murayama K, Kato-Murayama M, Ishizuka-Katsura Y, Tomabechi Y, Hayashi T, Terada T, Handa N, Shirouzu M, Akiyama T, Yokoyama S
Crystal Structures of the Armadillo Repeat Domain of Adenomatous Polyposis Coli and Its Complex with the Tyrosine-Rich Domain of Sam68
STRUCTURE 19, 1496 (2011)

Morishita EC, Murayama K, Kato-Murayama M, Ishizuka-Katsura Y, Tomabechi Y, Hayashi T, Terada T, Handa N, Shirouzu M, Akiyama T, Yokoyama S
Crystal Structures of the Armadillo Repeat Domain of Adenomatous Polyposis Coli and Its Complex with the Tyrosine-Rich Domain of Sam68 (vol 19, pg 1496, 2011)
STRUCTURE 19, 1896 (2011)

Morth JP, Pedersen BP, Buch-Pedersen MJ, Andersen JP, Vilsen B, Palmgren MG, Nissen P
A structural overview of the plasma membrane Na+, K+-ATPase and H+-ATPase ion pumps
NATURE REVIEWS MOLECULAR CELL BIOLOGY 12, 60 (2011)

Muckelbauer J, Sack JS, Ahmed N, Burke J, Chang CYY, Gao M, Tino J, Xie DL, Tebben AJ
X-Ray Crystal Structure of Bone Marrow Kinase in the X Chromosome: A Tec Family Kinase
CHEMICAL BIOLOGY & DRUG DESIGN 78, 739 (2011)

Mueller JW, Link NM, Matena A, Hoppstock L, Ruppel A, Bayer P, Blankenfeldt W
Crystallographic Proof for an Extended Hydrogen-Bonding Network in Small Prolyl Isomerases
JOURNAL OF THE AMERICAN CHEMICAL SOCIETY 0, 0 (2011)

Mund M, Neu A, Ullmann J, Neu U, Sprangers R
Structure of the LSm657 Complex: An Assembly Intermediate of the LSm1-7 and LSm2-8 Rings
JOURNAL OF MOLECULAR BIOLOGY 414, 165 (2011)

Munoz IG, Prieto J, Subramanian S, Coloma J, Redondo P, Villate M, Merino N, Marenchino M, D'Abramo M, Gervasio FL, Grizot S, Daboussi F, Smith J, Chion-Sotinel I, Paques F, Duchateau P, Alibes A, Stricher F, Serrano L, Blanco FJ, Montoya G
Molecular basis of engineered meganuclease targeting of the endogenous human RAG1 locus
NUCLEIC ACIDS RESEARCH 39, 729 (2011)

Munoz IG, Yebenes H, Zhou M, Mesa P, Serna M, Park AY, Bragado-Nilsson E, Beloso A, de Carcer G, Malumbres M, Robinson CV, Valpuesta JM, Montoya G
Crystal structure of the open conformation of the mammalian chaperonin CCT in complex with tubulin
NATURE STRUCTURAL & MOLECULAR BIOLOGY 18, 14 (2011)

Murdock DJE, Donoghue PCJ
Evolutionary Origins of Animal Skeletal Biomineralization
CELLS TISSUES ORGANS 194, 98 (2011)

Mutschler H, Gebhardt M, Shoeman RL, Meinhart A
A Novel Mechanism of Programmed Cell Death in Bacteria by Toxin-Antitoxin Systems Corrupts Peptidoglycan Synthesis
PLOS BIOLOGY 9, e1001033 (2011)

Navdaeva V, Zurbriggen A, Waltersperger S, Schneider P, Oberholzer AE, Bahler P, Bachler C, Grieder A, Baumann U, Erni B
Phosphoenolpyruvate: Sugar Phosphotransferase System from the Hyperthermophilic Thermoanaerobacter tengcongensis
BIOCHEMISTRY 50, 1184 (2011)

Neu U, Bauer J, Stehle T
Viruses and sialic acids: rules of engagement.
CURRENT OPINION IN STRUCTURAL BIOLOGY 21, 610 (2011)

Neu U, Wang JB, Macejak D, Garcea RL, Stehle T
Structures of the Major Capsid Proteins of the Human Karolinska Institutet and Washington University Polyomaviruses
JOURNAL OF VIROLOGY 85, 7384 (2011)

Nicula R, Ishizaki K, Stir M, Shen Z, Vaucher S
Rapid synthesis and densification of single-phase Al-Cu-Fe quasicrystals by spark plasma sintering or microwave heating
PHILOSOPHICAL MAGAZINE 91, 2450 (2011)

Nicula R, Stir M, Wurm A, Catala-Civera JM, Ishizaki K, Vaucher S, Zhuravlev E, Schick C
Microwave calorimetry using X-rays
THERMOCHIMICA ACTA 526, 137 (2011)

Niederberger T, Hartung S, Hopfner KP, Tresch A
Processive RNA decay by the exosome Merits of a quantitative bayesian sampling approach
RNA BIOLOGY 8, 55 (2011)

Niederfellner G, Lammens A, Mundigl O, Georges GJ, Schaefer W, Schwaiger M, Franke A, Wiechmann K, Jenewein S, Slootstra JW, Timmerman P, Brannstrom A, Lindstrom F, Mossner E, Umana P, Hopfner KP, Klein C
Epitope characterization and crystal structure of GA101 provide insights into the molecular basis for type I/II distinction of CD20 antibodies
BLOOD 118, 358 (2011)

Nilsson EC, Storm RJ, Bauer J, Johansson SMC, Lookene A, Angstrom J, Hedenstrom M, Eriksson TL, Frangsmyr L, Rinaldi S, Willison HJ, Domellof FP, Stehle T, Arnberg N
The GD1a glycan is a cellular receptor for adenoviruses causing epidemic keratoconjunctivitis
NATURE MEDICINE 17, 105 (2011)

Obeid S, Schnur A, Gloeckner C, Blatter N, Welte W, Diederichs K, Marx A
Learning from Directed Evolution: Thermus aquaticus DNA Polymerase Mutants with Translesion Synthesis Activity

CHEMBIOCHEM 12, 1574 (2011)

Ovaere M, Herdewijn P, Van Meervelt L
The Crystal Structure of the CeNA:RNA Hybrid ce(GCGTAGCG):r(CGCUACGC)
CHEMISTRY-A EUROPEAN JOURNAL 17, 7823 (2011)

Owen RL, Yorke BA, Gowdy JA, Pearson AR
Revealing low-dose radiation damage using single-crystal spectroscopy
JOURNAL OF SYNCHROTRON RADIATION 18, 367 (2011)

Pantoom S, Vetter IR, Prinz H, Suginta W
Potent Family-18 Chitinase Inhibitors X-RAY STRUCTURES, AFFINITIES, AND BINDING MECHANISMS
JOURNAL OF BIOLOGICAL CHEMISTRY 286, 24312 (2011)

Pesek J, Buchler R, Albrecht R, Boland W, Zeth K
Structure and Mechanism of Iron Translocation by a Dps Protein from Microbacterium arborescens
JOURNAL OF BIOLOGICAL CHEMISTRY 286, 34872 (2011)

Petrova O, Kulp C, van den Berg MWE, Klementiev KV, Otto B, Otto H, Lopez M, Bron M, Gruenert W
A Spectroscopic PEM Fuel Cell Test Setup allowing Fluorescence XAS Measurements during State-of-the-art Cell Tests
REVIEW OF SCIENTIFIC INSTRUMENTS 82, 044101-1 (2011)

Pijning T, Anwar MA, Boger M, Dobruchowska JM, Leemhuis H, Kralj S, Dijkhuizen L, Dijkstra BW
Crystal Structure of Inulosucrase from Lactobacillus: Insights into the Substrate Specificity and Product Specificity of GH68 Fructansucrases
JOURNAL OF MOLECULAR BIOLOGY 412, 80 (2011)

Pomowski A, Zumft WG, Kroneck PMH, Einsle O
N2O binding at a [4Cu:2S] copper-sulphur cluster in nitrous oxide reductase
NATURE 477, 234 (2011)

Planas N, Vigara L, Cady C, Miro P, Huang P, Hammarstrom L, Styring S, Leidel N, Dau H, Haumann M, Gagliardi L, Cramer CJ, Llobet A
Electronic Structure of Oxidized Complexes Derived from cis-Ru-II(bpy)(2)(H2O)(2)](2+) and Its Photoisomerization Mechanism
INORGANIC CHEMISTRY 50, 11134 (2011)

Potts B, Groll M
Proteasome structure, function, and lessons learned from beta-lactone inhibitors
CURRENT TOPICS IN MEDICINAL CHEMISTRY 11, 2850 (2011)

Potts BC, Albitar MX, Anderson KC, Baritaki S, Berkers C, Bonavida B, Chandra J, Chauhan D, Cusack JC, Fenical W, Ghobrial IM, Groll M, Jensen PR, Lam KS, Lloyd GK, McBride W, McConkey DJ, Miller CP, Neuteboom STC, Oki Y, Ovaa H, Pajonk F, Richardson PG, Roccaro AM, Sloss CM, Spear MA, Valashi E, Younes A, Palladino MA
Marizomib, a Proteasome Inhibitor for All Seasons: Preclinical Profile and a Framework for Clinical Trials
CURRENT CANCER DRUG TARGETS 11, 254 (2011)

Prime ME, Courtney SM, Brookfield FA, Marston RW, Walker V, Warne J, Boyd AE, Kairies NA, von der Saal W, Limberg A, Georges G, Engh RA, Goller B, Rueger P, Rueth M
Phthalazinone Pyrazoles as Potent, Selective, and Orally Bioavailable Inhibitors of Aurora-A Kinase
JOURNAL OF MEDICINAL CHEMISTRY 54, 312 (2011)

Quitterer F, List A, Eisenreich W, Bacher A, Groll M
Crystal Structure of Methylornithine Synthase (PylB): Insights into the Pyrrolysine Biosynthesis
ANGEWANDTE CHEMIE-INTERNATIONAL EDITION 0, 0 (2011)

Rabl J, Leibundgut M, Ataide SF, Haag A, Ban N

Crystal Structure of the Eukaryotic 40S Ribosomal Subunit in Complex with Initiation Factor 1
SCIENCE 331, 730 (2011)

Rajendran C, Gerhardt ECM, Bjelic S, Gasperina A, Scarduelli M, Pedrosa FO, Chubatsu LS, Merrick M, Souza EM, Winkler FK, Huergo LF, Li XD
Crystal structure of the GlnZ-DraG complex reveals a different form of P-II-target interaction
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 108, 18972 (2011)

Ramos A, Souza-Neto N, Tolentino H, Bunau O, Joly Y, Grenier S, Itie J-P, Flank A-M, Lagarde P, Caneiro A
Bandwidth-driven nature of the pressure-induced metal state of LaMnO3
EPL 96, 36002 (2011)

Rather LJ, Weinert T, Demmer U, Bill E, Ismail W, Fuchs G, Ermler U
Structure and Mechanism of the Diiron Benzoyl-Coenzyme A Epoxidase BoxB
JOURNAL OF BIOLOGICAL CHEMISTRY 286, 29241 (2011)

Reche C, Viana M, Moreno T, Querol X, Alastuey A, Pey J, Pandolfi M, Prevot A, Mohr C, Richard A, Artinano B, Gomez-Moreno FJ, Cots N
Peculiarities in atmospheric particle number and size-resolved speciation in an urban area in the western Mediterranean: Results from the DAURE campaign
ATMOSPHERIC ENVIRONMENT 45, 5282 (2011)

Reimann S, Stotzel J, Frahm R, Kleist W, Grunwaldt JD, Baiker A
Identification of the Active Species Generated from Supported Pd Catalysts in Heck Reactions: An in situ Quick Scanning EXAFS Investigation
JOURNAL OF THE AMERICAN CHEMICAL SOCIETY 133, 3921 (2011)

Reiss K, Kirchner E, Gijzen M, Zocher G, Loffelhardt B, Nurnberger T, Stehle T, Brunner F
Structural and Phylogenetic Analyses of the GP42 Transglutaminase from Phytophthora sojae Reveal an Evolutionary Relationship between Oomycetes and Marine Vibrio Bacteria
JOURNAL OF BIOLOGICAL CHEMISTRY 286, 42585 (2011)

Reiter DM, Frierson JM, Halvorson EE, Kobayashi T, Dermody TS, Stehle T
Crystal Structure of Reovirus Attachment Protein sigma 1 in Complex with Sialylated Oligosaccharides
PLOS PATHOGENS 7, e1002166 (2011)

Rekittke I, Nonaka T, Wiesner J, Demmer U, Warkentin E, Jomaa H, Ermler U
Structure of the E-1-hydroxy-2-methyl-but-2-enyl-4-diphosphate synthase (GcpE) from Thermus thermophilus
FEBS LETTERS 585, 447 (2011)

Reufer M, Dietsch H, Gasser U, Grobety B, Hirt AM, Malik VK, Schurtenberger P
Magnetic properties of silica coated spindle-type hematite particles
JOURNAL OF PHYSICS-CONDENSED MATTER 23, 065102 (2011)

Rhimi M, Bajic G, Ilhammami R, Boudebbouze S, Maguin E, Haser R, Aghajari N
The acid-tolerant L-arabinose isomerase from the mesophilic Shewanella sp ANA-3 is highly active at low temperatures
MICROBIAL CELL FACTORIES 10, 96 (2011)

Richard A, Gianini MFD, Mohr C, Furger M, Bukowiecki N, Minguillon MC, Lienemann P, Flechsig U, Appel K, DeCarlo PF, Heringa MF, Chirico R, Baltensperger U, Prevot ASH
Source apportionment of size and time resolved trace elements and organic aerosols from an urban courtyard site in Switzerland
ATMOSPHERIC CHEMISTRY AND PHYSICS 11, 8945 (2011)

Richter HGF, Benson GM, Bleicher KH, Blum D, Chaput E, Clemann N, Feng S, Gardes C, Grether U, Hartman P, Kuhn B, Martin RE, Plancher JM, Rudolph MG, Schuler F, Taylor S
Optimization of a novel class of benzimidazole-based farnesoid X receptor (FXR) agonists to improve physicochemical and ADME properties
BIOORGANIC & MEDICINAL CHEMISTRY LETTERS 21, 1134 (2011)

Richter HGF, Benson GM, Blum D, Chaput E, Feng S, Gardes C, Grether U, Hartman P, Kuhn B, Martin RE, Plancher JM, Rudolph MG, Schuler F, Taylor S, Bleicher KH
Discovery of novel and orally active FXR agonists for the potential treatment of dyslipidemia & diabetes
BIOORGANIC & MEDICINAL CHEMISTRY LETTERS 21, 191 (2011)

Ringel R, Sologub M, Morozov YI, Litonin D, Cramer P, Temiakov D
Structure of human mitochondrial RNA polymerase
NATURE 478, 269 (2011)

Roman-Hernandez G, Hou JY, Grant RA, Sauer RT, Baker TA
The ClpS Adaptor Mediates Staged Delivery of N-End Rule Substrates to the AAA plus ClpAP Protease
MOLECULAR CELL 43, 217 (2011)

Romer C, Patzer SI, Albrecht R, Zeth K, Braun V
Expression, purification and crystallization of the Cmi immunity protein from Escherichia coli
ACTA CRYSTALLOGRAPHICA SECTION F-STRUCTURAL BIOLOGY AND CRYSTALLIZATION COMMUNICATIONS 67, 517 (2011)

Roth J, Eller J, Buechi F
Effects of Synchrotron Radiation on Polymer Electrolyte Fuel Cell Materials
ECS TRANSACTIONS 41, 371 (2011)

Ruan WJ, Lehmann E, Thomm M, Kostrewa D, Cramer P
Evolution of Two Modes of Intrinsic RNA Polymerase Transcript Cleavage
JOURNAL OF BIOLOGICAL CHEMISTRY 286, 18701 (2011)

Rueeger H, Rondeau JM, McCarthy C, Mobitz H, Tintelnot-Blomley M, Neumann U, Desrayaud S
Structure based design, synthesis and SAR of cyclic hydroxyethylamine (HEA) BACE-1 inhibitors
BIOORGANIC & MEDICINAL CHEMISTRY LETTERS 21, 1942 (2011)

Russwurm M, Schlicker C, Weyand M, Koesling D, Steegborn C
Crystal structure of the GAF-B domain from human phosphodiesterase 5
PROTEINS-STRUCTURE FUNCTION AND BIOINFORMATICS 79, 1682 (2011)

Sakamoto H, Tsukaguchi T, Hiroshima S, Kodama T, Kobayashi T, Fukami TA, Oikawa N, Tsukuda T, Ishii N, Aoki Y
CH5424802, a Selective ALK Inhibitor Capable of Blocking the Resistant Gatekeeper Mutant
CANCER CELL 19, 679 (2011)

Salgado PS, Yan R, Rowan F, Cota E
Expression, crystallization and preliminary X-ray data analysis of NT-Als9-2, a fungal adhesin from Candida albicans
ACTA CRYSTALLOGRAPHICA SECTION F-STRUCTURAL BIOLOGY AND CRYSTALLIZATION COMMUNICATIONS 67, 467 (2011)

Salgado PS, Yan R, Taylor JD, Burchell L, Jones R, Hoyer LL, Matthews SJ, Simpson PJ, Cota E
Structural basis for the broad specificity to host-cell ligands by the pathogenic fungus Candida albicans
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 108, 15775 (2011)

Sauer E, Weichenrieder O
Structural basis for RNA 3' end recognition by Hfq
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 108, 13065 (2011)

Schellenberger P, Sauter C, Lorber B, Bron P, Trapani S, Bergdoll M, Marmonier A, Schmitt-Keichinger C, Lemaire O, Demangeat G, Ritzenthaler C
Structural Insights into Viral Determinants of Nematode Mediated Grapevine fanleaf virus

Transmission
PLOS PATHOGENS 7, e1002034 (2011)

Schiering N, D'Arcy A, Villard F, Simic O, Kamke M, Monnet G, Hassiepen U, Svergun DI, Pulfer R, Eder J, Raman P, Bodendorf U
A macrocyclic HCV NS3/4A protease inhibitor interacts with protease and helicase residues in the complex with its full-length target
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 108, 21052 (2011)

Schmidt MU, Bruening J, Glinnemann J, Huetzler MW, Moerschel P, Ivashevskaya SN, van de Streek J, Braga D, Maini L, Chierotti MR, Gobetto R
The Thermodynamically Stable Form of Solid Barbituric Acid: The Enol Tautomer
ANGEWANDTE CHEMIE-INTERNATIONAL EDITION 50, 7924 (2011)

Schmidt N, Hub C, Gnichwitz JF, Hieringer W, Hirsch A, Fink RH
Structure, morphology and interface properties of ultrathin SnTTBPP(OH)(2)-films adsorbed on Ag(100)
PHYSICAL CHEMISTRY CHEMICAL PHYSICS 13, 9839 (2011)

Schmitges FW, Prusty AB, Faty M, Stutzer A, Lingaraju GM, Aiwazian J, Sack R, Hess D, Li L, Zhou SL, Bunker RD, Wirth U, Bouwmeester T, Bauer A, Ly-Hartig N, Zhao KH, Chan HM, Gu J, Gut H, Fischle W, Muller J, Thoma NH
Histone Methylation by PRC2 Is Inhibited by Active Chromatin Marks
MOLECULAR CELL 42, 330 (2011)

Schneider EV, Bottcher J, Blaesse M, Neumann L, Huber R, Maskos K
The Structure of CDK8/CycC Implicates Specificity in the CDK/Cyclin Family and Reveals Interaction with a Deep Pocket Binder
JOURNAL OF MOLECULAR BIOLOGY 412, 251 (2011)

Schneider P, Meier M, Wepf R, Muller R
Serial FIB/SEM imaging for quantitative 3D assessment of the osteocyte lacuno-canalicular network
BONE 49, 304 (2011)

Schoebel S, Cichy AL, Goody RS, Itzen A
Protein LidA from Legionella is a Rab GTPase supereffector
PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 108, 17945 (2011)

Schoepe J, Pollet A, Verjans P, Delcour JA, Strelkov SV, Courtin CM
Crystallization and preliminary X-ray analysis of a cold-active endo-beta-1,4-D-xylanase from glycoside hydrolase family 8
ACTA CRYSTALLOGRAPHICA SECTION F-STRUCTURAL BIOLOGY AND CRYSTALLIZATION COMMUNICATIONS 67, 150 (2011)

Schon C, Roth W, Fischer I, Pfister J, Fink RF, Engels B
Paracyclophanes as model compounds for strongly interacting pi-systems. Part 2: mono-hydroxy paracyclophane
PHYSICAL CHEMISTRY CHEMICAL PHYSICS 13, 11076 (2011)

Schuettfort T, Huettner S, Lilliu S, Macdonald JE, Thomsen L, McNeill CR
Surface and Bulk Structural Characterization of a High-Mobility Electron-Transporting Polymer
MACROMOLECULES 44, 1530 (2011)

Schutz B, Seidel J, Sturm G, Einsle O, Gescher J
Investigation of the Electron Transport Chain to and the Catalytic Activity of the Diheme Cytochrome c Peroxidase CcpA of Shewanella oneidensis
APPLIED AND ENVIRONMENTAL MICROBIOLOGY 77, 6172 (2011)

Seizl M, Lariviere L, Pfaffeneder T, Wenzeck L, Cramer P
Mediator head subcomplex Med11/22 contains a common helix bundle building block with a specific function in transcription initiation complex stabilization

NUCLEIC ACIDS RESEARCH 39, 6291 (2011)

Shima S, Krueger M, Weinert T, Demmer U, Kahnt J, Thauer RK, Ermler U
Structure of a methyl-coenzyme M reductase from Black Sea mats that oxidize methane anaerobically
NATURE 481, 98 (2011)

Silva G, Poirot L, Galetto R, Smith J, Montoya G, Duchateau P, Paques F
Meganucleases and Other Tools for Targeted Genome Engineering: Perspectives and Challenges for Gene Therapy
CURRENT GENE THERAPY 11, 11 (2011)

Simon J, Kern M, Hermann B, Einsle O, Butt JN
Physiological function and catalytic versatility of bacterial multihaem cytochromes c involved in nitrogen and sulfur cycling
BIOCHEMICAL SOCIETY TRANSACTIONS 39, 1864 (2011)

Skarpeli-Liati M, Jiskra M, Turgeon A, Garr AN, Arnold WA, Cramer CJ, Schwarzenbach RP, Hofstetter TB
Using Nitrogen Isotope Fractionation to Assess the Oxidation of Substituted Anilines by Manganese Oxide
ENVIRONMENTAL SCIENCE & TECHNOLOGY 45, 5596 (2011)

Slater BJ, Mcloughlin S, Hilton J
Guadalupian (Middle Permian) megaspores from a permineralised peat in the Bainmedart Coal Measures, Prince Charles Mountains, Antarctica
REVIEW OF PALAEOBOTANY AND PALYNOLOGY 167, 140-155 (2011)

Sledz P, Stubbs CJ, Lang S, Yang YQ, McKenzie GJ, Venkitaraman AR, Hyvonen M, Abell C
From Crystal Packing to Molecular Recognition: Prediction and Discovery of a Binding Site on the Surface of Polo-Like Kinase 1
ANGEWANDTE CHEMIE-INTERNATIONAL EDITION 50, 4003 (2011)

Sonntag Y, Musgaard M, Olesen C, Schiott B, Moller JV, Nissen P, Thogersen L
Mutual adaptation of a membrane protein and its lipid bilayer during conformational changes
NATURE COMMUNICATIONS 2, 304 (2011)

Spatzal T, Aksoyoglu M, Zhang LM, Andrade SLA, Schleicher E, Weber S, Rees DC, Einsle O
Evidence for Interstitial Carbon in Nitrogenase FeMo Cofactor
SCIENCE 334, 940 (2011)

Spjut S, Qian WX, Bauer J, Storm R, Frangsmyr L, Stehle T, Arnberg N, Elofsson M
A Potent Trivalent Sialic Acid Inhibitor of Adenovirus Type 37 Infection of Human Corneal Cells
ANGEWANDTE CHEMIE-INTERNATIONAL EDITION 50, 6519 (2011)

Standfuss J, Edwards PC, D'Antona A, Fransen M, Xie GF, Oprian DD, Schertler GFX
The structural basis of agonist-induced activation in constitutively active rhodopsin
NATURE 471, 656 (2011)

Steuber H
An Old NSAID Revisited: Crystal Structure of Aldose Reductase in Complex with Sulindac at 1.0 angstrom Supports a Novel Mechanism for its Anticancer and Antiproliferative Effects
CHEMMEDCHEM 6, 2155 (2011)

Stotzel J, Lutzenkirchen-Hecht D, Frahm R
A new stand-alone QEXAFS data acquisition system for in situ studies
JOURNAL OF SYNCHROTRON RADIATION 18, 165 (2011)

Strohmeier J, Hertel I, Diederichsen U, Rudolph MG, Klostermeier D
Changing nucleotide specificity of the DEAD-box helicase Hera abrogates communication between the Q-motif and the P-loop
BIOLOGICAL CHEMISTRY 392, 357 (2011)

Tan S, Davey CA
Nucleosome structural studies

CURRENT OPINION IN STRUCTURAL BIOLOGY 21, 128 (2011)

Tang F, Bengtson S, Wang Y, Wang XL, Yin CY
Eoandromeda and the origin of Ctenophora
EVOLUTION & DEVELOPMENT 13, 408 (2011)

Thoma G, Nuninger F, Falchetto R, Hermes E, Tavares GA, Vangrevelinghe E, Zerwes HG
Identification of a Potent Janus Kinase 3 Inhibitor with High Selectivity within the Janus Kinase Family
JOURNAL OF MEDICINAL CHEMISTRY 54, 284 (2011)

Tonnerre JM, Przybylski M, Ragheb M, Yildiz F, Tolentino HCN, Ortega L, Kirschner J
Direct in-depth determination of a complex magnetic configuration in an exchange-coupled bilayer with perpendicular and in-plane anisotropy
PHYSICAL REVIEW B 84, 100407 (2011)

Tresadern G, Delgado F, Delgado O, Gijsen H, Macdonald GJ, Moechars D, Rombouts F, Alexander R, Spurlino J, Van Gool M, Vega JA, Trabanco AA
Rational design and synthesis of aminopiperazinones as beta-secretase (BACE) inhibitors
BIOORGANIC & MEDICINAL CHEMISTRY LETTERS 21, 7255 (2011)

Truebestein L, Tennstaedt A, Moonig T, Krojer T, Canellas F, Kaiser M, Clausen T, Ehrmann M
Substrate-induced remodeling of the active site regulates human HTRA1 activity
NATURE STRUCTURAL & MOLECULAR BIOLOGY 18, 386 (2011)

Van Petegem S, Zimmermann J, Van Swygenhoven H
Yield point phenomenon during strain rate change in nanocrystalline Ni-Fe
SCRIPTA MATERIALIA 65, 217 (2011)

Van Rossom W, Robeyns K, Ovaere M, Van Meervelt L, Dehaen W, Maes W
Odd-Numbered Oxacalix[n]arenes (n=5, 7): Synthesis and Solid-State Structures
ORGANIC LETTERS 13, 126 (2011)

Van de Water K, Soror SH, Wohlkonig A, van Nuland NAJ, Volkov AN
Crystallization and preliminary X-ray diffraction analysis of kanamycin-binding beta-lactamase in complex with its ligand
ACTA CRYSTALLOGRAPHICA SECTION F-STRUCTURAL BIOLOGY AND CRYSTALLIZATION COMMUNICATIONS 67, 703 (2011)

Vaucher S, Stir M, Ishizaki K, Catala-Civera JM, Nicula R
Reactive synthesis of Ti-Al intermetallics during microwave heating in an E-field maximum
THERMOCHIMICA ACTA 522, 151 (2011)

Vergauwen B, Van der Meeren R, Dansercoer A, Savvides SN
Delineation of the Pasteurellaceae-specific GbpA-family of glutathione-binding proteins
BMC BIOLOGY 12, 59 (2011)

Verstraete K, Remmerie B, Elegheert J, Lintermans B, Haegeman G, Vanhoenacker P, Van Craenenbroeck K, Savvides SN
Inducible production of recombinant human Flt3 ectodomain variants in mammalian cells and preliminary crystallographic analysis of Flt3 ligand-receptor complexes
ACTA CRYSTALLOGRAPHICA SECTION F-STRUCTURAL BIOLOGY AND CRYSTALLIZATION COMMUNICATIONS 67, 325 (2011)

Verstraete K, Vandriessche G, Januar M, Elegheert J, Shkumatov AV, Desfosses A, Van Craenenbroeck K, Svergun DI, Gutsche I, Vergauwen B, Savvides SN
Structural insights into the extracellular assembly of the hematopoietic Flt3 signaling complex
BLOOD 118, 60 (2011)

Voltolini M, Zandomeneghi D, Mancini L, Polacci M
Texture analysis of volcanic rock samples: Quantitative study of crystals and vesicles
JOURNAL OF VOLCANOLOGY AND GEOTHERMAL RESEARCH 202, 83 (2011)

von Balthazar M, Crane PR, Pedersen KR, Friis EM
New flowers of Laurales from the Early Cretaceous (Early to Middle Albian) of eastern North

America
L. Wanntorp and L.P. Ronse De Craene (Eds.), Flowers on the Tree of Life. Cambridge University Press, Cambridge, p 49ff (2011)

Wagner T, Bellinzoni M, Wehenkel A, O'hare HM, Alzari PM
Functional Plasticity and Allosteric Regulation of alpha-Ketoglutarate Decarboxylase in Central Mycobacterial Metabolism
CHEMISTRY & BIOLOGY 18, 1011 (2011)

Wallden K, Nordlund P
Structural Basis for the Allosteric Regulation and Substrate Recognition of Human Cytosolic 5 '-Nucleotidase II
JOURNAL OF MOLECULAR BIOLOGY 408, 684 (2011)

Weisser MA, Evans AD, Van Petegem S, Holdsworth SR, Van Swygenhoven H
In situ room temperature tensile deformation of a 1% CrMoV bainitic steel using synchrotron and neutron diffraction
ACTA MATERIALIA 59, 4448 (2011)

Witschel MC, Hoffken HW, Seet M, Parra L, Mietzner T, Thater F, Niggeweg R, Rohl F, Illarionov B, Rohdich F, Kaiser J, Fischer M, Bacher A, Diederich F
Inhibitors of the Herbicidal Target IspD: Allosteric Site Binding
ANGEWANDTE CHEMIE-INTERNATIONAL EDITION 50, 7931 (2011)

Wojtas M, Peralta B, Ondiviela M, Mogni M, Bell SD, Abrescia NGA
Archaeal RNA polymerase: the influence of the protruding stalk in crystal packing and preliminary biophysical analysis of the Rpo13 subunit
BIOCHEMICAL SOCIETY TRANSACTIONS 39, 25 (2011)

Wollmann P, Cui S, Viswanathan R, Berninghausen O, Wells MN, Moldt M, Witte G, Butryn A, Wendler P, Beckmann R, Auble DT, Hopfner KP
Structure and mechanism of the Swi2/Snf2 remodeller Mot1 in complex with its substrate TBP
NATURE 475, 403 (2011)

Wu B, Davey GE, Nazarov AA, Dyson PJ, Davey CA
Specific DNA structural attributes modulate platinum anticancer drug site selection and cross-link generation
NUCLEIC ACIDS RESEARCH 39, 8200 (2011)

Wu B, Ong MS, Groessl M, Adhireksan Z, Hartinger CG, Dyson PJ, Davey CA
A Ruthenium Antimetastasis Agent Forms Specific Histone Protein Adducts in the Nucleosome Core
CHEMISTRY-A EUROPEAN JOURNAL 17, 3562 (2011)

Yamada K, Frouws TD, Angst B, Fitzgerald DJ, DeLuca C, Schimmele K, Sargent DF, Richmond TJ
Structure and mechanism of the chromatin remodelling factor ISW1a
NATURE 472, 448 (2011)

Yatime L, Hein KL, Nilsson J, Nissen P
Structure of the RACK1 Dimer from Saccharomyces cerevisiae
JOURNAL OF MOLECULAR BIOLOGY 411, 486 (2011)

Yatime L, Laursen M, Morth JP, Esmann M, Nissen P, Fedosova NU
Structural insights into the high affinity binding of cardiotonic steroids to the Na+,K+-ATPase
JOURNAL OF STRUCTURAL BIOLOGY 174, 296 (2011)

Yebenes H, Mesa P, Munoz IG, Montoya G, Valpuesta JM
Chaperonins: two rings for folding
TRENDS IN BIOCHEMICAL SCIENCES 36, 424 (2011)

Zent E, Vetter I, Wittinghofer A
Structural and biochemical properties of Sept7, a unique septin required for filament formation
BIOLOGICAL CHEMISTRY 392, 791 (2011)

Zeth K, Pechlivanis M, Samol A, Pleiser S, Vonrhein C, Kerkhoff E
Molecular Basis of Actin Nucleation Factor Cooperativity CRYSTAL STRUCTURE OF THE SPIR-1 KINASE NON-CATALYTIC C-LOBE DOMAIN (KIND).FORMIN-2 FORMIN SPIR INTERACTION MOTIF (FSI) COMPLEX
JOURNAL OF BIOLOGICAL CHEMISTRY 286, 30732 (2011)

Zhang FJ, Zocher G, Sauter A, Stehle T, Schreiber F
Novel approach to controlled protein crystallization through ligandation of yttrium cations
JOURNAL OF APPLIED CRYSTALLOGRAPHY 44, 755 (2011)

Zimmermann I, Dutzler R
Ligand Activation of the Prokaryotic Pentameric Ligand-Gated Ion Channel ELIC
PLOS BIOLOGY 9, e1001101 (2011)

Ziolkowska NE, Karotki L, Rehman M, Huiskonen JT, Walther TC
Eisosome-driven plasma membrane organization is mediated by BAR domains
NATURE STRUCTURAL & MOLECULAR BIOLOGY 18, 854 (2011)

van Eis MJ, Evenou JP, Floersheim P, Gaul C, Cowan-Jacob SW, Monovich L, Rummel G, Schuler W, Stark W, Strauss A, von Matt A, Vangrevelinghe E, Wagner J, Soldermann N
2,6-Naphthyridines as potent and selective inhibitors of the novel protein kinase C isozymes
BIOORGANIC & MEDICINAL CHEMISTRY LETTERS 21, 7367 (2011)

PUBLICATIONS WITH SYN AUTHOR(S) AND NOT DESCRIBING AN SLS EXPERIMENT

Bartels-Rausch T, Ulrich T, Huthwelker T, Ammann M
A novel synthesis of the N-13 labeled atmospheric trace gas peroxynitric acid
RADIOCHIMICA ACTA 99, 285 (2011)

Bergamaschi A, Dinapoli R, Greiffenberg D, Henrich B, Johnson I, Mozzanica A, Radicci V, Schmitt B, Shi XT, Stoppani L
Time-over-threshold readout to enhance the high flux capabilities of single-photon-counting detectors
JOURNAL OF SYNCHROTRON RADIATION 18, 923 (2011)

Blaise M, Frechin M, Olieric V, Charron C, Sauter C, Lorber B, Roy H, Kern D
Crystal Structure of the Archaeal Asparagine Synthetase: Interrelation with Aspartyl-tRNA and Asparaginyl-tRNA Synthetases
JOURNAL OF MOLECULAR BIOLOGY 412, 437 (2011)

Bleiner D, Staub F, Guzenko V, Ekinci Y, Balmer JE
Evaluation of lab-scale EUV microscopy using a table-top laser source
OPTICS COMMUNICATIONS 284, 4577 (2011)

Carroll L, Imbert F, Sigg H, Suess M, Muller E, Virgilio M, Pizzi G, Rossbach P, Chrastina D, Isella G
Quantum-confined direct-gap transitions in tensile-strained Ge/SiGe multiple quantum wells
APPLIED PHYSICS LETTERS 99, 031907 (2011)

Cervellino A, Gvasaliya SN, Zaharko O, Roessli B, Rotaru GM, Cowley RA, Lushnikov SG, Shaplygina TA, Fernandez-Diaz MT
Diffuse scattering from the lead-based relaxor ferrolectric PbMg1/3Ta2/3O3
JOURNAL OF APPLIED CRYSTALLOGRAPHY 44, 603-609 (2011)

Chabior M, Donath T, David C, Bunk O, Schuster M, Schroer C, Pfeiffer F
Beam hardening effects in grating-based x-ray phase-contrast imaging
MEDICAL PHYSICS 38, 1189 (2011)

Chabior M, Donath T, David C, Schuster M, Schroer C, Pfeiffer F
Signal-to-noise ratio in x ray dark-field imaging using a grating interferometer
JOURNAL OF APPLIED PHYSICS 110, 053105 (2011)

Danilina N, Payrer EL, Troussard E, van Bokhoven JA

Selective Production of 2-Phenylhexane from Benzene and n-Hexane Over Pt- and Ga-Modified Zeolites
CATALYSIS LETTERS 141, 391 (2011)

David C, Gorelick S, Rutishauser S, Krzywinski J, Vila-Comamala J, Guzenko VA, Bunk O, Farm E, Ritala M, Cammarata M, Fritz DM, Barrett R, Samoylova L, Grunert J, Sinn H
Nanofocusing of hard X-ray free electron laser pulses using diamond based Fresnel zone plates
SCIENTIFIC REPORTS 1, 57 (2011)

Dreiser J, Schnegg A, Holldack K, Pedersen KS, Schau-Magnussen M, Nehrkorn J, Tregenna-Piggott P, Mutka H, Weihe H, Bendix J, Waldmann O
Frequency-Domain Fourier-Transform Terahertz Spectroscopy of the Single-Molecule Magnet (NEt4)[Mn-2(5-Brsalen)(2)(MeOH)(2)Cr(CN)(6)]
CHEMISTRY-A EUROPEAN JOURNAL 17, 7492 (2011)

Fesser P, Iacovita C, Wackerlin C, Vijayaraghavan S, Ballav N, Howes K, Gisselbrecht JP, Crobu M, Boudon C, Stohr M, Jung TA, Diederich F
Visualizing the Product of a Formal Cycloaddition of 7,7,8,8-Tetracyano-p-quinodimethane (TCNQ) to an Acetylene-Appended Porphyrin by Scanning Tunneling Microscopy on Au(111)
CHEMISTRY-A EUROPEAN JOURNAL 17, 5246 (2011)

Franco D, Klingauf M, Bednarzik M, Cecchini M, Kurtcuoglu V, Gobrecht J, Poulikakos D, Ferrari A
Control of initial endothelial spreading by topographic activation of focal adhesion kinase
SOFT MATTER 7, 7313 (2011)

Guan DD, Bianchi M, Bao SN, Perkins E, Meier F, Dil JH, Osterwalder J, Hofmann P
Strongly enhanced electron-phonon coupling in the Rashba-split state of the Bi/Ag(111) surface alloy
PHYSICAL REVIEW B 83, 155451 (2011)

Guzenko VA, Ziegler J, Savouchkina A, Padeste C, David C
Fabrication of large scale arrays of metallic nanodots by means of high resolution e-beam lithography
MICROELECTRONIC ENGINEERING 88, 1972 (2011)

Helfenstein P, Kirk E, Jefimovs K, Vogel T, Escher C, Fink HW, Tsujino S
Highly collimated electron beams from double-gate field emitter arrays with large collimation gate apertures
APPLIED PHYSICS LETTERS 98, 061502 (2011)

Hellwig O, Gunther CM, Radu F, Menzel A, Schlotter WF, Luning J, Eisebitt S
Ferrimagnetic stripe domain formation in antiferromagnetically-coupled Co/Pt-Co/Ni-Co/Pt multilayers studied via soft x-ray techniques
APPLIED PHYSICS LETTERS 98, 172503 (2011)

Henrich B, Becker J, Dinapoli R, Goettlicher P, Graafsma H, Hirsemann H, Klanner R, Krueger H, Mazzocco R, Mozzanica A, Perrey H, Potdevin G, Schmitt B, Shi X, Srivastava AK, Trunk U, Youngman C
The adaptive gain integrating pixel detector AGIPD a detector for the European XFEL
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT 633, S11 (2011)

Herzen J, Beckmann F, Donath T, Ogurreck M, David C, Pfeiffer F, Mohr J, Reznikova E, Riekehr S, Haibel A, Schulz G, Mueller B, Schreyer A
X-ray grating interferometer for imaging at a second-generation synchrotron radiation source
PROCEEDINGS OF THE SPIE - THE INTERNATIONAL SOCIETY FOR OPTICAL ENGINEERING 7804, 780407 (2011)

Herzen J, Donath T, Beckmann F, Ogurreck M, David C, Pfeiffer F, Mohr J, Schreyer A
X-ray grating interferometer for materials-science imaging at a low-coherent wiggler source
REVIEW OF SCIENTIFIC INSTRUMENTS 82, 113711 (2011)

Jensen TH, Bottiger A, Bech M, Zanette I, Weitkamp T, Rutishauser S, David C, Reznikova E, Mohr J, Christensen LB, Olsen EV, Feidenhans'l R, Pfeiffer F
X-ray phase-contrast tomography of porcine fat and rind
MEAT SCIENCE 88, 379 (2011)

Kartusch C, Makosch M, Sa J, van Bokhoven JA
The Dynamic Structure of Gold Supported on Ceria in the Liquid Phase Hydrogenation of Nitrobenzene
CHEMCATCHEM 4, 236 (2011)

Klyachkovskaya E, Strekal N, Motevich I, Vaschenko S, Harbachova A, Belkov M, Gaponenko S, Dais C, Sigg H, Stoica T, Grutzmacher D
Enhanced Raman Scattering of Ultramarine on Au-coated Ge/Si-nanostructures
PLASMONICS 6, 413 (2011)

Lebedev OI, Caignaert V, Raveau B, Pop N, Gozzo F, Van Tendeloo G, Pralong V
HRTEM and neutron diffraction study of LixMo5O17: From the ribbon (x=5) structure to the rock salt (x=12) structure
JOURNAL OF SOLID STATE CHEMISTRY 184, 790-796 (2011)

Lehmann EH, Tremsin A, Grunzweig C, Johnson I, Boillat P, Josic L
Neutron imaging - Detector options in progress
JOURNAL OF INSTRUMENTATION 6, C01050 (2011)

Lopez FC, Rigon L, Long OR, Arfelli F, Bergamaschi A. Chen RC, Dreossi D, Schmitt B, Vallazza E, Castelli E
Development of a fast read-out system of a single mammography with synchrotron radiation
JINST 6, 12031 (2011)

Lo Presti L, Allieta M, Scavini M, Ghigna P, Loconte L, Scagnoli V, Brunelli M
Crystal structure and structural phase transitions in the GdBaCo2O5.0 cobaltite
PHYSICAL REVIEW B 84, 104107 (2011)

Molina LM, Lee S, Sell K, Barcaro G, Fortunelli A, Lee B, Seifert S, Winans RE, Elam JW, Pellin MJ, Barke I, von Oeynhausen V, Lei Y, Meyer RJ, Alonso JA, Rodriguez AF, Kleibert A, Giorgio S, Henry CR, Meiwes-Broer KH, Vajda S
Size-dependent selectivity and activity of silver nanoclusters in the partial oxidation of propylene to propylene oxide and acrolein: A joint experimental and theoretical study
CATALYSIS TODAY 160, 116 (2011)

Monney C, Battaglia C, Cercellier H, Aebi P, Beck H
Exciton Condensation Driving the Periodic Lattice Distortion of 1T-TiSe2
PHYSICAL REVIEW LETTERS 106, 106404 (2011)

Mozzanica A, Bergamaschi A, Dinapoli R, Graafsma H, Henrich B, Kraft P, Johnson I, Lohmann M, Schmitt B, Shi X
A single photon resolution integrating chip for microstrip detectors
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT 633, S29 (2011)

Mustonen A, Beaud P, Kirk E, Feurer T, Tsujino S
Five picocoulomb electron bunch generation by ultrafast laser-induced field emission from metallic nano-tip arrays
APPLIED PHYSICS LETTERS 99, 103504 (2011)

Neuhaus S, Padeste C, Spencer ND
Functionalization of Fluropolymers and Polyolefins via Grafting of Polyelectrolyte Brushes From Atmospheric-Pressure Plasma Activated Surfaces
PLASMA PROCESSES AND POLYMERS 8, 512 (2011)

Neuhaus S, Padeste C, Spencer ND
Versatile Wettability Gradients Prepared by Chemical Modification of Polymer Brushes on Polymer Foils

LANGMUIR 27, 6855 (2011)

Nevou L, Liverini V, Friedli P, Castellano F, Bismuto A, Sigg H, Gramm F, Muller E, Faist J
Current quantization in an optically driven electron pump based on self-assembled quantum dots
NATURE PHYSICS 7, 423 (2011)

Oberta P, Flechsig U, Abela R
The SwissFEL facility and its preliminary optics beamline layout
ADVANCES IN X-RAY FREE-ELECTRON LASERS: RADIATION SCHEMES, X-RAY OPTICS, AND INSTRUMENTATION, PROCEEDINGS OF SPIE, 8078, 807805 (2011)

Oberta P, Mikulik P, Kittler M, Hrdy J
X-ray collimation by crystals with precise parabolic holes based on diffractive-refractive optics
JOURNAL OF SYNCHROTRON RADIATION 18, 522-526 (2011)

Pacosova L, Kartusch C, Kukula P, van Bokhoven JA
Is Fullerene a Nonmetal Catalyst in the Hydrogenation of Nitrobenzene
CHEMCATCHEM 1, 154 (2011)

Padeste C, Ozcelik H, Ziegler J, Schleunitz A, Bednarzik M, Yucel D, Hasirci V
Replication of high aspect ratio pillar array structures in biocompatible polymers for tissue engineering applications
MICROELECTRONIC ENGINEERING 88, 1836 (2011)

Patterson BD, Sa J, Ichsanow A, Hauri CP, Vicario C, Ruchert C, Czekaj I, Gehrig R, Sigg HC, van Bokhoven JA, Pedrini B, Abela R
Can Energetic Terahertz Pulses Initiate Surface Catalytic Reactions on the Picosecond Time Scale?
CHIMIA 65, 323 (2011)

Pedersen KS, Dreiser J, Nehrkorn J, Gysler M, Schau-Magnussen M, Schnegg A, Holldack K, Bittl R, Piligkos S, Weihe H, Tregenna-Piggott P, Waldmann O, Bendix J
A linear single-molecule magnet based on [Ru-III(CN)(6)](3-)
CHEMICAL COMMUNICATIONS 47, 6918 (2011)

Ranocchiari M, van Bokhoven JA
Catalysis by metal-organic frameworks: fundamentals and opportunities
ZEITSCHRIFT FUR PHYSIKALISCHE CHEMIE-INTERNATIONAL JOURNAL OF RESEARCH IN PHYSICAL CHEMISTRY & CHEMICAL PHYSICS 13, 6388 (2011)

Rhensius J, Vaz CAF, Bisig A, Schweitzer S, Heidler J, Korner HS, Locatelli A, Nino MA, Weigand M, Mechin L, Gaucher F, Goering E, Heyderman LJ, Klaui M
Control of spin configuration in half-metallic La0.7Sr0.3MnO3 nano-structures
APPLIED PHYSICS LETTERS 99, 062508 (2011)

Richner G, van Bokhoven JA, Neuhold YM, Makosch M, Hungerbuehler K
In situ infrared monitoring of the solid/liquid catalyst interface during the three-phase hydrogenation of nitrobenzene over nanosized Au on TiO2
PHYSICAL CHEMISTRY CHEMICAL PHYSICS 13, 12463 (2011)

Rigon L, Tapete F, Dreossi D, Arfelli F, Bergamaschi A, Chen RC, Longo R, Menk RH, Schmitt B, Vallazza E, Castelli E
Breast computed tomography with the PICASSO detector: A feasibility study
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT 628, 419 (2011)

Rutishauser S, Zanette I, Weitkamp, Donath T, David C
At-wavelenght characterization of refractive x-ray lenses using two-dimensional grating interferometer
APPLIED PHYSICS LETTERS 99, 221104 (2011)

Rutishauser S, Zanette I, Donath T, Sahlholm A, Linnros J, David C
Structured scintillator for hard x-ray grating interferometry

APPLIED PHYSICS LETTERS 98, 171107 (2011)

Savouchkina A, Foelske-Schmitz A, Guzenko VA, Weingarth D, Scherer GG, Wokaun A, Kotz R
In situ STM study of Pt-nanodot arrays on HOPG prepared by electron-beam lithography
ELECTROCHEMISTRY COMMUNICATIONS 13, 484 (2011)

Schift H, Spreu C, Schleunitz A, J Lee J
Shape control of polymer reflow structures fabricated by nanoimprint lithography
MICROELECTRONIC ENGINEERING 88, 87 (2011)

Schulz G, Morel A, Imholz MS, Deyhle H, Weitkamp T, Zanette I, Pfeiffer F, David C, Mueller-Gerbl M, Mueller B
Evaluating the microstructure of human brain tissues using synchrotron radiation-based micro computed tomography
PROCEEDINGS OF THE SPIE - THE INTERNATIONAL SOCIETY FOR OPTICAL ENGINEERING 7804, 78040F (2011)

Schwarz G, Bodenthin Y, Tomkowicz Z, Haase W, Geue T, Kohlbrecher J, Pietsch U, Kurth DG
Tuning the Structure and the Magnetic Properties of Metallo-supramolecular Polyelectrolyte-Amphiphile Complexes
JOURNAL OF THE AMERICAN CHEMICAL SOCIETY 133, 547 (2011)

Schwier EF, Monney C, Mariotti N, Vydrova Z, Garcia-Fernandez M, Didiot C, Garnier MG, Aebi P
Influence of elastic scattering on the measurement of core-level binding energy dispersion in X-ray photoemission spectroscopy
EUROPEAN PHYSICAL JOURNAL B 81, 399 (2011)

Shalaby M, Merbold H, Peccianti M, Razzari L, Sharma G, Ozaki T, Morandotti R, Feurer T, Weber A, Heyderman L, Patterson B, Sigg H
Concurrent field enhancement and high transmission of THz radiation in nanoslit arrays
APPLIED PHYSICS LETTERS 99, 041110 (2011)

Stampanoni M, Wang ZT, Thuring T, David C, Roessl E, Trippel M, Kubik-Huch RA, Singer G, Hohl MK, Hauser N
The First Analysis and Clinical Evaluation of Native Breast Tissue Using Differential Phase-Contrast Mammography
INVESTIGATIVE RADIOLOGY 46, 801 (2011)

Stohr M, Boz S, Schar M, Nguyen MT, Pignedoli CA, Passerone D, Schweizer WB, Thilgen C, Jung TA, Diederich F
Self-Assembly and Two-Dimensional Spontaneous Resolution of Cyano-Functionalized [7]Helicenes on Cu(111)
ANGEWANDTE CHEMIE-INTERNATIONAL EDITION 50, 9982 (2011)

Stuiber S, Wu G, Nehrkorn J, Dreiser J, Lan YH, Novitchi G, Anson CE, Unruh T, Powell AK, Waldmann O
Inelastic Neutron Scattering on an Mn-10 Supertetrahedron: Assessment of Exchange Coupling Constants, Ferromagnetic Spin Waves and an Analogy to the Huckel Method
CHEMISTRY-A EUROPEAN JOURNAL 17, 9094 (2011)

Thuering T, Modregger P, Grund T, Kenntner J, David C, Stampanoni M
High resolution, large field of view x-ray differential phase contrast imaging on a compact setup
APPLIED PHYSICS LETTERS 99, 041111 (2011)

Thuering T, Modregger P, Pinzer BR, Wang Z, Rutishauser S, David C, Grund T, Kenntner J, Stampanoni M
Towards X-ray differential phase contrast imaging on a compact setup
MEDICAL IMAGING 2011: PHYSICS OF MEDICAL IMAGING 7961, 79611G (2011)

Tsujino S, Paraliev M, Kirk E, Braun HH
Homogeneity improvement of field emission beam from metallic nano-tip arrays by noble-gas conditioning
APPLIED PHYSICS LETTERS 99, 073101 (2011)

Tsujino S, Paraliev M, Kirk E, Gough C, Ivkovic S, Braun HH
Sub-nanosecond switching and acceleration to relativistic energies of field emission electron bunches from metallic nano-tips
PHYSICS OF PLASMAS 18, 064502 (2011)

Tsujino S, Paraliev M, Kirk E, Vogel T, Le Pimpec F, Gough C, Ivkovic S, Braun HH
Nanosecond pulsed field emission from single-gate metallic field emitter arrays fabricated by molding
JOURNAL OF VACUUM SCIENCE & TECHNOLOGY B 29, 02B117 (2011)

Urwyler P, Schift H, Gobrecht J, Hafeli O, Altana M, Battiston F, Muller B
Surface patterned polymer micro-cantilever arrays for sensing
SENSORS AND ACTUATORS A-PHYSICAL 172, 2 (2011)

Varea A, Menendez E, Montserrat J, Lora-Tamayo E, Weber A, Heyderman LJ, Deevi SC, Rao KV, Surinach S, Baro MD, Buchanan KS, Nogues J, Sort J
Tuneable magnetic patterning of paramagnetic Fe60Al40 (at. %) by consecutive ion irradiation through pre-lithographed shadow masks
JOURNAL OF APPLIED PHYSICS 109, 093918 (2011)

Vicente BC, Nelson RC, Singh J, Scott SL, van Bokhoven JA
Electronic structures of supported Pt and PtSn nanoparticles in the presence of adsorbates and during CO oxidation
CATALYSIS TODAY 160, 137 (2011)

Vila-Comamala J, Gorelick S, Guzenko VA, David C
3D Nanostructuring of Hydrogen Silsesquioxane Resist by 100 keV Electron Beam Lithography
JOURNAL OF VACUUM SCIENCE & TECHNOLOGY B 29, 06F301 (2011)

Wackerlin C, Iacovita C, Chylarecka D, Fesser P, Jung TA, Ballav N
Assembly of 2D ionic layers by reaction of alkali halides with the organic electrophile 7,7,8,8-tetracyano-p-quinodimethane (TCNQ)
CHEMICAL COMMUNICATIONS 47, 9146 (2011)

Wang HC, Sawhney K, Berujon S, Ziegler E, Rutishauser S, David C
X-ray wavefront characterization using a rotating shearing interferometer technique
OPTICS EXPRESS 19, 16550 (2011)

Watts B, Swaraj S, Nordlund D, Luning J, Ade H
Calibrated NEXAFS spectra of common conjugated polymers
JOURNAL OF CHEMICAL PHYSICS 134, 024702 (2011)

Weitkamp T, Zanette I, David C, Baruchel J, Bech M, Bernard P, Deyhle H, Donath T, Kenntner J, Lang S, Mohr J, Mueller B, Pfeiffer F, Reznikova E, Rutishauser S, Schulz G, Tapfer A, Valad JP
Recent developments in X-ray Talbot interferometry at ESRF-ID19
PROCEEDINGS OF THE SPIE - THE INTERNATIONAL SOCIETY FOR OPTICAL ENGINEERING 7804, 780406 (2011)

Weitkamp T, Zanette I, Schulz G, Bech M, Rutishauser S, Lang S, Donath T, Tapfer A, Deyhle H, Bernard P, Valade JP, Reznikova E, Kenntner J, Mohr J, Mueller B, Pfeiffer F, David C, Baruchel J
X-ray Grating Interferometry at ESRF: Applications and Recent Technical Developments
AIP CONFERENCE PROCEEDINGS 1365, 28 (2011)

Xiong G, Huang XJ, Leake S, Newton MC, Harder R, Robinson IK
Coherent x-ray diffraction imaging of ZnO nanostructures under confined illumination
NEW JOURNAL OF PHYSICS 13, 033006 (2011)

Zaharko O, Christensen NB, Cervellino A, Tsurkan V, Maljuk A, Stuhr U, Niedermayer C, Yokaichiya F, Argyriou DN, Boehm M, Loidl A
Spin liquid in a single crystal of the frustrated diamond lattice antiferromagnet CoAl2O4
PHYSICAL REVIEW B 84, 094403 (2011)

Zanette I, Rutishauser S, David C, Weitkamp T

X-ray Interferometry with Two-Dimensional Gratings
AIP CONFERENCE PROCEEDINGS 1365, 325 (2011)

Zanette I, Weitkamp T, Lang S, Langer M, Mohr J, David C, Baruchel J
Quantitative phase and absorption tomography with an X-ray grating interferometer and synchrotron radiation
PHYSICA STATUS SOLIDI A-APPLICATIONS AND MATERIALS SCIENCE 208, 2526 (2011)

BOOKS

P. Willmott
Introduction to Synchrotron Radiation – Techniques and Applications lithography, 1st edition, John Wiley and Sons, Chichester, United Kingdom, (2011), Hardcover, ISBN: 978-0-470-74579-3; Paperback, ISBN: ISBN: 978-0-470-74578-6; ePDF, ISBN: 978-1-119-97096-5; eBook, ISBN: 978-1-119-97095-8

DIPLOMAS

J. Althaus

- *Einfluss von mikrostrukturierten (linierten) PEEK- Substraten auf die Differenzierung von mesenchymalen Stammzellen aus dem Fettgewebe*
  BSc Thesis by Sabrina Burgener, FHNW School of Life Sciences, Muttenz 2011

J. Gobrecht

- *Analyse der Oberflächen von Silikon-Hydrogel Kontaktlinsen*
  BSc Thesis by Martin Breitenstein FHNW Systemtechnik, Windisch 2011

J. Gobrecht, H. Schift

- *Mikroperforiertes Fluidiksystem*
  BSc Thesis by Eugen Müller, FHNW Maschinenbau, Windisch 2011

H. Schift

- *Herstellung von Uhrenziffernblättern durch Abformung von Perlmutt*
  BSc Thesis by Marco Sirogna, FHNW Nanotechnology,Windisch 2011
- *Mikrostrukturierte Kunststoffmembranen für funktionelle Assays von Membranproteinen*
  BSc Thesis by Eugen Müller, FHNW Nanotechnology Windisch 2010/2011
- *Optimierung der Abformung dreidimensionaler Mikro- und Nanostrukturen im Nanoimprintprozess mittels Experiment und Simulation*
  MSc Thesis by Mirco Altana, FHNW Nanotechnology, University of Applied Sciences Vorarlberg, 2010/2011

P. Schneider, K. Mader

- *Strain mapping based on osteocyte lacunae shape and organization*
  J. Wolf, B.S. Physics, ETH Zurich, Switzerland, semester project. Spring 2011
- *Assessment of reproducibility and resolution dependency of SR CT measurements for ultrastructural bone morphometry, applied to a study of the ultrastructural bone development over time*
  F. Knab, B.S. Mechanical Engineering, ETH Zurich, Switzerland, undergraduate thesis. Spring 2011

H. Sigg

- *Free Standing, Highly strained Germanium structures for Lasing Application.*
  Master Thesis by G. Schiefler, ETHZ 2011

C. Padeste

- *Erzeugung metallischer Nanostrukturen auf gegrafteten Polyelektrolyt Brushes*
  BSc Thesis by Remo Maurer, FHNW Muttenz, School of Life Sciences 2011

T. Thüring

- *Application software for image segmentation of tomographic data from abdominal cavity*
  G. Toporek, Diploma Thesis, AGH University of Science and Technology

J.A. van Bokhoven

- *New C-C P-C coupling process based on Pd catalysts in the liquid phase*
  S. Rummelt, ETH Zurich, Switzerland, 15.09.2011

INVITED TALKS

P. Aebi, C. Monney
Possible exction condensation in 1T-TiSe2
CERF11 conference in Rostock, Germany, 12-14.09.2011

N. Ballav, C. Waeckerlin, D. Chylarecka, M. Stoehr, J. Lobo Checa, C. Iacovita, L. Gade, S. Decurtins, F. Diederich, T. A. Jung
Electronic and Spin States in Metal--Organic Supramolecular Ad-Layers at Surfaces
Washington State University, Surface Science, Washington, USA, 08.11.2011

N. Ballav, C. Waeckerlin, D. Chylarecka, M. Stoehr, J. Lobo Checa, C. Iacovita, L. Gade, S. Decurtins, F. Diederich, T. A. Jung
Electronic and Spin States in Metal--Organic Supramolecular Layers at Surfaces
Simon Fraser University, Burnaby Britisch Columbia, CA, 09.11.2011

N. Ballav, C. Waeckerlin, D. Chylarecka, M. Stoehr, J. Lobo Checa, C. Iacovita, L. Gade, S. Decurtins, F. Diederich, T. A. Jung
Electronic and Spin States in Metal--Organic Supramolecular Surface Materials
IBM Almaden Research Center, Washington State University, Surface Science, Washington, USA, 14.11.2011

N. Ballav, C. Waeckerlin, D. Chylarecka, M. Stoehr, J. Lobo Checa, C. Iacovita, L. Gade, S. Decurtins, F. Diederich, T. A. Jung
Switching with Molecules at Surfaces: From Conformation to Spin
Molecular Foundry and Advanced Light Source, Lawrence Berkeley Laboratory, Berkeley CA, 17.11.2011

P. Beaud
Femtosecond X-Ray Diffraction in Solids
Assembly Meeting, NCCR MUST - Molecular Ultrafast Science and Technology, Lenk, Switzerland, 09–14.01.2011

C.N. Borca, D. Grolimund
Paint layers analysis by synchrotron based XRF and XRD
Swiss Institute for Art Research, Zürich, Switzerland, 02.2011

O. Bunk
Pixeldetektortechnologie an cSAXS: Von Konzeptstudien zum Dauerbetrieb
DECTRIS Klausur, Davos, Switzerland, 02-04.03.2011

O. Bunk
From proof-of-principle to daily operation: Pixel detector technology opens up new avenues in scanning imaging
13th International Workshop on Radiation Imaging Detectors iWoRiD, Zurich, Switzerland, 03-07.07.2011

O. Bunk
Multimodal imaging: bright-field, phase contrast and dark-field imaging of tissue samples
Seminar at Diamond Light Source, United Kingdom, 30.09.2011

O. Bunk
Multimodal Imaging: Phase Contrast and Dark Field in Scanning Probe Microscopy
Seventeenth Users' Meeting & Workshop at the National Synchrotron Radiation Research Center, Hsinchu, Taiwan, 19-21.10.2011

A. Cervellino
Debye function analysis on disordered metal-organic compounds: the pathfinder [Ru(CO)4]n
IUCr2011 - XXII Congress and General Assembly of the International Union of Crystallography conference, Madrid, Spain, 22-30.08.2011

A. Cervellino
The Debye function and disorder in crystals
ADD2011 - Analysis of Diffraction Data in Real Space workshop, Institute Laue-Langevin, Grenoble, France, 11-14.10.2011

C. David
Diffractive X-Ray Optics for Imaging and Metrology Applications
Technical University of Munich, Germany, 03.02.2011

C. David
Diffractive optics for hard X-FEL radiation
3rd IRUVX-PP Annual Meeting, Helmholtz-Zentrum, Berlin, Germany, 22.03.2011

C. David
Diffractive x-ray optics for imaging and metrology applications
Diamond Light Source, Didcot, UK, 04.06.2011

C. David
Diffractive optics for imaging and metrology on x-ray tubes, synchrotrons, and free-electron lasers
Synchrotron Soleil, Gif-sur-Yvette, France, 05.10.2011

C. David
X-ray Imaging with High Aspect Ratio Diffractive Optics
ANKA & KMNF Users Meeting, Karlsruhe, Germany, 14.10.2011

C. David
Diffractive optics for imaging on x-ray tubes, synchrotrons, and free-electron lasers
Academy of Sciences, Prague, Czechia, 27.10.2011

C. David
Diffractive optics for imaging on x-ray tubes, synchrotrons, and free-electron lasers
Royal Institute of Technology, Stockholm, Sweden, 22.11.2011

C. David
Diffractive optics for imaging on x-ray tubes, synchrotrons, and free-electron lasers
University of Göttingen, Germany, 09.12.2011

H. Dil
A photoemission experimentalist's view on topological insulators
Edgar Lüscher Seminar, Klosters, Switzerland, 16.01.2011

H. Dil
Spin- and angle-resolved photoemission on three-dimensional topological insulators
Institute for theoretical solid state physics, IFW, Dresden, Germany, 04.04.2011

H. Dil
Spin- and angle-resolved photoemission on three-dimensional topological insulators
MaNEP Topical Meeting on Topological Properties of Electronic Materials, Geneva, Switzerland, 16.05.2011

H. Dil
Spin-resolved ARPES on systems with strong spin-orbit interaction
Quantum many body phenomena in the solid state seminar, University of Würzburg, Germany, 26.05.2011

H. Dil
Spin texture manipulation in systems with large spin-obit interaction
Condensed matter seminar, Princeton university, Princeton, USA, 28.07.2011

H. Dil
Towards spin structure manipulation in 3D topological insulators
28th European conference on surface science, Wroclaw, Poland, 30.08.2011

H. Dil
Spin- and angle-resolved photoemission on 3D topological insulators
European materials research society fall meeting, Warsaw, Poland, 20.09.2011

H. Dil
Spin-resolved ARPES on 3D topological insulators and thin films
PSI-IOP (China) Joint Workshop on Studies of Novel Materials using Large Facilities, Beijing, China, 20.10.2011

H. Dil
Spin-resolved ARPES on thin films and 3D topological insulators
Xingjiang Zhou group seminar IOP, Beijing, China, 24.10.201

J. Dreiser, K. S. Pedersen, C. Piamonteze, S. Rusponi, Z. Salman, Md. E. Ali, M. Schau-Magnussen, C. Aa. Thuesen, S. Piligkos, H. Weihe, H. Mutka, O. Waldmann, P. M. Oppeneer, J. Bendix, F. Nolting, H. Brune
Magnetic exchange coupling in 3d-4f molecular nanomagnets investigated by X-ray magnetic circular dichroism
Annual Meeting of the Danish Chemical Society, Odense, Denmark, 09.06.2011

Y. Ekinci
EUV interference lithography and its plasmonic applications
Photonik ’11, Ankara, Turkey, 23.09.2011

Y. Ekinci
EUV interference lithography for high resolution nanostuctures
Anadolu University, Eskisehir, Turkey, 26.09.2011

Y. Ekinci
EUV interference lithography and plasmonic nanostructures for ultrasensitive biosensing
Fatih University, Istanbul, Turkey, 28.09.2011

Y. Ekinci
EUV interference lithography at Paul Scherrer Instittute
Shanghai Synchrotron Radiation Facility, Shanghai, China, 20.04.2011

M.C. Falub, M. Radovic, E. Razzoli, J. Krempasky, K. Hricovini, M. Shi, L. Patthey
Fermi Surface Topology of $La_{2/3}Sr_{1/3}MnO_3/SrTiO_3$ films
Spectroscopy workshop of Novel Materials, Beatenberg, Switzerland, 03-07.03.2011

J.L. Fife, F. Marone, R. Mokso, M. Stampanoni
Structures and dynamics of complex materials systems unveiled by synchrotron-based tomographic microscopy
High Resolution Non-Invasive Damage Diagnostics & Predictive Modeling Workshop-II, Oxfordshire, UK, 08-10.03.2011

J.L. Fife, S.C. Irvine, R. Mokso, F. Marone, M. Rappaz, M. Stampanoni
In-Situ Investigations of Materials Using Ultra-Fast X-Ray Tomographic Microscopy and Laser Heating
Joint User Meeting at PSI 2011, Villigen, Switzerland, 15-16.09.2011

P. Friedli
Broadband Gain and Loss Characterisation of Quantum Cascade Laser based on Quantum Wells and Dashes using Synchrotron Infrared Radiation
Joint Annual Meeting of the Swiss and Austrian Physical Society, Lausanne. Switzerland, 2011

M. R. Fuchs
Combining on-axis Raman, fluorescence and UV/Vis micro-spectroscopy with Macromolecular Crystallography at the Swiss Light Source
HZB-BESSY II Berlin, Deutschland, 30.11.2011

J. Gobrecht
Micro- und Nanofabrikationstechnologien für Life Sciences und andere Anwendungen
Forschungsseminar at the Fachhochschule Nordwetsschweiz, Hochschule für Life Sciences, Muttenz, Switzerland, 24.10.2011

J. Gobrecht
Herstellungstechnologien für mikro- und nanostrukturierte Oberlächen in der Medizintechnik
Medical Cluster, PSI, Villigen Switzerland, 09.11.2011

J. Gobrecht
Research and Applications of Nano Polymers at INKA, FHNW & PSI
i-net Nano Event at Adolphe Merkle Institut, Marly, Switzerland, 22.11.2011

F. Gozzo
The Swiss Light Source Materials Science beamline powder station: state of the art and X+n pilot project at the *AIC Itinerant Working Day: the Large Facilities* workshop
Politecnico of Milan, Italy, 24.06.2011

D. Grolimund, C.N. Borca, H.A.O. Wang, L. van Loon, F. Marone, N. Diaz, A. Jakob, S. Churakov, T. Gimmi, S. Hartmann, P. Vontobel
Imaging Chemistry (and Physics) in Space and Time: Towards a 3D Live View on Contaminant Transport in Heterogeneous Porous Media
Invited Keynote Lecture, Migration 2011 (International Conference on Chemistry and Migration Behavior of Actinides and Fission Products in the Geosphere), Beijing, China, 09.2011

D. Grolimund, C.N. Borca, H.A.O.Wang
Cs Migration in Opalinus Clay Rock: Results from X-Ray Tomography and Neutron Radiography
Invited Keynote lecture, NEA Clay Club 2011, Karlsruhe, Germany, 09.2011

D. Grolimund, C.N. Borca, H.A.O.Wang
Imaging Chemistry in Space and Time
Keynote lecture, ANAKON 2011, Zürich, Switzerland, 03.2011

M. Guizar-Sicairos
X-Ray coherent diffractive imaging using extended references: Holography beyond the point source
24th Meeting of the Japanese Society for Synchrotron Radiation Research, Tsukuba, Japan, 01.2011

M. Guizar-Sicairos, A. Diaz, A. Menzel, O. Bunk
Methods and applications of x-ray phase nanotomography
Frontiers in Optics 2011/Laser Science XXV, paper FME1, California, USA, 10.2011

L. Heyderman
Emergent magnetic monopoles and associated Dirac strings in artificial kagome spin ice
Deutsche Physikalische Gesellschaft Spring Meeting, Dresden, Germany, 13-18.03.2011

L. Heyderman
Magnetic nanostructures: from the physics of frustration to data storage applications
School of Physics, University of Bristol, UK, 20.06.2011

L. Heyderman
Emergent Magnetic Monopoles and Associated Dirac Strings in Artificial Kagome Spin Ice
Gordon Conference on X-ray Science, Waterville, Maine, USA, 07-12.08.2011

L. Heyderman
Magnetic nanostructures: from the physics of frustration to data storage applications
Department of Materials Science, MIT, Boston, USA, 15.08.2011

L. Heyderman
Magnetic nanostructures: from the physics of frustration to data storage applications
Center for Nanoscale Materials Colloquium, Argonne National Laboratories, USA, 17.08.2011

L. Heyderman
Magnetic nanostructures: from the physics of frustration to data storage applications
University of California, San Diego, USA, 22.08.2011

L. Heyderman
Emergent magnetic monopoles and associated Dirac strings in artifcial kagome spin ice
SPIE Meeting, San Diego, USA, 21-24.08.2011

L. Heyderman
Frustration and emergent magnetic monopoles in artificial kagome spin ice
Diamond Light Source User Meeting, Diamond, UK, 07-08.09.2011

L. Heyderman
Frustration and Emergent Magnetic Monopoles in Artificial Kagome Spin Ice
Royal Society Meeting on Emergent magnetic monopoles in frustrated magnetic systems, Chicheley Hall, Buckinghamshire, UK, 17-18.10.2011

L. Heyderman
Artificial Ferroic Systems
Minisymposium on Magnetic Materials, Department of Materials, ETHZ, Zürich, Switzerland, 02.12.2011

T. Ikonen
Molecular architecure of the spire-acting nucleaus and its implicationfor actin filament assembly
SLS Seminar, PSI, Villigen, Switzerland, 12.10.2011

G. Ingold
Non-equilibrium dynamics studied by femtosecond laser-pump / x-ray probe diffraction
Cheiron School 2011, the 5th AOFSRR School, Spring-8, Japan, 26.09.-05.10.2011

G. Ingold
Probing non-equilibrium first order phase transitions of long-range order with resonant and non-resonant sub-picosecond x-ray diffraction
European XFEL, Hamburg, Germany, 18.11.2011

S. L. Johnson
Femtoseond dynamics of symmetry changes in superlattice structures
PIPT4, Wrocław, Poland, 28.06.-02.07.2011

S. L. Johnson
Coherence and squeezing in femtosecond lattice dynamics
Workshop on quantum effects on ultrashort time scales, Leysin, Switzerland, 19-21.05.2011

S. L. Johnson
Ultrafast dynamics and symmetry in solids
Seminar, University of Konstanz, Germany, 07.07.2011

L. Le Guyader
Laser induced magnetization switching in engineered materials
Magnetization dynamics in the light of pulsed X-ray sources: From storage rings to X-FELs, Synchrotron SOLEIL, France, 28-29.06.2011

L. Le Guyader
All-thermal magnetization reversal in GdFeCo nanostructures
Moscow International Symposium on Magnetism, Lomonosov Moscow State University, Moscow, Russia, 08.2011

K. Mader
Automated, High-Throughput Assessment of Morphology in Dynamic Foam and Bone Systems
IUTAM Symposium: Mechanics of Liquid and Solid Foams; Austin, TX, USA, 09-13.05.2011

K. Mader
Genetic Studies on Bone using Synchrotron-based Tomography
SLS Symposium: X-Ray Imaging in Medicine; Villigen, Switzerland, 08.11.2011

S. O. Mariager
Structural response of a magnetic phase transition in FeRh
Seminar, University of Regensburg, Germany, 03.02.2011

F. Marone
Optimized data processing pipeline for X-ray tomographic microscopy at TOMCAT
ESRF Seminar, Grenoble, France, 27.04.2011

A. Menzel
Coherent Diffractive Tomography. A practitioner's view
COSMIC @ ALS, Lawarence Berkeley National Laboratory, Berkeley, USA, 02.08.2011

C. J. Milne
Ultrafast time-resolved x-ray absorption spectroscopy: Watching atoms dance
Physical Chemistry Seminar, University of Basel, Switzerland, 10.01.2011

C. J. Milne
High repetition rate ultrafast time-resolved x-ray absorption spectroscopy
XFEL seminar, European XFEL, Hamburg, Germany, 01.07.2011

C. J. Milne
High repetition rate ultrafast time-resolved x-ray absorption spectroscopy
International Conference on Chemical Kinetics, Boston MA, USA, 10-14.07.2011

C. J. Milne
High repetition rate ultrafast time-resolved x-ray absorption spectroscopy
Advanced Photon Source, Argonne National Laboratory, Lemont IL, USA, 15.07.2011

C. J. Milne
Ultrafast x-ray absorption spectroscopy: Probing electronic and structural dynamics
Americal Chemical Society Conference, Denver CO, USA, 28.08.-01.09.2011

R. Mokso
New perspectives for the study of dynamic processes in 3D with X-ray microtomography
EMPA seminar, Dubendorf, Switzerland, 19.05.2011

R. Mokso, C. Wouters, S Irvine, F. Marone, M. Stampanoni
New perspectives for the observation of complex systems in 3D with sub-second X-ray microtomography
INTERPORE2011, Bordeaux, France, 29-31.03.2011

R. Mokso
Recent advances in fast 4D imaging of complex systems
IFP Energies Nouvelles seminar, Paris, France, 26.08.2011

C. Monney, V. Bisogni, K.J. Zhou, R. Kraus, V. Strocov, J. Malek, S.-L. Drechsler, J. van den Brink, J. Geck, T. Schmitt
Probing the local magnetic structure of quasi-1D cuprates with RIXS
JUMP meeting at PSI, RIXS workshop, Switzerland, 16-17.09.11

C. Monney
Possible exciton condensation in 1T-TiSe2
Fritz-Haber Institut, Berlin, Germany, 09.12.2011

M. Nachtegaal
From modulation to oscillation: Identifying structural changes in catalysts with sub-second XAS
Brookhaven National Laboratory, Shirley, USA, 11.04.2011

M.Nachtegaal
SuperXAS beamline
Directorate National Synchrotron Light Source II, Shirley, USA, 11.04.2011

M. Nachtegaal
From modulation to oscillation: Identifying structural changes in catalysts with sub-second XAS
Joint IOP-PSI workshop, Beijing, China, 20-21.10.2011

M.Nachtegaal
SuperXAS beamline
Shanghai Synchrotron Radiation Facility, Shanghai, China, 24.10.2011

F. Nolting
A close look at magnetic nanoparticles and multilayers with spectromicroscopy
Workshop Nanoscience in the Snow 2011, Les Diablerets, Switzerland, 19-21.01.2011

F. Nolting
Twisting Magnetic Nanoparticles and Kicking Ferromagnets Studied with X-ray Spectromicroscopy
Physikalisches Kolloquium TU Kaiserslautern, Germany, 23.05.2011

F. Nolting
Studying Single Magnetic Nanoparticles and Multilayers with PEEM
Novel trends in optics and magnetism of nanostructures, Augustow, Polen, 03-06.06.2011

F. Nolting
A close look at magnetic multilayers and nanomagnets with X-ray microscopy
Colloquium SFB668, Hamburg, Germany, 12.07.2011

V. Olieric
Macromolecular Crystallography at the Swiss Light Source
Advanced Light Source, Berkeley, USA, 27.10.2011

C. Padeste
Functionalization of polymer surfaces with nanostructured polymer brushes.
Graduiertenkolleg "Biointerface", DWI/RWTH Aachen, Germany, 04.11.2011

B. Päivänranta, A. Langner, E. Kirk, B. Terhalle, C. David, J. Gobrecht, Y. Ekinci
High resolution periodic and quasiperiodic patterning using EUV interference lithography
Micro- and Nano-Engineering Conference, Berlin, Germany, 22.09.2011

L. Patthey
Angle-resolved Photoemission on thin films: New perspectives on tailored HTCS systems
Université de Fribourg, Switzerland, 14.01.2011

L. Patthey
Time Scale Hierarchy in Stripe Phase Nickelates
Spectroscopy Workshop on Novel Materials, Beatenberg, Switzerland, 03-07.03.2011

L. Patthey
Ultrafast dynamics of charge-spin ordering in correlated electron systems (Time resolved Resonant X-ray Scattering with X-FEL)
3rd IRUVX-PP Annual Meeting, EuroFEL, Berlin, Germany, 21-23.03.20011

L. Patthey
A time-resolved, resonant soft x-ray scattering spectroscopy experiment at the LCLS: Time scale hierarchy in stripe-phase nickelates
JUM@P'11, Paul Scherrer Institut, Switzerland, 15-17.09.2011

L. Patthey
SwissFEL project
Swiss-Taiwanese Workshop: Ultra-high Resolution Resonant Soft X-ray Spectroscopy, Paul Scherrer Institut, Villigen, Switzerland, 12-14.09.2011

L. Patthey
SwissFEL project
IOP – PSI Joint Workshop on Studies of Novel Materials using Large Facilities, Beijing, China, 19-21.10.2011

L. Patthey
SwissFEL photonics
Workshops on Hard X-Ray Instrumentation at the SwissFEL, University of Bern, Switzerland, 11.11.2011

S. Pauli, P. Willmott, S. Leake, C. Schlepütz, M. Björck, D. Martoccia, C. Schneider, J. Mannhart, S. Paetel
Buckling under tension: $LaAlO_3$ on $SrTiO_3$
1st Swiss-Swedish Workshop on Quantum Materials and Devices, Les Diablerets, Switzerland, 08.01.2011

S. Pauli, P. Willmott, S. Leake, C. Schlepütz, M. Björck, D. Martoccia, C. Schneider, J. Mannhart, S. Paetel
Buckling under tension: $LaAlO_3$ on $SrTiO_3$
3S'11, 11th International Symposium on Surface Science, Baquiera-Beret, Spain, 08.03.2011

S. Pauli, C. Cancellieri, M. Schmitt, K. Pomjakushina, M. Medarde, S. Leake, C. Schneider, J. Mannhart, D. Li, S. Gariglio, P. Ghosez, D. Fontaine, J-M. Triscone, P. Willmott
Mounting evidence for electronic reconstruction in $LaAlO_3$ on $SrTiO_3$
2nd Swiss-Swedish Workshop on Quantum Materials and Devices, Stenungsbaden, Sweden, 28.09.2011

S. Pauli, C. Cancellieri, M. Schmitt, K. Pomjakushina, M. Medarde, S. Leake, C. Schneider, J. Mannhart, D. Li, S. Gariglio, P. Ghosez, D. Fontaine, J-M. Triscone, P. Willmott
Mounting evidence for electronic reconstruction in $LaAlO_3$ on $SrTiO_3$
WOE18, 18th Workshop on Oxide Electronics, Napa Valley, California, 28.09.2011

C. Piamonteze
Measuring magneto-electric multipole in GaFeO3 with x-ray resonant Bragg diffraction
Institut de Physique et Chimie des Matériaux de Strasbourg, Strasbourg, France, 25.01.2011

B. R. Pinzer
Phase contrast imaging at the TOMCAT beamline
Seminar in the Vision Lab, Department of Physics, University of Antwerp, 13.04.2011

B. R. Pinzer, M. Cacquevel
The TOMCAT X-ray grating interferometer for biomedical imaging: Revealing the details of Alzheimer's Disease
JUM@P'11: Second Joint Users' Meeting @ PSI, Villigen Switzerland, 15-16.09.2011

B. R. Pinzer, M. Schneebeli
Of ice, air, and liquid solution: Pilot study on nondestructive X-ray imaging of ice cream microstructure
Workshop Nucleation and Crystal Growth, Nestle Research Center, Lausanne, Switzerland 09.11.2011

C. Quitmann
Making the invisible visible – modern methods of x-ray physics
Advanced Materials and Surfaces Day, Empa Akademie, 31.03.2011

C. Quitmann
Seeing and Feeling Matter on the Nano-Scale
Colloquium, Synchrotron Soleil, 07.02.2011

C. Quitmann
Dynamics of mesoscopic magnetic systems
TEAM Workshop, Zakopane, Poland, 12-16.04.2011

J. Raabe
X-ray Spectromicroscopy techniques
SOLEIL Synchrotron School on X-ray Microscopy (SOLEMIO), 02-06.05.2011

J. Raabe
PolLux & NanoXAS - STXM & Beyond
HERMES beamline workshop, SOLEIL Synchrotron, 31.05.–01.06.2011

M. Radović
When Superconductivity Meets Magnetism: La1-xSrxMnO3 as a knob to tune superconductivity in YBa2Cu3O7-x
LPMS Université de Cergy-Pontoise rue d'Eragny, Neuville/Oise, France, 13.05.2011

M. Radović
Using La1-xSrxMnO3 as a knob to tune superconductivity in YBa2Cu3O7-x
CORPES11: International Workshop on Strong Correlations and Angle-Resolved Photo-emission Spectroscopy, Berkeley, California, US, 18-22.07.2011

M. Radović
When superconductivity meets magnetism: Study of the interface properties between La1-xSrxMnO3 and YBa2Cu3O7-x
Physikalisches Institut - Institutsseminar - Universität Tübingen, Germany, 14.10.2011

E. Razzoli, M. Kobayashi, V. N. Strocov, B. Delley, Z. Bukowski, J. Karpinski, N. C. Plumb, M. Radovic, J. Chang, T. Schmitt, J. Mesot, M. Shi
Electronic correlations in $LaRu_2P_2$ superconductor studied by ARPES
IOP-PSI Joint Workshop, Beijing, China, 2011

V. Scagnoli
Multiferroic Cupric Oxide: also a model system to explain high-T_c superconductivity?
Brookhaven National Laboratory, USA, 31.05.2011

V. Scagnoli
Magnetism and Synchrotron Radiation
13-th International Conference-School, ADVANCED MATERIALS AND TECHNOLOGIES, Palanga, Lithuania, 27-31.08.2011

V. Scagnoli
Multiferroic Cupric Oxide: also a model system to explain high-T_c superconductivity?
Workshop on “Experimental and theoretical studies of resonant X-ray scattering”, Diamond Light Source, UK, 07.09.2011

V. Scagnoli
Cupric Oxide: also a model system to explain high-T_c superconductivity?
Joint Users' Meeting at PSI 2011, Paul Scherrer Institut, Switzerland, 16.09.2011

H. Schift
Replication of hybrid 3-D structures using flexible polymer molds and roll-to-plate UV-nanoimprint lithography
MNE2011, 37th Int. Conference on Micro and Nanoengineering, Berlin, Germany,19-23.09.2011

H. Schift
Grayscale electron beam lithography and thermal reflow: How molecular weight dependent processing can be used to fabricate 3-D nanoimprint stamps
NNT2011, 10th Int. Conference on Nanoimprint and Nanoprint Technology, The Shilla Jeju, South Korea, 19-21.10.2011

T. Schmitt
Momentum Dependent Soft X-Ray RIXS on Low- Dimensional Cuprate Materials
Swiss-Swedish Meeting on "Quantum Materials and Devices", Les Diablerets, Switzerland, 07-09.01.2011

T. Schmitt
Momentum Dependent Soft X-Ray RIXS in Quasi One Dimensional Cuprate Materials
Satellite Workshop "New prospects for Resonant Inelastic soft X-ray Scattering" of the Soleil Users' Meeting 2011, Synchrotron Soleil, France, 17.01.2011

T. Schmitt
High Resolution Soft X-Ray RIXS in Quasi One-Dimensional Cuprates and Oxide Heterostructures
Seminar Series "Quantum many-body phenomena in the solid state", Universität Würzburg, Germany, 10.02.2011

T. Schmitt
RIXS at the ADRESS Beamline of the Swiss Light Source
Spectroscopy on Novel Materials Workshop, Beatenberg, Switzerland, 03.03.2011

T. Schmitt
High Resolution Soft X-Ray RIXS in Quasi One-Dimensional Cuprates and Oxide Heterostructures
Seminar at the Ångström Laboratory, Uppsala University, Sweden, 05.05.2011

T. Schmitt
General introduction to PhD thesis "Redox reactions in Li-ion battery cycling and Cu corrosion studied by soft X-ray spectroscopy" by Håkan Hollmark
Invited to be Opponent at a public PhD defence, Uppsala University, Sweden, 06.05.2011

T. Schmitt
Momentum Dependent Soft X-Ray RIXS at the ADRESS Beamline of the Swiss Light Source
2011 International Workshop on Resonant Inelastic X-ray Scattering (RIXS), Las Vegas, USA, 23–27.05.2011

T. Schmitt
High Resolution Soft X-Ray RIXS on $LaAlO_3/SrTiO_3$ and $YBa_2Cu_3O_{7-x}/La_{2/3}Sr_{1/3}MnO_3$ superlattices
University of Geneva, Geneva, Switzerland, 21.06.2011

T. Schmitt
High Resolution Soft X-Ray RIXS in Quasi One-Dimensional Cuprates and Oxide Hetero-structures
Brookhaven National Laboratory, Brookhaven, Upton NY, USA, 10.08.2011

T. Schmitt
Soft X-Ray RIXS at the Swiss Light Source: Probing the momentum dependence of low energy excitations in correlated transition metal oxides
RIXS Mini-Workshop, Shanghai Synchrotron Radiation Facility, Shanghai, China, 22.08.2011

T. Schmitt
Dispersive high-energy spin excitations in iron pnictide superconductors revealed by Resonant Inelastic X-ray Scattering
2nd Swiss-Swedish Meeting on Quantum Materials and Devices, Stenungsbaden, Sweden, 25-27.08.2011

T. Schmitt
Momentum Dependent Soft X-Ray RIXS at the ADRESS Beamline of the Swiss Light Source
International Exploratory Workshop: Swiss-Taiwanese Workshop: Ultra-high Resolution Resonant Soft X-ray Spectroscopy, Paul Scherrer Institut, Villigen PSI, Switzerland, 12-14.09.2011

T. Schmitt
Momentum Dependent Soft X-Ray RIXS at the ADRESS Beamline of the Swiss Light Source
IOP China – PSI Joint Workshop, Beijing, China, 21.10.2011

M. Shi
ARPES Studies of Electronic Excitations in Cuprate HTSC
QUANTUM PHENOMENA IN COMPLEX MATTER 2011 – STRIPES 11 conference, Rome, Italy, 10-16.07.2011

M. Shi
ARPES Studies of High-Temperature Superconductors
Swiss-Taiwanese Workshop: Ultra-high Resolution Resonant Soft X-ray Spectroscopy, Paul Scherrer Institut, Villigen, Switzerland, 12-14.09.2011

M. Shi
Synchrotron-based ARPES on High-Temperature Superconductors
IOP – PSI Joint Workshop on Studies of Novel Materials using Large Facilities, Beijing, China, 19-21.10.2011

M. Shi
ARPES on Cuprates and Fe-based Superconductors
Superconductivity and New Energy R & D Center, Southwest Jiaotong University, Chengdu, China, 31.10.2011

H. Sigg
Gain spectroscopy, from intersubband to interband, from InGaAs/AlInAs to Si/Ge
TU Wien, Austria, 14.01.2011

M. Stampanoni
Röntgenphasenkontrast: von der Nanoskala bis zum klinischen Einsatz
Innovationen im Röntgenbereich, CSEM Zürich, Switzerland, 26.05.2011

M. Stampanoni
Phasenkontrastverfahren für die Röntgenbildgebung
Medical Cluster Event, Paul Scherrer Institut, Villigen, Switzerland, 09.11.2011

M. Stampanoni
Sub-second tomographic microscopy at SLS
Advanced Photon Source Physics Seminar,, Argonne National Laboratory, Chicago, USA, 30.11.2011

M. Stampanoni
Phase-contrast X-ray imaging: from the nanoscale into the clinics
Advanced Light Source, Physics Seminar, Berkeley, USA, 05.11.2011

M. Stampanoni
Phase-contrast X-ray imaging: soon into the clinics?
Xradia, Pleasanton, CA, USA, 06.12.2011

M. Stampanoni
From the nanoscale into clinics: cutting-edge phase contrast X-ray imaging
Stanford Synchrotron Radiation Laboratory, Physics Seminar, Stanford, USA, 07.12.2011

U. Staub
Electronic ordering phenomena, a view from resonant x-ray diffraction
Workshop on Resonant Elastic X-ray Scattering in Condensed Matter, Aussois, France, 13-17.06.2011

U. Staub
Magneto-electric effects studied by x-rays
Moscow International Symposium on Magnetism, Moscow, Russia, 21-25.08.2011

U. Staub
Observation of orbital currents in CuO
Meeting on Quantum Materials and Devices, Stenungsbaden, Sweden, 25-27.08.2011

U. Staub
Ultrafast magnetic and structural phase transitions in transition metal oxides studied with X-rays
Workshop on X-ray View of Ultrafast Dynamics in Solids, BESSY, Germany, 29-30.11.2011

C. Stirnimann
Automated in Situ X-ray Diffraction Screening at the SLS
Special Session: Molecular Dimensions Seminar: In situ X-ray diffraction Screening, IUCr Congress, Madrid, Spain, 19-30.08.2011

M. Stoehr, J. Lobo Checa, C. Iacovita, L. Gade, S. Decurtins, F. Diederich, T. A. Jung
Supramolecular and Covalent Chemistry at Surfaces: Novel Surface Properties Arising from Molecular Mechanics, Electronics and Spin States
UC Davis, Chemistry Department, 18.11.2011

V.N. Strokov
Soft-X-Ray ARPES Facility at SLS: Instrumentation and First Results
VERITAS beamline workshop, KTH, Stockholm, 21.01.2011

V.N. Strokov
Basics of ARPES in 3-dimensional k-space
15th Hiroshima International Symposium on Synchrotron Radiation, Hiroshima, Japan, 3-4.03.2011

V.N. Strokov
Soft-X-Ray ARPES Facility at SLS: Instrumentation and First Results
SPRing-8, Harima, Japan, 07.03.2011

V.N. Strokov
Soft-X-Ray ARPES Facility at SLS: Instrumentation and Applications to 3-Dimensional Systems
University Zuerich, Zuerich, Switzerland, 11.05.2011

V.N. Strokov
Soft-X-Ray ARPES View of Three-Dimensional Electronic Structure
International Workshop on Strong Correlations and Angle-Resolved Photoemission Spectroscopy (CORPES-2011), Berkeley, USA, 18-22.07.2011

V.N. Strokov
Soft-X-Ray ARPES View of Three-Dimensional Electronic Structure
JUM@P'11: Second Joint Users' Meeting @ PSI, Villigen, Switzerland, 15-16.09.2011

V.N. Strokov
Soft-X-Ray ARPES View of Three-Dimensional Electronic Structure
Workshop "Modern Trends in Photoemission", ALS Users Meeting, Berkeley, USA, 03-05.10.2011

V.N. Strokov
High-resolution soft-X-ray beamline ADRESS at Swiss Light Source for resonant X-ray scattering and angle-resolved photoelectron spectroscopies
DREAMLINE Workshop, Shanghai Synchrotron Radiation Facility, Shanghai, China, 13-14.12.2011

S. Tsujino
Nano field emitter arrays at Paul Scherrer Institut: progress and challenges for high-brightness cathode applications
EuroFEL Workshop on Photocathodes for RF Guns, INFN of Lecce, Italy.01-02.03.2011

J.A. van Bokhoven
Shining light on catalysts,
Universidad Autonoma de Madrid, Spain

C. Wäckerlin, D. Chylarecka, A. Kleibert, K. Müller, C. Iacovita, F. Nolting, K. Tarafder, P. M. Oppeneer, T. A. Jung, N. Ballav
A chemical switch for molecular spins undergoing exchange coupling with magnetic substrate
Seminar in Physics Department, Uppsala, Sweden, 04.03.2011

C. Wäckerlin, D. Chylarecka, A. Kleibert, K. Müller, C. Iacovita, F. Nolting, T. A. Jung, N. Ballav
A chemical switch for molecular spins undergoing exchange coupling with magnetic substrate
DPG 2011, Dresden, Germany, 17.03.2011

C. Wäckerlin, D. Chylarecka, A. Kleibert, K. Müller, C. Iacovita, T. Haehlen, K. Landheer, F. Nolting, K. Tarafder, P. M. Oppeneer, T. A. Jung, N. Ballav
Controlling spins in adsorbed molecules by a chemical switch
Sonderforschungsbereich 668 – Seminar, Hamburg, Germany, 17.05.2011

C. Wäckerlin, D. Chylarecka, T. K. Kim, K. Müller, F. Nolting, A. Kleibert, N. Ballav, T. A. Jung
Self-Assembly and Superexchange Coupling of Magnetic Molecules on Metallic and Oxygen-Reconstructed Ferromagnetic Thin Films
MolCHSurf V, Bern, Switzerland, 10.06.2010

M. Wang
Phosphor-SAD: A Novel Approach to Solve RNA Structure
Workshop on Extended Wavelength X-ray Crystallography in 2011 APS User Meeting, Argonne, USA, 04.05.2011

M. Wang
Protein Crystallography and Beamlines at SLS
Insititute of Phathogen Biology, Chinese Academy of Medical Science & Peking Union Medical College, Beijing, China, 12.12.2011

B. Watts, C.R. McNeill, N. Pilet, J. Raabe
Scanning Transmission X-ray Spectro-Microscopy (STXM) of Organic Materials
CECAM workshop on X-ray Spectroscopy : Recent Advances in Modelling and New Challenges, CECAM-ETHZ, Zurich, Switzerland, 13.-15.07.2011

B. Watts, C.R. McNeill, N. Pilet, J. Raabe
Imaging Nanostructures in Organic Semiconductor Films with STXM
21st International Congress on X-Ray Optics and Microanalysis, Indiatuba, Sao Paolo Brazil, 03.-10.09.2011

B. Watts, C.R. McNeill, N. Pilet, J. Raabe
Imaging Nanostructures in Organic Semiconductor Films at the PolLux STXM
Workshop on soft x-ray characterization of organic devices and energy materials, 2011 Advanced Light Source users meeting, Berkeley, California U.S.A., 03-05.10.2011

I. Zanette, S. Rutishauser, M. Bech, J. Kenntner, C. David, J. Mohr, F. Pfeiffer, T. Weitkamp
High-sensitivity phase imaging and tomography with an X-ray grating interferometer
21st International Congress on X-Ray Optics and Microanalysis, Campinas, Brazil, 08.09.2011

K. J. Zhou
Localized vs. delocalized character of charge carriers in LaAlO3/SrTiO3 superlattices
National Synchrotron Radiation Research Center, Hsinchu, Taiwan, 01-02.08.2011

K. J. Zhou
Resonant Inelastic X-ray Scattering on iron-pnictide superconductors and YBCO/LSMO oxide heterostructures
Mini RIXS workshop, SSRF, Shanghai, 21-22.08.2011

K. J. Zhou
RIXS on LAO/STO and YBCO/LSMO oxide heterostructures
Bilateral SLS-NSRRC Taiwan Workshop, Villigen, Switzerland, 12-14.09.2011

ORAL PRESENTATIONS

E.M. Alayon, M. Nachtegaal, E. Kleymenov, J.A. van Bokhoven
Methane to methanol conversion on Cu-MOR
1st Swiss Heterogeneous Catalysis Meeting, Grindelwald, Switzerland,16-17.06.2011

E.M. Alayon, M. Nachtegaal, E. Kleymenov, J.A. van Bokhoven
Probing the active site during methane conversion over Cu-MOR with X-ray absorption spectroscopy
5th International FEZA Conference, Valencia, Spain, 03-07.07.2011

E.M. Alayon, M. Nachtegaal, E. Kleymenov, J.A. van Bokhoven
Probing the active site during methane conversion over Cu-MOR with X-ray absorption spectroscopy
Joint Users Meeting at PSI, Villigen, Switzerland, 15-16.09.2011

J. Althaus
Effects of plasma-treatment and nanostructuring of PEEK substrates on osteogenic differentiation of adipose tissue-derived stem cells
European Society for Biomaterials (ESB) 2011, Dublin, 04-09.09.2011

K. Bedner
Silicon on Insulator based Nanowire Field Effect Transistor Arrays for Sensing Applications
Conference on Micro and Nano Engineering 2011, Berlin, Germany, 21.09.2011

C.N. Borca, A. Idhil, A. Uldry, N. Zema, S. Turchini, D. Catone, A. Foelske, D. Grolimund, M. Samaras
The influence of Cr-composition on the local atomic and magnetic structure of FeCr alloys
EMRS Spring Meeting, Nice, 05.2011

S. Borisova, J. C. Gerharz, Y. Ekinci, G. Mussler, D. Grützmacher
Growth of small-period Si/Ge quantum dot crystals by MBE
75. Jahrestagung der DPG, Dresden, Germany, 13-18.03.2011

C. Cancellieri, D. Fontaine, S. Gariglio, N. Reyren, A.D. Caviglia, A. Fete, S.J. Leake, P.R. Willmott, M. Stengel, Ph. Ghosez, J.-M. Triscone
Electrostriction in $LaAlO_3$/$SrTiO_3$ heterostructures
Oxide Workshop, Olbia, Italy, 26-28.05 2011

C. Cancellieri, D. Fontaine, S. Gariglio, N. Reyren, A.D. Caviglia, A. Fete, S.J. Leake, P.R. Willmott, M. Stengel, Ph. Ghosez, and J.-M. Triscone
Electrostriction at the $LaAlO_3$/$SrTiO_3$ interface
Swiss Physical Society Meeting, Lausanne, Switzerland, 15-17.06.2011

A. Caviezel, P. Beaud, S. Johnson, E. Vorobeva, U. Staub, R. De Souza 1, S. Mariager, C. Milne, G. Ingold, M. Garganourakis, Q. X. Jia
Photoinduced non-thermal phase transition in manganites
Joint Annual Meeting of the Swiss Physical Society and Austrian Physical Society with Swiss and Austrian Societies for Astronomy and Astrophysics, EPFL, Lausanne, Switzerland, 15-17.06.2011

R. V. Chopdekar, V.K. Malik, A. Fraile Rodríguez, L. Le Guyader, A. Scholl, Y. Takamura, F. Nolting, C. Bernhard, L. J. Heyderman
Strain-driven Anisotropy in Multiferroic Composites Observed with Soft X-ray Techniques
2011 Swiss Physical Society Meeting, Lausanne, Switzerland, 15-17.06.2011

R. V. Chopdekar, V.K. Malik, A. Fraile Rodríguez, L. Le Guyader, A. Scholl, Y. Takamura, F. Nolting, C. Bernhard, L. J. Heyderman
Strain-driven Anisotropy in Multiferroic Composites Observed with Soft X-ray Techniques
2011 Magnetism and Magnetic Materials Conference, Scottsdale, AZ, USA, 30.10.-03.11.2011

D. Chylarecka, C. Waeckerlin, C. Iacovita, P. Fesser, T. A. Jung, N. Ballav
Assembly of 2D ionic layers by reaction of alkali halides with the organic electrophile 7,7,8,8-tetracyano-p-quinodimethane (TCNQ)
European Conference on Surface Science ECOSS-28, Wroclaw, Poland, 28.08.-02.09.2011

M.E. Collinson, S.Y. Smith, S.R. Manchester, V. Wilde, L.E. Howard, F. Marone, J.L. Fife, M. Stampanoni
The Value of X-Ray Approaches in the Study of the Messel Fruit and Seed Flora
The 22nd International Senckenberg Conference, Frankfurt, Germany, 15-19.11.2011

C. David
Design of Nanolithography Facilities within NFFA-RI Centres
NFFA Scientific Panel & Advisory Council Meeting, Trieste, Italy, 18.01.2011

C. David
Diffractive optics for hard X-FEL radiation
SPIE Conference on Advances in X-Ray Free-Electron Lasers, Prague, Czechia, 21.04.2011

A. Diaz, P. Trtik, M. Guizar-Sicairos, B. Muench, A. Menzel, O. Bunk
Quantitative X-Ray Phase Nanotomography: Applications in Materials Science
MRS Fall Meeting *2011*, Boston, USA, 28.11.-02.12.2011

H. Dil
Spin structure manipulation in quantum well states and topological insulators
Spring meeting of the DPG, Dresden, Germany, 17.03.2011

H. Dil, G. Landolt, B. Slomski, E. Chulkov, J. Osterwalder
Spin structure manipulation in three dimensional topological insulators
The new generation in strongly correlated electron systems, Santiago de Compostella, Spain, 07.07.2011

H. Dil, G. Landolt, B. Slomski, E. Chulkov, J. Osterwalder
Spin structure manipulation in three dimensional topological insulators
11th International Conference on Atomically Controlled Surfaces, Interfaces and Nanostructures, St. Petersburg, Russia, 07.10.2011

J. Dreiser, K. S. Pedersen, J. Nehrkorn, A. Schnegg, K. Holldack, M. Schau-Magnussen, P. Tregenna-Piggott, H. Mutka, H. Weihe, J. Bendix, O. Waldmann
THz - EPR on cyanide-bridged single-molecule magnets: First results
Annual meeting of the German Physical Society, Dresden, Germany, 13-18.03.2011

J. Dreiser, C. Piamonteze, F. Nolting, S. Rusponi, H. Brune, K. S. Pedersen, J. Bendix, H. Weihe
3d-4f molecular nanomagnets investigated by X-ray magnetic circular dichroism
Annual meeting of the German Physical Society, Dresden, Germany, 13-18.03.2011

J. Dreiser, C. Piamonteze, S. Rusponi, K. S. Pedersen, O. Waldmann, H. Weihe, J. Bendix, F. Nolting, H. Brune
3d-4f molecular nanomagnets investigated by X-ray magnetic circular dichroism
Annual meeting of the Swiss Physical Society, Lausanne, Switzerland, 15-17.06.2011

J. Dreiser
X-ray magnetic circular dichroism on molecular nanomagnets. What can we learn?
Schauinsland Workshop III, Nanomagnetismus, Feldberg, Germany, 10-12.10.2011

S. El Moussaoui
Magnetization reversal in GdFeCo nanostructures with ultrafast heat pulses
Novel trends in optics and magnetism of nanostructures, Augustow, Polen, 03-06.06.2011

M.C. Falub, M. Radovic, M. Shi, E. Razzoli, J. Krempasky, N. Plumb, K. Hricovini and L. Patthey
Electronic structure and Fermi surface topology of LSMO films versus in-plane strain
Joint Annual Meeting of Swiss Physical Society and Austrian Physical Society, EPF Lausanne, Switzerland, 15-17.05.2011

M.C. Falub, M. Radovic, N. Plumb, E. Razzoli, M. Shi, J. Krempasky, K. Hricovini and L. Patthey
In-situ ARPES study of $La_{2/3}Sr_{1/3}MnO_3/SrTiO_3$ thin films: Fermi Surface Topology
Joint Users' Meeting at PSI, JUMP@11, Paul Scherrer Institut, Villigen, Switzerland, 15-16.09.2011

J.L. Fife, S.C. Irvine, R. Mokso, F. Marone, M. Rappaz, M. Stampanoni
In-Situ Investigations of Materials Using Ultra-Fast X-Ray Tomographic Microscopy and Laser Heating
Materials Research Society Fall Meeting, Boston, MA, 28.11.-2.12.2011

M. R. Fuchs
D3 - das neue Diffraktometer für die Proteinkristallographie (PX) Strahllinien der SLS
AMI Maschinenbau-Kolloquium, Paul Scherrer Institut, Villigen, Switzerland, 20.05.2011

R. Giannini, Y. Ekinci, J. F. Löffler
Experimental observation of decoupled plasmon resonances in metallic nanoparticles
75. Jahrestagung der DPG, Dresden, Germany, 13-18.03.2011

R. Giannini, Y. Ekinci, C. Hafner, J. F. Löffler
Decoupled plasmon resonances in metallic nanoparticles
7th Workshop on Numerical Methods for Optical Nano Structures, Zurich, Switzerland, 04-06.07.2011

J. Girovsky, D. Chylarecka, T.K. Kim, K. Tarafder, K. Müller, K. Gödel, I. Czekaj, C. Wäckerlin, M. Cinchetti, M. E. Ali, C. Piamonteze, F. Schmitt, J. P. Wüstenberg, C. Ziegler, F. Nolting, M. Aeschlimann, P. M. Oppeneer, N. Ballav, T. A. Jung
Indirect magnetic coupling of manganese porphyrin to a ferromagnetic cobalt substrate
European Conference on Surface Science ECOSS-28, Wroclaw, Poland, 28.08.-02.09.2011

J. Gobrecht, H. Solak
Presentation of the Eulitha-Phable project to the jury of the
ZKB Pionierpreis 2011, Technopark Zürich, Switzerland, 01.03.2011

J. Gobrecht
Nanofabrication at PSI
Presentation within the nano-tera project meeting “Nanowire-sensors” at PSI, Villigen, Switzerland, 15.06.2011

J. Gobrecht
Nanotechnologie zwischen science fiction und Realität
Tag der offenen Tür, PSI, Villigen, Switzerland, 16.10.2011

J. Gobrecht
Nanotechnologie – Anwendungen und Zukunftsperspektiven
Seniorenakademie Berlingen, Switzerland, 07.12.2011

D. Greiffenberg, J. Becker, P. Goettlicher, H. Graafsma, M. Gronewald, B. Henrich, H. Hirsemann, S. Jack, R. Klanner, H. Krueger, A. Marras, A. Mozzanica, B. Schmitt, X. Shi, U. Trunk, J. Zhang
The AGIPD Detector for the European XFEL
13th International Workshop on Radiation Imaging Detectors (iWoRID 2011), Zurich, Switzerland, 03-07.07.2011

M. Guizar-Sicairos, A. Diaz, A. Menzel, P. Trtik, O. Bunk
Phase tomography by coherent diffractive imaging: methods and applications
2011 SLS Symposia on Tomographic Microscopy, Paul Scherrer Institut, Villigen PSI, Switzerland, 05.2011

M. Guizar-Sicairos, A. Diaz, A. Menzel, O. Bunk
X-ray phase nanotomography through ptychographic coherent lensless imaging
22nd Congress of the International Commission for Optics, Puebla, Mexico, 08.2011

V.A. Guzenko, N. Belić, C. Sambale, A.Schleunitz, C. David
Optimization of the 3D Proximity Effect Correction Algorithms for the Grayscale Electron Beam Lithography
Conference on Micro and Nano Engineering 2011, Berlin, Germany, 23.09.2011

T. Hählen, C. Vanoni, T.A. Jung, S. Tsujino
Molecular surface doping of organic field effect transistor with a few monolayer channel thickness
Joint Annual Meeting of SPS and ÖPG, Lausanne, Switzerland,15-17.06.2011

T. Hählen, C. Vanoni, T.A. Jung, S. Tsujino
Surface transfer doping in an organic field effect transistor with a few monolayer channel thickness
Molecular Electronics: From Organic Electronics to Single Molecules, EMPA, Lausanne, Switzerland, 17.06.2011

P. Helfenstein, K. Jefimovs, E. Kirk, C. Escher, H.-W. Fink, S. Tsujino
Aperture size dependent collimation in double gate field emitter arrays
24th International Vacuum Nanoelectronics Conference, Wuppertal, Germany, 18-22.07.2011

P. Helfenstein, K. Jefimovs, E. Kirk, C. Escher, H.-W. Fink, S. Tsujino
Double-gate field emitter arrays: aperture size dependence of electron beam collimation characteristics
Joint Annual Meeting of Swiss Physical Society, Austrian Physical Society, with Swiss and Austrian Societies for Astronomy and Astrophysics, EPF Lausanne, Switzerland, 15-17.06.2011

M. Hojeij, B. Oswald, A. Lieb, Y. Ekinci, J. Gobrecht
Design and Fabrication of Resonant Nanostructures for Fluorescence Enhancement or Field enhancement of nanostructured pillars: Calulations and applications
7th Workshop on Numerical Methods for Optical Nano Structures, Zurich, Switzerland 04-06.07.2011

S. C. Irvine, R. Mokso, F. Marone, M. Stampanoni
Faster and smaller: towards real-time tomographic microscopy at TOMCAT
European Congress and Exhibition on Advanced Materials and Processes EUROMAT2011, Montpellier, France, 12-15.09.2011

I. Johnson, A. Bergamaschi, R. Dinapoli, D. Greiffenberg, B. Henrich, D Maliakal, A. Mozzanica, V. Radicci, Ch Ruder, L. Schädler, B. Schmitt, X. Shi
EIGER: A *fast framing, large area pixel detector for X-ray applications*
2011 CMOS Emerging Technologies Workshop Whistler, BC Canada,15-17.06.2011

C. Kartusch, M. Makosch, J. Sá, J. A. van Bokhoven
In situ determination of the oxidation state of gold supported on ceria in the liquid phase hydrogenation of nitrobenzene
EuropaCat X, Glasgow, Scotland, 28.08.-02.09.2011

C. Kartusch, M. Makosch, J. Sá, K. Hungerbuehler, J. A. van Bokhoven
Dynamic structure of supported gold in liquid phase hydrogenation
SCS Fall Meeting, EPFL Lausanne, Lausanne, Switzerland, 09.09.2011

C. Kartusch, M. Makosch, J. Sá, J. A. van Bokhoven
The structure of ceria supported gold in liquid phase hydrogenation
14^{th} Austrian Chemistry Days, Linz, Austria, 26–29.09.2011

A. Kleibert, A. Balan, J. Bansmann, A. Fraile Rodriguez, F. Nolting
Size-dependent magnetization curves of individual iron nanoparticles at finite temperatures
Clustertreffen 2011, Burg Rothenfels, Germany, 25-30.09.2011

C.F.J. König, J.A. van Bokhoven, T. Schildhauer, M. Nachtegaal
Quantitative analysis of modulated-excitation X-ray absorption spectra
1^{st} Swiss Heterogeneous Catalysis Meeting, Grindelwald, Switzerland, 16-17.06.2011

G. Landolt, B. Slomski, E. Chulkov, J. Osterwalder, H. Dil
Spin structure of 3D topological insulators
Joint Annual Meeting of the SPS, ÖPG, SSAA and ÖGAA at, EPFL, Lausanne, Switzerland, 15.06.2011

G. Landolt, B. Slomski, J. Osterwalder, H. Dil
Spin structure of topological insulators in the ultra-thin film limit
E-MRS 2011 Fall Meeting, Warsaw, Poland, 21.09.2011

L. Le Guyader, A. Kleibert, L. Joly, R. Pisarev, A. Kirilyuk, F. Nolting, Th. Rasing, A. V. Kimel
Ultrafast heating above the spin reorientation phase transition in the Co/SmFeO3 heterostructure
Workshop on Ultrafast Dynamics in Strongly Correlated Systems, ETH Zürich, Switzerland, 04.2011

S.J. Leake, S.A. Pauli, M. Garcia-Fernandez, P. Aebi, M. Schmitt, P. Zubko, R. Scherwitzl, J-M. Triscone, P.R. Willmott
Structural studies of the metal-insulator transition in LaNiO3 thin films
Swiss Light Source Symposium, Paul Scherrer Institut, Villigen, Switzerland, 05.04.2011

S.J. Leake
Developments in Surface X-ray Diffraction and the potential for Coherent Diffractive Imaging at the Materials Science beamline
Swiss Light Source, Paul Scherrer Institut, Villigen, Switzerland, 07.10.2011

M. Makosch, J. A. van Bokhoven
Hydrogenation of nitrobenzene over Au/MeO_x catalysts - a matter of the support
1^{st} Swiss Catalysis Meeting, Grindelwald, 16-17.06.2011

S.O. Mariager, F. Pressacco, S. Johnson, P. Beaud, G. Ingold, C. Quitmann, A. Caviezel, E. Vorobeva, C. Milne, C. H. Back, R. Feidenhans'l
Lattice and magnetic dynamics of a laser induced phase transition in FeRH
International Workshop on Ultrafast Dynamics in Strongly Correlated Systems, ETHZ, Zürich, Switzerland, 04-07.04.2011

S. O. Mariager, F. Pressacco, S. Johnson, P. Beaud, G. Ingold, C. Quitmann, A. Caviezel, E. Vorobeva, C. Milne, C. H. Back, R. Feidenhans'l
Structural dynamics of a laser induced magnetic phase transition in FeRh
Swiss Physical Society - Joint Annual Meeting 2011, EPFL, Lausanne, Switzerland, 15.06.2011

R. Mokso, S. Irvine, F. Marone, M. Stampanoni
4D microtomographic imaging with sub-second temporal resolution with hard X-rays
Swiss Physical Society annual meeting, Lausanne, Switzerland, 15-17.06.2011

C. Monney, V. Bisogni, K.J. Zhou, R. Kraus, V. Strocov, J. Malek, S.-L. Drechsler, J. van den Brink, J. Geck, T. Schmitt
Probing the local magnetic structure of quasi-1D cuprates with RIXS
RIXS workshop, SUM meeting at Soleil synchrotron, France 17-18.01.11

C. Monney
ARPES on 1T-TiSe2
Presentation of the intermediary MANEP report on behalf of Prof. P. Aebi, Neuchâtel, Switzerland, 21.01.2011

C. Monney, V. Bisogni, K.J. Zhou, R. Kraus, V. Strocov, J. Malek, S.-L. Drechsler, J. van den Brink, J. Geck, T. Schmitt
Probing the local magnetic structure of quasi-1D cuprates with RIXS
Annual group workshop, Beatenberg, Switzerland, 03-07.03.11

C. Monney, V. Bisogni, K.J. Zhou, R. Kraus, V. Strocov, J. Malek, S.-L. Drechsler, J. van den Brink, J. Geck, T. Schmitt
RIXS on a prototype edge-sharing chain compound
DPG annual meeting, Dresden, Germany, 14-18.03.11

C. Monney, V. Bisogni, K.J. Zhou, R. Kraus, V. Strocov, J. Malek, S.-L. Drechsler, J. van den Brink, J. Geck, T. Schmitt
Probing the local magnetic structure of quasi-1D cuprates with RIXS
SPG annual meeting, EPFL, Lausanne, Switzerland, 15-17.06.11

C. Monney, V. Bisogni, K.J. Zhou, R. Kraus, V. Strocov, J. Malek, S.-L. Drechsler, J. van den Brink, J. Geck, T. Schmitt
Probing the local magnetic structure of quasi-1D cuprates with RIXS
NGSCES conference, Santiago de Compostella, Spain, 04-08.07.11

C. Monney, V. Bisogni, K.J. Zhou, R. Kraus, V. Strocov, J. Malek, S.-L. Drechsler, J. van den Brink, J. Geck, T. Schmitt
Probing the local magnetic structure of quasi-1D cuprates with RIXS
XRMS 2011 conference, SLAC, Stanford, California, USA, 22-23.10.11

A. Mozzanica, A. Bergamaschi, R. Dinapoli, H. Graafsma, D. Greiffenberg, B. Henrich, I. Johnson, M. Lohmann, D Maliakal, V. Radicci, Ch Ruder, L. Schädler, B. Schmitt, X. Shi
The GOTTHARD charge integrating readout detector: design and characterization
13th International Workshop on Radiation Imaging Detectors (iWoRID 2011), Zurich, Switzerland, 03-07.07.2011

A. Mustonen, P. Beaud, E. Kirk, T. Feurer, S. Tsujino
Laser induced field emission from metallic field emitters: near field enhancement of optical electric field at metallic nano-surfaces
24th International Vacuum Nanoelectronics Conference, Wuppertal, Germany, 18-22.07.2011

A. Mustonen, P. Beaud, E. Kirk, T. Feurer, S. Tsujino
Inducing electron emission from field emitter arrays by fs near infrared laser
Joint Annual Meeting of Swiss Physical Society, Austrian Physical Society, with Swiss and Austrian Societies for Astronomy and Astrophysics, EPF Lausanne, Swizerland, 15-17.06.2011

S. Neuhaus, N.D. Spencer, C. Padeste
Anisotropic wetting phenomena on polymer foils as a function of topography,
37th International Conference on Micro and Nano Engineering (MNE) Berlin, Germany, 19-23.09.2011

S. Neuhaus, N.D. Spencer, C. Padeste
Characterization of iron oxide nanoparticles created in a polymer brush matrix
European Polymer Congress 2011, Granada, Spain, 26.06.–01.07.2011

V. Olieric
Current status of automation at SLS MX beamlines
Biostruct-X New-Pin workshop, Hamburg, Germany, 06.12.2011

H. Özcelik, C. Padeste, V. Hasirci
Nuclei deformation and micropillar bending as a response to matrix rigidity
Annual Meeting of the European Chapter of the Tissue Engineering and Regenerative Medicine International Society (TERMIS 2011), Granada, Spain, 07-10.07.2011

S. Pauli, P. Willmott, S. Leake, C. Schneider, J. Mannhart, S. Paetel, C. Cancellieri, M. Schmitt
Buckling under tension: $LaAlO_3$ on $SrTiO_3$
MaNEP review meeting, University of Geneva, Switzerland, 30.05.2011

M.Paraliev, S.Tsujino, C.Gough, E.Kirk, S.Ivkovic
Sub-nanosecond Electron Emission from Electrically Gated Field Emitting Arrays
18th IEEE International Pulsed Power Conference, Chicago, United States, 19-23.06.2011

S. Peter, P. Modregger, M.K. Fix, P. Manser, M. Stampanoni
Simulation of Grating-based hard X-ray imaging using Monte Carlo methods
3 Ländertagung der ÖGMP, DGMP und SGSMP, Wien, Austria, 28.09.-01.10.2011

C. Piamonteze, J. Dreiser, U. Staub, Frithjof Nolting, S. Rusponi, H. Brune, A. Fraile Rodriguez, N. Terada
Studying the magnetic anisotropy in CuFeO2 by x-ray magnetic circular dichroism
Swiss Physical Society Meeting, EPF Lausanne, Switzerland 15-17.06.2011

B. R. Pinzer, M. Cacquevel, P. Modregger, S. A. McDonald, J. C. Bensadoun, T. Thuering, P. Aebischer, M. Stampanoni
Differential phase contrast imaging of Alzheimer-plaques in mouse brains
SLS symposium on X-ray imaging for medicine, 08.11.2011

L. Quaroni
Resolution of Single Chromophores in Dynamic Subcellular FTIR Spectra by 2D Correlation Analysis.
ICAVS6-2DCOS. Sonoma, USA, 06.2011

L. Quaroni
FTIR Spectromicroscopy Investigations of Preserved Tissue from Kwäday Dän Ts'ínchi
International Congress of Mummy Studies. University of San Diego, USA, 06.2011

V. Radicci, A. Bergamaschi, R. Dinapoli, D. Greiffenberg, B. Henrich, I. Johnson, D Maliakal, A. Mozzanica, Ch Ruder, L. Schädler, B. Schmitt, X. Shi
EIGER a new single photon counting detector for X Ray applications: performance of the chip
13th International Workshop on Radiation Imaging Detectors (iWoRID 2011), Zurich, Switzerland, 03-07.07.2011

V. Radicci, A. Bergamaschi, R. Dinapoli, D. Greiffenberg, B. Henrich, I. Johnson, D Maliakal, A. Mozzanica, Ch Ruder, L. Schädler, B. Schmitt, X. Shi
EIGER a new single photon counting detector for X Ray applications: performance of the chip
The 9th International Conference on Position Sensitive Detectors, Aberystwyth, 12-16.09.2011

M. Radović, E. Razzoli, Y. Sassa, M. Mansson, M. Shi, C. Monney, K. Zhou, T. Schmitt, J. Stahn, J. Mesot, L. Patthey
When Superconductivity meets Magnetism: ARPES studies on YBa2Cu3O7−x/La0.7Sr0.3MnO3 Heterostructures
Joint Annual Meeting of Swiss Physical Society and Austrian Physical Society, EPFL Lausanne, Switzerland, 15-17.06.2011

M. Radović
When Superconductivity meets Magnetism: ARPES and RIXS studies on YBa2Cu3O7−x/La0.7Sr0.3MnO3 heterostructures

Joined Workshop of Institute of Physic-Chinese Academy of Sciences and Paul Scherrer Institut, Bejin, China, 20-23.10.2011

M. Ranocchiari, M. Servalli, J. A. van Bokhoven
Fast and High Yield Post-synthetic modification of Metal-Organic Frameworks by vapor diffusion
1st Swiss Heterogeneous Catalysis Meeting, Grindelwald, Switzerland, 17.06.2011

M. Ranocchiari, M. Servalli, J. A. van Bokhoven
Fast and High Yield Post-synthetic modification of Metal-Organic Frameworks by vapor diffusion
XV International Symposium on Relations Between Homogeneous and Heterogeneous Catalysis – Berlin, Germany, 15.09.2011

M. Ranocchiari, J. A. van Bokhoven
Metal-Organic Frameworks: from Synthetic to Catalytic Challenges Towards Enzyme-Like catalysis
SYN Symposium at PSI – Villigen, Switzerland, 11.10.2011

E. Razzoli, M. Kobayashi, V.N. Strocov, B. Delley, Z. Bukowski, J. Karpinski, N.C. Plumb, M. Radovic, J. Chang, T. Schmitt, J. Mesot, M. Shi
Electronic structure of $LaRu_2P_2$ *probed by ARPES*
Swiss Physical Society Joint Annual Meeting, Lausanne, Switzerland, 15-17.06.2011

E. Razzoli, M. Kobayashi, V. N. Strocov, B. Delley, Z. Bukowski, J. Karpinski, N. C. Plumb, M. Radovic, J. Chang, T. Schmitt, J. Mesot, M. Shi
Electronic structure of $LaRu_2P_2$ *probed by ARPES*
Spectroscopy Workshop on Novel Materials 2011, Beatenberg, Switzerland

E. Razzoli, M. Kobayashi, V. N. Strocov, B. Delley, Z. Bukowski, J. Karpinski, N. C. Plumb, M. Radovic, J. Chang, T. Schmitt, J. Mesot, M. Shi
Electronic structure of LaRu2P2 probed by ARPES
SPS Joint Annual Meeting 2011, Lausanne

E. Razzoli, Y. Sassa, G. Drachuck, M. Månsson, A. Keren, M. Shay, M. H. Berntsen, O. Tjernberg, M. Radovic, J. Chang, S. Pailhès, N. Momono, M. Oda, M. Ido, O. J. Lipscombe, S. M. Hayden, L. Patthey, J. Mesot, M. Shi
The Fermi surface and band folding of $La_{2-x}Sr_xCuO_4$
Soleil users' Meeting 2011, Paris, France

E. Razzoli, Y. Sassa, G. Drachuck, M. Månsson, A. Keren, M. Shay, M. H. Berntsen, O. Tjernberg, M. Radovic, J. Chang, S. Pailhès, N. Momono, M. Oda, M. Ido, O. J. Lipscombe, S. M. Hayden, L. Patthey, J. Mesot, M. Shi
ARPES on High Temperature Superconductors
Swiss Light Source symposium, PSI 2011, Villigen,Switzerland

S. Rutishauser
Hard X-FEL source diagnostics at LCLS/XPP using a grating interferometer
SPIE Conference on Advances in X-Ray Free-Electron Lasers, Prague, Czechia, 21.04.2011

T. Samuely, K. Landheer, S.-X. Liu, M. Haas, S. Decurtins, T. A. Jung, M. Stöhr
Self-assembly of individual adressable complexes of C60 and phthalocynines on a metal surface: Structural and electronic investigations
European Conference on Surface Science ECOSS-28, Wroclaw, Poland, 28.08-02.09.2011

A. Savouchkina, A. Foelske-Schmitz, V. A. Guzenko, D. Weingarth, R. Kötz, G. G. Scherer, A. Wokaun
In situ STM study of Pt-nanodot arrays on HOPG prepared by electron beam lithography
European Conference on Applications of Surface and Interface Analysis, Cardiff, UK, 04-9.09.2011

V. Scagnoli
Multiferroic Cupric Oxide: also a model system to explain high-T_c *superconductivity?*
Workshop on Structure and Magnetism in Multiferroics, Institute Laue-Langevin, Grenoble, France, 07-09.02.2011

V. Scagnoli
Cupric Oxide: also a model system to explain high-T_c *superconductivity?*
Conference on Resonant Elastic X-Ray Scattering in Condensed matter, Aussois, France, 13-17.06.2011

V. Scagnoli
Cupric Oxide: also a model system to explain high-T_c superconductivity?
Swiss Workshop on Materials with Novel Electronic Properties, Les Diablerets, Switzerland, 29.06.-01.07 2011

V. Scagnoli
Cupric Oxide: also a model system to explain high-T_c superconductivity?
Swiss-Taiwanese Workshop: Ultra-high Resolution Resonant Soft X-ray Spectroscopy, Paul Scherrer Institut, Switzerland, 13.09.2011

H. Schift
Fabrication of stepped and reflowed 3-D profiles for optical applications by dose-modulated electron beam lithography and selective thermal reflow
CLEO2011, Conference on Lasers and Electro-Optics, Baltimore, MA, USA, 01-06.04.2011

A. Schleunitz
Combining nanoimprint lithography and a molecular weight selective thermal reflow for the generation of mixed 3-D structures
EIPBN2011, 54th Int. Conference on Electron, Ion, and Photon Beam Technology and Nanofabrication, Anchorage, Alaska, USA, 01-04.06.2011

A. Schleunitz
Selective profile transformation of electron-beam exposed multilevel resist structures based on a molecular weight dependent thermal reflow
EIPBN2011, 54th Int. Conference on Electron, Ion, and Photon Beam Technology and Nanofabrication, Anchorage, Alaska, USA, 01-04.06.2011

T. Schmitt
RIXS - the other animal
Quo Vadis Microscopy and Magnetism Group Meeting, Weggis, Switzerland, 12-16.012011

T. Schmitt
Zhang-Rice and Orbital Excitations in Quasi-One-Dimensional Cuprates
Internal workshop on MaNEP Project 6: Magnetism and competing interactions in bulk materials, Neuchatel, Switzerland, 21.01.2011

T. Schmitt
Momentum Dependent Soft X-Ray RIXS in Quasi One-Dimensional Cuprate Materials
Korrelationstage 2011, Max-Planck-Institut für Physik komplexer Systeme, Dresden, 01.03.2011

T. Schmitt, K. Zhou, M. Radovic, J. Schlappa, V. Strocov, R. Frison, J. Mesot, L. Patthey
Localized and delocalized character of charge carriers in $LaAlO_3/SrTiO_3$ superlattices revealed by Resonant Inelastic X-Ray Scatering
13th International Conference on the Formation of Semiconductor Interfaces ICFSI 2011, Prague, Czech Republic, 03-08.07.2011

T. Schmitt, C. Monney, V. Bisogni, K.J. Zhou, R. Kraus, V.N. Strocov, J. Geck
Probing the Local Magnetic Order in Quasi-1D Cuprates with Resonant Inelastic X-Ray Scattering
International Workshop on Strong Correlations and Angle-Resolved Photoemission Spectroscopy (CORPES 2011), Lawrence Berkeley National Laboratory (LBNL), Advanced Light Source (ALS), Berkeley, California, USA, 18–22.07.2011

M. Shi, J. Mesot
Recent ARPES Results on Cuprates and Fe-based Superconductors
MaNEP Internal Workshops 2011, Neuchâtel, Switzerland, 18.01.2011

M. Shi, E. Razzoli, M. Radovic, Y. Sassa, A. Benounan, M. Masson, L. Patthey, V. Strokov, G. Drachuck, Y. Lubashevsky, M. Shay, A. Kanigal, A. Keren, U. Chatterjee, M. R. Norman, J. C. Campuzano Y. Huang, Y. M. Xu, H. Ding, J. Mesot
Recent ARPES Results on Cuprates and Fe-based Superconductors
Soleil users' Meeting 2011, Paris, France, 20.01.2011

X. Shi, R. Dinapoli, H. Graafsma, D. Greiffenberg, B. Henrich, H. Krueger, A. Marras, A. Mozzanica, B. Schmitt, U. Trunk
Analog Front-End for the XFEL AGIPD Detector
2011 IEEE Nuclear Science Symposium and Medical Imaging Conference, Valencia, Spain, 23-29.10.2011

T. Siegfried, Y. Ekinci, H. Solak, O.J.F. Martin, H. Sigg
Plasmonic Nanogap Arrays for a Deterministic Sensor Performance by EUV Lithography
SPG annual meeting in Lausanne, Switzerland, 15-17.06.2011

T. Siegfried, Y. Ekinci, H. Sigg, O.J.F. Martin
Intense quenching of SERS with Chromium adhesion layer
The 5th International conference on surface plasmon photonics, Busan, Korea, 15-20.05.2011

B. Slomski, G. Landolt, F. Meier, J. Osterwalder, H. Dil
Manipulating the Rashba-type spin texture and spin splitting in Pb quantum well states
SPS Meeting, Lausanne, Switzerland, 15.06.2011

U. Staub, S. L. Johnson, P. Beaud, G. Ingold, R. Abela, L. Patthey
Proposed pump-probe experimental station for FLASH II.
FLASHII Workshop, DESY, Hamburg, 13-14.10.2011

U. Staub, S. L. Johnson, R. A. de Souza, P. Beaud, E. Vorobeva, G. Ingold, A. Caviezel, V. Scagnoli, W.F. Schlotter, J. J. Turner, O. Krupin, W.-S. Lee, Y.-D. Chuang, L. Patthey, R. G. Moore, D. Lu, M. Yi, P. S. Kirchmann, M. Trigo, P. Denes, D. Doering, Z. Hussain, Z.-X. Shen, D. Prabhakaran, A.T. Boothroyd
Femtosecond magnetic order dynamics of a multiferroic phase transition
Workshop on Ultrafast Dynamics in Strongly Correlated Systems, ETH Zürich, Switzerland, 04-06.04.2011

B. Terhalle, A. Langner, B. Päivänranta, C. David, and Y. Ekinci
Advanced holographic methods in EUV interference lithography
SPIE Optics + Photonics, San Diego, USA, 12.08.2011

T. Thüring, P. Modregger, B. R. Pinzer, Z. Wang, S. Rutishauser, C. David, T. Grund, J. Kenntner, M. Stampanoni
Towards X-ray differential phase contrast imaging on a compact setup, SPIE Medical Imaging Lake Buena Vista, Florida, USA, 12-17.02.2011

S. Tsujino, M. Paraliev, E. Kirk, C. Gough, S. Ivkovic, H. Braun
Characterization of all-metallic field emitter arrays in combined diode-RF cavity electron gun
24th International Vacuum Nanoelectronics Conference, Wuppertal, Germany, 18-22.07.2011

J.F. van der Veen
Welcome address
IR workshop, Biozentrum, University of Basel, Basel, Switzerland, 01.02.2011

J. F. van der Veen
Introduction to the SLS
Visit Mr. Anton Demarmels / Mr. Andreas Biedermann, Ammann Group, Langenthal, PSI, Villigen, Switzerland, 24.03.2011

J.F. van der Veen
Introduction to the SLS
Visit SystemsX.ch, PSI, Villigen, Switzerland, 30.03.2011

J.F. van der Veen
Introduction to the SLS
Visit of Swatch Group R&C SA, PSI, Villigen, Switzerland, 11.04.2011

J.F. van der Veen
Introduction to the SLS
Visit Prof. Ingolf Lindau/Prof. Z.X. Shen, SLAC Chief Scientist, SLAC National Accelerator Lab, Stanford, PSI, Villigen, Switzerland, 24.05.2011

J.F. van der Veen
Introduction to the SLS
Visit “Grosser Rat”, PSI, Villigen, Switzerland, 31.05.2011

J.F. van der Veen
Welcome address
iWoRID 2011 conference, ETH, Zürich, Switzerland, 04.07.2011

J.F. van der Veen
Introduction to the SLS
Visit Institute of High Energy Physics and Institute of Physics, Delegation Chinese Academy of Science, PSI, Villigen, Switzerland, 14.07.2011

J.F. van der Veen
Welcome address
10th PSI Summer School "Probing Phase transitions using Photons, Muons and Neutrons", Institut Montana Zugerberg, Zug, Switzerland, 13.08.2011

J.F. van der Veen
Introduction to the SLS
Visit of the representatives of the Republic of Armenia, PSI, Villigen, Switzerland, 25.08.2011

J.F. van der Veen
Talk due to the 10 years anniversary of the SLS*, Glanzlichter aus 10 Jahren Synchrotron Lichtquelle Schweiz*
PSI, Villigen, Switzerland, 14.09.2011

J.F. van der Veen
Welcome address/Introduction to the SLS
Visit Prof. Koichi Kitazawa, President of the Japan Science and Technology Agency, PSI, Villigen, Switzerland, 21.09.2011

J.F. van der Veen
Introduction to the SLS
Visit Embassy of the Netherlands, PSI, Villigen, Switzerland, 18.10.2011

J.F. van der Veen
Introduction to the SLS
Visit Embassy of France, PSI, Villigen, Switzerland, 07.11.2011

J.F. van der Veen
Introduction to the SLS
Visit IBM Forschungslabor Zürich, Dr. Matthias Kaiserswerth/Dr. Walter Riess, PSI, Villigen, Switzerland, 11.11.2011

J. Vila-Comamala, S. Gorelick, V. A. Guzenko, C. David
Sub-100 nm 3D Nanostructuring of HSQ Resist by 100 keV Electron Beam Lithography
International Conference on Electron, Ion, and Photon Beam Technology and Nanofabrication EIPBN 2011, Las Vegas, USA, 03.06.2011

J. Vila-Comamala, A. Diaz, M. Guizar-Sicairos, S. Gorelick, V. A. Guzenko, P. Karvinen, A. Menzel, O.Bunk, C. David
High-resolution zone-doubled Fresnel zone plates for the multi-keV regime
Annual Conference on Applications of X-ray Analysis, Colorado Springs, USA, 04.08.2011

J. Vila-Comamala, A. Diaz, M. Guizar-Sicarios, A. Mantion, C. M. Kewish, V. A. Guzenko, O. Bunk, C. David
Characterization of a 20-nm Hard X-ray Focus by Coherent Diffraction Imaging
SPIE Conference on Advances in X-Ray/EUV Optics and Components, San Diego, USA, 22.08.2011

E. Vorobeva
Structural Response to a Non-Thermal Melting of a Charge Density Wave
International Workshop on Ultrafast Dynamics in Strongly Correlated Systems, ETHZ, Zürich, Switzerland, 04-07.04.2011

P.W. Voorhees, J.L. Fife, L.K. Aagesen, A.E. Johnson, M.J. Miksis, E.M. Lauridsen
4D Measurements of Interfacial Evolution During Coarsening
Materials Science and Technology 2011, Columbus, OH, 16-20.10.2011

P.W. Voorhees, L. K. Aagesen, A. Johnson, C. Park, J. L. Fife, J. Gibbs, K. Thornton, E. M. Lauridsen, M. Miksis
4D Measurements of Interfacial Evolution in Materials
Materials Research Society Fall Meeting, Boston, MA, 28.11-02.12.2011

C. Wäckerlin, C. Iacovita, D. Chylarecka, P. Fesser, T. A. Jung, N. Ballav
Assembly of 2D ionic layers by reaction of alkali halides with an organic electrophile (TCNQ)
Swiss Physical Society Meeting, Lausanne, Switzerland, 15-17.06.2011

C. Wäckerlin, D. Chylarecka, A. Kleibert, K. Müller, C. Iacovita, T. Haehlen, K. Landheer, F. Nolting, K. Tarafder, P. M. Oppeneer, T. A. Jung, N. Ballav
Switching of surface supported molecular spins by axial ligation
Swiss Nanoscience Institute / Eidgenössische Materialprüfungsanstalt Workshop, Dübendorf, Switzerland, 24.06.2011

C. Wäckerlin, D. Chylarecka, J. Girovsky, A. Kleibert, K. Müller, C. Iacovita, F. Nolting, T. A. Jung, N. Ballav
Controlling spins in adsorbed molecules by a chemical switch
European Conference on Surface Science ECOSS-28, Wroclaw, Poland, 28.08-02.09.2011

C. Wäckerlin, K. Tarafdar, D. Chylarecka, J. Girovsky, T. Hählen, C. Iacovita, A. Kleibert, F. Nolting, T. A. Jung, P. M. Oppeneer, N. Ballav
Controlling the spin in adsorbed molecules by axial ligation - nitric oxide coordination on Co, Fe and Mn-tetraphenylporphyrin
SLS Symposium on Novel Molecular Systems, PSI Villigen, Switzerland, 06.12.2011

H.A.O Wang, D. Grolimund, L.R. Van Loon, C.N. Borca, D. Günther
Quantitative microscopic Studies with High Spatial Resolution of Contaminant Diffusion into Opalinus clay rock
Fall Meeting of the Swiss Chemical Society 2011, Lausanne, Switzerland, 09.2011

H.A.O. Wang, D. Grolimund, L.R. Van Loon, C.N. Borca, D. Günther
Multi-dimensional quantitative microscopic studies with high spatial resolution of contaminant diffusion into opalinus clay rock
Migration 2011, Beijing, China, 09.2011

M. Wang
Phosphor-SAD: A Novel Approach to Solve RNA Structure
Workshop on Extended Wavelength X-ray Crystallography in 2011 APS User Meeting, Argonne, USA, 04.05.2011

Z. Wang, T. Thüring, P. Modregger, B. R. Pinzer, C. David, E. Rössl, M. Trippel, R.A. Kubik-Huch, G. Singer, M. K. Hohl, N. Hauser, M. Stampanoni
Towards X-Ray Differential Phase Contrast Mammography: a Native Breast Tissue Study, IEEE-MIC-2011 Conference, Spain, Valencia, 28.10.2011

Z.Wang, T. Thüring, P. Modregger, B. R. Pinzer, C. David, E. Rössl, M. Trippel, R.A. Kubik-Huch, G. Singer, M. K. Hohl, N. Hauser, M. Stampanoni
Differential Phase Contrast Mammography
SLS Symposium on X-ray Imaging for Medicine, PSI, Villigen, Switzerland, 08.11.2011

S. Waltersperger
The versatile MX-beamlines at the Swiss Light Source, recent developments and their benefits on data quality
25th Rhine-Knee Regional Meeting on Crystallography of Biomacromolecules, Sursee, Switzerland, 28-30.09.2011

S. Waltersperger
Status Report and current developments of the multi-axes goniometer PRIGO III at the Swiss Light Source
Annual Meeting of the Kappa Workgroupe, Berlin, Germany, 28-29.11.2011

B. Watts, J. Raabe
Investigating Polymer Nanostructures with Scanning Transmission X-ray Microscopy (STXM)
ANAKON 2011, Zurich, Switzerland, 22-25.03.2011

B. Watts, C.R. McNeill, J. Raabe
Imaging Nanostructures in Organic Semiconductor Films with STXM
Conference of the European Materials Research Society 2011, Nice, France, 08-13.05.2011

B. Watts, C.R. McNeill, N. Pilet, J. Raabe
Imaging Polymer Nanostructures with STXM
Meeting of the Swiss Physical Society 2011, Lausanne, Switzerland, 14-18.06.2011

B. Watts, C.R. McNeill, J. Raabe
Imaging Polymer Nanostructures with STXM
Conference of the European Polymer Federation 2011, Granada, Spain, 25.06.-01.07.2011

P.R. Willmott
Buckling under tension: $LaAlO_3$ on $SrTiO_3$
MaNEP Internal Workshop, Neuchatel, Switzerland, 20.01.2011

P. Willmott
Pulsed laser deposition
SLS Colloquium, Paul Scherrer Institut, Villigen, Switzerland, 06.09.2011

K. J. Zhou, M. Radovic, J. Schlappa, V. N. Strocov, R. Frison, J. Mesot, L. Patthey, T. Schmitt
Localized vs. delocalized character of charge carriers in LAO/STO superlattices
RIXS workshop, SOLEIL, France, 17-18.01.2011

K. J. Zhou, M. Radovic, J. Schlappa, V. N. Strocov, R. Frison, J. Mesot, L. Patthey, T. Schmitt
Localized vs. delocalized character of charge carriers in LAO/STO superlattices
DPG Annual Meeting, Dresden, Germany, 15-18.03.2011

K. J. Zhou, M. Radovic, C. Monney, V. N. Strocov, J. Mesot, L. Patthey, T. Schmitt
Orbital reconstruction at YBCO/LSMO interfaces revealed by XAS and RIXS
Swiss Physical Society Annual Meeting, Lausanne, Switzerland, 15-16.06.2011

K. J. Zhou, M. Radovic, C. Monney, V. N. Strocov, J. Mesot, L. Patthey, T. Schmitt
Orbital reconstruction at YBCO/LSMO interfaces revealed by XAS and RIXS
Swiss workshop on Materials with Novel Electronic Properties, Les Diablerets, Switzerland, 28.06.-01.07.2011

K. J. Zhou, M. Radovic, C. Monney, V. N. Strocov, J. Mesot, L. Patthey, T. Schmitt
Orbital reconstruction at YBCO/LSMO interfaces revealed by XAS and RIXS
New Generation in Strongly Correlated Electron Systems, Santiago de Compostela, Spain, 03-8.07.2011

K. J. Zhou, Y. B. Huang, C. Monney, X. Dai, V. N. Strocov, N. L. Wang, Z. G. Chen, Chenglin Zhang, Pengcheng Dai, L. Patthey, J. van den Brink, H. Ding, T. Schmitt
Dispersive high-energy spin excitations in iron pnictide superconductors revealed by resonant inelastic x-ray scattering
International Conference on Novel Superconductivity, Tainan, Taiwan, 03-08.08.2011

K. J. Zhou, Y. B. Huang, C. Monney, X. Dai, V. N. Strocov, N. L. Wang, Z. G. Chen, Chenglin Zhang, Pengcheng Dai, L. Patthey, J. van den Brink, H. Ding, T. Schmitt
Persistent high-energy spin excitations in iron pnictide superconductors
Joint Users Meeting at PSI, RIXS workshop, Vlligen, Switzerland, 14-16.09.2011

POSTERS

E.M. Alayon, M. Nachtegaal, E. Kleymenov, M. Ranocchiari, J.A. van Bokhoven
Methane to methanol conversion on Cu-MOR
Swiss Chemical Society Fall Meeting, Lausanne, Switzerland, 09.09.2011

E.M. Alayon, M. Nachtegaal, E. Kleymenov, M. Ranocchiari, J.A. van Bokhoven
Methane to methanol conversion on Cu-MOR
5th IDECAT/ERIC J-CAT Conference on Catalysis, Bertinoro, Italy, 21-25.09.2011

M. Altana, A. Schleunitz, H. Schift
Sidewall-angle dependent mold filling of threedimensional microcavities in thermal nanoimprint lithography
MNE2011, Int. Conf. on Micro and Nanoengineering, Berlin, Germany, 19-23.09.2011

J. Althaus, H. Deyhle, O. Bunk, B. Müller
Structural anisotropies of PEEK foils revealed by optical dichroism and X-ray scattering methods
SSB 2011, Swiss Conference for Biomaterial, Yverdon, Switzerland, 04.05.2011

J. Althaus, J. Köser, U. Pieles, B. Müller
Auto-fluorescence of polyetheretherketone (PEEK) foils
ESB 2011, 24th European Conference on Biomaterials, Dublin, Ireland, 04-09.09.2011

K. Bedner, B. Päivänranta, V. A. Guzenko, C. David, J. Gobrecht
Fabrication of Nanowire FET Arrays,
Nanotech-date 2011, Dätwill-Baden, Switzerland, 29.03.2011

K. Bedner, V. A. Guzenko, B. Päivänranta, C. David, J. Gobrecht
Fabrication of Nanowire FET Arrays,
Nanotera Annual Meeting, Bern, Switzerland, 12.05.2011

O. Bunk, T.H. Jensen, M. Bech, M. Thomson, A. Menzel, A. Diaz, A. Bouchet, G. Le Duc, F. Pfeiffer, R. Feidenhans'l
Scanning small-angle X-ray scattering at the cSAXS beamline
JUM@P '11: Joint Users' Meeting at PSI, Villigen PSI, Switzerland, 15-16.09.2011

C. Cancellieri, D. Fontaine, S. Gariglio, N. Reyren, A.D. Caviglia, A. Fete, S.J. Leake, P.R. Willmott, M. Stengel, Ph. Ghosez, J.-M. Triscone
Electrostriction at the LaAlO3/SrTiO3 interface
WOE18, 18th Workshop on Oxide Electronics, Napa Valley, California, USA, 26-28.09.2011

A. Caviezel, P. Beaud, S.L. Johnson, E. Möhr-Vorobeva, S.O. Mariager, G. Ingold
Femtosecond hard X-ray source: Slicing at the Swiss Light Source
NCCR MUST Assembly Meeting, Lenk, Switzerland, 09-14.01.2011

A. Caviezel, P. Beaud, S.L. Johnson, E. Möhr-Vorobeva, S.O. Mariager, U. Staub, M. Garganourakis, C.J. Milne, R.A. De Souza, Q.X. Jia, N. Lee, S.W. Cheong, G. Ingold
Ultrafast photoinduced dynamics and phase transitions in mixed valence manganites
10th PSI Summer School, Probing Phase Transitions using Photons, Muons and Neutrons, Institut Montana Zugerberg, Zug, Switzerland, 13-19.08.2011

A.Caviezel, P.Beaud, S.L. Johnson, U.Staub, S.O. Mariager, J.A. Johnson, S.Grübel, G.Ingold,
Ultrafast Structural Dynamics in Strongly Correlated Electron System: Timing Specifications
SwissFEL Hard X-ray Instrumentation Workshops 2011: Diffraction, Bern, Switzerland, 21.11.2011

S. Chodankar, E. Perret, K. Nygård, O. Bunk, D.K. Satapathy, R.M. Espinosa Marzal, T. E. Balmer, M. Heuberger, J. F. van der Veen
Influence of surface ion specificity on the distance between two flat surfaces in contact
Gordon Research Conference X-Ray Science, Colby College, Waterville ME, USA, 07-12.08.2011

S. Chodankar, E. Perret, K. Nygård, O. Bunk, D.K. Sataphathy, R.M. Espinosa Marzal, T.E. Balmer, M. Heuberger, J. F. van der Veen
Density profile of water in nanoslit
JUM@P '11, Joint Users' Meeting at PSI, -Villigen, Switzerland 15-15.09.2011

R. V. Chopdekar, V.K. Malik, A. Fraile Rodríguez, L. Le Guyader, A. Scholl, Y. Takamura, F. Nolting, C. Bernhard, L. J. Heyderman
Strain-driven Anisotropy in Multiferroic Composites Observed with Soft X-ray Techniques
2011 Swiss Workshop on Materials with Novel Electronic Propertie, Les Diablerets, Switzerland, 29.06.-01.07.2011

R. V. Chopdekar, S.L. Lee, V.K. Malik, Y. Takamura, A. Fraile Rodríguez, L. Le Guyader, J. Stahn, C. Bernhard, F. Nolting, L.J. Heyderman
Epitaxial multiferroic composite heterostructures probed with x-rays and neutrons
Joint Users' Meeting at PSI, Paul Scherrer Institut, Villigen, Switzerland, 15-16.09.2011

J. Dreiser, K. S. Pedersen, C. Piamonteze, S. Rusponi, Z. Salman, Md. E. Ali, M. Schau-Magnussen, C. Aa. Thuesen, S. Piligkos, H. Weihe, H. Mutka, O. Waldmann, P. M. Oppeneer, J. Bendix, F. Nolting, H. Brune
X-ray magnetic circular dichroism for the study of 3d-4f molecular nanomagnets
Advanced Complex Inorganic Nanomaterials, Namur, Belgium, 11-14.09.2011

J. Dreiser, K. S. Pedersen, C. Piamonteze, S. Rusponi, Z. Salman, Md. E. Ali, M. Schau-Magnussen, C. Aa. Thuesen, S. Piligkos, H. Weihe, H. Mutka, O. Waldmann, P. M. Oppeneer, J. Bendix, F. Nolting, H. Brune
Study of 3d-4f Molecular Nanomagnets by X-ray circular dichroism
JUMP – PSI user meeting, Villigen, Switzerland, 15-16.09.2011

J. Dreiser, K. S. Pedersen, C. Piamonteze, S. Rusponi, Z. Salman, Md. E. Ali, M. Schau-Magnussen, C. Aa. Thuesen, S. Piligkos, H. Weihe, H. Mutka, O. Waldmann, P. M. Oppeneer, J. Bendix, F. Nolting, H. Brune
X-ray magnetic circular dichroism for the study of 3d-4f molecular nanomagnets
European Conference on Molecular Magnetism, Paris, France, 22-25.11.2011

R. B. Duarte, S. Damyanova, D. C. De Oliveira, C.M.P. Marques, J. A. van Bokhoven, J.M.C. Bueno
Study of Sm2O3 and CeO2 Effect On Pt/Al2O3 Catalyst For Partial Methane Oxidation
EuropaCat X, University of Glasgow, Scotland, UK. 29.08.-02.09.2011

R. B. Duarte, J. A. van Bokhoven
The role of Sm2O3 and CeO2 promoters on the structure and activity of Rh/Al2O3 catalysts for methane steam reforming
1st Swiss Heterogeneous Catalysis Meeting, Grindelwald, Switzerland,16-17.6.2011

Y. Ekinci, Michaela Vockenhuber, Bernd Terhalle, M. Hojeij, L. Wang, T. R. Younkin
Evaluation of resist performance with EUV interference lithography for sub-22 nm patterning
2011 International Symposia on Extreme Ultraviolet Lithography and Lithography Extensions, Miami, USA, 17-21.10.2011

A. Farhan, A. Balan, R.V. Chopdekar, E. Mengotti, A. Bisig, A. Fraile-Rodriguez, L. Le Guyader, F. Nolting, R. Hügli, H.B. Braun, L.J. Heyderman
Ground State Ordering in Artifcial Spin Ice
PSI Summer School, Zuggerberg, Switzerland, 13-19.08.2011

A. Farhan, A. Balan, R.V. Chopdekar, E. Mengotti, A. Bisig, A. Fraile-Rodriguez, L. Le Guyader, F. Nolting, R. Hügli, H.B. Braun, L.J. Heyderman
Thermal Ordering in Artifcial Spin Ice
Joint Users' Meeting at PSI, Paul Scherrer Institut, Villigen, Switzerland, 15-16.09.2011

A. Foelske-Schmitz, A. Savouchkina, V.A. Guzenko, D. Weingarth, A. Wokaun, G.G. Scherer, R. Kötz
In situ STM Study of Pt-nanodot Arrays on HOPG Prepared by Electron Beam Lithography
220th Annual Meeting of the International Society of Electrochemistry and Energy Summit, Boston, USA, 09-14.10.2011

P. Friedli, H. Sigg, A. Hugi, S. Riedi, V. Liverini, J. Faist, P. Lerch
Quantum cascade laser investigated with synchrotron IR
6th International Workshop on Infrared Spectroscopy and Microscopy with Accelerator-Based Sources, 2011

M. R. Fuchs, F. S. N. Dworkowski, G. Pompidor, V. Thominet, M. A. Hough, C. Schulze-Briese
Single-crystal Raman, Fluorescence and UV/Vis Micro-Spectrophotometry combined with Macromolecular Crystallography at the Swiss Light Source
Symposium "Advanced EPR Spectroscopy on Biomolecules", Mülheim an der Ruhr, Germany 20-22.06.2011

M. R. Fuchs, F. S. N. Dworkowski, G. Pompidor, V. Thominet, C. Schulze-Briese
On-axis single-crystal Raman, fluorescence and UV/Vis micro-spectroscopy at the MX SpectroLab of the Swiss Light Source
22nd Congress of the International Union of Crystallography IUCr2011, Madrid, Spain, 22-30.08.2011

M. R. Fuchs, G. Pompidor, F. S. N. Dworkowski, V. Thominet, M. A. Hough, C. Schulze-Briese
On axis UV/Vis absorption micro-spectrophotometry combined with macromolecular crystallography at the Swiss Light Source
14th European Conference on the Spectroscopy of Biological Molecules ECSBM2011, Coimbra, Portugal, 29.08.-03.09.2011

J. Gobrecht, H. Schift, A. Schleunitz, Y. Ekinci, V. Guzenko, P. M. Kristiansen
Nanofabrication made in Aargau
Nanotech-date 2011, Dätwill-Baden, Switzerland, 29.03.2011

J. Gobrecht, H. Schift, Y. Ekinci, V. Guzenko, M. Kristiansen
Nanofabrication „made in Aargau"
Swiss NanoConvention 2011,Baden, Switzerland, 18-19.05.2011

J. Gobrecht, H. Schift, M. Kristiansen
Institute of Polymer Nanotechnology
Swiss NanoConvention 2011, Baden, Switzerland, 18-19.05.2011

O. Grimm, N. Arnold, M. Bednarzik, A. Benz, F. Farnik, P. Gallagher, G. Hurford, S. Krucker, O. Limousin, P. Orleanski
The Spectrometer Telescope for Imaging X-rays (STIX) on-board Solar Orbiter
European Solar Physics Meeting, Rhodes, Greece, 12-16.09.2011

M. Guizar-Sicairos, A. Diaz, P. Trtik, M. Holler, A. Menzel, O. Bunk
Quantitativeness and Projection Processing for X-ray Ptychographic Nanotomography
Joint Users' Meeting at PSI 2011, Paul Scherrer Institut, Villigen PSI, Switzerland, 09.2011

V. A. Guzenko, N. Belić, N. Ünal, A. Schleunitz, C. David
The modeling and correction of lateral resist development effects in 3D Electron-Beam Lithography,
24th International Microprocesses and Nanotechnology Conference, Kyoto, Japan, 27.10.2011

T. Haatainen, T. Mäkelä, A. Schleunitz, G. Grenci, M. Tormen
Integration of rotated 3-D structures into pre-patterned PMMA substrate using step & stamp nanoimprint lithography
MNE2011, Int. Conf. on Micro and Nanoengineering, Berlin, Germany, 19-23.09.2011

T. Haatainen, T. Mäkelä, A. Schleunitz, G. Grenci, M. Tormen
Nanoimprint fabrication process for hybrid 3-D stamps
NNT 2011, Int. Conference on Nanoimprint and Nanoprint Technology, The Shilla Jeju, Korea, 19-21.10.2011

T. Hählen C. Vanoni, T.A. Jung, S. Tsujino
Molecular surface doping of pentacene monolayers in a field effect transistor
European Conference on Molecular Electonics ECME, Barcelona, Spain, 07-10.09.2011

G. Heldt ,S. L. Lee, R.V. Chopdekar, J. Kohlbrecher, O. Bunk, V. Guzenko , L.J. Heyderman, T. Thomson
Nanoscale Magnetic Island Arrays
Current Research in Magnetism Workshop (CRIM 2011), Department of Physics, Durham University, Durham, UK, 21.09.2011

M. Hojeij, Y. Ekinci, G. Marowsky, M. Ehrat, A. Lieb, J. Gobrecht
Design, fabrication and investigation of nanostructured waveguides for optical detection of biomolecules
Nanotech-date Nordwestschweiz 2011, ABB, Baden, Switzerland, 29.03.2011 and at Nanotech Apéro Nordwestschweiz, Liestal, Switzerland, 02.11.2011

M. Hojeij, B. Oswald , A. Lieb, V. Guzenko, Y. Ekinci, J. Gobrecht
Dielectric resonant nanostrcutures for fluorescenc enhancement
Nanotech-meeting, Liestal, Switzerland, 02.11.2011

M. Hojeij, Y. Ekinci, G. Marowsky , M. Ehrat , A. Lieb , J. Gobrecht
Design, fabrication and investigation of nanostructured waveguides for optical detection of biomolecules
Nanotech-date 2011, Dätwill-Baden, Switzerland, 29.03.2011

M. Hojeij, B. Oswald, A. Lieb, Y. Ekinci, and J. Gobrecht
Design and Fabrication of Resonant Nanostructures for Fluorescence Enhancement
Micro- and Nano-Engineering Conference, Berlin, Germany, 22.09.2011

A. Idhil, C.N. Borca, A.-C. Uldry, D. Grolimund, M. Samaras
Investigating the structure of Fe-Cr alloys using synchrotron based X-ray microanalysis
Joint annual meeting SPS - APS, Lausanne, Switzerland, 06.2011

S. C. Irvine, R. Mokso, M. Stampanoni,
Combining 3-D X-ray Velocimetry with ultra-fast tomography
JUM@P'11: Second Joint Users' Meeting @ PSI, Villigen, Switzerland, 15-16.9.2011

D. Jarzabek, T. A. Jung
Titanium/polyamide and SiO2 nanotowers fracture on the Scanning Force Microscope
37th International Conference on Micro and Nano Engineering (MNE 2011), Berlin, Germany, 19-23.09.2011

D. Jarzabek, T. A. Jung, Z. Rymuza
SiO2/Si Nanotower Fracture probed by the Scanning Force Microscope
2011 MRS Fall Meeting & Exhibit, Boston, MA, USA, 28.11-02.12.2011

J.A. Johnson, S. Grübel, S.O. Mariager, A. Caviezel, P. Beaud, G. Ingold, T. Kubacka, S.L. Johnson
Coherent Control of Microscopic Order: High Field THz and Xray experiments at the SwissFEL
SwissFEL Hard X-ray Instrumentation Workshops 2011: Diffraction, Bern, Switzerland, 21.11.2011

I. Kalichava, M. Iannucci, D.Martoccia, O. Bunk, P. Willmott, T. Greber, J. Hutter
Graphene on Ruthenium
Swiss Physical Society meeting, EPFL, Lausanne, Switzerland, 15-17.06.2011

I. Kalichava, M. Iannucci, D.Martoccia, O. Bunk, P. Willmott, T. Greber, J. Hutter
Graphene on Ruthenium
MaNEP Swiss Workshop: 'Materials with new electronic properties', Les Diablerets, Switzerland, 29.06.-01-07.2011

I. Kalichava, M. Iannucci, D.Martoccia, O. Bunk, P. Willmott, T. Greber, J. Hutter
Graphene on Ruthenium
SLS Symposium Seminar, PSI Summer School: 'Probing phase transition using photons, neutrons and muons', Zug, Switzerland, 13-22.08.2011

C. Kartusch, J. A. van Bokhoven
Synthesis and characterization of well-defined mesoporous oxidic catalyst supports
Austrian Chemistry Days, Vienna, Austria, 24–27.08.2009

C. Kartusch, J. A. van Bokhoven
Synthesis, characterization and performance of supported gold catalysts in chemo-selective hydrogenation
SCS Fall Meeting, EPFL Lausanne, Lausanne, Switzerland, 04..09.2009

C. Kartusch, J. A. van Bokhoven
Synthesis and characterization of mesoporous oxides
SCS Fall Meeting, Universität Zürich, Zürich, Switzerland, 11.09.2008

C. Kartusch, F. Krumeich, J. A. van Bokhoven
Chemo-selective hydrogenation of substituted nitro aromatics
SCS Fall Meeting, ETH Zürich, Zürich, Switzerland, 16.09.2010

P. Karvinen, S. Rutishauser, S. Gorelick, A. Mozzanica, D. Greiffenberg, J. Krzywinski, D.M. Fritz, H.T. Lemke, M. Cammarata, C. David
Diffractive optics for focusing and characterization of hard X-ray free electron laser radiation
Workshop on Hard X-ray instrumentation at the SwissFEL, Bern, Switzerland, 21.11.2011

E. Kirk, A. Mustonen, E. Pomjakushina, S. Ritter, J. Gobrecht, S. Tsujino
Smoother Mo films for molded FEAs by additio of N2 to Ar sputter gas
24th International Vacuum Nanoelectronics Conference, Wuppertal, Germany, 18-22.07.2011

A. Kleibert, S. Valencia, A. Gaupp, J. Rusz, D. Legut, J. Bansmann, W. Gudat, P. M. Oppeneer
Novel Quadratic X-Ray Magneto-Optical Effect for Time-resolved Experiments at the M Edges of the 3d Transition Metals
Workshop on "Ultrafast Dynamics in Strongly Correlated Systems", Zürich, Switzerland, 04-06.04.2011

M. Kobayashi, V.N. Strocov, E. Razzoli, M. Shi, T. Schmitt, Y. Huang, H. Ding, M. Oshima, L. Patthey
Three-Dimensional Fermi Surface of Iron-Based Superconductor $Ba_{1-x}K_xFe_2As_2$ Studied by Soft X-ray Angle-Resolved Photoemission Spectroscopy
HAXPES 2011, 4th International Workshop on Hard X-ray Photoelectron Spectroscopy, Hamburg, Germany, 14-16.09.2011

G. Landolt, B. Slomski, L. Patthey, E. Chulkov, J. Osterwalder, H. Dil
Spin- and angle-resolved photoemission on three dimensional topological insulators
Fall School, Würzburg, Germany, 03.10.2011

L. Le Guyader, S. El Moussaoui, A. Kleibert, F. Nolting, E. Mengotti, L. Heyderman, A. Tsukamoto, A. Itoh, A. Kirilyuk, Th. Rasing, A. V. Kimel
Laser induced magnetization switching in nanostructured GdFeCo thin films
Magnetics and Optics Research International Symposium 2011, Nijmegen, The Netherlands, 06.2011

S.J. Leake, S.A. Pauli, M. Garcia-Fernandez, P. Aebi, M. Schmitt, P. Zubko, R. Scherwitzl, J-M. Triscone, P.R. Willmott
Structural studies of the metal-insulator transition in LaNiO3 thin films
3S'11, SYMPOSIUM ON SURFACE SCIENCE, Donostia-San Sebastián, Spain, 06-12.03.2011

S.J. Leake, S.A. Pauli, M. Garcia-Fernandez, P. Aebi, M. Schmitt, P. Zubko, R. Scherwitzl, J-M. Triscone, P.R. Willmott
Structural studies of the metal-insulator transition in LaNiO3 thin films
LSC meeting, FHNW Brugg, Switzerland, 06.04.2011

S.J. Leake, S.A. Pauli, M. Garcia-Fernandez, P. Aebi, M. Schmitt, P. Zubko, R. Scherwitzl, J-M. Triscone, P.R. Willmott
Structural determination of LaNiO3 thin films with Direct Methods
X-ray Science Gordon Conference, Colby College, MA, USA, 07-12.08.2011

S.J. Leake
Bragg Coherent Diffractive Imaging at an X-ray Free Electron Laser
SwissFEL workshop 2: Scattering and diffraction experiments, Bern, Switzerland, 21.11.2011

G. Lovric, R. Mokso, J. Schittny, M. Roth-Kleiner, M. Stampanoni
In-vivo study of lung physiology with sub-second x-ray tomographic microscopy
Second Joint Users Meeting @ PSI (JUM@P), PSI Villigen, Switzerland, 15-16.09.2011

K. Mader, P. Schneider, D. Ruffoni, T. Kohler, L. R. Donahue, R. Müller, M. Stampanoni
Ultrastructural Bone Phenomics using High-throughput Synchrotron-based X-Ray Tomography.
NCCBI Meeting, National Competence Center for Biomedical Imaging, Lausanne, Switzerland, 29.08.2011

K. Mader, P. Schneider, D. Ruffoni, T. Kohler, L. R. Donahue, R. Müller, M. Stampanoni
Ultrastructural Bone Phenomics using High-throughput Synchrotron-based X-Ray Tomography.
Joint Users Meeting, Paul Scherrer Institute; Villigen, Switzerland, 15.09.2011

M. Makosch, J. A. van Bokhoven
In situ ATR-FTIR / HERFD XAS cell for liquid/solid reactions
1st Swiss Heterogeneous Catalysis Meeting, Grindelwald, Switzerland, 16-17.06.2011

M. Makosch, J. Sa, J. A. van Bokhoven
Control of reaction mechanism of the hydrogenation of nitrobenzene by varying the support
EuropaCat X, Glasgow, UK, 28.08.2011

S.O. Mariager, P. Beaud, A. Caviezel, S. Grübel, J.A. Johnson, G. Ingold, U. Staub, V. Scagnoli, S.L. Johnson, L. Le Guyader, F. Nolting, C. Quitmann
Probing Magnetic Phase Transitions
SwissFEL Hard X-ray Instrumentation Workshops 2011: Diffraction, Bern, Switzerland, 21.11.2011

F. Marone, A. Studer, R. Mokso, G. Lovric, M. Stampanoni
Ultrafast data post processing pipeline for real-time tomographic microscopy at TOMCAT
Second Joint Users' Meeting @ PSI, Villigen, Switzerland, 15-16.09.2001

F. Marone, R. Mokso, P. Modregger, J. Fife, B. Pinzer, S. Irvine, Z. Wang, T. Thüring, K. Mader, S. Peter, A. Medebach, G. Lovric, M. Zauner, A. Isenegger, G. Mikuljan, M. Stampanoni
X-ray tomographic microscopy at TOMCAT: an overview
Second Joint Users' Meeting @ PSI, Villigen, Switzerland, 15-16.09.2001

A. Medebach, B. R. Pinzer, S. C. Irvine, M. Schneebeli, C. Dubois, H.-J. Limbach, M. Stampanoni
Microstructure of food under changing external temperature
JUM@P'11: Second Joint Users' Meeting @ PSI, Villigen, Switzerland, 15-16.09.2011

C.J. Milne
Electronic and Structural Dynamics in Solution: Pump-Probe XAS, XES, RIXS
SwissFEL Hard X-ray Instrumentation Workshops 2011: Spectroscopy, Bern, Switzerland, 12.09.2011

P. Modregger, B. Weber, S. Peter , T. Thüring , B. R. Pinzer , S. Hoerstrup, M. Stampanoni
Biomedical research with X-ray grating interferometry at TOMCAT
Joint user meeting @ PSI, Villigen, Switzerland, 12-13.10.2011

R. Mokso, G. Lovric, S Irvine, F. Marone, G. Mikuljan, M. Stampanoni
4D microtomographic imaging with sub-second temporal resolution with hard X-rays
JUMP2011, PSI, Villigen, Switzerland, 12-13.09.2011

C. Monney, P. Aebi, H. Beck
How does an exciton condensate couple to the lattice: the case of 1T-TiSe2
SPG annual meeting, EPFL, Lausanne, Switzerland, 15-17.06.2011

C. Monney, V. Bisogni, K.J. Zhou, R. Kraus, V. Strocov, J. Malek, S.-L. Drechsler, J. van den Brink, J. Geck, T. Schmitt
RIXS on a prototype edge-sharing chain compound
MaNEP annual meeting, les Diablerets, Switzerland, 29-30.06.2011

C. Monney, P. Aebi, H. Beck
How does an exciton condensate couple to the lattice: the case of 1T-TiSe2
MaNEP annual meeting, les Diablerets, Switzerland, 29-30.06.2011

A. Mozzanica, A. Bergamaschi, R. Dinapoli, D. Greiffenberg, B. Henrich, I. Johnson, D Maliakal, V. Radicci, Ch Ruder, L. Schädler, B. Schmitt, X. Shi
Adaptive gain charge integrating detectors for SwissFEL
Swissfel Workshop 1: Spectroscopic experiments, University of Berne, Switzerland, 12.09.2011

S. Neuhaus, C. Padeste, N.D. Spencer
Polymer brushes grafted on polymer foils as platforms for enzyme immobilization
European Polymer Congress 2011, Granada, Spain, 26.06.–01.07.2011

S. Neuhaus, N.D. Spencer, C. Padeste
Strategies to graft polyelectrolyte brushes on polymer surfaces: on the creation of nano-patterned brushes and the tailoring of surface properties
Frontiers in Polymer Science 2011, Lyon, France, 29-31.05.2011

S. Neuhaus, N.D. Spencer, C. Padeste
Polyelectrolyte brushes grafted on polymer surfaces: creation of nanopatterned brushes and tailoring of surface properties
Annual Conference of the Division of Polymers and Colloids of the Swiss Chemical Society, Geneva, Switzerland, 29.04.2011

J. Novakovski, C. Wäckerlin, D. Chylarecka, K. Tarafder, A. Kleibert, K. Müller, C .Iacovita, F. Nolting, P. M. Oppeneer, T. A. Jung, N. Ballav
Controlling spins in adsorbed molecules by a chemical switch
PSI – Joint Users' Meeting: JUM@P'11, PSI Villigen, Switzerland 15-16.09.2011

J. Nowakowski, C. Wäckerlin, C Iacovita, D. Chylarecka, P. Fesser, T. A. Jung, N. Ballav
Assembly of 2D ionic layers by reaction of alkali halides with an organic electrophile – TCNQ
Trends in NanoTechnology (TNT 2011), Tenerife, Canary Islands, Spain, 21-25.11.2011

S. Nowakowski, P. Fesser, C. Iacovita, A. Shchyrba, C. Wäckerlin, S. Vijayaraghavan, N. Ballav, K. Howes, J.-P. Gisselbrecht, M. Crobu, C. Boudon, M. Stöhr, T.A. Jung, F. Diederich
Self Assembly of Acetylene-Appended Porphyrin on Au(111) and cycloaddition of 7,7,8,8-Tetracyano-p-quinodimethane (TCNQ) visualized by Scanning Tunneling Microscopy
Trends in Nano Technology (TNT 2011), Tenerife Canary Islands, Spain, 21-25.11.2011

K. Nygård, R. Kjellander, S. Sarman, J. Buitenhuis, J.F. van der Veen
Anisotropic pair correlations of confined hard-sphere fluids, an experimental and theoretical study
Eighth Liquid Matter Conference, Wien, Austria, 06-10.09.2011

V. Olieric, C. Stirnimann, M. Wang
Automated in situ X-ray diffraction screening at beamline X06DA at the Swiss Light Source
SSRL/LCLC user's meeting, Stanford, USA, 22-26.10.2011

C. Padeste, J. Ziegler, A. Giese, K. Ballmer-Hofer
Generation of protein patterns and gradients on PDMS surfaces using simple passive microfluidics,
37th Int. Conference on Micro- and Nano engineering (MNE) Berlin, Germany,
19–23.09.2011

S. Peter, P. Modregger, M.K. Fix, P. Manser, M. Stampanoni
Simulation of grating-based hard X-ray imaging by combining Monte Carlo methods and wave optics
Second Joint users Meeting at PSI, Villigen Switzerland, 15-16.09.2011

C. Piamonteze, J. Dreiser, U. Staub, F. Nolting, S. Rusponi, H. Brune, A. Fraile Rodriguez, N. Terada
Magnetic anisotropy in CuFeO2
Swiss Workshop on materials with novel electronic properties, Les Diablerets, Switzerland, 29.06.-01.07.2011

C. Piamonteze, J. Dreiser, U. Staub, F. Nolting, S. Rusponi, H. Brune, A. Fraile Rodriguez, N. Terada
Magnetic anisotropy in CuFeO2 probed by XMCD
SCES- Strongly Correlated Electron Systems 2011, Cambridge, UK, 29.08-03.09.2011

M. Pistone, P. Ulmer, L. Caricchi, J.L. Fife, F. Marone, P. Benson, B.S.G. Almqvist, E. Reusser, A. Rust, L. Burlini
In-Situ Ultrafast Imaging of Magma Vesiculation at High Temperature
Joint User Meeting at PSI 2011, Villigen, Switzerland, 15-16.10.2011

G. Pompidor, F. Dworkwoski, C. Hed, H. Ogata, M. Knipp, M.R. Fuchs
Combination of in-situ optical spectroscopy and macromolecular crystallography
XXII Congress of the International Union of Crystallography, IUCr 2011, Madrid, Spain, 22-30.08.2011

G. Pompidor, F. Dworkwoski, V. Thominet., M.A. Hough, H.-P. Hersleth, A. Pica, A. Vergala, M.R. Fuchs
Combining X-ray diffraction and vibrational spectroscopy in structural biology
14th ECSBM, Coimbra, Portugal, 29.08.-03.09.2011

M. Ranocchiari, M. Servalli, J. A. van Bokhoven
Fast and High Yield Post-synthetic modification of Metal-Organic Frameworks by vapor diffusion
Fall Meeting of the Swiss Chemical Society 2011, Lausanne, Switzerland, 09.09.2011

M. Ranocchiari, B. Vilhanova, F. Münch, J. A. van Bokhoven
Heterogeneous Rh-MOF-Catalyzed Asymmetric Hydrogenation of Olefins
SCS-Syngenta Symposium 2011,Stein, Switzerland, 28.10.2011

E. Razzoli, M. Kobayashi, V. N. Strocov, B. Delley, Z. Bukowski, J. Karpinski, N. C. Plumb, M. Radovic, J. Chang, T. Schmitt, J. Mesot, M. Shi
Electronic correlation in LaRu2P2 studied by ARPES
Joint Users' Meeting @ PSI, Workshops, 2011

Ch. Rytka, M. Kristiansen, M. Altana, H. Solak, J. Gobrecht
High Fidelity Mass Replication of Nanostructures
Nanotech-date Nordwestschweiz 2011, ABB, Baden, Switzerland, 29.03.2011 and at Nanotech Apéro Nordwestschweiz, Liestal, Switzerland, 02.11.2011

O.V. Safonova, C. Paun, A. Cervellino, P. Abdala, E. Kleymenov, M. Nachtegaal, J.A. van Bokhoven
Structural changes in nano-ceria during redox cycling: Correlation of in situ XAS, XRD and Raman spectroscopy
Swiss Chemical Society Fall Meeting, , Lausanne, Switzerland, 09.09.2011

A. Savouchkina, V. A. Guzenko, A. Foelske-Schmitz, D. Weingarth, R. Kötz, A. Wokaun, G. G. Scherer
Model electrodes prepared by electron beam lithography: Pt (im)mobility on HOPG
27th One-Day-Symposium on Electrochemistry, PSI Villigen, Switzerland, 11.05.2011

A. Schleunitz, V. A. Guzenko, C. Spreu, M. Vogler, H. Atasoy, G. Grützner, H. Schift
Enhancing 3-D structural variety by combination of electron-beam and nanoimprint lithography with thermal reflow
MNE2011, Int. Conf. on Micro and Nanoengineering, Berlin, Germany, 19-23.09.2011

M. L. Schmitt, C. Cancellieri, S. A. Pauli, C. W. Schneider, S. J. Leake, P. R. Willmott
Study of $(LaAl)_x(SrTi)_{1-x}O_3$ thin films on $SrTiO_3$ grown by pulsed laser deposition
Hercules School on Synchrotron Radiation Techniques, Grenoble (ESRF)/St-Aubin (SOLEIL), France, 28.02.-30.03.2011

M. L. Schmitt, C. Cancellieri, S. A. Pauli, C. W. Schneider, S. J. Leake, P. R. Willmott
Better understanding of the $LaAlO_3$ /$SrTiO_3$ system: Contribution of Intermixing
SLS Symposium Seminar, Swiss Light source, Paul Scherrer Institut, Villigen, Switzerland, 05.04.2011

M. L. Schmitt, C. Cancellieri, S. A. Pauli, C. W. Schneider, S. J. Leake, P. R. Willmott
Study of $La_{0.5}Al_{0.5}Sr_{0.5}Ti_{0.5}O_3$ thin films on $SrTiO_3$ grown by pulsed laser deposition
LSC Quo Vadis Meeting, FHNW Windisch, Switzerland, 06.04.2011

M. L. Schmitt, C. Cancellieri, S. A. Pauli, C. W. Schneider, S. J. Leake, P. R. Willmott
Study of $La_{0.5}Al_{0.5}Sr_{0.5}Ti_{0.5}O_3$ thin films on $SrTiO_3$ grown by pulsed laser deposition
Swiss Physical Society meeting, EPFL, Lausanne, Switzerland, 15-17.06.2011

M. L. Schmitt, C. Cancellieri, M. Medarde, C. W. Schneider, S. A. Pauli, S. J. Leake, P. R. Willmott
Better understanding of the $LaAlO_3$ /$SrTiO_3$ system: Contribution of Intermixing
MaNEP Swiss Workshop: 'Materials with new electronic properties', Les Diablerets, Switzerland, 29.06.-01-07.2011

M. L. Schmitt, C. Cancellieri, M. Medarde, E. Pomjakushina, C. W. Schneider, D. Li, S. Gariglio, J.-M. Triscone, P. R. Willmott
Study of $La_{0.5}Al_{0.5}Sr_{0.5}Ti_{0.5}O_3$ thin films on $SrTiO_3$ grown by pulsed laser deposition
SLS Symposium Seminar, PSI Summer School: 'Probing phase transition using photons, neutrons and muons', Zug, Switzerland, 13-22.08.2011

M. L. Schmitt, C. Cancellieri, D. Li, M. Medarde, E. Pomjakushina, C. W. Schneider, S. Gariglio, J.-M. Triscone, P. R. Willmott
And then there were two: The demise of intermixing in the $LaAlO_3$ /$SrTiO_3$ system
WOE18, 18th Workshop on Oxide Electronics, Napa Valley, California, USA, 26-28.09.2011

T. Siegfried, Y. Ekinci, H. Sigg, O. J. F. Martin
High density fabrication of deterministic nanogap arrays
The 5th International conference on surface plasmon photonics, Busan, Korea, 15-20.05.2011

T. Siegfried, Y. Ekinci, H. Solak, O. J.F. Martin, H. Sigg
Large area periodic nanogap arrays of for plasmonic sensing
Photonics day at the EPFL, Lausanne, Switzerland, 05.11.2011

T. Sitar, J. Gallinger, A. M. Ducka, T. P. Ikonen, M. Wohlhoefler, K. M. Schmoller, A. R. Bausch, P. Joel, K. M. Trybus, A. A. Noegel, M. Schleicher, R. Huber, T. A. Holak
Molecular architecture of the Spire–actin nucleus and its implication for actin filament assembly
Joint Users' Meeting at PSI 2011, Paul Scherrer Institut, Villigen PSI, Switzerland, 09.2011

B. Slomski, G. Landolt, J. Osterwalder, H. Dil
Manipulating the Rashba-type spin splitting of Pb quantum well states
Fall School, Würzburg, Germany, 03.10.2011

M. Stampanoni, F. Marone, S. Irvine, J. Vila-Comamala, R. Mokso
Nanotomographic hard X-ray microscopy at TOMCAT
Second Joint Users' Meeting @ PSI, Villigen, Switzerland, 15-16.09.2001

U. Staub, S. L. Johnson, R. A. de Souza, P. Beaud, E. Vorobeva, G. Ingold, A. Caviezel, V. Scagnoli, W.F. Schlotter, J. J. Turner, O. Krupin, W.-S. Lee, Y.-D. Chuang, L. Patthey, R. G. Moore, D. Lu, M. Yi, P. S. Kirchmann, M. Trigo, P. Denes, D. Doering, Z. Hussain, Z.-X. Shen, D. Prabhakaran, A.T. Boothroyd
Femtosecond magnetic order dynamics of a multiferroic phase transition MaNEP meeting
Swiss Workshop on materials with novel electronic properties Les Diablarets, Switzerland, 29.06.-01.07.2011

S.E. Stevenson, G. Heldt, R.V. Chopdekar, C. Quitmann, L.J. Heyderman, J. Raabe
Optimising Magnetic Switching
SOLEIL Synchrotron School on X-ray Microscopy, Saint-Aubin, France, 02-06.05.2011

S.E. Stevenson, G. Heldt, R.V. Chopdekar, C. Quitmann, L.J. Heyderman, J. Raabe
Optimising Magnetic Switching
Joint Annual Meeting SPS – ÖPG – ÖGAA, EPF Lausanne, Switzerland, 15-17.06.2011

S.E. Stevenson, G. Heldt, R.V. Chopdekar, C. Quitmann, L.J. Heyderman, J. Raabe
Optimising Magnetic Switching
European School of Magnetism, Targoviste, Romania, 22.08-02.09.2011

S.E. Stevenson, G. Heldt, R.V. Chopdekar, C. Quitmann, L.J. Heyderman, J. Raabe
Optimising Magnetic Switching
Joint Users' Meeting at PSI, Paul Scherrer Institut, Villigen, Switzerland, 15-16.09.2011

C. U. Stirnimann, R. Bingel-Erlenmeyer, V. Olieric, M. Wang
In situ diffraction screening at the Crystallization Platform at the SLS
International School on Biological Crystallization, Granada, Spain, 22-26.05.2011

C. U. Stirnimann, V. Olieric, M. Wang, the MX-group
In situ diffraction screening at the Crystallization Platform at the SLS
RAMC Meeting, Le Bischenberg, France, 11-14.09.2011

V.N. Strocov, M. Kobayashi, M. Shi, C. Hess, T. Schmitt, L. Patthey
Soft-X-ray ARPES facility at the ADRESS beamline: Instrumentation for k-resolved studies of 3-dim systems
Swiss Physical Society Joint Annual Meeting, Lausanne, Switzerland, 15-17.06.2011

T. Thüring, P. Modregger, B. R. Pinzer, Z. Wang, S. Rutishauser, C. David, T. Grund, J. Kenntner, S. Haemmerle, S. Weiss, M. Stampanoni
X-ray differential phase contrast tomography on a compact industrial micro CT scanner
2nd Joint Users Meeting, PSI Villigen, Switzerland, 15-16.09.2011

T. Thüring, P. Modregger, B. R. Pinzer, Z. Wang, S. Rutishauser, C. David, T. Grund, J. Kenntner, S. Haemmerle, S. Weiss, M. Stampanoni
X-ray differential phase contrast tomography on a compact industrial micro CT scanner
3rd ANKA / KNMF Joint Users Meeting, Karlsruhe, Germany, 13-14.10.2011

T. Thüring, P. Modregger, B. R. Pinzer, Z. Wang, S. Rutishauser, C. David, T. Grund, J. Kenntner, S. Haemmerle, S. Weiss, M. Stampanoni
X-ray differential phase contrast imaging on a compact industrial micro CT scanner
IEEE Nuclear Science Symposium and Medical Imaging Conference, Valencia, Spain, 23-29.10.2011

T. Thüring, P. Modregger, B. R. Pinzer, Z. Wang, M. Stampanoni
Regularized image integration for X-ray differential phase contrast radiography
IEEE Nuclear Science Symposium and Medical Imaging Conference, Valencia, Spain, 23-29.10.2011

P. Trtik, A. Diaz, M. GUizar-Sicairos, A. Menzel, O. Bunk
Density Mapping of Hardened Cement Paste using Ptychography
Joint Users' Meeting at PSI 2011, Paul Scherrer Institut, Villigen PSI, Switzerland, 09.2011

P. Ulmer, M. Pistone, L. Caricchi, E. Reusser, J.L. Fife, F. Marone, B. Tripoli, B.S.G. Almqvist, P. Benson, C. Madonna, A. Rust, L. Burlini
In-Situ Ultrafast 3D Imaging of Magma Vesiculation at High Temperature
AGU Fall Meeting 2011, San Francisco, CA, 05.09.12.2011

P. Urwyler, J. Althaus, J.Köser, S. Kaiser, F.Battiston, J. Gobrecht, U.Pieles, B.Müller
Polymer cantilevers for biomedical applications
NanoTechDay 2011

P. Urwyler, J.Köser, O. Häfeli, H. Schift, J. Gobrecht, F.Battiston, B.Müller
Injection molded micro-cantilever arrays for sensing
MMB 2011, Luzern, Switzerland, 04-06.05.2011

P. Urwyler, J.Köser, O. Häfeli, H. Schift, J. Gobrecht, F.Battiston, B.Müller
Injection molded micro-cantilever arrays for detecting DNA sequences
SSB 2011, Yverdon, Switzerland, 04.05.2011

P. Urwyler, J.Köser, O. Häfeli, H. Schift, J. Gobrecht, F.Battiston, B.Müller
Variotherm injection molded micro-cantilever arrays for sensing
CLINAM 2011, Basel, Switzerland, 23-25.05.2011

J. Vila-Comamala, A. Diaz, M. Guizar-Sicairos, A. Mantion, A. Menzel, O. Bunk
Characterization of a 20 nm Hard X-Ray Focus by Coherent Diffractive Imagine
Joint Users' Meeting at PSI 2011, Paul Scherrer Institut, Villigen PSI, Switzerland, 09.2011

C. Wäckerlin, D. Chylarecka, A. Kleibert, K. Müller, C. Iacovita, F. Nolting, T. A. Jung, N, Ballav
Controlling spins in adsorbed molecules by a chemical switch
Quantum Nanoscience Winterschool, Crans Montana, Switzerland, 29.03.2011

C. Wäckerlin, D. Chylarecka, K. Tarafdar, A. Kleibert, K. Müller, C. Iacovita, F. Nolting, P. M. Oppeneer, T. A. Jung, N. Ballav
Controlling spins in adsorbed molecules by a chemical switch
Swiss Physical Society Meeting, Lausanne, Switzerland, 15-17.06.2011

C. Wäckerlin, D. Chylarecka, A. Kleibert, K. Müller, C. Iacovita, T. Haehlen, K. Landheer, F. Nolting, K. Tarafder, P. M. Oppeneer, T. A. Jung, N. Ballav
Switching of surface supported molecular spins by axial ligation
Swiss Nanoscience Institute / Eidgenössische Materialprüfungsanstalt Workshop, Dübendorf, Switzerland, 24.06.2011

S. Waltersperger, G. Peng, C. Schultze-Briese, B.C. Wang, V. Olieric, M. Wang
Current developments on S-SAD/P-SAD phasing methods and the multi-axes goniometer PRIGO at the Swiss Light Source (SLS)
Annual Meeting, Amercian Crystallography Asscociation, New Orleans, LA, USA 28.05.-02.06.2011

L. Wang, H.H. Solak, Y. Ekinci,
Fabrication of large-are bi-layer wire grid polarizers for display technology using EUV interference lithography
Nanotech-meeting, Liestal, Switzerland, 02.11.2011

M. Wang, V. Olieric, C. Stirnimann, J. Schneider, J. Gabadinho, E. Panepucci, T. Tomizaki, X. Wang, R. Schneider, C. Praderwand, W. Glettig, A. Isenegger, C. Schulze-Briese
Automated in situ Diffraction Screening at Beamline X06DA at the Swiss Light Source
XXII Congress and General Assembly of International Union of Crystallography, Madrid, Spain, 22-30.08.2011

Z. Wang, T. Thüring, P. Modregger, B. R. Pinzer, C. David, E. Rössl, M. Trippel, R.A. Kubik-Huch, G. Singer, M. K. Hohl, N. Hauser, M. Stampanoni
Towards X-ray Differential Phase Contrast Mammography
Joint Users' Meeting at PSI 2011, Villigen, Switzerland, 2011

B. Watts, C.R. McNeill, J. Raabe
Imaging Polymer Nanostructures with STXM
Deutsche Physikalische Gesellschaft spring meeting 2011, Dresden, Germany, 13-19.03.2011

B. Watts
Imaging Composition and Molecular Orientation with STXM
CCMX annual meeting, Bern, Switzerland, 05.04.2011

V. Zelenay, T. Tritscher, A. Krepelova, M. F. Heringa, R. Chirico, A. S. H. Prévôt, E. Weingartner, U. Baltensperger, J. Dommen, B. Watts, J. Raabe, T. Huthwelker, M. Ammann
The climate effect of soot particles caught in act
15th ETH Conference on Combustion Generated Nanoparticles, Zürich, Switzerland, 26-29.06.2011

WORKSHOPS AND CONFERENCES

C.N. Borca, D. Grolimund
Scanning and tomographic micro-XRPD imaging using the XRDUA package
Villigen-PSI, Switzerland, 14-16.11.2011 Organizer

J. Fitts, T. Lanzirotti, D. Grolimund
ICOBTE 2011, Special symposium on x-ray microprobes and trace metal biogeochemistry
Florence, Italy, 03-07.07.2011 Co-Organizer

F. Gozzo, M. Tremayne
Determination of ab initio crystal structures from powder diffraction and their application in pharmaceutical industry
XXII Congress and General Assembly of the International Union of Crystallography, Madrid, Spain, 22-30.08.2011

D. Grolimund, C.N. Borca
JUM@P '11: Joint Users' Meeting at PSI 2011
Topical workshop on 'Advancing Quantitative Chemical Imaging', Villigen-PSI, Switzerland, 15-16.09.2011 Organizer

S. L. Johnson (Chair), P. Beaud, G. Ingold, U. Staub
Organisation of International Workshop on Ultrafast Dynamics in Strongly Correlated Systems
ETHZ, Campus Science City, Zürich, Switzerland, 04-07.04.2011

V. Olieric Co-Organizer
25th Rhine-Knee Regional Meeting in Crystallography of Biomacromolecules
Sursee, Switzerland, 28-30.09.2011

L. Quaroni
Workshop, IR Spectromicroscopy: A User Perspective
Biozentrum, Basel, Switzerland, 02.2011

B. Schmitt, E. Lehmann, Ch. Heer, B. Henrich, S. Reber, N. Schlumpf
13th International Workshop on Radiation Imaging Detectors (iWoRID 2011)
Zurich, Switzerland, 03-07.07.2011

M. Shi
Co-organizer for *IOP – PSI* Joint Workshop on Studies of Novel Materials using Large Facilities
Beijing, China, 19-21.10.2011

U. Staub (co-chair)
Workshop on Ultrafast Dynamics in Strongly Correlated Systems
ETH Zürich, Switzerland, 04-06.04.2011

U. Staub (co-chair)
Joint Annual Meeting of the Swiss Physical Society, Autrian Physical Society with the Swiss and Austrian Societies of Astronomy and Astrophyiscs
EPFL, Lausanne, Switzerland, 15-17.06.2011

U. Staub (co-chair)
Swiss-Taiwanese Workshop: Ultra-high Resolution Resonant Soft X-ray Spectroscopy
Paul Scherrer Institut, Villigen, Switzerland, 12-14.09.2011

U. Staub (co-chair)
International Workshop on Resonant Inelastic and Elastic X-Ray Scattering
Paul Scherrer Institut, Villigen, Switzerland, 16.-17.09.2011

PUBLIC RELATIONS

J. Gobrecht
- Closing remarks at the “Swiss Nanoconvention 2011”, Baden Switzerland, 18–19.05.2011
- Introductory talk and overview on Nanotechnology and SLS relared research at PSI for PSI summer students, 24.08.2011
- Radio-interview on nanotechnology research at PSI, presented at World Radio Switzerland, 06.10.2011
- Interview on Polymder Nanotechnology at FHNW in online-journal Sauberkeit und Reinraum, 12.2011
- Throughout the year 2011: Several introductory talks on PSI and guided tours for PSI visitor groups

J. Gobrecht, B. Gobrecht
- Wozu Schneewittchen sieben Nanotechnologen braucht, Januar-Meeting, Soroptimist International, Club Bremgarten Freiamt, 18.01.2011

J. Gobrecht, H. Schift, V. Guzenko, C. Padeste
- INKA Institute, Booth at MNE2011, Int. Conf. on Micro and Nanoengineering, Berlin, Germany, 19-23.09.2011

L. Heyderman, F. Nolting, H. B. Braun
- Monopole aus Nanomagneten Spektrum der Wissenschaft, 03.2011

C. Quitmann
- Glanzlichter aus 10 Jahren SLS, Oral Presentation for the general public, Paul Scherrer Institut, Villigen, Switzerland, 04.10. 2011

H. Schift, A. Schleunitz
- NaPANIL Projekt, Booth at MNE2011, Int. Conf. on Micro and Nanoengineering, Berlin, Germany, 19-23.09.2011

M. Stampanoni
- Grundlagenforschung ermöglicht aussagekräftigere Bilder, Vortragsreihen am PSI, PSI, Villigen, Switzerland, 01.06.2011
- Röntgenphasenkontrast Mammographie, Supporter Krebsliga Schweiz, Paul Scherrer Institut, Villigen, Switzerland, 27.08.2011
- Röntgendiagnostik – Grundlagenforschung ermöglicht aussagekräftigere Bilder, Tag der Offene Türen, Paul Scherrer Institut, Villigen, Switzerland, 16.10.2011

J. A. van Bokhoven
- Katalysatoren für alle Grössenbereiche
  http://www.ethlife.ethz.ch/archive_articles/110721_inti-van-bokhoven_per/index
  Fenster zur Forschung Ausgabe 03/11, Paul Scherrer Institut, 09.2011, ISSN 1664-8854
  SPECTRUM 2011/II Themenspektrum (Interview): Fotosynthese soll zur Energieversorgung beitragen, Von Pflanzen inspiriert

C. Wäckerlin
- The article: "Controlling Spins in Adsorbed Molecules by a Chemical Switch" by C. Wäckerlin et al. was mentioned in the following press releases:
  * Martina Huber, Daten speichern mit Blut-Molekülen?, *20 minuten p. 22-23* (17.02.2011)
- A short interview with Christian Wäckerlin in the context of a video highlighting the Nanoscience degree course at the University of Basel
  NZZ Campus – Nanowissenschaften in Basel – Ein besonderer Studiengang

DISSERTATIONS

P. Beaud
- *Short and long-range structural time evolution in optically excited solids probed by X-rays.*
  E. Möhr-Vorobeva ETHZ, Zürich, Switzerland, (2011)
- *Investigation of Physiological Solutions of Metalloproteins in a High-Repetition Rate Picosecond X-ray Absorption Experiment.*
  F. Alves Lima EPFL, Lausanne, Switerzland, (2011)

L. J. Heyderman, M. Kläui
- *Spin Dynamics and Spin Configuration in Nanopatterned Elements*
  J. Rhensius, University of Basel, Switzerland, (2011)

T. A. Jung
- *Insight into the exchange coupling between magnetic molecules and the supporting surface : spectromicrocopy correlation including X-ray magnetic circular dichroism*
  C. Chylarecka, University of Basel, Switzerland, (2011)
- *Nanofracture mechanics: Scanning Force Microscopy for the investigation of adhesion and corrosion at solid-solid interfaces*
  A. Kaufmann, University of Basel, Switzerland, (2011)

C. Padeste
- *Towards Single Cell Proteomics*
  J. Ziegler, University of Basel, Switzerland, (2011)

C. Padeste
- *Functionalization of Polymer Surfaces with Polyelectrolyte Brushes*
  S. Neuhaus, ETH Zürich, Switzerland, (2011)

J.A. van Bokhoven
- *Heterogeneous hydrogenation of unsaturated hydrocarbons over oxide-supported palladium nanoparticles*
  Tew Min Wei, (2011)

J.F. van der Veen

- *Determination of trace elements in ambient aerosols with synchrotron radiation induced X-ray fluorescence spectrometry and subsequent source apportionment*
  A.C.J. Richard, ETH Zürich, Switzerland, (2011)

AWARDS

M. Guizar-Sicairos
2010 University of Rochester Outstanding Dissertation Award for Engineering and Applied Sciences
University of Rochester, Rochester NY USA

A. Schleunitz, V. A. Guzenko, C. Spreu, M. Vogler, H. Atasoy, G. Grützner, H. Schift
Best poster award in category Lithography and Systems: *Enhancing 3-D structural variety by combination of electron-beam and nanoimprint lithography with thermal reflow,* MNE2011, Int. Conf. on Micro and Nanoengineering, Berlin, Germany, 19-23.09.2011

J. Nowakovski, et. al
TNT 2011 Poster Award: *Assembly of 2D ionic layers by reaction of alkali halides with an organic electrophile – TCNQ,* Trends in NanoTechnology 2011, Tenerife, Canary Islands, Spain, 21-25.11.2011

H.A.O. Wang
Swiss Chemical Society, Metrohm Prize (Best Oral Presentation in Analytical Chemistry), Quantitative Microscopic Studies with High Spatial Resolution of Contaminant Diffusion into Opalinus clay rock, Fall Meeting of the Swiss Chemical Society 2011, Lausanne, Switzerland, 09.2011

MEMBERSHIPS IN EXTERNAL COMMITTEES

C. David

- Member of the International Program Committee of the MNE: Micro- and Nano-Engineering Conference Series
- Member of the Scientific Advisory Board of the Courant Research Centre "Nano-Spectroscopy and X-ray Imaging", University of Göttingen, Germany
- Member of the Editorial Board of the Journal of X-ray Optics and Instrumentation
- Member of the Program Committee of the ICXOM: International Conference on X-ray Optics and Microanalysis Conference Series
- Member of the Program Committee of the SPIE Conference on Optics + Optoelectronics: "Advances in X-ray Free-Electron Lasers: Radiation Schemes, X-ray Optics and Instrumentation"
- Member of the Program Committee of the SPIE Conference on Optics + Optoelectronics: "Advances in X-Ray/EUV Optics and Components VII"

U. Flechsig

- Design Review Committee for the DREAMLINE Beamline at SSRF - Shanghai Synchrotron Radiation Facility, Shanghai, 2011

J. Gobrecht

- Head of the Institute of Polymer Nanotechnology, University of Applied Sciences Nordwestschweiz, Brugg/Windisch, Switzerland
- Vice Director Technology of the Swiss Nanoscience Institute at the University of Basel
- Member of the board of the Swiss Micro- and Nanotechnology Network
- Member of the Scientific Advisory Board, HeiQ Materials AG, Bad Zurzach, Switzerland
- Member of the board of directors, Eulitha AG, 5232 Villigen PSI

- Epert reviewer for the “Förderpreis für Jungunternehmen” of the “W. A. de Vigier Foundation”, Solothurn, Switzerland
- Member of the “Board Wirtschaft” of i-net Basel Nano, and leader of innovation circle “Nanofabrication” within i-net Basel Nano
- Member of the proposal review committee, Karlsruhe Nano- and Micro-Facility in the Karlsruhe Institute of Technology
- Member of the search committee for an ext. ord. professorship in microtechnology at the Ecole Polytechnique Federale de Lausanne (EPFL), 2011
- External member of the PhD examination committee of Jan Rhensius at the physics dept. of the University of Konstanz, Germany, Sept. 2011
- Chair of the panel 17 “Engineering Department” of the “Quality and Renewal” audit (KoF11) of the University of Uppsala, Sweden, May 2011
- Member of the Steering Committee and local organizing committee of the Swiss Nanoconvention 2011 in Baden, Switzerland
- Member of the election committee of a professor for solar physics at the FHNW, Windisch, Switzerland

F. Gozzo

- Member of the Commission of Instrumentation and Computing
- Italian Crystallography Association
- Swiss representative of the Swiss Norwegian Beamline Council

L. Heyderman

- Member of the Advisory Committee of the IEEE Magnetics Society
- Member of the Board of Editors, Journal of Magnetism and Magnetic Materials
- Member of Program Committee of Annual Conference on Magnetism and Magnetic Materials (MMM) 2011
- Member of Program Committee of the International Colloquium on Magnetic Films and Surfaces (ICMFS)
- International Conference on Micro & Nano Engineering (MNE): International Program Committee 2011. Organising Committee and Program Chair, MNE 2014, Switzerland.
- Scientific committee of the European School on Magnetism

T. Huthwelker

- External Reviewer at the Canadian Light Source

M. Janousch

- Member of the SOLEIL Computing and Electronics Advisory Committee

T.A. Jung

- Scientific Committee for New and Emerging Health Risks of the European Comission (SCENIHR)

F. Marone

- Member of the SINQ-ACNI Proposal Review Committee

A. Menzel

- BioCAT Advisory Committee, Advanced Photon Source (APS) – Argonne National Laboratory, Argonne IL, USA
- Proposal Review Committee “Methods and Instrumentation” European Synchrotron Radiation Facility (ESRF), Grenoble, France
- Beamline Development Team “High-Brilliance X-ray Scattering for Life Sciences (LiX)” National Synchrotron

F. Nolting

- Scientific Committee of 2011 Magnetics and Optics Research International Symposium, MORIS 2011 – Nijmegen, The Netherlands
- PhD Thesis committee, Saqib Javid, University of Strasbourg, France, 15.09.2011
- PhD Thesis committee, Kadir Vahaplar, University of Nijmegen, The Netherlands, 1.09.2011

L. Patthey

- Member of MAX IV Programm Advice Committee
- Opponent for a public PhD defense (of Eike Fabian Schwier) at the Faculty of Physique, University of Fribourg, Switzerland, September 23, 2011

L. Quaroni

Diamond Light Source - Peer Review Panel II - Soft Matter

Canadian Light Source - Member of Beamline Scientific Team - MidIR Beamline

C. Quitmann

- Member ALBA Synchrotron Light Facility Scientific Advisory Committee
- Member Diamond Light Source Scientific Advisory Committee
- Member Council of the Swiss-Norwegian Foundation for Research with X-Rays
- Member Working Group on the Scientific Mission of the ESRF
- Member international review of x-ray microscopy activities at Lawrence Berkeley Labs / Advanced Light Source, Berkeley, CA, USA, 21-22.04.2011
- Member international review of x-ray microscopy activities at Helmholtzzentrum Berlin – BESSY II, Berlin, Germany, 04-05.03.2011

T. Schmitt

- Opponent for a public PhD thesis defense (of Håkan Hollmark) at the Faculty of Sciences and Technology at Uppsala University, Sweden, 06.05.2011
- Member of the international advisory committee of the *2011 International Workshop on Resonant Inelastic X-ray Scattering (RIXS)*, Las Vegas, Nevada, USA, 25-27.05.2011
- Chair of the organization committee of the *International Workshop on "Resonant Inelastic and Elastic X-Ray Scattering"*, Paul Scherrer Institut, Switzerland, 16-17.09.2011

U. Staub

- Executive committee member of the Swiss Physical Society (SPS) (representative for condensed matter physics)
- Member of the Proposal Review Panel of FLASH
- Member of the Scientific Committee of NCCR MaNEP
- Habilitation committee of M. Amara, CNRS Grenoble (16.11.2011)
- Member of the SPS Prize committee

M. Stampanoni

- Chair of ESRF-PRC-MD Panel, the European Synchrotron Radiation Facility Program Review Committee, Medical Applications Panel
- Member of the International Advisory Committee of the Intl. Conference for Medical Applications of Synchrotron Radiation

S. Tsujino

- Secretary of the International Steering Committee, International Vacuum Nanoelectronics Conference

J. van Bokhoven

- ILS (Institutsleitungssitzung)
- Konferenz des Lehrkörpers Beratendes Gremium der Schulleitung ETH Zurich

- Phys. Chem. Chem. Phys. Advisory Board GB
- Proposal Review Committee Synchrotron Diamond
- Council for the Swiss Norwegian Beamline ESRF
- Proposal Review Committee Dutch/Beglium Beamline, ESRF Grenoble

J.F. Van der Veen

- Chairman of Science Advisory Committee of the Advanced Light Source, Berkeley, USA
- Science Advisory Committee of Synchrotron SOLEIL, Gif-sur-Yvette, France
- Science Advisory Committee of Advanced Photon Source, Argonne National Laboratory, USA
- Science Advisory Committee of ANKA, Karlsruhe Institute of Technology, Karlsruhe, Germany
- Science Advisory Committee for Brookhaven National Laboratory's Light Sources Directorate, USA
- Science Advisory Committee of Synchrotron NSRRC, Hsinchu, Taiwan
- Programme Committee of PSI Summer School on Condensed Matter Research, Zug, Switzerland
- Scientific Advisory Committee of HERCULES, Grenoble
- International Advisory Committee of the International Conference Series on Synchrotron Radiation Instrumentation
- Advisory Committee of the International Conference Series on Surface X-Ray and Neutron Scattering
- Steering Committee CCMX, Competence Centre for Materials Science and Technology, ETH, Switzerland
- Steering Committee NCCBI, National Competence Center in Biomedical Imagine, ETH, Switzerland
- Member Evaluation Group University of Göttingen, Excellence Initiative 'Institutional Strategies', Wissenschaftsrat, Germany
- Chairman of Review Committee advising NWO on investments in chemical sciences, The Netherlands
- Chairman of International Peer Review Committee evaluating physics research at nine universities in The Netherlands
- Science Advisory Committee for the Van der Waals-Zeeman Instituut, University of Amsterdam, The Netherlands

B. Watts

- Member of the NeXus International Advisory Committee

P.R. Willmott

- Member of the Diamond Light Source Proposal Review Committee
- Member of the PSI Forschungskommission

PATENTS

L.J. Heyderman, T. Jung, E. Mengotti, A. Bisig, A. Fraile Rodríguez, F. Nolting, H.B. Braun, T. Schrefl
Method and system for coding and read out of information in a microscopic cluster comprising coupled functional islands
United States Patent US 8,085,578 B2, 27.12.2011

A. Schleunitz, H. Schift
Fabrication of 3-D nanoimprint stamps with continuous reliefs using dose-modulated electron beam lithography and thermal reflow
PCT/EP2011/056818, Int. filing date 29.04.2011, Priority date 07.05.2010

Z. Wang, M. Stampanoni
Image enhancement for phase contrast imaging
Patent EP11175756, 28.07.2011

Research with Neutrons and Muons

Staff NUM, Condensed Matter Theory

LIST OF PUBLICATIONS (PEER REVIEWED)

Atanasov M, Delley B, Neese F, Tregenna-Piggott PL, Sigrist M
Theoretical Insights into the Magnetostructural Correlations in Mn-3-Based Single-Molecule Magnets
INORGANIC CHEMISTRY **50**, 2112 (2011)

Bruska MK, Czekaj I, Delley B, Mantzaras J, Wokaun A
Electronic structure and oxygen vacancies in PdO and ZnO: validation of DFT models
PHYSICAL CHEMISTRY CHEMICAL PHYSICS **13**, 15947 (2011)

Castrucci P, Scilletta C, Del Gobbo S, Scarselli M, Camilli L, Simeoni M, Delley B, Continenza A, De Crescenzi M
Light harvesting with multiwall carbon nanotube/silicon heterojunctions
NANOTECHNOLOGY **22**, 115701 (2011)

Chiesa S, Derlet PM, Dudarev SL, Van Swygenhoven H
Optimization of the magnetic potential for alpha-Fe
JOURNAL OF PHYSICS-CONDENSED MATTER **23**, 206001 (2011)

Cui XY, Zheng RK, Liu ZW, Li L, Delley B, Stampfl C, Ringer SP
Magic numbers of nanoholes in graphene: Tunable magnetism and semiconductivity
PHYSICAL REVIEW B **84**, 125410 (2011)

Derlet PM, Gilbert MR, Dudarev SL
Simulating dislocation loop internal dynamics and collective diffusion using stochastic differential equations
PHYSICAL REVIEW B **84**, 134109 (2011)

Derlet PM, Maass R
Thermal-activation model for freezing and the elastic robustness of bulk metallic glasses
PHYSICAL REVIEW B **84**, 220201 (2011)

Deupi X, Standfuss J
Structural insights into agonist-induced activation of G-protein-coupled receptors
CURRENT OPINION IN STRUCTURAL BIOLOGY **21**, 541 (2011)

Gonzalez A, Perez-Acle T, Pardo L, Deupi X
Molecular Basis of Ligand Dissociation in beta-Adrenergic Receptors
PLOS ONE **6**, e23815 (2011)

Neupert T, Santos L, Chamon C, Mudry C
Fractional Quantum Hall States at Zero Magnetic Field
PHYSICAL REVIEW LETTERS **106**, 236804 (2011)

Neupert T, Santos L, Ryu S, Chamon C, Mudry C
Fractional topological liquids with time-reversal symmetry and their lattice realization
PHYSICAL REVIEW B **84**, 165107 (2011)

Pauli SA, Leake SJ, Delley B, Bjorck M, Schneider CW, Schleputz CM, Martoccia D, Paetel S, Mannhart J, Willmott PR
Evolution of the Interfacial Structure of LaAlO3 on SrTiO3
PHYSICAL REVIEW LETTERS **106**, 036101 (2011)

Sansuk K, Deupi X, Torrecillas IR, Jongejan A, Nijmeijer S, Bakker RA, Pardo L, Leurs R
A Structural Insight into the Reorientation of Transmembrane Domains 3 and 5 during Family A G Protein-Coupled Receptor Activation
MOLECULAR PHARMACOLOGY **79**, 262 (2011)

Santos L, Neupert T, Ryu SS, Chamon C, Mudry C
Time-reversal symmetric hierarchy of fractional incompressible liquids
PHYSICAL REVIEW B **84**, 165138 (2011)

Santos L, Nishida Y, Chamon C, Mudry C
Counting Majorana zero modes in superconductors
PHYSICAL REVIEW B **83**, 104522 (2011)

Shieh CC, Cui XY, Delley B, Stampfl C
Built-in electric fields and valence band offsets in InN/GaN(0001) superlattices: First-principles investigations
JOURNAL OF APPLIED PHYSICS **109**, 083721 (2011)

Storni M, Morf RH
Localized quasiholes and the Majorana fermion in fractional quantum Hall state at v=5/2 via direct diagonalization
PHYSICAL REVIEW B **83**, 195306 (2011)

Suzuki H, Delley B, Satoko C
DFT study on magnetic interaction in an orbitally degenerate Ti3+ dimer complex
JOURNAL OF PHYSICS-CONDENSED MATTER **23**, 375502 (2011)

Todorova T, Peitz D, Krocher O, Wokaun A, Delley B
Guanidinium Formate Decomposition on the (101) TiO2-Anatase Surface: Combined Minimum Energy Reaction Pathway Calculations and Temperature-Programmed Decomposition Experiments
JOURNAL OF PHYSICAL CHEMISTRY C **115**, 1195 (2011)

Viitala M, Cramariuc O, Delley B, Rantala TT
Conformation and energetics of benzene adsorbate on SnO2(110) surfaces: A first principles study
SURFACE SCIENCE **605**, 1563 (2011)

Warschkow O, Chuasiripattana K, Lyle MJ, Delley B, Stampfl C
Cu/ZnO(0001) under oxidating and reducing conditions: A first-principles survey of surface structures
PHYSICAL REVIEW B **84**, 125311 (2011)

d'Ambrumenil N, Halperin BI, Morf RH
Model for Dissipative Conductance in Fractional Quantum Hall States
PHYSICAL REVIEW LETTERS **106**, 126804 (2011)

INVITED TALKS

P. Derlet
Langevin Dynamics and probing the atomic scale
Joint User's Meeting at PSI, Paul Scherrer Institut, Switzerland, September 11th, 2011

P. Derlet
Understanding disorder and how metallic glasses yield
Department of Physics, NTNU, Trondheim, Norway, April 11th 2011

P. Derlet
Semi-empirical atomistic modelling of itinerant magnetic systems
Spring Meeting, Swiss Association of Computational Chemistry, Bern, Switzerland, February 18th 2011

X. Deupi
Integration of GPCR Structure, Dynamics and Function
Keystone Symposia on Molecular and Cellular Biology: G Protein-Coupled Receptors April 7 - 12, 2010. Breckenridge, Colorado.

Chr. Mudry
Fractional topological insulators
Workshop on Novel Quantum States in Condensed Matter: Correlation, Frustration and Topology,
Yukawa Institute for Theoretical Physics (YITP), Kyoto University, Japan November 7 - December 9, 2011

Chr. Mudry
Fractional topological insulators
Workshop on Topological Insulators and Superconductors, KITP, September 19 - December 16, 2011

Chr. Mudry
Fractional topological insulators
Workshop on Quantum Field Theory aspects of Condensed Matter Physics, 6-9 September 2011 INFN - Laboratori Nazionali di Frascati, Italy

Chr. Mudry
Qauntum phase transitions: an overview
10th PSI Summer School on Condensed Matter Research, 13-22 August 2011 Institut Montana Zugerberg in Zug, Switzerland

Chr. Mudry
Point defects in topological Bloch insulators or superconductors,
“Topological Properties of Electronic Materials”, MaNEP topical meeting, University of Geneva, May 6 2011

Chr. Mudry
Topological aspects in superconducting materials
“Advanced Working Group on Experimental Probes for Topological Materials”, Royal Holloway College, University of London, February 18-19 2011

Chr. Mudry
Fractional topological insulators,
Dahlem Center Colloquium, Freie Universität Berlin June 2011.

Chr. Mudry
Fractional topological insulators
Boston College, October 2011

Chr. Mudry
Fractional topological insulators
UIUC, October 2011

Chr. Mudry
Fractional quantum Hall states at zero magnetic field
RIKEN, April 2011

Chr. Mudry
Topological aspects in superconducting materials
Hong-Kong University of Science and Technology, April 2011

MEMBERSHIP IN EXTERNAL COMMITTEES

Dr. K. Clausen
- Member of the Board of NMI3 (2004-2011)
- International Advisory Committee for The RIKEN-RAL Muon Facility
- Member of the NIAC (J-PARC)
- Chairman ESS Technical Advisory Committee
- Member ob ILL Scientific Advisory Committee

LECTURES AND COURSES

K. Clausen
Introduction I: Materials and Life Science: potential for use of and demands to the performance of high power hadron machines
CERN School, High Power Hadron Machines, Bilbao, Spain, May 24 – June 2, 2011

K. Clausen
Introduction II: Particle Physics and Energy research: potential for use of and demands to the performance of high power hadron machines
CERN School, High Power Hadron Machines, Bilbao, Spain, May 24 – June 2, 2011

Chr. Mudry
Field theory in condensed matter physics
ETHZ

DISSERTATIONS

M. Storni
Non-Abelian braiding statistics in the fractional quantum Hall state at filling factor nu=5/2? Exact diagonalization investigations
ETH Zürich (September 2011)

EXCHANGE STUDENTS

Araceli Valles Sales (UPC, Barcelona, Spain)

Angel Gonzalez-Wong (Universidad Andres Bello, Chile)

Research with Neutrons and Muons

Laboratory for Particle Physics (LTP)

LIST OF PUBLICACTIONS (PEER REVIEWED)

Aaron FD, Alexa C, Andreev V, Backovic S, Baghdasaryan A, Baghdasaryan S, Barrelet E, Bartel W, Begzsuren K, Belousov A, Belov P, Bizot JC, Boenig MO, Boudry V, Bozovic-Jelisavcic I, Bracinik J, Brandt G, Brinkmann M, Brisson V, Britzger D, Bruncko D, Bunyatyan A, Buschhorn G, Bystritskaya L, Campbell AJ, Avila KBC, Ceccopieri F, Cerny K, Cerny V, Chekelian V, Contreras JG, Coughlan JA, Cvach J, Dainton JB, Daum K, Delcourt B, Delvax J, De Wolf EA, Diaconu C, Dobre M, Dodonov V, Dossanov A, Dubak A, Eckerlin G, Egli S, Eliseev A, Elsen E, Favart L, Fedotov A, Felst R, Feltesse J, et al.
Measurement of D(+/-) meson production and determination of F-2(c(c)over-bar) at low Q(2) in deep-inelastic scattering at HERA*
EUROPEAN PHYSICAL JOURNAL C **71**, 1769 (2011)

Aaron FD, Alexa C, Andreev V, Backovic S, Baghdasaryan A, Baghdasaryan S, Barrelet E, Bartel W, Begzsuren K, Belousov A, Belov P, Bizot JC, Boudry V, Bozovic-Jelisavcic I, Bracinik J, Brandt G, Brinkmann M, Brisson V, Britzger D, Bruncko D, Bunyatyan A, Buschhorn G, Bystritskaya L, Campbell AJ, Avila KBC, Ceccopieri F, Cerny K, Cerny V, Chekelian V, Contreras JG, Coughlan JA, Cvach J, Dainton JB, Daum K, Delcourt B, Delvax J, De Wolf EA, Diaconu C, Dobre M, Dodonov V, Dossanov A, Dubak A, Eckerlin G, Egli S, Eliseev A, Eisen E, Favart L, Fedotov A, Felst R, Feltesse J, Ferencei J, et al.
Search for lepton flavour violation at HERA
PHYSICS LETTERS B **701**, 20 (2011)

Aaron FD, Alexa C, Andreev V, Backovic S, Baghdasaryan A, Baghdasaryan S, Barrelet E, Bartel W, Begzsuren K, Belousov A, Belov P, Bizot JC, Boudry V, Bozovic-Jelisavcic I, Bracinik J, Brandt G, Brinkmann M, Brisson V, Britzger D, Bruncko D, Bunyatyan A, Buschhorn G, Bystritskaya L, Campbell AJ, Avila KBC, Ceccopieri F, Cerny K, Cerny V, Chekelian V, Contreras JG, Coughlan JA, Cvach J, Dainton JB, Daum K, Delcourt B, Delvax J, De Wolf EA, Diaconu C, Dobre M, Dodonov V, Dossanov A, Dubak A, Eckerlin G, Egli S, Eliseev A, Elsen E, Favart L, Fedotov A, Felst R, Feltesse J, Ferencei J, et al.
Measurement of photon production in the very forward direction in deep-inelastic scattering at HERA
EUROPEAN PHYSICAL JOURNAL C **71**, (2011)

Aaron FD, Alexa C, Andreev V, Backovic S, Baghdasaryan A, Baghdasaryan S, Barrelet E, Bartel W, Begzsuren K, Belousov A, Belov P, Bizot JC, Boudry V, Bozovic-Jelisavcic I, Bracinik J, Brandt G, Brinkmann M, Brisson V, Britzger D, Bruncko D, Bunyatyan A, Buschhorn G, Bystritskaya L, Campbell AJ, Avila KBC, Ceccopieri F, Cerny K, Cerny V, Chekelian V, Contreras JG, Coughlan JA, Cvach J, Dainton JB, Daum K, Delcourt B, Delvax J, De Wolf EA, Diaconu C, Dobre M, Dodonov V, Dossanov A, Dubak A, Eckerlin G, Egli S, Eliseev A, Elsen E, Favart L, Fedotov A, Felst R, Feltesse J, Ferencei J, et al.
Search for contact interactions in e(+/-)p collisions at HERA H1 Collaboration
PHYSICS LETTERS B **705**, 52 (2011)

Aaron FD, Alexa C, Andreev V, Backovic S, Baghdasaryan A, Baghdasaryan S, Barrelet E, Bartel W, Begzsuren K, Belousov A, Bizot JC, Boudry V, Bozovic-Jelisavcic I, Bracinik J, Brandt G, Brinkmann M, Brisson V, Britzger D, Bruncko D, Bunyatyan A, Buschhorn G, Bystritskaya L, Campbell AJ, Avila KBC, Ceccopieri F, Cerny K, Cerny V, Chekelian V, Cholewa A, Contreras JG, Coughlan JA, Cvach J, Dainton JB, Daum K, Delcourt B, Delvax J, DeWolf EA, Diaconu C, Dobre M, Dodonov V, Dossanov A, Dubak A, Eckerlin G, Egli S, Eliseev A, Elsen E, Favart L, Fedotov A, Felst R, Feltesse J, Ferencei J, et al.
Search for squarks in R-parity violating supersymmetry in ep collisions at HERA
EUROPEAN PHYSICAL JOURNAL C **71**, 1572 (2011)

Aaron FD, Alexa C, Andreev V, Backovic S, Baghdasaryan A, Baghdasaryan S, Barrelet E, Bartel W, Behrend O, Belov P, Begzsuren K, Belousov A, Bizot JC, Boudry V, Bozovic-Jelisavcic I, Bracinik J, Brandt G, Brinkmann M, Brisson V, Britzger D, Bruncko D, Bunyatyan A, Buschhorn G, Bylinkin A, Bystritskaya L, Campbell AJ, Avila KBC, Ceccopieri F, Cerny K, Cerny V, Chekelian V, Cholewa A, Contreras JG, Coughlan JA, Cvach J, Dainton JB, Daum K, Delcourt B, Delvax J, De Wolf EA, Diaconu C, Dobre M, Dodonov V, Dossanov A, Dubak A, Eckerlin G, Egli S, Eliseev A, Elsen E, Favart L, Fedotov A, et al.
Measurement of the inclusive e(+/-) p scattering cross section at high inelasticity y and of the structure function F-L
EUROPEAN PHYSICAL JOURNAL C **71**, 1579 (2011)

Aaron FD, Alexa C, Andreev V, Backovic S, Baghdasaryan A, Barrelet E, Bartel W, Begzsuren K, Belousov A, Bizot JC, Boudry V, Bozovic-Jelisavcic I, Bracinik J, Brandt G, Brinkmann M, Brisson V, Britzger D, Bruncko D, Bunyatyan A, Buschhorn G, Bystritskaya L, Campbell AJ, Avila KBC, Ceccopieri F, Cerny K, Cerny V, Chekelian V, Cholewa A, Contreras JG, Coughlan JA, Cvach J, Dainton JB, Daum K, Deak M, Delcourt B, Delvax J, De Wolf EA, Diaconu C, Dobre M, Dodonov V, Dossanov A, Dubak A, Eckerlin G, Efremenko V, Egli S, Eliseev A, Elsen E, Favart L, Fedotov A, Felst R, Feltesse J, et al.
Measurement of charm and beauty jets in deep inelastic scattering at HERA
EUROPEAN PHYSICAL JOURNAL C **71**, (2011)

Aaron FD, Alexa C, Andreev V, Backovic S, Baghdasaryan A, Barrelet E, Bartel W, Begzsuren K, Belousov A, Bizot JC, Boudry V, Bozovic-Jelisavcic I, Bracinik J, Brandt G, Brinkmann M, Brisson V, Britzger D, Bruncko D, Bunyatyan A, Buschhorn G, Bystritskaya L, Campbell AJ, Avila KBC, Ceccopieri F, Cerny K, Cerny V, Chekelian V, Cholewa A, Contreras JG, Coughlan JA, Cvach J, Dainton JB, Daum K, Deak M, Delcourt B, Delvax J, De Wolf EA, Diaconu C, Dobre M, Dodonov V, Dossanov A, Dubak A, Eckerlin G, Efremenko V, Egli S, Eliseev A, Elsen E, Favart L, Fedotov A, Felst R, Feltesse J, et al.
Measurement of the cross section for diffractive deep-inelastic scattering with a leading proton at HERA
EUROPEAN PHYSICAL JOURNAL C **71**, 1578 (2011)

Adam J, Bai X, Baldini A, Baracchini E, Bemporad C, Boca G, Cattaneo PW, Cavoto G, Cei F, Cerri C, Corbo M, Curalli N, de Bari A, De Gerone M, Doke T, Dussoni S, Egger J, Fratini K, Fujii Y, Galli L, Gallucci G, Gatti F, Golden B, Grassi M, Grigoriev DN, Haruyama T, Hildebrandt M, Ignatov F, Iwamoto T, Kettle PR, Khazin BI, Kiselev O, Korenchenko A, Kravchuk N, Maki A, Mihara S, Molzon W, Mori T, Mzavia D, Natori H, Nicolo D, Nishiguchi H, Nishimura Y, Ootani W, Panareo M, Papa A, Pazzi R, Piredda G, Popov A, Renga F, Ritt S, et al.
Calibration and monitoring of the MEG experiment by a proton beam from a Cockcroft-Walton accelerator
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **641**, 19 (2011)

Adam J, Bai X, Baldini AM, Baracchini E, Bemporad C, Boca G, Cattaneo PW, Cavoto G, Cei F, Cerri C, de Bari A, De Gerone M, Doke T, Dussoni S, Egger J, Fratini K, Fujii Y, Galli L, Gallucci G, Gatti F, Golden B, Grassi M, Grigoriev DN, Haruyama T, Hildebrandt M, Hisamatsu Y, Ignatov F, Iwamoto T, Kettle PR, Khazin BI, Kiselev O, Korenchenko A, Kravchuk N, Maki A, Mihara S, Molzon W, Mori T, Mzavia D, Natori H, Nicolo D, Nishiguchi H, Nishimura Y, Ootani W, Panareo M, Papa A, Pazzi R, Piredda G, Popov A, Renga F, Ritt S, Rossella M, et al.
New Limit on the Lepton-Flavor-Violating Decay mu(+) -> e(+)gamma
PHYSICAL REVIEW LETTERS **107**, 171801 (2011)

Affolder A, Aleev A, Allport PP, Andricek L, Artuso M, Balbuena JP, Barabash L, Barber T, Barcz A, Bassignana D, Bates R, Battaglia M, Beimforde M, Bemardini J, Betancourt C, Bilei GM, Bisello D, Blue A, Bohm J, Bolla G, Borgia A, Borrello L, Bortoletto D, Boscardin M, Bosma MJ, Bowcock TJV, Breindl M, Broz J, Bruzzi M, Brzozowski A, Buhmann P, Buttar C, Campabadal F, Candelori A, Casse G, Charron S, Chren D, Cihangir S, Cindro V, Collins P, Gil EC, Costinoaia CA, Creanza D, Cristobal C, Dalla Betta GF, de Boer W, De Palma M, Demina R, Dierlamm A, Diez S, Dobos D, et al.
Silicon detectors for the sLHC
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **658**, 11 (2011)

Altarev I, Ban G, Bison G, Bodek K, Daum M, Fertl M, Fierlinger P, Franke B, Gutsmiedl E, Heil W, Henneck R, Horras M, Khomutov N, Kirch K, Kistryn S, Kraft A, Knecht A, Knowles P, Kozela A, Lauer T, Lauss B, Lefort T, Lemiere Y, Mtchedlishvili A, Naviliat-Cuncic O, Pazgalev A, Petzoldt G, Piegsa FM, Pierre E, Pignol G, Quemener G, Rebetez M, Rebreyend D, Roccia S, Schmidt-Wellenburg P, Severijns N, Sobolev Y, Weis A, Zejma J, Zenner J, Zsigmond G
Testing isotropy of the universe using the Ramsey resonance technique on ultracold neutron spins
PHYSICA B-CONDENSED MATTER **406**, 2365 (2011)

Antognini A et AL
The Lamb Shift in Muoni Hydrogen and the Proton Radius
PHYSICS PROCEDIA **17**, 10 (2011)

Antognini A, Biraben F, Cardoso JMR, Covita DS, Dax A, Fernandes LMP, Gouvea AL, Graf T, Hansch TW, Hildebrandt M, Indelicato P, Julien L, Kirch K, Kottmann F, Liu YW, Monteiro CMB, Mulhauser F, Nebel T, Nez F, dos Santos JMF, Schuhmann K, Taqqu D, Veloso JFCA, Voss A, Pohl R
Illuminating the proton radius conundrum: the mu He+ lamb shift
CANADIAN JOURNAL OF PHYSICS **89**, 47 (2011)

Antognini A, Nez F, Amaro FD, Biraben F, Cardoso JMR, Covita DS, Dax A, Dhawan S, Fernandes LMP, Giesen A, Graf T, Hansch T, Indelicato P, Julien L, Kao CY, Knowles P, Kottman F, Le Bigot EO, Liu YW, Lopes JAM, Ludhova L, Monteiro CMB, Mulhauser F, Nebel T, Rabinowitz P, dos Santos JMF, Schaller LA, Schuhmann K, Schwob C, Taqqu D, Veloso JFCA, Pohl R
Muonic hydrogen spectroscopy: the proton radius puzzle
ICONO 2010: INTERNATIONAL CONFERENCE ON COHERENT AND NONLINEAR OPTICS **7993**, 79931K (2011)

Araujo H, Canizares P, Chmeissani M, Conchillo A, Diaz-Aguilo M, Garcia-Berro E, Gesa L, Gibert F, Grimani C, Hajdas W, Hollington D, Lloro I, Lobo A, Mateos I, Nofrarias M, Puigdengoles C, Ramos-Castro J, Sanjuan J, Sopuerta CF, Wass P
Milli-Hertz Gravitational Waves: LISA and LISA PathFinder
SPANISH RELATIVITY MEETING (ERE 2010): GRAVITY AS A CROSSROAD IN PHYSICS **314**, 012014 (2011)

Atchison F, Blau B, Bodek K, van den Brandt B, Brys T, Daum M, Fierlinger P, Geltenbort P, Hautle P, Henneck R, Heule S, Holley A, Kasprzak M, Kirch K, Knecht A, Konter JA, Kuzniak M, Liu CY, Pichlmaier A, Plonka C, Pokotilovski Y, Saunders A, Tortorella D, Wohlmuther M, Young AR, Zejma J, Zsigmond G
Production of ultracold neutrons from cryogenic H-2(2), O-2, and (CH4)-H-2 converters
EPL **95**, 12001 (2011)

Balin DV, Ganzha VA, Kozlov SM, Maev EM, Petrov GE, Soroka MA, Schapkin GN, Semenchuk GG, Trofimov VA, Vasiliev AA, Vorobyov AA, Voropaev NI, Petitjean C, Gartner B, Lauss B, Marton J, Zmeskal J, Case T, Crowe KM, Kammel P, Hartmann FJ, Faifman MP
High precision study of muon catalyzed fusion in D-2 and HD gas
PHYSICS OF PARTICLES AND NUCLEI **42**, 185 (2011)

Barron-Palos L, Alarcon R, Balascuta S, Blessinger C, Bowman JD, Chupp TE, Covrig S, Crawford CB, Dabaghyan M, Dadras J, Dawkins M, Fox W, Gericke MT, Gillis RC, Lauss B, Leuschner MB, Lozowski B, Mahurin R, Mason M, Mei J, Nann H, Penttila SI, Ramsay WD, Salas-Bacci A, Santra S, Seo PN, Sharma M, Smith T, Snow WM, Wilburn WS, Yuan V
Determination of the parahydrogen fraction in a liquid hydrogen target using energy-dependent slow neutron transmission
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **659**, 579 (2011)

Bergamaschi A, Dinapoli R, Greiffenberg D, Henrich B, Johnson I, Mozzanica A, Radicci V, Schmitt B, Shi XT, Stoppani L
Time-over-threshold readout to enhance the high flux capabilities of single-photon-counting detectors
JOURNAL OF SYNCHROTRON RADIATION **18**, 923 (2011)

Bergamaschi A, Dinapoli R, Henrich B, Johnson I, Mozzanica A, Shi X, Schmitt B
Beyond single photon counting X-ray detectors
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **628**, 238 (2011)

Carron J, Rosenfelder R
A new path-integral representation of the T-matrix in potential scattering
PHYSICS LETTERS A **375**, 3781 (2011)

Cattaneo PW, Sawada R, Cei F, Yamada S, Schneebeli M
The architecture of MEG simulation and analysis software
EUROPEAN PHYSICAL JOURNAL PLUS **126**, 60 (2011)

Chachamis G, Angioni M, Madrigaloe J, Sabio Vera A
Dijet Production at Large Rapidity Separation in N=4 SYM
PHYSICAL REVIEW LETTERS **107**, 191601 (2011)

Chachamis G, Deak M, Vera AS, Stephens P
A comparative study of small x Monte Carlos with and without QCD coherence effects
NUCLEAR PHYSICS B **849**, 28 (2011)

Chatrchyan S
Determination of Jet Energy Calibration and Transvers Momentum Resolution in CMS
JOURNAL OF INSTRUMENTATION **6**, 11002 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Fried M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, Blyweert S, D'Hondt J, et al.
Measurement of W+W- production and search for the Higgs boson in pp collisions at root s=7 TeV
PHYSICS LETTERS B **699**, 25 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Fried M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Maes J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, et al.
A search for excited leptons in pp collisions at root s=7 TeV
PHYSICS LETTERS B **704**, 143 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Haensel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, Blyweert S, D'Hondt J, et al.
Search for large extra dimensions in the diphoton final state at the Large Hadron Collider
JOURNAL OF HIGH ENERGY PHYSICS , 085 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hartl C, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Beauceron S, Blekman F, et al.
Observation and studies of jet quenching in PbPb collisions at root s(NN)=2.76 TeV
PHYSICAL REVIEW C **84**, 024906 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hartl C, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, Blyweert S, et al.
Study of Z Boson Production in PbPb Collisions at root s(NN)=2.76 TeV
PHYSICAL REVIEW LETTERS **106**, 212301 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hoermann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez J, Benucci L, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, Blyweert S, D'Hondt J, et al.
Measurement of the B-0 Production Cross Section in pp Collisions at root s=7 TeV
PHYSICAL REVIEW LETTERS **106**, 252001 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, De Wolf EA, Janssen X, Maes J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, Blyweert S, et al.
Measurement of W gamma and Z gamma production in pp collisions at root s=7 TeV
PHYSICS LETTERS B **701**, 535 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, Blyweert S, D'Hondt J, et al.
Measurement of the differential dijet production cross section in proton-proton collisions at root s=7 TeV
PHYSICS LETTERS B **700**, 187 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, Blyweert S, D'Hondt J, et al.
Measurement of the inclusive Z cross section via decays to tau pairs in pp collisions at root s=7 TeV
JOURNAL OF HIGH ENERGY PHYSICS , 117 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, Blyweert S, D'Hondt J, et al.
Measurement of the lepton charge asymmetry in inclusive W production in pp collisions at root s=7TeV
JOURNAL OF HIGH ENERGY PHYSICS , 050 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, Blyweert S, D'Hondt J, et al.
Measurement of the ratio of the 3-jet to 2-jet cross sections in pp collisions at root s=7 TeV
PHYSICS LETTERS B **702**, 336 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, Blyweert S, D'Hondt J, et al.
Search for Supersymmetry in pp Collisions at root s=7 TeV in Events with Two Photons and Missing Transverse Energy
PHYSICAL REVIEW LETTERS **106**, 211802 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, Blyweert S, D'Hondt J, et al.
Search for a W ' boson decaying to a muon and a neutrino in pp collisions at root s=7 TeV
PHYSICS LETTERS B **701**, 160 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, Blyweert S, D'Hondt J, et al.
Search for a heavy bottom-like quark in pp collisions at root s=7 TeV
PHYSICS LETTERS B **701**, 204 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, Blyweert S, D'Hondt J, et al.
Search for new physics with same-sign isolated dilepton events with jets and missing transverse energy at the LHC
JOURNAL OF HIGH ENERGY PHYSICS , 077 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, Blyweert S, D'Hondt J, et al.
Search for physics beyond the standard model in opposite-sign dilepton events in pp collisions at root s=7 TeV
JOURNAL OF HIGH ENERGY PHYSICS , 026 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, Blyweert S, D'Hondt J, et al.
Search for resonances in the dilepton mass distribution in pp collisions at root s=7 TeV
JOURNAL OF HIGH ENERGY PHYSICS , 093 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rahbaran B, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Trauner C, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Luyckx S, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, et al.
Measurement of the Drell-Yan cross section in pp collisions at root s=7 TeV
JOURNAL OF HIGH ENERGY PHYSICS , 007 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rahbaran B, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Trauner C, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Luyckx S, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, et al.
Measurement of the weak mixing angle with the Drell-Yan process in proton-proton collisions at the LHC
PHYSICAL REVIEW D **84**, 112002 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rahbaran B, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Trauner C, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Luyckx S, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, et al.
Search for B-s(0) -> mu(+)mu(-) and B-0 -> mu(+)mu(-) Decays in pp Collisions at root s=7 TeV
PHYSICAL REVIEW LETTERS **107**, 191802 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rahbaran B, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Trauner C, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Luyckx S, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, et al.
Search for resonances in the dijet mass spectrum from 7 TeV pp collisions at CMS
PHYSICS LETTERS B **704**, 123 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rahbaran B, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Maes J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, et al.
Indications of Suppression of Excited Upsilon States in Pb-Pb Collisions at root(NN)-N-s=2.76 TeV
PHYSICAL REVIEW LETTERS **107**, 052302 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rahbaran B, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Maes J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, et al.
Measurement of the t(t)over-bar production cross section in pp collisions at 7 TeV in lepton plus jets events using b-quark jet identification
PHYSICAL REVIEW D **84**, 092004 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rahbaran B, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Maes J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, et al.
Search for supersymmetry in pp collisions at root s=7 TeV in events with a single lepton, jets, and missing transverse momentum
JOURNAL OF HIGH ENERGY PHYSICS , 156 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rahbaran B, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, et al.
Measurement of the inclusive W and Z production cross sections in pp collisions at root s = 7 TeV with the CMS experiment
JOURNAL OF HIGH ENERGY PHYSICS , 132 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rahbaran B, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, et al.
Search for Three-Jet Resonances in pp Collisions at root s=7 TeV
PHYSICAL REVIEW LETTERS **107**, 101801 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rahbaran B, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, et al.
Search for same-sign top-quark pair production at root s=7 TeV and limits on flavour changing neutral currents in the top sector
JOURNAL OF HIGH ENERGY PHYSICS , 005 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Maes J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, et al.
Long-range and short-range dihadron angular correlations in central PbPb collisions at root s(NN)=2.76 TeV
JOURNAL OF HIGH ENERGY PHYSICS , 076 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Maes J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, et al.
Measurement of the B-s(0) Production Cross Section with B-s(0) -> J/psi phi Decays in pp Collisions at root s=7 TeV
PHYSICAL REVIEW D **84**, 052008 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Maes J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, et al.
Measurement of the Inclusive Jet Cross Section in pp Collisions at root s=7 TeV
PHYSICAL REVIEW LETTERS **107**, 132001 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Maes J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, et al.
Measurement of the t(t)over-bar production cross section and the top quark mass in the dilepton channel in pp collisions at root s=7 Tev
JOURNAL OF HIGH ENERGY PHYSICS , 049 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Maes J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, et al.
Measurement of the t(t)over-bar production cross section in pp collisions at root s=7 TeV using the kinematic properties of events with leptons and jets
EUROPEAN PHYSICAL JOURNAL C **71**, 1721 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Maes J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, et al.
Measurement of the t-Channel Single Top Quark Production Cross Section in pp Collisions at root s=7 TeV
PHYSICAL REVIEW LETTERS **107**, 091802 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Maes J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, et al.
Measurement of the underlying event activity at the LHC with root s=7 TeV and comparison with root s=0.9 TeV
JOURNAL OF HIGH ENERGY PHYSICS , 109 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Maes J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, et al.
Search for New Physics with a Monojet and Missing Transverse Energy in pp Collisions at root s=7 TeV
PHYSICAL REVIEW LETTERS **107**, 201804 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Maes J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, et al.
Search for first generation scalar leptoquarks in the e nu jj channel in pp collisions at root s=7 TeV
PHYSICS LETTERS B **703**, 246 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Maes J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, et al.
Search for light resonances decaying into pairs of muons as a signal of new physics
JOURNAL OF HIGH ENERGY PHYSICS , 098 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Maes J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, et al.
Search for physics beyond the standard model using multilepton signatures in pp collisions at root s=7 TeV
PHYSICS LETTERS B **704**, 411 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Maes J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, et al.
Search for supersymmetry in events with a lepton, a photon, and large missing transverse energy in pp collisions at root s=7 TeV
JOURNAL OF HIGH ENERGY PHYSICS , 093 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Maes J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, et al.
Search for supersymmetry in events with b jets and missing transverse momentum at the LHC
JOURNAL OF HIGH ENERGY PHYSICS , 113 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Maps J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, et al.
Search for new physics with jets and missing transverse momentum in pp collisions at root s=7 TeV
JOURNAL OF HIGH ENERGY PHYSICS , 155 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, De Wolf EA, Janssen X, Maes J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, Blyweert S, et al.
Charged particle transverse momentum spectra in pp collisions at root s=0.9 and 7 TeV
JOURNAL OF HIGH ENERGY PHYSICS , 086 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, De Wolf EA, Janssen X, Maes J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, Blyweert S, et al.
Measurement of the Polarization of W Bosons with Large Transverse Momenta in W plus jets Events at the LHC
PHYSICAL REVIEW LETTERS **107**, 021802 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, De Wolf EA, Janssen X, Maes J, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, Blyweert S, et al.
Missing transverse energy performance of the CMS detector
JOURNAL OF INSTRUMENTATION **6**, P09001 (2011)

Chatrchyan S, Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Eroe J, Fabjan C, Friedl M, Fruehwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Haevermaet H, Mechelen P, Remortel N, Blekman F, Blyweert S, D'Hondt J, et al.
Search for Neutral Minimal Supersymmetric Standard Model Higgs Bosons Decaying to Tau Pairs in pp Collisions at root s=7 TeV
PHYSICAL REVIEW LETTERS **106**, 231801 (2011)

Chatrchyan S, et AL
Measurement of energy flow at large pseudorapidities in pp collisions at sqrt (s) = 0.0 and 7 TeV
JOURNAL OF HIGH ENERGY PHYSICS **11**, 148 (2011)

Chatrchyan S, et AL
Measurement of the Differential Cross Section for Isolated Prompt Photon Production in pp Collisions at 7 TeV
PHYSICAL REVIEW D **84**, 052011 (2011)

Courtois P, Menthonnex C, Hehn R, Andersen KH, Nesvizhevsky V, Zimmer O, Piegsa F, Geltenbort P, Greene G, Allen R, Huffman PR, Schmidt-Wellenburg P, Fertl M, Mayer S
Production and characterization of intercalated graphite crystals for cold neutron monochromators
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **634**, S37 (2011)

Daum M, Fierlinger P, Franke B, Geltenbort P, Goeltl L, Gutsmiedl E, Karch J, Kessler G, Kirch K, Koch HC, Kraft A, Lauer T, Lauss B, Pierre E, Pignol G, Reggiani D, Schmidt-Wellenburg P, Sobolev Y, Zechlau T, Zsigmond G
First observation of trapped high-field seeking ultracold neutron spin states
PHYSICS LETTERS B **704**, 456 (2011)

De Gerone M, Dussoni S, Fratini K, Gatti F, Valle R, Boca G, Cattaneo PW, Rossella M, Nardo R, Papa A, Signorelli G, Cavoto G, Piredda G, Renga F, Voena C, Uchiyama Y
The MEG timing counter calibration and performance
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **638**, 41 (2011)

Denner A, Dittmaier S, Kallweit S, Pozzorini S
Next-to-Leading-Order QCD Corrections to W(+)W(-)b(b)over-bar Production at Hadron Colliders
PHYSICAL REVIEW LETTERS **106**, 052001 (2011)

Denner A, Heinemeyer S, Puljak I, Rebuzzi D, Spira M
Standard model Higgs-boson branching ratios with uncertainties
EUROPEAN PHYSICAL JOURNAL C **71**, 1753 (2011)

Dinapoli R, Bergamaschi A, Henrich B, Horisberger R, Johnson I, Mozzanica A, Schmid E, Schmitt B, Schreiber A, Shi XT, Theidel G
EIGER: Next generation single photon counting detector for X-ray applications
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **650**, 79 (2011)

Dittmaier S, Kramer M, Spira M, Walser M
Charged-Higgs-boson production at the LHC: Next-to-leading-order supersymmetric QCD corrections
PHYSICAL REVIEW D **83**, 055005 (2011)

Egger J, Hildebrandt M, Petitjean C
The 10 bar hydrogen time projection chamber of the MuCap experiment
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **628**, 199 (2011)

Friederich H, Davatz G, Hartmann U, Howard A, Meyer H, Murer D, Ritt S, Schlumpf N
A Scalable DAQ System Based on the DRS4 Waveform Digitizing Chip
IEEE TRANSACTIONS ON NUCLEAR SCIENCE **58**, 1652 (2011)

Gericke MT, Alarcon R, Balascuta S, Barron-Palos L, Blessinger C, Bowman JD, Carlini RD, Chen W, Chupp TE, Crawford C, Covrig S, Dabaghyan M, Fomin N, Freedman SJ, Gentile TR, Gillis RC, Greene GL, Hersman FW, Ino T, Jones GL, Lauss B, Leuschner M, Lozowski WR, Mahurin R, Masuda Y, Mei J, Mitchell GS, Muto S, Nann H, Page SA, Penttila SI, Ramsay WD, Salas-Bacci A, Santra S, Sharma M, Seo PN, Sharapov EI, Smith TB, Snow WM, Wilburn WS, Yuan V
Measurement of parity-violating gamma-ray asymmetry in the capture of polarized cold neutrons on protons
PHYSICAL REVIEW C **83**, 015505 (2011)

Henrich B, Becker J, Dinapoli R, Goettlicher P, Graafsma H, Hirsemann H, Klanner R, Krueger H, Mazzocco R, Mozzanica A, Perrey H, Potdevin G, Schmitt B, Shi X, Srivastava AK, Trunk U, Youngman C
The adaptive gain integrating pixel detector AGIPD a detector for the European XFEL
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **633**, S11 (2011)

Hildebrandt M, Horisberger R
Search for First Generation Leptoquarks in ep Collisions at HERA
PHYSICS LETTERS B **B704**, 388 (2011)

Horisberger R, Kotlinski D, Starodumov A
PIXEL 2010 Proceedings of the International Workshop on Semiconductor Pixel Detectors for Particles and Imaging Preface
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **650**, V (2011)

Hurley K, Atteia JL, Barraud C, Pelangeon A, Boer M, Vanderspek R, Ricker G, Mazets E, Golenetskii S, Frederiks DD, Pal'shin VD, Aptekar RL, Smith DM, Wigger C, Hajdas W, Rau A, von Kienlin A, Mitrofanov IG, Golovin DV, Kozyrev AS, Litvak ML, Sanin AB, Boynton W, Fellows C, Harshman K, Barthelmy S, Cline T, Cummings J, Gehrels N, Krimm HA, Yamaoka K, Fukazawa Y, Hanabata Y, Ohno M, Takahashi T, Tashiro M, Terada Y, Murakami T, Makishima K, Guidorzi C, Frontera F, Montanari CE, Rossi F, Trombka J, McClanahan T, Starr R, Goldsten J, Gold R
THE INTERPLANETARY NETWORK SUPPLEMENT TO THE HETE-2 GAMMA-RAY BURST CATALOG
ASTROPHYSICAL JOURNAL SUPPLEMENT SERIES **197**, 34 (2011)

Kettle PR
In Search of Mu ->e gamma - The MEG Experiment Status & Latest Results
PHYSICS PROCEDIA **17**, 113 (2011)

Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hartl C, Hoch M, Homann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, Ceard L, Cerny K, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Adler V, et al.
Measurements of inclusive W and Z cross sections in pp collisions at root s=7 TeV
JOURNAL OF HIGH ENERGY PHYSICS , 080 (2011)

Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hartl C, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Wal-Tenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, Cerny K, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Beauceron S, et al.
Strange particle production in pp collisions at root s=0.9 and 7 TeV
JOURNAL OF HIGH ENERGY PHYSICS , 064 (2011)

Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hartl C, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, Cerny K, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Adler V, et al.
Inclusive b-hadron production cross section with muons in pp collisions at root s=7 TeV
JOURNAL OF HIGH ENERGY PHYSICS , 090 (2011)

Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hartl C, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, Cerny K, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Adler V, et al.
Measurement of Bose-Einstein correlations in pp collisions at root s=0.9 and 7 TeV
JOURNAL OF HIGH ENERGY PHYSICS , 029 (2011)

Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hartl C, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, Cerny K, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Adler V, et al.
Measurement of the B+ Production Cross Section in pp Collisions at root s=7 TeV
PHYSICAL REVIEW LETTERS **106**, 112001 (2011)

Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hartl C, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, Cerny K, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Beauceron S, et al.
Measurement of B(B)over-bar angular correlations based on secondary vertex reconstruction at root s=7 TeV
JOURNAL OF HIGH ENERGY PHYSICS , 136 (2011)

Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hartl C, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, Cerny K, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen R, Van Remortel N, Beauceron S, et al.
Search for supersymmetry in pp collisions at 7 TeV in events with jets and missing transverse energy
PHYSICS LETTERS B **698**, 196 (2011)

Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hartl C, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, Cerny K, DeWolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Beauceron S, et al.
Dijet Azimuthal Decorrelations in pp Collisions at root s=7 TeV
PHYSICAL REVIEW LETTERS **106**, 122003 (2011)

Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hartl C, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, Cerny K, DeWolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Beauceron S, et al.
Search for Pair Production of First-Generation Scalar Leptoquarks in pp Collisions at root s=7 TeV
PHYSICAL REVIEW LETTERS **106**, 201802 (2011)

Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hartl C, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, Ceard L, Cerny K, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Adler V, et al.
Charged particle multiplicities in pp interactions at root s=0:9, 2:36, and 7 TeV
JOURNAL OF HIGH ENERGY PHYSICS , 079 (2011)

Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hartl C, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, Ceard L, Cerny K, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Adler V, et al.
Measurement of the Isolated Prompt Photon Production Cross Section in pp Collisions at root s=7 TeV
PHYSICAL REVIEW LETTERS **106**, 082001 (2011)

Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hartl C, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, Ceard L, Cerny K, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Adler V, et al.
Search for Stopped Gluinos in pp Collisions at root s=7 TeV
PHYSICAL REVIEW LETTERS **106**, 011801 (2011)

Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hartl C, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, Ceard L, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Adler V, Beauceron S, et al.
Prompt and non-prompt J/psi production in pp collisions at root s=7 TeV
EUROPEAN PHYSICAL JOURNAL C **71**, 1575 (2011)

Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hartl C, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, Cerny K, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Adler V, Beauceron S, et al.
First measurement of hadronic event shapes in pp collisions at root s=7 TeV
PHYSICS LETTERS B **699**, 48 (2011)

Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hartl C, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, Cerny K, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Adler V, Beauceron S, et al.
Search for a heavy gauge boson W ' in the final state with an electron and large missing transverse energy in pp collisions at root s=7 TeV
PHYSICS LETTERS B **698**, 21 (2011)

Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hartl C, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, Cerny K, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Adler V, Beauceron S, et al.
Search for microscopic black hole signatures at the Large Hadron Collider
PHYSICS LETTERS B **697**, 434 (2011)

Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruuhwirth R, Ghete VM, Hammer J, Nsel SH, Hartl C, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, Cerny K, DeWolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Beauceron S, et al.
Search for Pair Production of Second-Generation Scalar Leptoquarks in pp Collisions at root s=7 TeV
PHYSICAL REVIEW LETTERS **106**, 201803 (2011)

Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Haensel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, Cerny K, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Beauceron S, Blekman F, Blyweert S, et al.
Measurement of Dijet Angular Distributions and Search for Quark Compositeness in pp Collisions at root s=7 TeV
PHYSICAL REVIEW LETTERS **106**, 201804 (2011)

Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Eroe J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hartl C, Hoch M, Hoermann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, Ceard L, Cerny K, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Adler V, et al.
Search for heavy stable charged particles in pp collisions at root s=7 TeV
JOURNAL OF HIGH ENERGY PHYSICS , 024 (2011)

Khachatryan V, Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Eroo J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hartl C, Hoch M, Hormann N, Hrubec J, Jeitler M, Kasieczka G, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Benucci L, Ceard L, Cerny K, De Wolf EA, Janssen X, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Adler V, et al.
Upsilon production cross section in pp collisions at root s=7 TeV
PHYSICAL REVIEW D **83**, 112004 (2011)

Kontar EP, Brown JC, Emslie AG, Hajdas W, Holman GD, Hurford GJ, Kasparova J, Mallik PCV, Massone AM, McConnell ML, Piana M, Prato M, Schmahl EJ, Suarez-Garcia E
Deducing Electron Properties from Hard X-ray Observations
SPACE SCIENCE REVIEWS **159**, 301 (2011)

Kozela A, Ban G, Bialek A, Bodek K, Gorel P, Kirch K, Kistryn S, Kuzniak M, Naviliat-Cuncic O, Severijns N, Stephan E, Zejma J
Free Neutron Decay and Time Reversal Violation
ACTA PHYSICA POLONICA B **42**, 789 (2011)

Li Q, Spira M, Gao J, Li CS
Higgs Boson Production via Gluon Fusion in the Standard Model with four Generations
PHYSICAL REVIEW D **83**, 094018 (2011)

McKenzie I, Scheuermann R, Sedlak K, Stoykoy A
Molecular Dynamics in Rod-Like Liquid Crystals Probed by Muon Spin Resonance Spectroscopy
JOURNAL OF PHYSICAL CHEMISTRY B **115**, 9360 (2011)

Mozzanica A, Bergamaschi A, Dinapoli R, Graafsma H, Henrich B, Kraft P, Johnson I, Lohmann M, Schmitt B, Shi X
A single photon resolution integrating chip for microstrip detectors
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **633**, S29 (2011)

Nez F, Antognini A, Amaro FD, Biraben F, Cardoso JMR, Covita D, Dax A, Dhawan S, Fernandes L, Giesen A, Graf T, Hansch TW, Indelicato P, Julien L, Kao CY, Knowles PE, Le Bigot E, Liu YW, Lopes JAM, Ludhova L, Monteiro CMB, Mulhauser F, Nebel T, Rabinowitz P, Dos Santos JMF, Schaller L, Schuhmann K, Schwob C, Taqqu D, Veloso JFCA, Kottmann F, Pohl R
Is the proton radius a player in the redefinition of the International System of Units?
PHILOSOPHICAL TRANSACTIONS OF THE ROYAL SOCIETY A-MATHEMATICAL PHYSICAL AND ENGINEERING SCIENCES **369**, 4064 (2011)

Noth D, Spira M
Supersymmetric Higgs Yukawa couplings to bottom quarks at next-to-next-to-leading order
JOURNAL OF HIGH ENERGY PHYSICS , 084 (2011)

Orsi S, Haas D, Hajdas W, Honkimaki V, Lamanna G, Lechanoine-Leluc C, Marcinkowski R, Pohl M, Produit N, Rapin D, Suarez-Garcia E, Rybka D, Vialle JP
Response of the Compton polarimeter POLAR to polarized hard X-rays
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **648**, 139 (2011)

Pohl R, Amaro FD, Antognini A, Biraben F, Cardoso JMR, Covita DS, Dax A, Dhawan S, Fernandes LMP, Giesen A, Graf T, Hansch TW, Indelicato P, Julien L, Kao CY, Knowles P, Le Bigot EO, Liu YW, Lopes JAM, Ludhova L, Monteiro CMB, Mulhauser F, Nebel T, Nez F, Rabinowitz P, dos Santos JMF, Schaller LA, Schuhmann K, Schwob C, Taqqu D, Veloso JFCA, Kottmann F
The size of the proton and the deuteron
22ND INTERNATIONAL CONFERENCE ON ATOMIC PHYSICS **264**, 012008 (2011)

Pohl R, Antognini A, Nez F, Amaro FD, Biraben F, Cardoso JMR, Covita DS, Dax A, Dhawan S, Fernandes LMP, Giesen A, Graf T, Hansch TW, Indelicato P, Julien L, Kao CY, Knowles P, Le Bigot EO, Liu YW, Lopes JAM, Ludhova L, Monteiro CMB, Mulhauser F, Nebel T, Rabinowitz P, dos Santos JMF, Schaller LA, Schuhmann K, Schwob C, Taqqu D, Veloso JFCA, Kottmann F
The Lamb shift in muonic hydrogen
CANADIAN JOURNAL OF PHYSICS **89**, 37 (2011)

Renga F
SIGNATURES OF EXOTIC HADRONS
INTERNATIONAL JOURNAL OF MODERN PHYSICS A **26**, 4855 (2011)

Rohe T, Bean A, Radicci V, Sibille J
Planar sensors for the upgrade of the CMS pixel detector
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **650**, 136 (2011)

Rosenfelder R
Exact Path-Integral Representations for the T-Matrix in Nonrelativistic Potential Scattering
FEW-BODY SYSTEMS **49**, 41 (2011)

Sirunyan AM, Tumasyan A, Adam W, Bergauer T, Dragicevic M, Ero J, Fabjan C, Friedl M, Fruhwirth R, Ghete VM, Hammer J, Hansel S, Hoch M, Hormann N, Hrubec J, Jeitler M, Kiesenhofer W, Krammer M, Liko D, Mikulec I, Pernicka M, Rahbaran B, Rohringer H, Schofbeck R, Strauss J, Taurok A, Teischinger F, Trauner C, Wagner P, Waltenberger W, Walzel G, Widl E, Wulz CE, Mossolov V, Shumeiko N, Gonzalez JS, Bansal S, Benucci L, De Wolf EA, Janssen X, Luyckx S, Maes T, Mucibello L, Ochesanu S, Roland B, Rougny R, Selvaggi M, Van Haevermaet H, Van Mechelen P, Van Remortel N, Blekman F, et al.
Dependence on pseudorapidity and on centrality of charged hadron production in PbPb collisions at root s(NN)=2.76 TeV
JOURNAL OF HIGH ENERGY PHYSICS , 141 (2011)

Stoykov A, Scheuermann R, Amato A, Bartkowiak M, Konter JA, Rodriguez J, Sedlak K
A lens-coupled scintillation counter in cryogenic environment
JOURNAL OF INSTRUMENTATION **6**, P02003 (2011)

Strauch T, Amaro FD, Anagnostopoulos DF, Buhler P, Covita DS, Gorke H, Gotta D, Gruber A, Hirtl A, Indelicato P, Le Bigot EO, Nekipelov M, dos Santos JMF, Schmid P, Schlesser S, Simons LM, Trassinelli M, Veloso JFCA, Zmeskal J
Pionic deuterium
EUROPEAN PHYSICAL JOURNAL A **47**, 88 (2011)

Webber DM, Tishchenko V, Peng Q, Battu S, Carey RM, Chitwood DB, Crnkovic J, Debevec PT, Dhamija S, Earle W, Gafarov A, Giovanetti K, Gorringe TP, Gray FE, Hartwig Z, Hertzog DW, Johnson B, Kammel P, Kiburg B, Kizilgul S, Kunkle J, Lauss B, Logashenko I, Lynch KR, McNabb R, Miller JP, Mulhauser F, Onderwater CJG, Phillips J, Rath S, Roberts BL, Winter P, Wolfe B
Measurement of the Positive Muon Lifetime and Determination of the Fermi Constant to Part-per-Million Precision
PHYSICAL REVIEW LETTERS **106**, 041803 (2011)

Webber DM, Tishchenko V, Peng Q, Battu S, Carey RM, Chitwood DB, Crnkovic J, Debevec PT, Dhamija S, Earle W, Gafarov A, Giovanetti K, Gorringe TP, Gray FE, Hartwig Z, Hertzog DW, Johnson B, Kammel P, Kiburg B, Kizilgul S, Kunkle J, Lauss B, Logashenko I, Lynch KR, McNabb R, Miller JP, Mulhauser F, Onderwater CJG, Phillips J, Rath S, Roberts BL, Winter P, Wolfe B
Measurement of the Positive Muon Lifetime and Determination of the Fermi Constant to Part-per-Million Precision (vol 106, 041803, 2011)
PHYSICAL REVIEW LETTERS **106**, 079901 (2011)

de Aquino P, Hagiwara K, Li Q, Maltoni F
Simulating graviton production at hadron colliders
JOURNAL OF HIGH ENERGY PHYSICS , 132 (2011)

OTHER PUBLICATIONS

Altarev I., Ban G., Bison G., Bodek K., Daum M., Fertl M., Fierlinger P., Franke B., Gutsmiedl E., Heil W. *et al.*
Testing isotropy of the universe using the Ramsey resonance technique on ultracold neutron spins.
e-Print: **arXiv:1009.6060 [physics.atom-ph]** September, 2010. 6 pp

Antognini A., Crivelli P., Prokscha T., Khaw K.S., Barbiellini B., Liszkay L., Kirch K., Kwuida K., Morenzoni E., Piegsa F.M. *et al.*
Muonium emission into vacuum from mesoporous thin films at cryogenic temperatures.
arXiv:1112.4887. December, 2011. 5 pp.
e-Print: **arXiv:1112.4887 [physics.atom-ph]**

K. Kirch, B. Lauss, S. Ritt,
Exploring the low-energy precision frontier
CERN Courier, Feb 23 (2011)

Kozela A., Ban G., Bialek A., Bodek K., Gorel P., Kirch K., Kistryn St., Naviliat-Cuncic O., Severijns N., Stephan E. *et al.*
Measurement of Transverse Polarization of Electrons Emitted in Free Neutron Decay.
e-Print: **arXiv:1111.4695 [nucl-ex]** November, 2011

BOOK CHAPTER

Dittmaier et al, for PSI Spira M. (LHC Higgs Cross Section Working Group Collaboration).
Handbook of LHC Higgs Cross Sections: 1. Inclusive Observables.
January 2011. 153 pp
e-Print: arXiv:1101.0593 [hep-ph]

Spira M., Schumacher M.
The Higgs boson: Still elusive after 40 years.
Published in In *Brock, Ian, Schoerner-Sadenius, Thomas (eds.): Physics at the terascale*
2011, p 123-142

EDITORS

Kirch K., Lauss B. and Ritt St.
Proceedings of the 2nd International Workshop on the Physics of fundamental Symmetries and Interactions - PSI2010
Physics Procedia, Volume 17, Pages 1-268 (2011)

Horisberger R., Kotlinski B. and Starodumov A.
Proceedings of the International Workshop on Semiconductor Pixel Detectors for Particles and Imaging Preface – Pixel 2010
Nuclear Instruments and Methods in Physics Research A, 650 (2011), 252 p

CONFERENCE, WORKSHOP AND SEMINAR CONTRIBUTIONS

Altrarev I, Lauss B. et al.
Testing isotropy of the universe using the Ramsey resonance technique on ultracold neutron spins
Physica B: Phyiscs of Condensed matter, Vol 406, issue 12, p. 2365-2369

Antognini A.; Biraben F.; Cardoso J. M. R.; et al.
Illuminating the proton radius conundrum: the mu He(+) lamb shift
International Conference on Precision Physics of Simple Atomic Systems, LesHouches, FR, May 30 - June 04, 2010
Canadian Journal of Physics Vol. **89, I**ssue: **1**, 47-57
DOI: 10.1139/P10-113 Published: JAN 2011

Britvitch I., Hajdas W., Rybka D. et al.
POLAR: a Gamma-Ray Burst Polarimeter onboard the Chinese Spacelab
32nd International Cosmic Ray Conference, Beijing, China, August 11 – 18, 2011

Britvitch I., Hajdas W., Rybka D.
Qualification Tests of the Space-Based POLAR X-Ray Polarimeter
32nd International Cosmic Ray Conference, Beijing, China, August 11 – 18, 2011

Britvitch I., Hajdas W., Rybka D. et al.
POLAR: A novel space-borne probe for Gamma-Ray Bursts polarization
Joint Annual Meeting of the Swiss Physical Society and Austrian Physical Society with Swiss and Austrian Societies for Astronomy and Astrophysics, Lausanne, Switzerland, June 15 – 17, 2011

Britvitch I., Hajdas W., Scherrer S., Mozzanica A., Schmidt.B.
Real time beam uniformity monitoring system
ICATPP - 12th International Conferences on Advanced Technology and Particle Physics, Como, Italy,
October 3 – 7, 2011

Burghoff M. et al.
An improved search of the nEDM
Meeting of the Division of Particles and Fields of the American Physical Society, August 9 - 13, 2011

Cattaneo P.W., De Gerone M., Dussoni S., Gatti F., Uchiyama Y., Rossella M., Valle R., MEG Collaboration
The Timing Counter of the MEG experiment: calibration and performance
12th Topical Seminar on Innovative Particle and Radiation Detectors (IPRD10), Siena, Italy, June 7 - 10, 2010.
Nucl.Phys.Proc.Suppl.215:281-283,2011.
e-Print: arXiv:1104.1035 [physics.ins-det]

Chowdhuri Z.
Search for a neutron electric dipole moment at PSI (talk)
SPS Joint Annual Meeting 2011, EPF Lausanne, Switzerland, June 15 - 17, 2011

Fertl M.
Recent Improvements of the Hg cohabiting magnetometer for the nEDM experiment at PSI (talk)
DPG Fruehjahrstagung, Muenster, Deutschland, March 21 - 25 2011

Fertl M.
Improvements of the Hg cohabiting magnetometer for the nEDM experiment (Talk)
Gemeinsame Jahresjahrstagung der SPS und ÖPG, Lausanne, Switzerland, June 15 – 17, 2011

Fertl M.
Improvements of the Hg cohabiting magnetometer for the nEDM experiment at PSI (Poster)
43rd Conference of the European Group for Atomic Systems, University of Fribourg, Fribourg, Switzerland, June 28 -July 2, 2011

Franke B.
nEDM@PSI- Towards a new measurement of the neutron electric dipole moment (talk)
DPG Tagung, Münster, Germany, March 23, 2011

Goeltl L.
First Ultracold Neutrons at the new High-Intesity Source of the Paul Scherrer Institute (talk)
SPS Joint Annual Meeting 2011, EPF Lausanne, Switzerland, June 15-17, 2011

Goeltl L.
The Ultra-Cold Neutron Source at PSI (talk)
AccApp11 Knoxville,TN, USA, April 5, 2011

Hajdas W., Desorgher L.
Observing Forbush decreases in space with a fleet of SREM monitors
32nd International Cosmic Ray Conference, Beijing, China, August 11 – 18, 2011

Hajdas W, Britvitch I. et al.
Perspectives for improved space radiation modeling using the Energetic Particle Telescope (EPT)
Conference on Radiation Effets on Components and Systems RADECS, Sevilla, Spain, September 19 – 23, 2011,

Hajdas W. et al.
Proton monitor "Las Dos Torres": first intercomparison of in-orbit results
Conference on Radiation Effets on Components and Systems RADECS, Sevilla, Spain, September 19 – 23, 2011

Hajdas W. et al.
The Interplanetary Network Supplement to the Fermi GBM Catalog - An AO-2 and AO-3 Guest Investigator Project
The 3rd Fermi Symposium, Rome, Italy, May 9 – 11, 2011
e-Print: arXiv:1110.6470 [astro-ph.HE], October 2011

Hildebrandt M.
The Low-Mass Drift Chamber System of the MEG experiment (poster)
2011 IEEE Nuclear Science Symposium and Medical Imaging Conference, Valencia, Spain, October 23 – 29, 2011

Horras M.
A masurement of the Hg geometric phase effect (poster)
SPS Joint Annual Meeting 2011, Lausanne, Switzerland, June 15-17, 2011

Ingram Q.
Response of CMS avalanche photo-diodes to low energy neutrons
6th Intenational Conference on New Developments in Photodetections, Lyon, France, July 4 - 8, 2011

Kästli H.C.
Measurement of exclusive B-hadron production at 7 TeV with the CMS experiment
Hadron2011 - XIV International Conference on Hadron Spectroscopy; Munich, Germany, June 13 – 17, 2011

Kästli H.C.
Readout electronics for the CMS pixel detector upgrade
iWoRID 2011 - 13th International Workshop on Radiation Imaging Detectors, Zürich, Switzerland,
July 3 – 7, 2011

Kozela A.; Ban G.; Bialek A.; et al.
Free Neutron Decay and Time Reversal Violation
Conference on Nuclear Physics - Extremes of the Nuclear Landscape, Zakopane, Poland, Aug 30- Sep5, 2010
Acta Physica Polonica B, 42, 3-4, 789-793 (2011)
DOI: 10.5506/APhysPolB.42.789

Kozela A., Ban G., Bialek A.a, Bodek K., Gorel P., Kirch K.,Kistryn S., Kuzniak M., Naviliat-Cuncic O, Severijns N. *et al*.
Measurement of the transverse polarization of electrons emitted in free neutron decay.
Published in PoS EPS-HEP2009 (2009) 377. 4 pp
Prepared for Conference: C09-07-16

Krempel J., Franke B., Goeltl L., Fertl M., Lauss B., Schmidt-Wellenburg P, Zsigmond G.
An Improved Search for the Neutron Electric Dipole Moment.
To appear in the proceedings of Conference: C11-08-09
e-Print: arXiv:1110.1505 [nucl-ex]

Krempel J., Franke B.,
*Active compensation of the magnetic field surrounding a new nEDM apparatus (*talk)
SPS Joint Annual Meeting 2011, Lausanne, Switzerland, June 15 - 17, 2011

Lauss B (talk)
"Commissioning of the new high-intensity ultracold neutron source at the Paul Scherrer Institute"
Physics Conference 2010 – INPC-2010, Vancouver, Canada, July 4 - 9, 2010
J. Phys.: Conf. Ser. 312 (2011) 052005

Lauss B (talk)
A new Facility for fundamental Particle Physics: The High-Intensity Ultracold Neutron Source a the Paul Scherrer Institute
19th Particles and Nuclei International Conference (PANIC11). Boston, USA, July 24 - 29, 2011

Lauss B (poster)
Status of the Muon Capture Research at the Paul Scherrer Insitute
Gemeinsame Jahrestagung er schweizer und österreichischen Physikalischen Gesellchaft (SPG/ÖPG) 2011, EPF Lausanne, Switzerland, June 15 – 17, 2011

Langenegger U.
Search for Bs → mu+mu- and B0 → mu+mu- with CMS
EPS International Conference on High Energy Physics, Grenoble, France, July 2011.

Natori H., MEG Collaboration
Search of charged Lepton Flavor Violation decay μ→eγ: the MEG experiment
9th International Conference on Hyperons, Charm and Beauty Hadrons: BEACH 2010, Perugia, Italy,
June 21 – 26, 2010.
Nucl. Phys. B. Proc. Suppl. 210-211 (2011) 241-244

Nishiguchi H., MEG Collaboration
MEG experiment: New result and prospects.
Neutrino factories, superbeams, and betabeams. Proceedings, 12th International Workshop, NuFact10, Mumbai, India, October 20 - 25, 2010.AIP Conf.Proc. 1382 (2011) 239-241

Schmidt-Wellenburg P. and Fertl M.
Production and characterization of intercalated graphite crystals for cold neutron monochromators
NIMA 634(2011)37-40 (NOP-workshop 2010)

Stoykov A.
A time resolution study with a plastic scintillator read out by Geiger-mode Avalanche Photodiode
6th International Conference on New Developments in Photodetection – NDIP2011, Lyon, France, June 4 – 8, 2011

Theidel G. and Schmid E.
Modular High Bandwidth Data Acquisition System with Gigabit and 10 Gigabit Ethernet Uplinks (Poster)
iWoRID 13, Zürich, Switzerland, July 3 – 7, 2011

Zenner J.
*The high voltage system of the neutron electric dipole moment experiment (*Poster)
SPS Joint Annual Meeting, Lausanne, Switzerland, June 15 - 17, 2011

Zsigmond G.
MCUCN code and simulations for the nEDM experiment (talk)
LTP Seminar, PSI, May 9, 2011

Zsigmond G.
A neutron Electric Dipole Moment experiment (nEDM) - exploring the low-energy precision frontier (talk)
Int. Europhysics Conference on High Energy Physics, Grenoble, France, July 21 - 27, 2011

Zsigmond G.
Technical aspects of simulation of storable neutrons in inhomogeneous and RF magnetic fields (talk)
Workshop on Monte Carlo simulations, ECNS 2011, Prague, Czech Republic, July 23 - 24, 2011

INVITED TALKS

Actis S.
Measuring the luminosity at colliders with Bhabha scattering
New York City College of Technology, USA, October 13, 2011

Baracchini E., MEG Collaboration
New limit on LFV searches from the MEG experiment
International Workshop on e+e- collisions from Phi to Psi (PHIPS11)
Budker Institute of Nuclear Physics, Siberian Branch of Russian Academy of Science, Novosibirsk, Russia, September 19 - 22, 2011

Brucherseifer M.
Higgs boson self couplings in the MSSM
DPG Fruehjahrstagung, Karlsruhe, Germany, March 30, .2011

Brucherseifer M.
MSSM Higgs Selbstkopplungen
Zurich PhD seminar 2011", ETH Zürich Hoenggerberg, Switzerland, August 29, 2011

Chachamis G.
Mellin-Barnes techniques and gauge boson pair production to NNLO
Kick-off meeting of the LHCPhenoNet Initial Training Network, Valencia, Spain, February 2011

Chachamis G.
Mellin- Barnes techniques and 2-loop QCD corrections to W pair production
Seminar Talk, Universidad Autonoma de Madrid, Madrid, Spain, February 2011

Chachamis G.
W pair production at NNLO: status report
Les Houches 2011: Physics at TeV Colliders, Les Houches, France, June 2011

Chachamis G.
Towards q q -> W W at NNLO at the LHC
Collider Cross Talk seminar, CERN, Switzerland, November 2011,

De Gerone M., MEG Collaboration
$\mu \to e\gamma$ and $\mu \to eee$ status & perspectives
Flavor Physics & CP Violation 2011 (FPCP 2011), Maale Hachamisha, Israel, May 23 - 27, 2011

Dinapoli R.
EIGER: next generation single photon counting detector for X-Ray applications
FEE 2011, Bergamo, Italy, May 24 – 27, 2011

Dinapoli R.
Performance of the EIGER single photon counting X-ray detector
IEEE-NSS, Sevilla, Spain, October 23 – 31, 2011

Kallweit St.
NLO QCD Corrections to WWbb Production at Hadron Colliders
Evanston, IL, Northwestern University und High Energy Physics division des Argonne National Laboratory,. May 14, 2011

Kettle P.-R., MEG Collaboration
Search for the lepton-flavour violating decay Mu $\to$ e + gamma -- Latest results from the MEG Experiment
2011 Fall Meeting of the American Physical Society, APS Division of Nuclear Physics (DNP11), East Lansing, Michigan, USA, October 26 – 29, 2011
Bulletin of the American Physical Society, Volume 56, Number 12

Kirch K.
Our frontiers in fundamental physics
PSI-Kolloquium, February 4, 2011

Kirch K.
Low energy precision experiments at PSI
ICFA 2011, CERN, Switzerland, October 3 – 6, 2011

Kirch K.
Search for the electric dipole moment of the neutron
Search for EDMs at Storage Rings, Bad Honnef, Germany, July 4.- 6, .2011

Kirch K.
Low energy precision experiments at PSI
Teilchenphysikkolloquium, Heidelberg, Germany, July 12, 2011,

Kirch K.
New search for the neutron electric dipole moment
PANIC 2011, Cambridge, USA, July 24 – 29, 2011

Kirch K.
The search for permanent electric dipole moments
TRIUMF-Kolloquium, USA, August 3, 2011

Kirch K.
Klein aber oho – Ultrakalte Neutronen erzählen vom Universum
PSI-Vortragsreihe: 'Forschung live erleben', September 7, 2011

Kirch K.
The search for the neutron electric dipole moment
EMG-Seminar, Mainz, Germany, November 16, 2011,

Kirch K.
Other Nucleon EDM efforts
Fundamental Physics at the Intensity Frontier, Rockville, USA, November 30 – December 2, 2011

Kotlinski B.
Pixel Detectors at LHC
International Workshop on Radiation Imaging Detectors (iWoRID 2011), ETH Zürich, Switzerland,
July 3 – 7, 2011

Lauss B.
Startup of the ultracold neutron source at the Paul Scherrer Institute
2011 CHIPP Annual Plenary Meeting, Leysin, Switzerland, September 1 -2, 2011

Lauss B (talk)
Startup of the High-Intensity Ultracold Neutron Source at the Paul Scherrer Institute
International conference on Exoctic Atoms and Related Topics (EXA 2011). Wien, Austria, September 5-9, 2011

Li.Q.
One Loop Matrix Element Matching with Parton Shower for Higgs Gluon fusion
Pheno11, Wisconsin Madsion, USA, October 5, 2011.

Li Q.
One Loop Matrix Element Matching with Parton Shower for Higgs Gluon fusion
Michigan State Univeristy, East Lansing, USA, December 5, 2011.

Nicolo D. `, MEG Collaboration
Recent results from the MEG experiment
Meeting of the Division of Particles and Fields of the American Physical Society,
Brown University, Providence, Rhode Island, USA, August 9 -13, 2011

Nishiguchi H., MEG Collaboration
Latest Result from the MEG Experiment
From the Planck Scale to the ElectroWeak Scale (PLANCK 2011), Instituto Superior Técnico (IST), Lisboa, Portugal, May 30 – June 3, 2011

Nishimura Y., MEG Collaboration
Search for the decay μ→eγ in the MEG experiment
2nd International Conference on Particle Physics
in Memoriam Engin Arık and Her Colleagues (ICPP-Istanbul II)
Doğuş University, İstanbul, Turkey, June 20 – 25, 2011

Papa A., MEG Collaboration
The μ→e γ decay fom the MEG experiment
1st Workshop on Flavor Symmetries and consequences in Accelerators and Cosmology, Valencia, Spain, July 11 – 14, 2011

C. Petitjean,
Nuclear Muon Capture in Hydrogen Isotopes
Symposium on Exciting Physics, Makutsi Farm, South Africa, November 14 – 19, 2011

Schmidt-Wellenburg P.
Measurement of the neutron EDM
Open User Meeting PSI, February 17, 2011

Schmidt-Wellenburg P.
An improved search of the nEDM
7th Patras Workshop on Axions, WIMPs and WISPs, Mykonos, Greece, 27 June - 1 July, 2011

Schmidt-Wellenburg P.
An improved search of the nEDM
Meeting of the Division of Particles and Fields of the American Physical Society, August 9 - 13, 2011

Spira M.
LHC Theory'
CHIPP Plenary Meeting, Leysin, Switzerland, September 2011

Spira M.
News on HDECAY and HIGLU'
Higgs Days, Santander, Spain, September 19 – 23 2011

Spira M.
Precision Higgs physics at the LHC and future LCs'
Conference LC11, Trento, Italy, September 11 – 15, 2011

Spira M.
MSSM Neutral Higgs'
Workshop of LHC Higgs Cross Section Working Group, Orsay, France, Oktober 2011

Spira M.
SM BR
Workshop of LHC Higgs Cross Section Working Group, Orsay, France, November 21 – 23, 2011

Uchiyama Y., MEG Collaboration
Search for mu -> e gamma Decay : MEG latest result
NEW TRENDS IN HIGH-ENERGY PHYSICS (experiment, phenomenology, theory), Alushta, Crimea, Ukraine, September 3 - 10, 2011

CONFERENCE ORGANIZATION

Hajdas W.
Session Chairman for the session Dosimetry and Facilities,
The Conference on Radiation Effets on Components and Systems RADECS, Sevilla, Spain
September 19 - 23, 2011
Hajdas W.
Offcial reviewer for the session Dosimetry
IEEE Nuclear & Space Radiation Effects Conference (NSREC 2011), Las Vegas, USA, July 25 – 29, 2011

Rohe T.
MC-PAD training event on CV writing and interview skills; PSI, Switzerland, November 8 – 10, 2011

MEMBERSHIPS IN COMMITTEES

Daum M.
- PAC, Programme Advisory Committee ISINN20 (International Symposium on the Interactions of Neutrons with Nuclei)

Horisberger R.
- President of the PSI Internal FOKO

Kirch K.
- SPS Board (2005-2011)
- CHIPP Board (since 2009)
- CHIPP Executive Board (since 2010, designated Chair 2012/13)
- Reviewer and Reviews in 2011:
    - Phys.Rev. Journals, Nucl. Instr. Meth. A, Euro Physics Letters
    - DOE Office of Nuclear Physics

Langenegger U.
- Member of International Advisory Committee for the conference "Flavor Physics and CP Violation"
- Member of thesis committee of Bora Akgun (Carnegie Mellon University)
Upsilon(nS) Cross Section Measurement in pp collisions at sqrt(s) = 7TeV with the CMS Detector "
- Member of thesis committee of Remi Louvot (EPFL)
" Study of Bs-meson production and measurement of Bs decays into a Ds(*-) and a light meson in e+e- collisions at sqrt(s) = 10.87GeV "

Petitjean C.
- Member of the JINR PAC on Nuclear Physics, Dubna, Russia

Spira M.
- Convenor of the working group “Electroweak Gauge Theories and Alternative Theories” of the ECFA Study of Physics and Detectors for a Linear Collider
- Convenor of the working group “ttH Higgs Associated Production Process” and working group “MSSM Neutral Higgs” of the LHC Higgs Cross Section Working Group
- Member Berufungskommission für die Nachfolge von Daniel Wyler an der Universität Zürich
- Program and advisory committee, PSI Ring-Zyklotron

DIPLOMA

Grether S.
Aufbau und Inbetriebnahme einer experimentellen Infrastruktur fuer Experiment emit monoenergetischen Elektronen (Bachelor Thesis)
Studierenden-Projekt Nr. 4252-S, Fachhochschule Nordwestschweiz, Hochschule fuer Technick, Brugg-Windisch, Switzerland, August 20, 2011

Research with Neutrons and Muons

Laboratory for Neutron Scattering (LNS)

LIST OF PUBLICATIONS (PEER REVIEWED)

Abakumov AM, Batuk D, Hadermann J, Rozova MG, Sheptyakov DV, Tsirlin AA, Niermann D, Waschkovski F, Hemberger J, Van Tendeloo G, Antipov EV
Antiferroelectric (Pb,Bi)1-xFe1+xO3-y Perovskites Modulated by Crystallographic Shear Planes
CHEMISTRY OF MATERIALS **23**, 255-265 (2011)

Aguadero A, Martinez-Lope MJ, Pomjakushin V, Alonso JA
Oxygen-Deficient R2MoO6-d (R=Tb, Dy, Y, Ho, Er, Tm; Yb) with Fluorite Structure as Potential Anodes in Solid Oxide Fuel Cells
EUROPEAN JOURNAL OF INORGANIC CHEMISTRY **2011**, 3226-3231 (2011)

Almasy L, Bende A
Ab initio structures of interacting methylene chloride molecules with comparison to the liquid phase
JOURNAL OF MOLECULAR LIQUIDS **158**, 205-207 (2011)

Amir SM, Gupta M, Gupta A, Stahn J, Wildes A
Surfactant induced symmetric and thermally stable interfaces in Cu/Co multilayers
JOURNAL OF PHYSICS-CONDENSED MATTER **23**, 485003 (2011)

Amstad E, Kohlbrecher J, Muller E, Schweizer T, Textor M, Reimhult E
Triggered Release from Liposomes through Magnetic Actuation of Iron Oxide Nanoparticle Containing Membranes
NANO LETTERS **11**, 1664 (2011)

Atanasov M, Delley B, Neese F, Tregenna-Piggott PL, Sigrist M
Theoretical Insights into the Magnetostructural Correlations in Mn-3-Based Single-Molecule Magnets
INORGANIC CHEMISTRY **50**, 2112 (2011)

Babkevich P, Roessli B, Gvasaliya SN, Regnault LP, Freeman PG, Pomjakushina E, Conder K, Boothroyd AT
Spin anisotropy of the resonance peak in superconducting FeSe0.5Te0.5
PHYSICAL REVIEW B **83**, 180506 (2011)

Baidya S, Sanyal P, Das H, Roessli B, Chatterji T, Saha-Dasgupta T
Understanding neutron scattering data in YMn2O5: An effective spin Hamiltonian
PHYSICAL REVIEW B **84**, 054444 (2011)

Balagurov AM, Bobrikov IA, Pomjakushin VYU, Pomjakushina EV, Sheptyakov DV, Troyanchuk IO
Low-Temperature Structural Anomalies in Pr0.5Sr0.5CoO3
JETP LETTERS **93**, 263-268 (2011)

Balasoiu M, Bica I, Raikher YL, Dokukin EB, Almasy L, Vatzulik B, Kuklin AI
Particle concentration effects on the ferrofluids based elastomers microstructure
JOURNAL OF OPTOELECTRONICS AND ADVANCED MATERIALS **5(5)**, 514 (2011)

Balog S, Gasser U, Mortensen K, Ben Youcef H, Gubler L, Scherer GG
Nano-scale morphology in graft copolymer proton-exchange membranes cross-linked with DIPB
JOURNAL OF MEMBRANE SCIENCE **383**, 50-59 (2011)

Barrett M, Deschner A, Embs JP, Rheinstaedter MC
Chain formation in a magnetic fluid under the influence of strong external magnetic fields studied by small angle neutron scattering
SOFT MATTER **7**, 6678-6683 (2011)

Bellin CH, Barbiellini B, Klotz S, Buslaps T, Rousse G, Straessle TH, Shukla A
Oxygen disorder in ice probed by x-ray Compton scattering
PHYSICAL REVIEW B **83**, 094117 (2011)

Bende A, Almasy L
Ab initio study of mixed clusters of water and N,N'-dimethylethyleneurea
Ukrainian Journal of Physics **56**, 8 (2011)

Bende A, Almasy L
Weakly bonded cluster structures of N, N'-dimethylethyleneurea and water
JOURNAL OF MOLECULAR LIQUIDS **162**, 45-49 (2011)

Boeni P, Roessli B, Hradil K
Inelastic neutron and x-ray scattering from incommensurate magnetic systems
JOURNAL OF PHYSICS-CONDENSED MATTER **23**, 254209 (2011)

Bouillot P, Kollath C, Laeuchli A, Zvonarev M, Thielemann B, Rueegg C, Orignac E, Citro R, Klanjsek M, Berthier C, Horvatic M, Giamarchi TH
Static and dynamics of weakly coupled antiferromagnetic spin-1/2 ladders in a magnetic field
PHYSICAL REVIEW B **83**, 054407 (2011)

Boukaoud A, Meinnel J, Boudjada A, Juranyi F, Carlile CJ, Jeannin O
Inelastic neutron scattering of methyl tunnelling in isotopic mixtures of dibromomesitylene
CHEMICAL PHYSICS LETTERS **509**, 20-24 (2011)

Capponi S, Arbe A, Cerveny S, Busselez R, Frick B, P Embs J, Colmenero J
Quasielastic neutron scattering study of hydrogen motions in an aqueous poly(vinyl methyl ether) solution
JOURNAL OF CHEMICAL PHYSICS **134**, 204906 (2011)

Cervellino A, Gvasaliya SN, Zaharko O, Roessli B, Rotaru GM, Cowley RA, Lushnikov SG, Shaplygina TA, Fernandez-Diaz MT
Diffuse scattering from the lead-based relaxor ferrolectric PbMg1/3Ta2/3O3
JOURNAL OF APPLIED CRYSTALLOGRAPHY **44**, 603-609 (2011)

Chakravarty S, Jiang M, Tietze U, Lott D, Geue T, Stahn J, Schmidt H
Migration and annihilation of non-equilibrium point defects in sputter deposited nanocrystalline alpha-Fe films
ACTA MATERIALIA **59**, 5568 (2011)

Chen Q, Huang TW, Baldini M, Hushur A, Pomjakushin V, Clark S, Mao WL, Manghnani MH, Braun A, Graule TH
Effect of Compresive Strain on the Raman Modes of the Dry and Hydrated BaCe0.8Y0.2O3
JOURNAL OF PHYSICAL CHEMISTRY C **115**, 24021 (2011)

Chinchalikar AJ, Aswal VK, Kohlbrecher J, Wagh AG
SANS Study of Liquid-Liquid Phase Transition in Protein Electrolyte Solution
AIP CONFERENCE PROCEEDINGS **1349**, 202-203 (2011)

Cowley RA, Gvasaliya SN, Lushnikov SG, Roessli B, Rotaru GM
Relaxing with relaxors: a review of relaxor ferroelectrics
ADVANCES IN PHYSICS **60**, 229-327 (2011)

Deng G, Pomjakushin V, Petricek V, Pomjakushina E, Kenzelmann M, Conder K
Structural evolution of one-dimensional spin-ladder compounds Sr14-xCaxCu24O41 with Ca doping and related evidence of hole redistribution
PHYSICAL REVIEW B **84**, 144111 (2011)

Dhiman I, Das A, Nigam AK, Gasser U
Influence of B-site disorder in La0.5Ca0.5Mn1−xBxO3 (B = Fe, Ru, Al and Ga) manganites
JOURNAL OF PHYSICS-CONDENSED MATTER **23**, 246006 (2011)

Doenni A, Kitazawa H, Straessle TH, Keller L, Matsuda M, Kakurai K, Ano G, Akatsu M, Nemoto Y, Goto T
Crystal Field Level Diagrams at the Pr Sites (8c) and (4a) in the Clathrate Compound Pr3Pd20Si6
JOURNAL OF THE PHYSICAL SOCIETY OF JAPAN **80**, 044715 (2011)

Drokina T, Petrakovskii G, Keller L, Schefer J
Quasi-one-dimensional pyroxene NaFeGe2O6: magnetic structure and magnetic phase diagram Perspectivneie materiali (Rus) (Smart materials)
Proc. IX Rus.-China IC "New materials and technologies" **13**, 675-680 (2011)

Drokina TV, Petrakovskii GA, Keller L, Schefer J, Balaev AD, Kartashev AV, Ivanov DA
Modulated Magnetic Structure in Quasi-One-Dimensional Clinopyroxene NaFeGe2O6
JOURNAL OF EXPERIMENTAL AND THEORETICAL PHYSICS **112**, 121-126 (2011)

Dufour C, Fitzsimmons MR, Borchers JA, Laver M, Krycka KL, Dumesnil K, Watson SM, Chen WC, Won J, Singh S
Nanometer-size magnetic domains and coherent magnetization reversal in a giant exchange-bias system
PHYSICAL REVIEW B **84**, 064420 (2011)

Fally M, Klepp J, Pruner C, Tomita Y, Eckerlebe H, Kohlbrecher J, Rupp RA
Holographic gratings for cold neutron optics
IEEE-Conf. proceedings of IP2011 (Information Photonics) **2011**, 1-2 (2011)

Fontana P, Schefer J, Pettit D
Characterization of sodium chloride crystals grown in microgravity
JOURNAL OF CRYSTAL GROWTH **324**, 207-211 (2011)

Frandsen C, Lefmann K, Lebech B, Bahl CRH, Brok E, Ancona SN, Theil Kuhn L, Keller L, Kasama T, Gontard LC, Morup S
Spin reorientation in a-Fe2O3 nanoparticles induced by interparticle exchange interactions in a-Fe2O3/NiO nanocomposites
PHYSICAL REVIEW B **84**, 214435 (2011)

Freeman PG, Prabhakaran D, Nakajima K, Stunault A, Enderle M, Niedermayer C, Frost CD, Yamada K, Boothroyd AT
Low-energy quasi-one-dimensional spin dynamics in charge-ordered La(2-x)Sr(x)NiO4
PHYSICAL REVIEW B **83**, 094414 (2011)

Furrer A
Magnetic cluster excitations
JOURNAL OF PHYSICS: CONFERENCE SERIES **325**, 012001 (2011)

Furrer A, Juranyi F, Kraemer KW, Schneider M, Straessle TH
Single-ion versus two-ion anisotropy in magnetic compounds: A neutron scattering study
PHYSICAL REVIEW B **83**, 024404 (2011)

Furrer A, Pomjakushina E, Pomjakushin V, Embs JP, Straessle TH
Ferromagnetic and antiferromagnetic dimer splittings in LaMn0.1Ga0.9O3
PHYSICAL REVIEW B **83**, 174442 (2011)

Furrer A, Straessle TH, Embs J P, Juranyi F, Pomjakushin V, Schneider M, Kraemer K W
Direct observation of local Mn-Mn distances in the paramagnetic compound CsMnxMg1-xBr3
PHYSICAL REVIEW LETTERS **107**, 115502 (2011)

Gallova J, Uhrikova D, Kucerka N, Svorkova M, Funari SS, Murugova TN, Almasy L, Mazur M, Balgavy P
Influence of Cholesterol and B-Sitosterol on the Structure of EYPC Bilayers
JOURNAL OF MEMBRANE BIOLOGY **243**, 1-13 (2011)

Gomes S, Nedelec JM, Jallot E, Sheptyakov D, Renaudin G
Silicon Location in Silicate-Substituated Calcium Phosphate Ceramics Determined by Neutron Diffraction
CRYSTAL GROWTH & DESIGN **11**, 4017-4026 (2011)

Gomes S, Nedelec JM, Jallot E, Sheptyakov D, Renaudin G
Unexpected Mechanism of Zn2+ Insertion in Calcium Phosphate Bioceramics
CHEMISTRY OF MATERIALS **23**, 3072-3085 (2011)

Goto M, Wilk A, Kazama A, Chodankar S, Kohlbrecher J, Matsuki H
Chain elongation of diacylphosphatidylcholine induces fully bilayer interdigiation under atmospheric pressure
COLLOIDS AND SURFACES B-BIOINTERFACES **84**, 44-48 (2011)

Gupta M, Amir SM, Gupta A, Stahn J
Surfactant mediated growth of Ti/Ni multilayers
APPLIED PHYSICS LETTERS **98**, 101912 (2011)

Gupta M, Tayal A, Gupta A, Gupta R, Stahn J, Horisberger M, Wildes A
Iron and nitrogen self-diffusion in non-magnetic iron nitrides
JOURNAL OF APPLIED PHYSICS **110**, 123518 (2011)

Gupta M, Tayal A, Gupta A, Raghavendra Reddy V, Horisberger M, Stahn J
Study of non-magnetic iron mononitride thin films
JOURNAL OF ALLOYS AND COMPOUNDS **509**, 8283-8288 (2011)

Halder M, Yusuf SM, Kumar A, Nigam AK, Keller L
Crossover from antiferromagnetic to ferromagnetic ordering in the semi-Heusler alloys Cu1-xNixMnSb with increasing Ni concentration
PHYSICAL REVIEW B **84**, 094435 (2011)

Hanson HA, Wang X, Dimitrov IK, Shi J, Ling XS, Maranville BB, Majkrzak CF, Laver M, Keiderling U, Russina M
Structural evidence for an edge-contaminated vortex phase in a Nb crystal using neutron diffraction
PHYSICAL REVIEW B **84**, 014506 (2011)

Hase M, Pomjakushin VYU, Keller L, Doenni A, Sakai O, Yang T, Cong R, Lin J, Ozawa K, Kitazawa H
Spiral magnetic structure in spin-5/2 frustrated trimerized chains in SrMn3P4O14
PHYSICAL REVIEW B **84**, 184435 (2011)

Hase M, Pomjakushin VYU, Sikolenko V, Keller L, Luetkens H, Doenni A, Kitazawa H
Negative magnetization of Li2Ni2Mo3O12: A spin system composed of distorted honeycomb lattices and linear chains
PHYSICAL REVIEW B **84**, 104402 (2011)

Hueger E, Schmidt H, Geue T, Stahn J, Tietze U, Lott D, Markwitz A, Geckle U, Bruns M
Nitrogen Self-Diffusion in Magnetron Sputtered Si-C-N Films
JOURNAL OF APPLIED PHYSICS **109** , 093522 (2011)

Justino LL, Ramos ML, Knaapila M, Marques AT, Kudla CJ, Scherf U, Almasy L, Schweins R, Burrows HD, Monkman AP
Gel Formation and Interpolymer Alkyl Chain Interactions with Poly(9,9-dioctylfluorene-2,7-diyl) (PFO) in Toluene Solution: Results from NMR, SANS, DFT, and Semiempirical Calculations and Their Implications for PFO B-Phase Formation
MACROMOLECULES **44**, 334-343 (2011)

Kawano-Furukawa H, Bowell CJ, White JS, Heslop RW, Cameron AS, Forgan EM, Kihou K, Lee CH, Iyo A, Eisaki H, Saito T, Fukazawa H, Kohori Y, Cubitt R, Dewhurst CD, Gavilano JL, Zolliker M
Gap in KFe2As2 studied by small-angle neutron scattering observations of the magnetic vortex lattice
PHYSICAL REVIEW B **84**, 024507 (2011)

Kawasaki Y, Gavilano JL, Keller L, Schefer J, Christensen NB, Amato A, Ohno T, Kishimoto Y, He ZZ, Ueda Y, Itoh M
Magnetic structure and spin dynamics of the quasi-one-dimensional spin-chain antiferromagnet BaCo2V2O8
PHYSICAL REVIEW B **83**, 064421 (2011)

Khan AU, Bursik J, Grytsiv A, Pomjakushin V, Effenberger H, Rogl P
Crystal structure of T5-TiNi2-xAl5 (x=0.48) and isotypic (Zr,Hf) Ni2-xAl5-y
INTERMETALLICS **19**, 1340-1347 (2011)

Khan AU, Grytsiv A, Yan X, Rogl P, Saccone A, Pomjakushin V, Giester G
Phase Relations and Crystal Structure of T6-Ti2(Ti0.16Ni0.43Al0.41)3
INORGANIC CHEMISTRY **50**, 4537-4547 (2011)

Khomchenko V A, Troyanchuk I O, Bushinsky M V, Mantytskaya O S, Sikolenko V, Paixao J A
Structural phase evolution in Bi7/8Ln1/8FeO3 (Ln=La-Dy) series
MATERIALS LETTERS **65**, 1970 (2011)

Klepp J, Pruner C, Tomita Y, Plonka-Spehr C, Geltenbort P, Ivanov S, Manzin G, Andersen KH, Kohlbrecher J, Ellabban MA, Fally M
Diffraction of slow neutrons by holographic SiO2, nanoparticle-polymer composite gratings
PHYSICAL REVIEW A **84**, 013621 (2011)

Klotz S, Straessle TH, Cornelius AL, Philippe J, Pomjakushin V
Elastic properties of a-iron at high temperature by high-pressure neutron scattering
JOURNAL OF PHYSICS D-APPLIED PHYSICS **44**, 055406 (2011)

Knaapila M, Bright DW, Stepanyan R, Torkkeli M, Almasy L, Schweins R, Vainio U, Preis E, Galbrecht F, Scherf U, Monkman AP
Network structure of polyfluorence sheets as a function of alkyl side chain length
PHYSICAL REVIEW E **83**, 051803 (2011)

Komarek A, Isobe M, Hemberger J, Meier D, Lorenz T, Trots D, Cervellino A, Fernandez-Diaz MT, Ueda Y, Braden M
Dimerization and Charge Order in Hollandite K2V8O16
PHYSICAL REVIEW LETTERS **107**, 027201 (2011)

Korneychik OE, Batuk M, Abakumov AM, Hadermann J, Rozova MG, Sheptyakov DV, Pokholok KV, Filimonov DS, Antipov EV
Pb2.85Ba2.15Fe4SnO13: A new member of the AnBnO3n-2 anion-deficient perovskite-based homologous series
JOURNAL OF SOLID STATE CHEMISTRY **184**, 3150-3157 (2011)

Krzton-Maziopa A, Pomjakushina E, Pomjakushin V, Sheptyakov D, Chernyshov D, Svitlyk V, Conder K
The synthesis, and crystal and magnetic structure of the iron selenide BaFe2Se3 with possible superconductivity at Tc=11K
JOURNAL OF PHYSICS-CONDENSED MATTER **23**, 402201 (2011)

Krzton-Maziopa A, Shermadini Z, Pomjakushina E, Pomjakushin V, Bendele M, Amato A, Khasanov R, Luetkens H, Conder K
Synthesis and crystal growth of Cs0.8(FeSe0.98)2: a new iron-based superconductor with Tc=27K
JOURNAL OF PHYSICS-CONDENSED MATTER **23**, 052203 (2011)

Kumar S, Aswal VK, Kohlbrecher J
SANS Study of Protein Adsorption on Nanoparticles
AIP CONFERENCE PROCEEDINGS **1349**, 222-223 (2011)

Kumar S, Aswal VK, Kohlbrecher J
SANS and UV-vis Spectroscopy Studies of Resultant Structure from Lysozyme Adsorption on Silica Nanoparticles
LANGMUIR **27**, 10167-10173 (2011)

Kuzmin A, Efimov V, Efimova E, Sikolenko V, Pascarelli S, Troyanchuk IO
Interpretation of the Co K-edge EXAFS in LaCoO3 using molecular dynamics simulations
SOLID STATE IONICS **188**, 21-24 (2011)

Kyeremateng SO, Busse K, Kohlbrecher J, Kressler J
Synthesis and Self-Organization of Poly(propylene oxide)-Based Amphiphilic and Triphilic Block Copolymers
MACROMOLECULES **44**, 583-593 (2011)

Larregola SA, Alonso JA, Sheptyakov D, Alguero M, Munoz A, Pomjakushin V, Pedregosa JC
High-Temperature Behavior and Polymorphism in Novel Members of the Perovskite Family Pb2LnSbO6 (Ln=Ho, Er, Yb, Lu)
INORGANIC CHEMISTRY **50**, 5545-5557 (2011)

Li K, Sheptyakov D, Wang Y, Loong C-K, Lin J
Phase digram of SrO-InO1.5-CoOx and a new compound Sr3In0.9Co1.1O6
JOURNAL OF SOLID STATE CHEMISTRY **184**, 888-892 (2011)

Li YA, Egetenmeyer N, Gavilano JL, Barisic N, Greven M
Magnetic vortex lattice in HgBa2CuO4+delta observed by small-angle neutron scattering
PHYSICAL REVIEW B **83**, 054507 (2011)

Lietor-Santos JJ, Sierra-Martin B, Gasser U, Fernandez-Nieves A
The effect of hydrostatic pressure over the swelling of microgel particles
SOFT MATTER **DOI:**, 10.1039/c1sm05328k (2011)

Lister SJ, Kohlbrecher J, Venkataramana V, Thomson T, Takano K, Lee SL
Analysing SANS data to determine magnetisation reversal processes in composite perpendicular magnetic recording media using TEM images
International Journal of Material Research **102**, 1142 (2011)

Lonetti B, Tsigkri A, Lang PR, Stellbrink J, Willner L, Kohlbrecher J, Lettinga MP
Full Characterization of PB-PEO Wormlike Micelles at Varying Solvent Selectivity
MACROMOLECULES **44**, 3583-3593 (2011)

Malavasi L, Tealdi C, Ritter C, Pomjakushin V, Gozzo F, Diaz-Fernandez Y
Combined Neutron and Synchotron X-ray Diffraction Investigation of the BaCe0.85-xZrY0.15O3-d Proton Conductors
CHEMISTRY OF MATERIALS **23**, 1323-1330 (2011)

Marczak W, Czech B, Almasy L, Lairez D
Molecular cluster in aqueous solutions of pyridine and its methyl derivatives
PHYSICAL CHEMISTRY CHEMICAL PHYSICS **13**, 6260-6269 (2011)

Martelli P, Remhof A, Borgschulte A, Ackermann R, Straessle T, Embs JP, Ernst M, Matsuo M, Orimo SI, Zuettel A
Rotational Motion in LiBH4/LiI Solid Solutions
JOURNAL OF PHYSICAL CHEMISTRY A **115**, 5329 (2011)

Michels A, Bick JP, Birringer R, Ferdinand A, Baller J, Santuary R, Philippi S, Lott D, Balog S, Rotenberg E, Kaindl G, Doebrich KM
Influence of crystallite size and temperature on the antiferromagnetic helices of terbium and holmium metal
PHYSICAL REVIEW B **83**, 224415 (2011)

Mishra SK, Mittal R, Pomjakushin VYU, Chaplot SL
Phase stability and structural temperature dependence in sodium niobate: A high-resolution powder neutron diffraction study
PHYSICAL REVIEW B **83**, 134105 (2011)

Mitra S, Sharma VK, Garcia Sakai V, Embs JP, Mukhopadhyay R
Molecular Mobility in Solid Sodium Dodecyl Sulfate
JOURNAL OF PHYSICAL CHEMISTRY B **115**, 9732-9738 (2011)

Moechel A, Sergueev I, Wille HC, Juranyi F, Schober H, Schweika W, Brown SR, Kauzlarich SM, Hermann RP
Lattice dynamics in the thermoelectric Zintl compound Yb14MnSb11
PHYSICAL REVIEW B **84**, 184303 (2011)

Nandi S, Su Y, Xiao Y, Price S, Wang XF, Chen XH, Herrero-Martin J, Mazzoli C, Walker HC, Paolasini L, Francoual S, Shukla DK, Strempfer J, Chatterji T, Kumar CMN, Mittal R, Ronnow HM, Rueegg CH, Mcmorrow DF, Brueckel TH
Strong coupling of Sm and Fe magnetism in SmFeAsO as revealed by magnetic x-ray scattering
PHYSICAL REVIEW B **84**, 054419 (2011)

Normand B, Rueegg CH
Complete bond-operator theory of the two-chain spin ladder
PHYSICAL REVIEW B **83**, 054415 (2011)

Owens FJ, Gladczuk L, Szymczak R, Dluzewski P, Wisniewski A, Szymczak H, Golnik A, Bernhard C, Niedermayer C
High temperature magnetic order in zinc sulfide doped with copper
JOURNAL OF PHYSICS AND CHEMISTRY OF SOLIDS **72**, 648 (2011)

Pajzderska A, Czarnecki P, Embs JP, Ganzalez MA, Juranyi F, Krawczyk J, Peplinska B, Wasicki J
A study of out-of-plane cation dynamics in a bis-thiourea pyridinium chloride inclusion compound
PHYSICAL CHEMISTRY CHEMICAL PHYSICS **13**, 8908-8914 (2011)

Pajzderska A, Gonzalez MA, Embs JP, Wasicki J
Complex Dynamics of Pyridinium Cation in Ferroelectric Bis (thiourea) pyridinium Iodide Studied by Quasi-Elastic Neutron Scattering
JOURNAL OF PHYSICAL CHEMISTRY C **115**, 15164-15171 (2011)

Petrakovskii G, Drokina T, Schefer J, Keller L, Kartashev A
Incommensurate magnetic structure and Phase Transition in Quasi-one-dimensional Clinopyroxene NaFeGe2O6 Thesis
INTERNATIONAL CONFERENCE ON FUNCTIONAL MATERIALS **2011**, 58 (2011)

Pitt M, Webb J, Paskevicius M, Sheptyakov D, Buckley C, Gray E
In Situ Neutron Diffraction Study of the Deuteration of Isotopic Mg11B2
JOURNAL OF PHYSICAL CHEMISTRY C **115**, 22669 (2011)

Podlesnyak A, Ehlers G, Frontzek M, Sefat AS, Furrer A, Straessle TH, Pomjakushina E, Conder K, Demmel F, Khomskii DI
Effect of carrier doping on the formation and collapse of magnetic polarons in lightly hole-doped La1-xSrxCoO3
PHYSICAL REVIEW B **83**, 134430 (2011)

Pomjakushin V, Pomjakushina E, Krzton-Maziopa A, Conder K, Shermadini Z
Room temperature antiferromagnetic order in superconducting XyFe2−xSe2(X=Rb, K): a neutron powder diffraction study
JOURNAL OF PHYSICS-CONDENSED MATTER **23**, 156003 (2011)

Pomjakushin VYU, Sheptyakov DV, Pomjakushina EV, Krzton-Maziopa A, Conder K, Chernyshov D, Svitlyk V, Shermadini Z
Iron-vacancy superstructure and possible room-temperature antiferromagnetic order in superconducting CsyFe2-xSe2
PHYSICAL REVIEW B **83**, 144410 (2011)

Poole A, Roessli B, Zaharko O, Kramer KW
The magnetic structure of multiferroic BaMnF4
JOURNAL OF PHYSICS-CONDENSED MATTER **23**, 266004 (2011)

Ray D, Aswal VK, Kohlbrecher J
Synthesis and Characterization of High Concentration Block Copolymer-Mediated Gold Nanoparticles
LANGMUIR **27**, 4048-4056 (2011)

Reufer M, Dietsch H, Gasser U, Grobety B, Hirt AM, Malik VK, Schurtenberger P
Magnetic properties of silica coated spindle-type hematite particles
JOURNAL OF PHYSICS-CONDENSED MATTER **23**, 065102 (2011)

Ross KA, Yaraskavitch LR, Laver M, Gardner JS, Quilliam JA, Meng S, Kycia JB, Singh DK, Proffen T, Dabkowska HA, Gaulin BD
Dimensional evolution of spin correlations in the magnetic pyrochlore Yb2Ti2O7
PHYSICAL REVIEW B **84**, 174442 (2011)

Runov V, Stuhr U
Neutron spectroscopy study of magnons in the austenite and martensite phases of a Ni-Mn-Ga Heusler alloy
JOURNAL OF MAGNETISM AND MAGNETIC MATERIALS **323**, 244-247 (2011)

Sassa Y, Radovic M, Mansson M, Razzoli E, Cui XY, Pailhes S, Guerrero S, Shi M, Willmott PR, Granozio FM, Mesot J, Norman MR, Patthey L
Ortho-II band folding in YBa2Cu3O7-delta films revealed by angle-resolved photoemission
PHYSICAL REVIEW B **83**, 140511 (2011)

Schuwer N, Geue T, Hinestrosa J P, Klok H-A
Neutron Reflectivity Study on the Postpolymerization Modification of Poly(2-hydroxyethyl methacrylate) Brushes
MACROMOLECULES **44**, 6868 (2011)

Schwarz G, Bodenthin Y, Tomkowicz Z, Haase W, Geue T, Kohlbrecher J, Pietsch U, Kurth DG
Tuning the Structure and the Magnetic Properties of Metallo-supramolecular Polyelectrolyte-Amphiphile Complexes
JOURNAL OF THE AMERICAN CHEMICAL SOCIETY **133**, 547 (2011)

Seefeldt M, Dillien S, Stuhr U
Neutron Diffraction Analysis of Load Transfer in DP 600 Steel During in situ Tensile Tests
MATERIALS SCIENCE FORUM **681**, 31 (2011)

Shermadini Z, Krzton-Maziopa A, Bendele M, Khasanov R, Luetkens H, Conder K, Pomjakushina E, Weyeneth S, Pomjakushin V, Bossen O, Amato A
Coexistence of Magnetism and Superconductivity in the Iron-Based Compound Cs0.8(FeSe0.98)2
PHYSICAL REVIEW LETTERS **106**, 117602 (2011)

Singh PS, Aswal VK, Kohlbrecher J
Influence of hydrophilic silica nanoparticles to the conformation of hydrophilic polymer chain in dilute solution system
JOURNAL OF COLLOID AND INTERFACE SCIENCE **353**, 52 (2011)

Stahn J, Panzner T, Filges U, Marcelot C, Boeni P
Study on a focusing, low-background neutron delivery system
NUCLEAR INSTRUMENTS AND METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **634**, S12 (2011)

Sugiyama J, Nozaki H, Harada M, Kamazawa K, Ofer O, Mansson M, Brewer JH, Ansaldo EJ, Chow KH, Ikedo Y, Miyake Y, Ohishi K, Watanabe I, Kobayashi G, Kanno R
Magnetic and diffusive nature of LiFePO4 investigated by muon spin rotation and relaxation
PHYSICAL REVIEW B **84**, 054430 (2011)

Svitlyk V, Chernyshov D, Pomjakushina E, Krzton-Maziopa A, Conder K, Pomjakushin V, Dmitriev V
Temperature and Pressure Evolution of the Crystal Structure of Ax(Fe1-ySe)2(A=Cs,Rb,K) Studied by Synchrotron Powder Diffraction
INORGANIC CHEMISTRY **50**, 10703-10708 (2011)

Toth S, Lake B, Kimber SAJ, Pieper O, Reehuis M, Islam ATMN, Zaharko O, Ritter C, Hill AH, Ryll H, Kiefer K, Argyriou DN, Williams AJ
120deg helical magnetic order in the distorted triangular antiferromagnet a-CaCr2O4
PHYSICAL REVIEW B **84**, 054452 (2011)

Udby L, Willendrup PK, Knudsen E, Niedermayer C, Filges U, Christensen NB, Farhi E, Wells BO, Lefmann K
Analysing neutron scattering data using McStas virtual experiments
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **634**, S138 (2011)

Villesuzanne A, Paulus W, Cousson A, Hosoya S, Le Dreau L, Hernandez O, Prestipino C, Ikbel Houchati M, Schefer J
On the role of lattice dynamics on low-temperature oxygen mobility in solid oxides: a neutron diffraction and first-principles invstigation of La2CuO4+d
JOURNAL OF SOLID STATE ELECTROCHEMISTRY **15**, 357-366 (2011)

White JS, Heslop RW, Holmes AT, Forgan EM, Hinkov V, Egetenmeyer N, Gavilano JL, Laver M, Dewhurst CD, Cubitt R, Erb A
Magnetic-field-induced nonlocal effects on the vortex interactions in twin-free YBa2Cu3O7
PHYSICAL REVIEW B **84**, 104519 (2011)

Wiedenmann A, Gaehler R, Dewhurst CD, Keiderling U, Prevost S, Kohlbrecher J
Relaxation mechanisms in magnetic colloids studied by stroboscopic spin-polarized small-angle neutron scattering
PHYSICAL REVIEW B **84**, 214303 (2011)

Wu H, Xie J, Lattuada M, Kohlbrecher J, Morbidelli M
Effect of Primary Particle Size and Salt Concentration on the Structure of Colloidal Gels
JOURNAL OF PHYSICAL CHEMISTRY C **115**, 931-936 (2011)

Zaharko O, Christensen NB, Cervellino A, Tsurkan V, Maljuk A, Stuhr U, Niedermayer C, Yokaichiya F, Argyriou DN, Boehm M, Loidl A
Spin liquid in a single crystal of the frustrated diamond lattice antiferromagnet CoAl2O4
PHYSICAL REVIEW B **84**, 094403 (2011)

Zhigadlo ND, Katrych S, Bendele M, Moll PJW, Tortello M, Weyneth S, Pomjakushin VYU, Kanter J, Puzniak R, Bukowski Z, Keller H, Gonnelli RS, Khasanov R, Karpinski J, Batlogg B
Interplay of composition, structure, magnetism, and superconductivity in SmFeAs1-xPxO1-x
PHYSICAL REVIEW B **84**, 134526 (2011)

de Viguerie L, Keller R, Jonas U, Berger R, Clark CG, Klein CO, Geue TH, Muellen K, Butt HJ, Vlassopoulos D
Effect of the Molecular Structure on the Hierarchical Self-Assembly of Semifluorinated Alkanes at the Air/Water Interface
LANGMUIR **27**, 8776-8786 (2011)

INVITED TALKS

N. Egetenmeyer
μSR study of the noncentrosymmetric heavy fermion $CeRhSi_3$ and ARPES study of underdoped $Ba(Fe_{1-x}Ni_x)_2As_2$
Université de Montréal
Montréal, Canada, September 15, 2011

T. Fennell
Magnetic monopoles in spin ice
DYPROSO
Aussois, France, September 18-22, 2011

T. Fennell
Coulomb phase in spin ice
ASRC Meeting
Tokai, Japan, March 14-17, 2011 (cancelled due to earthquake)

A. Furrer
Pressure effects of crystal-field interactions applied to barocaloric cooling
Workshop McPhase 2011: A software suite for complex magnetism
Gijon, Spain, May 10-13, 2011

U. Gasser, V. Staedele, J.J. Lietor-Santos, E.S. Herman, P. Mohanty, J. Crassous, D. Paloli, K. van Gruijthuijsen, M. Obiols-Rabasa, A. Stradner, P. Schurtenberger, L.A. Lyon, A. Fernandez-Nieves
Structural properties and phase behavior of densely packed microgel particles
8th Liquid Matter Conference
Vienna, Austria, September 6-10, 2011

U. Gasser, V. Staedele, J.J. Lietor-Santos, E.S. Herman, P. Mohanty, J. Crassous, D. Paloli, K. van Gruijthuijsen, M. Obiols-Rabasa, A. Stradner, P. Schurtenberger, L.A. Lyon, A. Fernandez-Nieves
Structural properties and phase behavior of densely packed microgel particles
JUM@P'11: Joint Users' Meeting at PSI
Villigen PSI, Switzerland, September 15-16, 2011

F. Juranyi
Linking the diffusion of water in compacted clays at two different time scales: tracer through-diffusion and QENS
NEA Clay Club Workshop
Karlsruhe, Germany, September 6-8, 2011

J. Kohlbrecher
Interpretation of small-angle scattering curves using SASfit
BAM (Bundesamt für Materialforschung)
Berlin, Germany, March 28, 2011

J. Kohlbrecher
Magnetisation reversal processes in composite perpendicular magnetic recording media
University of Luxemburg
Luxemburg, Luxemburg, March 21-23, 2011

J. Kohlbrecher
Magnetic response of functionalised lipid bilayers
University of Lund
Lund, Sweden, September 12-14, 2011

J. Kohlbrecher
Magnetic response of functionalised lipid bilayers
Physics Department, University of Goa
Goa, India, December 15, 2011

J. Kohlbrecher
Magnetisation reversal processes in composite perpendicular magnetic recording media
55th DAE Solid State Physics Symposium
Tamilnadu, India, December 19-23, 2011

M. Laver
Neutron scattering explorations of iron-gallium
PSI Seminar
Villigen PSI, Switzerland, May 5, 2011

M. Laver
Magnetic flux lines in type-II superconductors and the “hairy ball” theorem
PSI Theory Seminar
Villigen PSI, Switzerland, May 12, 2011

M. Laver
Small angle neutron scattering: a probe for nanomagnetism and vortices in superconductors
International Workshop on Complex Phenomena in Superconductors & Magnetic Systems
Øystese, Norway, September 1, 2011

M. Laver
La diffusion de neutrons, une sonde pour les systèmes magnétiques et la supraconductivité
INSA Seminar
Toulouse, France, September 13, 2011

M. Laver
Topological aspects of flux lines in type-II superconductors and the “hairy ball” theorem
Topological Materials 2011
Grenoble, France, October 26-28, 2011

L. Le Dreau, O. Hernandez, C. Prestipino, J. Schefer, G. Vaughan. S. Hosoya, W. Paulus
Structural modulation and phase transitions in La_2CoO_{4+d}
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011

C. Niedermayer
Muons in condensed matter research
Symposium on Size Selected Clusters
Davos, Switzerland, March 20-25, 2011

C. Niedermayer
Magnetic properties of orthorhombic $LuMnO_3$ *thin films*
IOP-PSI Workshop
Beijing, China, October 20-21, 2011

A. Poole, B. Roessli, P. Babkevich, A. Boothroyd, D. Prabakaran
Polarimetry studies of CuO
JUM@P'11: Joint Users' Meeting at PSI
Villigen PSI, Switzerland, September 15-16, 2011

Ch. Rüegg
Luttinger-liquid and BEC physics in spin ladders
Americal Physical Society (APS) March Meeting
Dallas, USA, March 21-25, 2011

Ch. Rüegg
Novel phases in quantum magnets at high magnetic fields
High-field Workshop, Helmholtz Zentrum Berlin
Berlin, Germany, March 31 - April 1, 2011

Ch. Rüegg
Non-equilibrium effects in quantum spin ladders?
Workshop "Integrability and its breaking in strongly correlated and disordered systems", ICTP
Trieste, Italy, May 23-27, 2011

Ch. Rüegg
Quantum spin ladders with frustration and non-magnetic vacancies
Theoretical and Experimental Magnetism Meeting
Abingdon, United Kingdom, June 16-17, 2011

Ch. Rüegg
Magnetic excitations and quantum critical points in spin ladder materials
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011

Ch. Rüegg
The crystallography of quantum magnets
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011

Ch. Rüegg
Get involved – closing remarks
ESS Science & Scientists workshop
Prague, Czech Republic, July, 22-23, 2011

Ch. Rüegg
Excitations in spin ladders – from low energies to the complete spectrum
Workshop "Synergies between field theory and exact computational methods in strongly correlated quantum matter", ICTP
Trieste, Italy, July 25-29, 2011

Ch. Rüegg
Exploring and controlling spins in model quantum magnets
Swiss-Swedish Meeting on Quantum Materials and Devices
Stenungsbaden, Sweden, August 25-27, 2011
Ch. Rüegg
Neutron scattering studies of model quantum magnets
Renmin University
Beijing, China, October 19, 2011

Ch. Rüegg
Neutron scattering studies of quantum critical points in quantum magnets
IOP-PSI Workshop
Beijing, China, October 20-21, 2011

Ch. Rüegg
Future challenges for neutron scattering
Topological Materials 2011
Grenoble, France, October 26-28, 2011

Ch. Rüegg
Excitations in quantum spin ladders
International Workshop on Recent Progress in Many-Body Theories
Bariloche, Argentina, November 28 - December 2, 2011

Ch. Rüegg
Materials science and model quantum magnets – neutron scattering experiments at the Swiss spallation neutron source SINQ
Group Seminar Züttel, EMPA
Dübendorf, Switzerland, December 15, 2011

D. Schaniel, Th. Woike, A. Cervellino, L. Keller, J. Schefer
Identification of single photoswitchable molecules in nanopores of silica xerogels using neutron powder diffraction
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011

J. Stahn
Polarised neutron reflectometry - a complementary method to RIXS and ARPES
Spectroscopy workshop on novel materials, PSI
Beatenberg, Switzerland, May 3-7, 2011

J. Stahn, U. Filges, T. Panzner, M. Cardenas, B. Klösgen
Concept, design and first results: convergent-beam reflectometry using a focusing elliptic guide
First In-Kind Contributions Meeting for Neutron Science for the ESS (IKON-1)
Lund, Sweden , September 8, 2011

J. Stahn
Concept for a reflectometer for the ESS with focusing in the sample plane, and a convergent beam in the scattering plane
Meeting of the ESS reflectometry TAP
Lund, Sweden, September 15, 2011

R. Sura, M. Ceretti, C. Prestipino, W. Paulus, J. Schefer, L. Keller, K. Conder, E. Pomjakushina
Effect of strontium doping on the oxygen diffusion in $La_{2-x}Sr_xCuO_{4+d}$ *samples investigated by single crystal neutron diffraction and oxygen isotope back exchange*
Annual Meeting of Swiss Society for Crystallography
Bern, Switzerland, September 16, 2011

R. Sura
Effect of strontium doping on the oxygen diffusion in $La_{2-x}Sr_xCuO_{4+d}$ *samples investigated by single crystal neutron diffraction and oxygen isotope back exchange*
Laboratory for Neutron Scattering (LNS)
Villigen PSI, Switzerland, September 14, 2011

J. White, T. Honda, K. Kimura, T. Kimura, Ch. Niedermayer, O. Zaharko, A. Poole, B. Roessli, V.Yu. Pomjakushin, M. Kenzelmann
Coupling of magnetic and ferroelectric hysteresis by a multi-component magnetic structure in Mn_2GeO_4
Annual Meeting of the American Crystallographic Association (ACA)
New Orleans, USA, May 28 - June 2, 2011

J. White, T. Honda, K. Kimura, T. Kimura, Ch. Niedermayer, O. Zaharko, A. Poole, B. Roessli, V.Yu. Pomjakushin, M. Kenzelmann
Coupling of magnetic and ferroelectric hysteresis by a multi-component magnetic structure in Mn_2GeO_4
JUM@P'11: Joint Users' Meeting at PSI
Villigen PSI, Switzerland, September 15-16, 2011

CONFERENCE, WORKSHOP AND SEMINAR CONTRIBUTIONS, POSTERS

N. Aliouane
TriCS: Neutron single crystal diffractometer development project at the SINQ facility
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, poster

N. Aliouane
Development concepts of TriCS: The neutron single crystal diffractometer at the SINQ
JCNS Workshop "Trends and perspectives in neutron instrumentation: From continuous to spallation sources"
Tutzing, Germany, October 4-7, 2011, talk

M. Bestel, F. Jurányi, C. Marcelot-Garcia, G.J. Schneider, L.R. Van Loon, Th. Gimmi, L.W. Diamond
Water-distribution in na-montmorillonite as a function of bulk dry density
HERCULES school
Grenoble, France, February 27 - March 3, 2011, poster

M. Bestel, F. Jurányi, C. Marcelot-Garcia, G.J. Schneider, L.R. Van Loon, Th. Gimmi, L.W. Diamond
Discriminating between interlayer pores and macropores in na-montmorillonite
Euroclay Conference
Antalya, Turkey, June 26 - July 1, 2011, poster

M. Bestel, F. Jurányi, C. Marcelot-Garcia, G.J. Schneider, L.R. Van Loon, Th. Gimmi, L.W. Diamond
Water-distribution in na-montmorillonite
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, poster

M. Bestel, F. Jurányi, C. Marcelot-Garcia, G.J. Schneider, L.R. Van Loon, Th. Gimmi, L.W. Diamond
Discriminating between interlayer pores and macropores in na-montmorillonite
NEA ClayClub workshop
Karlsruhe, Germany, September 6-8, 2011, poster

N. Egetenmeyer, S. Gerber, Y. Sassa, J.L. Gavilano, M. Kenzelmann, M.H. Berntsen, O. Tjernberg, A. Safa-Sefat, M. Månsson
Three dimensional electronic properties of underdoped $Ba(Fe_{1-x}Ni_x)_2As_2$ probed by ARPES
Swiss Workshop on Materials with Novel Electronic Properties (SWM11)
Les Diablerets, Switzerland, June 28 - July 1, 2011, poster

N. Egetenmeyer, S. Gerber, J.L. Gavilano, M. Kenzelmann, A. Maisuradze, R. Khasanov, Ch. Baines, G. Seyfarth, A. Desilets-Benoit, A.D. Bianchi, D. Andreica
μSR studies of the heavy fermion $CeRhSi_3$
5^{th} European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, poster

N. Egetenmeyer, S. Gerber, Y. Sassa, J.L. Gavilano, M. Kenzelmann, M.H. Berntsen, O. Tjernberg, A. Safa-Sefat, M. Månsson
ARPES study of underdoped $Ba(Fe_{1-x}Ni_x)_2As_2$
International Conference on Strongly Correlated Electron Systems (SCES)
Cambridge, United Kingdom, August 29 - September 3, 2011, poster

J.P. Embs, A. Remhof, P. Martelli, A. Züttel, B. Frick, Th. Strässle
Localized hydrogen dynamics in complex borohydrides
5^{th} European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, talk

S. Gerber, J.L. Gavilano, N. Egetenmeyer, M. Laver, E. Pomjakushina, K. Conder, A.D. Bianchi, M. Kenzelmann
Ferromagnetic fluctuations in EuB_6 probed by Small Angle Neutron Scattering (SANS)
International Conference on Strongly Correlated Electron Systems (SCES)
Cambridge, United Kingdom, August 29 - September 3, 2011, poster

S. Gerber, N. Egetenmeyer, J.L. Gavilano, E. Ressouche, A.D. Bianchi, R. Movshovich, E.D. Bauer, J.L. Sarrao, J.D. Thompson, M. Kenzelmann
Coupled superconducting and magnetic order in $CeCoIn_5$
International Conference on Strongly Correlated Electron Systems (SCES)
Cambridge, United Kingdom, August 29 - September 3, 2011, poster

S. Gerber, J.L. Gavilano, N. Egetenmeyer, M. Laver, E. Pomjakushina, K. Conder, A.D. Bianchi, M. Kenzelmann
Ferromagnetic fluctuations in EuB_6 probed by Small Angle Neutron Scattering (SANS)
5^{th} European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, poster

S. Gerber, N. Egetenmeyer, J.L. Gavilano, E. Ressouche, C. Niedermayer, A.D. Bianchi, R. Movshovich, E.D. Bauer, J.L. Sarrao, J.D. Thompson, M. Kenzelmann
Coupled superconducting and magnetic order in $CeCoIn_5$
MaNEP Review
Geneva, Switzerland, May 30, 2011, talk

S. Gerber, N. Egetenmeyer, J.L. Gavilano, E. Ressouche, C. Niedermayer, A.D. Bianchi, R. Movshovich, E.D. Bauer, J.L. Sarrao, J.D. Thompson, M. Kenzelmann
Coupled superconducting and magnetic order in $CeCoIn_5$
Swiss Workshop on Materials with Novel Electronic Properties (SWM11)
Les Diablerets, Switzerland, June 28 - July 1, 2011, talk

S. Gerber, N. Egetenmeyer, J.L. Gavilano, Th. Strässle, A.D. Bianchi, E. Ressouche, R. Movshovich, E.D. Bauer, J.L. Sarrao, J.D. Thompson, M. Kenzelmann
Evidence for a magnetically driven superconducting Q-Phase of $CeCoIn_5$
Joint Annual Meeting of the Swiss Physical Society and Austrian Physical Society
Lausanne, Switzerland, June 15-17, 2011, poster

S. Gerber, N. Egetenmeyer, J.L. Gavilano, E. Ressouche, C. Niedermayer, A.D. Bianchi, R. Movshovich, E.D. Bauer, J.L. Sarrao, J.D. Thompson, M. Kenzelmann
Coupled superconducting and magnetic order in $CeCoIn_5$
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, poster

T.M. Geue, P. Huber, O. Bunk, M. Textor
Investigation of colloidal multilayers using GISAXS
ECOF 12
Sheffield, United Kingdom, July 17-20, 2011, poster

Y. Kawasaki, J.L. Gavilano, L. Keller, J. Schefer, N.B. Christensen, A. Amato, T. Ohno, Y. Kishimoto, Z. He, Y. Ueda, M. Itoh
Magnetic structure and spin dynamics of the quasi-one-dimensional spin-chain antiferromagnet $BaCo_2V_2O_8$
International Conference on Strongly Correlated Electron Systems (SCES)
Cambridge, United Kingdom, August 29 - September 3, 2011, poster

Y. Kawasaki, J.L. Gavilano, L. Keller, J. Schefer, N.B. Christensen, A. Amato, T. Ohno, Y. Kishimoto, Z. He, Y. Ueda, M. Itoh
Magnetic structure and spin dynamics of the quasi-one-dimensional spin-chain antiferromagnet $BaCo_2V_2O_8$
Swiss Workshop on Materials with Novel Electronic Properties (SWM11)
Les Diablerets, Switzerland, June 28 - July 1, 2011, poster

J. Kohlbrecher
The Swiss-Danish work package for a compact SANS instrument at the ESS
ESS-SANS Workshop
Geestacht, Germany, May 10-11, 2011, talk

J. Kohlbrecher
Magnetisation reversal processes in composite perpendicular magnetic recording media
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, talk

M. Laver, E.M. Forgan
Hairy balls and flux lines in superconductors
Americal Physical Society (APS) March Meeting
Dallas, USA, March 21-25, 2011, talk

L. Le Dreau, O. Hernandez, C. Prestipino, J. Schefer, G. Vaughan. S. Hosoya, W. Paulus
Structural modulation and phase transitions in La_2CoO_{4+d}
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, poster

K. Lefmann, A.T. Roemer, J. Chang, N.B. Christensen, B.M. Andersen, L. Maehler, J.L. Gavilano, C. Niedermayer, H.M. Ronnow, A. Schneidewind, P. Link, M. Oda, M. Ido, N. Momono, J. Mesot
Anisotropy of gapped incommensurate magnetic excitations in $La_{2-x}Sr_xCuO_4$ *(x=0.12)*
Neutron Applications on Strongly Correlated Electron Systems 2011
Tokai, Ibaraki, Japan, February 23-25, 2011, poster

J.J. Lietor-Santos, B. Sierra-Martin, R. Vavrin, Z. Hu, U. Gasser, A. Fernandez-Nieves
Deswelling microgel particles using hydrostatic pressure
Swiss Soft Day IV
Lausanne, Switzerland, February 2, 2011, poster

J.J. Lietor-Santos, B. Sierra-Martin, R. Vavrin, Z. Hu, U. Gasser, A. Fernandez-Nieves
Deswelling microgel particles using hydrostatic pressure
Swiss Soft Day V
Basel, Switzerland, June 8, 2011, poster

V. Mitropoulos, B. Struth, Th. Geue, E.J. Windhab, P. Fischer
Morphological and mechanical properties of recombinant protein interfaces
The Society of Rheology, 83rd Annual Meeting
Cleveland, OH, USA, October 9-13, 2011, talk

C. Niedermayer, C. Bernhard, P. Marsik, T. Wolf
Coexistence of magnetism and superconductivity in underdoped $BaFe_{2-x}Co_xAs_2$
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, poster

V.Yu. Pomjakushin, D. Sheptyakov, E. Pomjakushina, A. Krzton-Maziopa, K. Conder, D. Chernyshov, V. Svitlyk, Z. Shermadini
Iron vacancy superstructure and room temperature antiferromagnetic order in superconducting $Cs_yFe_{2-x}Se_2$
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, poster

V.Yu. Pomjakushin, E. Pomjakushina, D.V. Sheptyakov, A. Krzton-Maziopa, K. Conder, D. Chernyshov, V. Svitlyk, Z. Shermadini
Iron vacancy superstructure and room temperature antiferromagnetic order in superconducting $X_yFe_{2-x}Se_2$ *(X=K, Cs, Rb)*
E-MRS 2011 Fall Meeting, Warsaw University of Technology
Warsaw, Poland, September 19-23, 2011, talk

V.Yu. Pomjakushin, E. Pomjakushina, D.V. Sheptyakov, A. Krzton-Maziopa, K. Conder, D. Chernyshov, V. Svitlyk, Z. Shermadini
Iron vacancy superstructure and room *temperature antiferromagnetic order in superconducting* $X_yFe_{2-x}Se_2$ *(X=K, Cs, Rb)*
IUCr 2011
Madrid, Spain, August 22-30, 2011, talk

A. Poole, B. Fak, T. Ziman
Inelastic scattering and magneto-electric control of multiferroic $MnWO_4$
Electromagnon Workshop, CNRS
Grenoble, France, February 24-28, 2011, talk

A. Poole, B. Roessli, K. Kraemer, P. Babkevich, A. Boothroyd
SNP@PSI
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, talk

M. Pregelj
Magnetic excitations in a layered multiferroic system $FeTe_2O_5Br$
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, talk

E. Reichert, T. Burankova, J.P. Embs, R. Hempelmann
Cation dynamics in ionic liquids as seen by quasi-elastic neutron scattering
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, poster

E. Reichert, T. Burankova, J.P. Embs, R. Hempelmann
Cation dynamics in ionic liquids as seen by quasi-elastic neutron scattering
Annual scientific colloquium 2011, Neutron Scattering Workshop DFG-SPP priority program: Ionic Liquids
Fürth, Germany, November 28-30, 2011, poster

G. Seyfarth, D. Andreica, A. Desilets-Benoit, A.D. Bianchi, Ch. Baines, R. Khasanov, D. MacLaughlin
ARPES study of underdoped $Ba(Fe_{1-x}Ni_x)_2As_2$
International Conference on Strongly Correlated Electron Systems (SCES)
Cambridge, United Kingdom, August 29 - September 3, 2011, poster

D. Sheptyakov, N.Z. Ali, M. Jansen
Structural and magnetic transformations in $AFeO_2$ (A = K, Rb and Cs): a neutron diffraction study
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, poster

V. Staedele, U. Gasser, H. Dietsch
Dynamic light scattering study on ellipsoidal hybrid magnetic microgel particles with thermally tunable aspect ratios
13th European Student Colloid Conference
Falkenberg, Sweden, June 14-17, 2011, talk

V. Staedele, U. Gasser, H. Dietsch
Ellipsoidal hybrid magnetic microgel particles with thermally tunable aspect ratios
8th Liquid Matter Conference
Vienna, Austria, September 6-10, 2011, poster

J. Stahn, U. Filges, T. Panzner
Selene: high-intensity specular reflectometry
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, talk

J. Stahn
Meeting of the ESS reflectometry TAP
JCNS Workshop "Trends and perspectives in neutron instrumentation: From continuous to spallation sources"
Tutzing, Germany, October 4-7, 2011, talk

P. Strunz, D. Mukherji, R. Gilles, T. Geue, J. Rösler
Investigation of metal-matrix composite containing liquid-phase dispersion
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, poster

R. Sura, M. Ceretti, C. Prestipino, W. Paulus, J. Schefer, K. Conder, E. Pomjakushina
The effect of Sr doping on the oxygen diffusion in La_2CuO_{4+y}
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, talk

R. Sura, M. Ceretti, C. Prestipino, W. Paulus, J. Schefer, L. Keller, K. Conder, E. Pomjakushina
Effect of strontium doping on the oxygen diffusion in $La_{2-x}Sr_xCuO_{4-d}$ samples investigated by oxygen isotope back exchange and neutron single crystal diffraction
Joint Meeting Crystal Minerals and Materials
Salzburg, Austria, September 20-24, 2011, poster

R. Sura, M. Ceretti, C. Prestipino, W. Paulus, J. Schefer, L. Keller, K. Conder, E. Pomjakushina
Effect of strontium doping on the oxygen diffusion in $La_{2-x}Sr_xCuO_{4+d}$ *samples investigated by oxygen isotope back exchange and neutron single crystal diffraction*
JUM@P'11: Joint Users' Meeting at PSI
Villigen PSI, Switzerland, September 15-16, 2011, poster

R. Sura, M. Ceretti, C. Prestipino, W. Paulus, J. Schefer, L. Keller, K. Conder, E. Pomjakushina
Oxygen diffusion in $La_{2-x}Sr_xCuO_{4-d}$ *samples investigated by oxygen isotope back exchange*
Joint Annual Meeting of the Swiss Physical Society and Austrian Physical Society
Lausanne, Switzerland, June 15-17, 2011, poster

R. Sura, M. Ceretti, C. Prestipino, W. Paulus, J. Schefer, L. Keller, K. Conder, E. Pomjakushina
Oxygen diffusion in $La_{2-x}Sr_xCuO_{4+d}$ *samples investigated by oxygen isotope back exchange*
10th PSI Summer School
Zugerberg, Switzerland, August 13-19, 2011, poster

W.A. Wallace, O. Zaharko, B. Delley, G. McIntyre
Spin density distribution of the orbital singlet Mn(II): A polarised and non-polarised neutron diffraction study of the $[Mn(Imz)_6]^2+(NO^{3-})_2$ *complex, where Imz = Imidazole*
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, poster

W.A. Wallace, O. Zaharko, B. Delley, G. McIntyre
Spin density distribution of the orbital singlet Mn(II): A polarised and non-polarised neutron diffraction study of the $[Mn(Imz)_6]^2+(NO^{3-})_2$ *complex, where Imz = Imidazole*
Meeting of the Swiss Society for Crystallography, University of Bern
Bern, Switzerland, September 16, 2011, poster

W.A. Wallace, O. Zaharko, B. Delley, G. McIntyre
Spin density distribution of the orbital singlet Mn(II): A polarised and non-polarised neutron diffraction study of the $[Mn(Imz)_6]^{2+}(NO^{3-})_2$ *complex, where Imz = Imidazole*
European Conference on Molecular Magnetism, Université Paris Sud
Paris, France, November 22-25, 2011, poster

W.A. Wallace, O. Zaharko, B. Delley, G. McIntyre
Spin density distribution of the orbital singlet Mn(II): A polarised and non-polarised neutron diffraction study of the $[Mn(Imz)_6]^{2+}(NO^{3-})_2$ *complex, where Imz = Imidazole*
10th PSI Summer School
Zugerberg, Switzerland, August 13-19, 2011, poster

S. Ward, H. Ryll, D. Binner, K. Kiefer, K. Kraemer, Ch. Rüegg
Magnetic excitations and phase diagram of the spin ladder material $(HPIP)_2CuCl_4$
Joint Annual Meeting of the Swiss Physical Society and Austrian Physical Society
Lausanne, Switzerland, June 15-17, 2011, talk

S. Ward, H. Ryll, K. Kiefer, P. Bouillot, T. Giamarchi, D. Binner, K. Kraemer, Ch. Rüegg
Magnetic excitations in the ideal spin ladder material $(C_5H_{12}N)_2CuCl_4$
10th PSI Summer School
Zugerberg, Switzerland, August 13-19, 2011, poster

J. White, H. Kawano-Furukawa, C.J. Bowell, R.W. Heslop, A.S. Cameron, E.M. Forgan, K. Kihou, C.H. Lee, A. Iyo, H. Eisaki, T. Saito, H. Fukuzawa, Y. Kohori, R. Cubitt, C.D. Dewhurst, J.L. Gavilano, M. Zolliker
The pairing state in KFe_2As_2 *studied by measurements of the vortex lattice*
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, poster

J. White, S. Zabihzadeh, S. Wang, Ch. Rüegg, M. Kenzelmann, H.M. Rønnow
Magnetization measurements under sample pressures of 1 GPa using the easyLab mcell 10 and a Cryogenic S700X SQUID magnetometer
49th European High Pressure Research Group (EHPRG) Conference
Budapest, Hungary, August 28 - September 2, 2011, poster

J. White, R.W. Helsop, A.T. Holmes, E.M. Forgan, V. Hinkov, N. Egetenmeyer, J.L. Gavilano, M. Laver, C.D. Dewhurst, R. Cubitt, A. Erb
Study of nonlocality under high magnetic fields in the mixed state of a high-temperature superconductor
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, talk

J. White, T. Honda, K. Kimura, T. Kimura, Ch. Niedermayer, O. Zaharko, A. Poole, B. Roessli, V.Yu. Pomjakushin, M. Kenzelmann
Coupling of magnetic and ferroelectric hysteresis by a multi-component magnetic structure in Mn_2GeO_4
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, talk

Y. Zannatul, J. Schefer, L. Keller, W. Paulus, S. Paofai, M. Schmalz, M. Krebs
Chemical in-situ reduction of $LaNi_5$*-deuterides observed by neutron powder diffraction*
5th European Conference on Neutron Scattering (ECNS)
Prague, Czech Republic, July 17-22, 2011, poster

O. Zaharko
Spin liquid in a single crystal of the frustrated diamond lattice antiferromagnet $CoAl_2O_4$
Topological Materials 2011
Grenoble, France, October 26-28, 2011, poster

AWARDS, PRIZES AND NOMINATIONS

C. Niedermayer
Honorary Professorship
University of Connecticut,
Storrs, USA, January 1, 2011

Ch. Rüegg
Erwin Felix Lewy-Bertaut Prize
European Neutron Scattering Association and European Crystallography Association
Prague, Czech Republic, July 22, 2011

Ch. Rüegg
Honorary Professorship
University College London
London, UK, April 11, 2011

J. White
Poster Award
European High Pressure Research Group (EHPRG)
Budapest, Hungary, August 28 - September 2, 2011

BOOKS / BOOK CHAPTERS / REPORTS

E.M. Forgan, E. Blackburn, A.T. Holmes, A.S. Cameron, G.R. Walsh, J. Lim, J.S. White, C.D. Dewhurst, E. Mossou, T. Forsyth, M. Savey-Bennett
Very high horizontal field investigations using SANS at the ILL
ILL 2010 annual report, 18-19, Editors: G. Cicognani and A. Harrison, 2011

LECTURES AND COURSES

M. Bestel
Praktikum zu den Grundzügen der Erdwissenschaften I, Prof. T. Naegler
Institute of Geological Sciences, University of Bern, Bern, Switzerland, September 28 - December 21, 2011

N. Egetenmeyer
Small Angle Neutron Scattering study of magnetic structures
ETH Zurich/PSI, Villigen PSI, Switzerland, October 17, 2011

J.P. Embs
Quasielastic neutron scattering on water
ETH Zurich/PSI, Villigen PSI, Switzerland, November 14, 2011

U. Gasser, J. Kohlbrecher, R. Vavrin, A. Wilk, M. Ratajczyk, M.P. Lettinga, J. Buitenhuis, G. Meier
Phase behavior of sticky hard spheres
10th PSI Summer School, Zugerberg, Switzerland, August 13-19, 2011

J. Kohlbrecher
Short Introduction to neutron scattering
University of Lund, Lund, Sweden, September 12-14, 2011

J. Kohlbrecher
Introduction to small angle scattering
University of Goa, Goa, India, December 14, 2011

J. Kohlbrecher
Introduction to small angle scattering
LMVT, ETH Zurich, Zurich, Switzerland, April 13, 2011

M. Laver
Organisation of two danish neutron scattering courses at PSI
Villigen PSI, Switzerland, 2011

C. Niedermayer
Kernphysik
Universität Konstanz, Konstanz, Germany, October 2010 - April 2011

Ch. Rüegg
Neutron spectroscopy – theory, instruments and examples
10th PSI Summer School, Zugerberg, Switzerland, August 13-19, 2011

Jürg Schefer
Magnetic Neutron Diffraction
Soprano Doctoral School , Timisoara , Rumänien , April 7 , 211

J. Schefer
Magnetic neutron scattering
MaMaSELF Master in Masterials Science Exploring Large Scale Facilities
Rennes, France, September 21-22, 2011

J. Schefer
Single crystal neutron diffraction
10th PSI Summer School, Zugerberg, Switzerland, August 13-19, 2011

J. Schefer
Single crystal neutron diffraction
ETH Zurich/PSI, Villigen PSI, Switzerland, October 3, 2011

J. Stahn
Neutron diffraction studies of magnetic structures
University of Basel, Basel, Switzerland, June 7-8, 2011

O. Zaharko
Basics of neutron and X-ray scattering
10th PSI Summer School, Zugerberg, Switzerland, August 13-19, 2011

MEMBERSHIP IN INTERNATIONAL COMMITTEES

N. Aliouane
- - Scientific advisory committee, NIST Center for Neutron Research, Gaithersburg, USA(since 2010)

T. Fennell
- Workshop advisory committee, Royal Society Theo Murphy Meeting on emergent magnetic monopoles in frustrated magnetic systems, Chicheley Hall, United Kingdom, October 17-18, 2011

A. Furrer
- Scientific advisory committee, 3rd World Academy of Sciences, Trieste, Italy (since 2003, periodically)
- Editorial advisory board, The Open Superconductors Journal, Villigen PSI, Switzerland (2008-2011)

U. Gasser
- Swiss Society for Neutron Scattering, Secretary, Villigen PSI, Switzerland (since 2009)

J.L. Gavilano
- Peruvian Academy of Nuclear Sciences, Lima, Peru (since 2008)

Th. Geue
- International scientific advisory committee, Budapest Neutron Center, BNC, Budapest, Hungary (since 2008)
- User Selection Panel, Budapest Neutron Center BNC, Budapest, Hungary (since 2008)
- User Selection Group, NIST Center for Neutron Research, Gaithersburg, USA (since 2010)
- Committee for equal opportunities, Villigen PSI, Switzerland (since 2011)

J. Kohlbrecher
- Proposal committee College 1, chairman, scientific council, Institut Laue-Langevin, Grenoble, France (2008-2011)

M. Laver
- Science review committee neutron scattering, Oak Ridge National Laboratory, Oak Ridge, Tennessee, USA (since 2011)

V. Pomjakushin
- Commission on magnetic structures of IUCr, International Union of Crystallography, (since 2011)

B. Roessli
- Tables Rondes, Saclay, Paris, France (since 2010)
- PNCMI Advisory Board (since 2009)
- M. Loire, PhD thesis examination, jury member, University of Grenoble, France

Ch. Rüegg

- Proposal committee College 4, chairman, scientific council, Institut Laue-Langevin, Grenoble, France (since 2011)
- Instrument review panel, Institut Laue-Langevin, Grenoble, France
- Executive program committee, ICNS 2013, Edinburgh, U.K.
- International advisory board, QCNP 2012, Dresden, Germany
- International advisory committee, Topological Materials 2011, Grenoble, France
- Program committee, SWM11, Les Diablerets, Switzerland
- Organizing committee, JUM@P Joint Users' Meeting 2011, Villigen PSI
- Organizing committee, 10th PSI Summer School 2011, Zugerberg, Switzerland
- Interview panel for recruiting, ESS, Lund, Sweden
- Joint Users' Association of PSI (JUSAP), member of the board, Villigen PSI, Switzerland, (2008-2011)
- P. Bouillot, PhD thesis examination, jury member, University of Geneva, Switzerland

J. Schefer

- Scientific advisory committee, FRM-II, Munich, Germany (since 2008)
- Newsletter of the Swiss Society for Crystallography, editor, Swiss Society for Crystallography SGK/SSCr (since 2006)
- Organizing committee, 10th PSI Summer School 2011, Zugerberg, Switzerland
- Swiss Society for Crystallography SGK/SSCr, member of the board (since 2006)
- MaMaSELF Erasmus Mundus, evaluation board (since 2009)

J. Stahn

- Scientific advisory committee, FRM-II, Munich, Germany (since 2011)

J. White

- Beamtime review committee for small-angle neutron scattering, NIST Center for Neutron Research, Gaithersburg, USA (since 2010)

DISSERTATION

Loïc LeDreau
Oxygen transport in La_2CoO_4 and $NdNiO_4$ perovskites
July 6, 2011 (Dissertation N° 4366 Université de Rennes, France), LNS-Report N°241

Yasmine Sassa
ARPES investigations on in-situ PLD Grown $YBa_2Cu_3O_{7-\delta}$
February, 2011 (Dissertation University of Neuchâtel), LNS-Report N° 239

MASTER DIPLOMA

Mattia Mena
Neutron scattering analysis of statical and dynamical properties of $Na_{0.71}CoO_2$ and $La_2CoO_{4.14}$
January, 2011 (Master ETH Zürich), LNS-Report N°240

CONGRESSES ORGANIZED

T. Fennell
Topological Materials 2011
Grenoble, France, October 26-28, 2011
Number of Participants: 100+

C. Niedermayer
Multiple Order Parameter Systems
JUM@P'11: Joint Users' Meeting at PSI
Villigen PSI, Switzerland, September 15-16, 2011
Number of Participants: 30

Research with Neutrons and Muons

Spallation Neutron Source Division (ASQ)

LIST OF PUBLICATIONS (PEER REVIEWED)

Brandl C, Derlet PM, Van Swygenhoven H
Dislocation mediated plasticity in nanocrystalline Al: the strongest size
MODELLING AND SIMULATION IN MATERIALS SCIENCE AND ENGINEERING **19**, 074005 (2011)

Chiesa S, Derlet PM, Dudarev SL, Van Swygenhoven H
Optimization of the magnetic potential for alpha-Fe
JOURNAL OF PHYSICS-CONDENSED MATTER **23**, 206001 (2011)

Dai Y, Henry J, Tong Z, Averty X, Malaplate J, Long B
Neutron/proton irradiation and He effects on the microstructure and mechanical properties of ferritic/martensitic steels T91 and EM10
JOURNAL OF NUCLEAR MATERIALS **415** (3): 306-310 (2011)

De Ridder M, Van den Bulcke J, Vansteenkiste D, Van Loo D, Dierick M, Masschaele B, De Witte Y, Mannes D, Lehmann E, Beeckman H, Van Hoorebeke L, Van Acker J
High-resolution proxies for wood density variations in Terminalia superba
ANNALS OF BOTANY **107**, 293 (2011)

Drezet JM, Evans A, Pirling T
Residual Stresses in DC cast Aluminum Billet: Neutron Diffraction Measurements and Thermomechanical Modeling
14TH INTERNATIONAL CONFERENCE ON MATERIAL FORMING ESAFORM, 2011 PROCEEDINGS **1353**, 1131 (2011)

Gao N, Van Swygenhoven H, Victoria M, Chen J
Formation of dislocation loops during He clustering in bcc Fe
JOURNAL OF PHYSICS-CONDENSED MATTER **23**, 442201 (2011)

Gao N, Victoria M, Chen J, Van Swygenhoven H
Helium-vacancy cluster in a single bcc iron crystal lattice
JOURNAL OF PHYSICS-CONDENSED MATTER **23**, 245403 (2011)

Gereke T, Anheuser K, Lehmann E, Kranitz K, Niemz P
Moisture Behaviour of Recent and Naturally Aged Wood
WOOD RESEARCH **56**, 33 (2011)

Gramlich A, Moradi AB, Robinson BH, Kaestner A, Schulin R
Dimethylglyoxime (DMG) staining for semi-quantitative mapping of Ni in plant tissue
ENVIRONMENTAL AND EXPERIMENTAL BOTANY **71**, 232 (2011)

Grolimund D, Berger D, Schreyer SB, Borca CN, Hartmann S, Muller F, Hovind J, Hunger K, Lehmann EH, Vontobel P, Wang HAO
Combined neutron and synchrotron X-ray microprobe analysis: attempt to disclose 3600 years-old secrets of a unique bronze age metal artifact
JOURNAL OF ANALYTICAL ATOMIC SPECTROMETRY **26**, 1012 (2011)

Hosemann P, Stergar E, Peng L, Dai Y, et al.
Macro and microscale mechanical testing and local electrode atom probe measurements of STIP irradiated F82H, Fe-8Cr ODS and Fe-8Cr-2W ODS
JOURNAL OF NUCLEAR MATERIALS **417** (1-3): 274-278 (2011)

Josic L, Lehmann E, Kaestner A
Energy selective neutron imaging in solid state materials science
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **651**, 166 (2011)

Kaestner A, Munch B, Trtik P, Butler L
Spatiotemporal computed tomography of dynamic processes
OPTICAL ENGINEERING **50**, 123201 (2011)

Kaestner AP
MuhRec - A new tomography reconstructor
NUCLEAR INSTRUMENTS AND METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **651**, 156 (2011)

Kaestner AP, Hartmann S, Kuhne G, Frei G, Grunzweig C, Josic L, Schmid F, Lehmann EH
The ICON beamline - A facility for cold neutron imaging at SINQ
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **659**, 387 (2011)

Kickhofel JL, Zboray R, Damsohn M, Kaestner A, Lehmann EH, Prasser HM
Cold neutron tomography of annular coolant flow in a double subchannel
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **651**, 297 (2011)

Lehmann EH, Kaestner A, Josic L, Hartmann S, Mannes D
Imaging with cold neutrons
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **651**, 161 (2011)

Lehmann EH, Tremsin A, Grunzweig C, Johnson I, Boillat P, Josic L
Neutron imaging - Detector options in progress
JOURNAL OF INSTRUMENTATION **6**, C01050 (2011)

Lehmann EH, Vontobel P, Frei G, Kuehne G, Kaestner A
How to organize a neutron imaging user lab? 13 years of experience at PSI, CH
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **651**, 1 (2011)

Medarde M, Moormann R, Frison R, Puzniak RJ, Pomjakushina E, Conder K, Platacis E, Dai Y, Kiselev D, Zanini L, Torok S, Zagyvai P, Heinitz S, Neuhausen J, Schumann D, Thomsen K
Lead-gold eutectic: An alternative liquid target material candidate for high power spallation neutron sources
JOURNAL OF NUCLEAR MATERIALS **411**, 72 (2011)

Maloy SA, Romero TJ, Hosemann P, Toloczko MB, Dai Y
Shear punch testing of candidate reactor materials after irradiation in fast reactors and spallation environments
JOURNAL OF NUCLEAR MATERIALS **417** (1-3): 1005-1008 (2011)

Moradi AB, Carminati A, Vetterlein D, Vontobel P, Lehmann E, Weller U, Hopmans JW, Vogel HJ, Oswald SE
Three-dimensional visualization and quantification of water content in the rhizosphere
NEW PHYTOLOGIST **192**, 653 (2011)

Peng L, Dai Y
Helium-induced hardening effect in ferritic/martensitic steels F82H and Optimax-A irradiated in a mixed spectrum of high energy protons and spallation neutrons
Journal of Nuclear Materials 417 (2011) 996.

Rees R, Robinson BH, Menon M, Lehmann E, Guenthardt-Goerg MS, Schulin R
Boron accumulation and toxicity in hybrid poplar (Populus nigra x euramericana)
ENVIRONMENTAL SCIENCE & TECHNOLOGY **45**, 10538 (2011)

Tremsin A, Mcphate J, Vallerga J, Siegmund O, Feller B, Lehmann E, Butler L, Dawson M
High-resolution neutron microtomography with noiseless neutron counting detector
NUCLEAR INSTRUMENTS AND METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **0**, 0 (2011)

Tremsin AS, McPhate JB, Vallerga JV, Siegmund OHW, Feller WB, Lehmann E, Dawson M
Improved efficiency of high resolution thermal and cold neutron imaging
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **628**, 415 (2011)

Trtik P, Munch B, Weiss WJ, Kaestner A, Jerjen I, Josic L, Lehmann E, Lura P
Release of internal curing water from lightweight aggregates in cement paste investigated by neutron and X-ray tomography
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **651**, 244 (2011)

Van Petegem S, Zimmermann J, Van Swygenhoven H
Yield point phenomenon during strain rate change in nanocrystalline Ni-Fe
SCRIPTA MATERIALIA **65**, 217 (2011)

Vavrik D, Jeon I, Lehmann E, Kaestner A, Vacik J
Inspection of the metal composite materials using a combination of X-ray radiography and Neutron Imaging
JOURNAL OF INSTRUMENTATION **6**, C03001 (2011)

Velasco M, Van Swygenhoven H, Brandl C
Coupled grain boundary motion in a nanocrystalline grain boundary network
SCRIPTA MATERIALIA **65**, 151 (2011)

Wagner W, Vontobel P, Dai Y
Materials issues of the SINQ high-power spallation target
INTERNATIONAL JOURNAL OF MATERIALS RESEARCH **102**, 1101 (2011)

Wohlmuther M, Wagner W
PIE preparatin of the MEGAPIE target
JOURNAL OF NUCLEAR MATERIALS, in press

Weisser MA, Evans AD, Van Petegem S, Holdsworth SR, Van Swygenhoven H
In situ room temperature tensile deformation of a 1% CrMoV bainitic steel using synchrotron and neutron diffraction
ACTA MATERIALIA **59**, 4448 (2011)

Zanini L, Dementjev S, Groschel F, Leung W, Milenkovic R, Thomsen K, Wagner W, Wohlmuther M, Cheng X, Class A, Konobeyev A, Agostini P, Meloni P, David JC, Letourneau A, Leray S, Panebianco S, Cachon L, Latge C, Roubin P, Guertin A, Thiolliere N, Dierckx M
Experience from the post-test analysis of MEGAPIE
JOURNAL OF NUCLEAR MATERIALS **415**, 367 (2011)

Zhang P, Zhao T, Zhang L, Wittmann FH, Lehmann E, Vontobel P
Application of neutron radiography to observe water absorption of concrete
PROCEEDINGS OF THE 18TH INTERNATIONAL CONFERENCE ON NUCLEAR ENGINEERING **18**, (2011)

van Langh R, James J, Burca G, Kockelmann W, Zhang SY, Lehmann E, Estermann M, Pappot A
New insights into alloy compositions: studying Renaissance bronze statuettes by combined neutron imaging and neutron diffraction techniques
JOURNAL OF ANALYTICAL ATOMIC SPECTROMETRY **26**, 949 (2011)

LIST OF PUBLICATIONS

B. Blarer, G. Dzieglewski, P.A. Duperrex, F. Heinrich, A. Mezger, D. Reggiani, U. Rohrer, K. Thomsen, M. Wohlmuther,
The Beam Safety Sstems of the PSI UCN Source
DIPAC2011, May 16-18, Hamburg, Germany, 2011.

Keunecke, D., Novosseletz, K., Lanvermann, C., Mannes, D., Niemz, P. (2011)
Combining X-ray imaging and digital image correlation to analyse strain in wood: potential and difficulties
European Journal of Wood and Wood Products (available onine DOI: 10.1007/s00107-011-0573-8)

M. Magan, S. Terron, K. Thomsen, F. Sordo, J.M. Perlado, and J. Bermejo
Neutron performance analysis for ESS target proposal
NIMA in print.

W. Wagner, H. Heyck, D. Kiselev, K. Thomsen, M. Wohlmuther, L. Zanini
PSI Experience with High-Power Target Design and Operation
Proceedings Intl. Workshop on 'Technology and Components of Accelerator Driven Systems', Nuclear Science, ISBN 978-92-64-11727-3, OECD (2011) 275

Ch. Latgé, M. Wohlmuther, P. Agostini, M. Dierckx, C. Fazio, A. Guertin, Y. Kurata, G. Laffont, T. Song, K. Thomsen, W. Wagner, F. Groeschel, L. Zanini, Y. Dai, J. Henri, J. Konys, K. Woloshun
MEGAPIE Spallation Target: Irradiation of the First Prototypical Spallation Target for Future ADS
Proceedings Intl. Workshop on 'Technology and Components of Accelerator Driven Systems', Nuclear Science, ISBN 978-92-64-11727-3, OECD (2011) 263

INVITED TALKS

Y. Dai, J. Henry, Z. Tong, X. Averty, J. Malaplate, B. Long
Neutron/proton irradiation and He effects on the microstructure and mechanical properties of ferritic/martensitic steels T91 and EM10
Journal of Nuclear Materials 415 (2011) 306–310

P. Hosemann, E. Stergar, L. Peng, Y. Dai, S.A. Maloy, M.A. Pouchon, K. Shiba, D. Hamaguchi , H. Leitner
Macro and microscale mechanical testing and local electrode atom probe measurements of STIP irradiated F82H, Fe–8Cr ODS and Fe–8Cr–2W ODS
Journal of Nuclear Materials 417 (2011) 211

P. Hosemann, Y. Dai, E. Stergar, H. Leitner, E. Olivas, A.T. Nelson, S.A. Maloy
Large and small scale materials testing of HAT-9 irradiated in the STIP irradiation program
Experimental Mechanics 51 (2011) 1095.

E. H. Lehmann, C. Grünzweig, D. Mannes, P. Boillat, A. Kaestner, P. Vontobel, J. Hovind, L. Josic, F. Schmid
Improved options in neutron imaging for industrial and scientific applications
ECNS, Prag, 17.-22. July, 2011

E. H. Lehmann, A. Kaestner, and S. Hartmann
Progress and Visions in Future Neutron Imaging
ASMES Workshop, Lausanne, 28.-29. June, 2011

E. H. Lehmann, D. Mannes, M. Wörle, K. Hunger, S. Braovacv, H. Kutzke, M. Christensen
Wood investigations by means of radiation transmission techniques in the analysis of cultural heritage objects of different size scale
Final COST-IE0601 and COST-MP0601 Meeting, Paris, Nov. 14-18, 2011

S.A. Maloy, T.J. Romero, P. Hosemann, M.B. Toloczko, Y. Dai
Shear punch testing of candidate reactor materials after irradiation in fast reactors and spallation environments
Journal of Nuclear Materials 417 (2011) 1005.

M. Magan, S. Terrón, K. Thomsen, F. Sordo, C. Kharoua , M. Perlado, J. Bermejo,
Water cold plate proposal for solid rotating target
4th HPTW, Malmö, Sweden, May 2011.

D. Mannes
Neutron imaging of Cultural Heritage
International Joint Focused Meeting of COST Action IE0601 and MP0601, Paris, 5. – 7. May 2011

K. Thomsen, F. Heinrich, M. Butzek, J. Wolters, F. Sordo, A.I.S. Holm
Technical issues for Cannelloni at High Power 4th
HPTW, Malmö, Sweden, May 2011.

K. Thomsen, M. Butzek, F. Gallmeier and J. Wolters,
Options for water cooling a SINQ-type cannelloni target at high power
AccApp'11, Knoxville, April 2011.

Van Swygenhoven
- Keynote lecture at the International Plasticity conference, Mexico, January 2011.
- Invited seminar at Institut für Werkstoffwissenschaften (Prof. M. Goeken), Erlangen, February 1st, 2011.
- Invited seminar at Institut für Komplexe Materialien, IFW Colloquium (Prof. J. Eckert), February 10th, 2011
- Invited seminar at the Technical University of Munich (TUM), in the series of seminar of the FRM II, "neutrons in science and industry" (Prof. W. Petry, Prof. P. Boeni) , February 14th, 2011
- Invited seminar at Los Alamos National Laboratory, (LANCE and Materials science and Technology group), February 24th, 2011
- Invited lecture at the TMS annual meeting, San Diego 2011 in the symposium "Computational Plasticity", March 1st 2011
- Keynote lecture at the TMS annual meeting, San Diego 2011 in the symposium Neutron and X-Ray Studies of Advanced Materials: Dislocations, Strains and Stresses II, March 2nd 2011
- Invited lecture on 20th DYMAT Meeting "Mechanical behaviour of nanomaterials, metallic glasses and architecturally designed materials", September 7-9, Paris 2011
- Invited talk IMRC meeting in the symposium "Micro- and Nanomechanical Testing of Materials and Devices", Cancun, Mexico from August 14-19. 2011.
- Invited lecture in the 2nd International Workshop on the Plasticity of Nanocrystalline Metals, September 25 2011, Bostal Germany

W. Wagner, P. Vontobel, Y. Dai, M. Wohlmuther
Target Development Initiatives at SINQ Applying Neutron Techniques
TMS 2011, 140th Annual Meeting and Exhibition, San Diego, USA, Feb. 28 - March 4, 2011 (invited)

M. Wohlmuther, W. Wagner, K. Thomsen
The Status of the MEGAPIE Project
AccApp'11, 10th Internatl. Topical Meeting on Nuclear Applications of Accelerators, Knoxville, USA, April 3-7, 2011 (invited)

W. Wagner, H. Heyck. K. Geissmann, M. Wohlmuther, Y. Dai
14 Years Operational Experience with PSI's Spallation Neutron Source SINQ
AccApp'11, 10th Internatl. Topical Meeting on Nuclear Applications of Accelerators, Knoxville, USA, April 3-7, 2011

W. Wagner
Operational Experience of High-Power Spallation Targets
4th High Power Targetry Workshop, Malmö, Sweden, USA, May 2-6, 2011 (invited)

W. Wagner, M. Wohlmuther
MEGAPIE – Unexpected behaviors and findings during operation and dismantling
4th High Power Targetry Workshop, Malmö, Sweden, USA, May 2-6, 2011

W. Wagner, M. Wohlmuther, H. Heyck, K. Thomsen, K. Geissmann, P. Vontobel, Y. Dai
The SINQ solid spallation target – Operation experience and recent improvements
4th High Power Targetry Workshop, Malmö, Sweden, USA, May 2-6, 2011

W. Wagner
Most recent developments at the PSI Spallation Neutron Source SINQ
ECNS 2011: 5th European Conference on Neutron Scattering, Prag, CZ, 17-22 July, 2011

W. Wagner, K. Thomsen, H. Heyck, M. Wohlmuther, P. Vontobel,
Handling of Target Anomalies at SINQ
4th HPTW, Malmö, Sweden, May 2011.

J. Zimmermann
In-situ powder diffraction experiments on nanocrystalline NiFe".
E-MRS spring meeting, Nice-France, May 9-13, 2011

CONFERENCE, WORKSHOP AND SEMINAR CONTRIBUTIONS

V. Davydov, P. Lukáš, M. Petrenec, O. Man, P. Strunz, R. Kužel, H. Van Swygenhoven
Internal stresses and microstructure studied by neutron diffraction profile analysis: comparison with other techniques
TMS 2011: 140th Annual Meeting & Exhibition, San Diego, California, USA, February 27 - March 3, 2011.

V. Davydov, S. Van Petegem, H. Van Swygenhoven
POLDI materials science diffractometer with multiple pulse overlap technique
19th NeT Steering Committee Meeting, Athens, Greece, June 9-10, 2011.

V. Davydov, J.-M. Drezet, H. Van Swygenhoven
Neutron diffraction internal stress studies in heat treatable aluminium components with a direct comparison to finite element predictions
5th European Conference on Neutron Scattering (ECNS 5th), Prague, The Czech Republic, July 17-22, 2011 (Poster)

V. Davydov, J.-M. Drezet, H. Van Swygenhoven
Neutron diffraction internal stress studies in heat treatable aluminium components with a direct comparison to finite element predictions
6th International Conference on Mechanical Stress Evaluation by Neutrons and Synchrotron Radiation (MECA SENS VI), Hamburg, Gemany, September 7-9, 2011.

V. Davydov, P. Lukáš, M. Petrenec, O. Man, P. Strunz, R. Kužel, H. Van Swygenhoven
Internal stresses and microstructure studied by neutron diffraction profile analysis: comparison with other techniques
EUROMAT 2011, Montpellier, France, September 12-15, 2011.

A.P. Kaestner, B. Muench, P. Trtik, L. Butler
Spatio-temporal neutron tomography of dynamic processes
EGU-2011, Wien, 3-8 April, 2011

A.P. Kaestner, D. Mannes, E. Lehmann, F. Schmid, and J. Hovind
Non-destructive characterization od adhesive distribution by means of neutron imaging
36th Munich Adhesives and Finishing Symposium 2011, 24.-26. October, 2011

D. Kecik, H. Van Swygenhoven, G-M Rignanese,
TokyoTech-EPFL Workshop on Materials, Château-d'Oex, Switzerland, March 13th – 16th, 2011
Colour of gold alloys studied from first principles

D. Kecik, H. Van Swygenhoven, G-M Rignanese
Colour of gold alloys studied from density functional theory
CCMX Annual Meeting, Bern, Switzerland, April 5th, 2011 (Poster)

D. Kecik, H. Van Swygenhoven, G-M Rignanese
Colour of gold alloys studied from density functional theory"
IMX Doctoral Day, EPFL, Switzerland, March 17th, 2011 (Poster + Presentation)

D. Kecik, H. Van Swygenhoven, G-M Rignanese
Optical properties of gold and its alloys: first principles calculations at different levels
XX International Materials Research Congress, MRS Mexico, Cancun, August 14th – 19th, 2011 (Contributed Talk)

D. Kecik, H. Van Swygenhoven, G-M Rignanese
Ab initio calculation of the optical properties of gold and its alloys"
Euromat 2011, Montpellier, France, September 12th – 15th, 2011 (Contributed Talk)

D. Kecik, T. Rangel, H. Van Swygenhoven, G-M Rignanese,
Optical response calculations of gold alloys from first principles
16th ETSF Workshop on Electronic Excitations, Turin, Italy, September 27th – 30th, 2011 (Contributed Talk)

E. H. Lehmann, J. Hovind, S. Lovacs, S. Tesh, M. O. Speidel
Applying Neutron Imaging Methods to Learn About the Hidden Religious Content of Tibetan Buddha and Stupa Sculptures
ART'11, Firenze, 13.-15. April, 2011

D. Mannes, E. Lehmann
Possibilities and limitations of advanced radiation methods for imaging of wood
COST-FP0904: 1st Conference, 16-17 February 2011, in Biel Switzerland

D. Mannes, E. Lehmann
X-ray and neutron imaging as complementary non-destructive methods for investigations of historical brasswind instruments
2nd International Workshop on Diagnostic and Imaging of Musical Instruments, Ravenna 14. - 16. April 2011

S. Peetermans, L. Josic, H. Van Swygenhoven, E. Lehmann
Energy-selective Neutron Imaging
EUROMAT 2011, 12-15 September 2011

S. Peetermans, L. Josic, H. Van Swygenhoven, E. Lehmann
A new monochromator for Energy-Selective Imaging
Neuwave 4, 2-5 October 2011.

S. Peetermans, F. Grazzi, F. Salvemini, E. Lehmann
Archaeometallurgical studies at ICON
Neuwave 4, 2-5 October 2011.

S. Pierret, A. Evans, A.M. Paradowska, A. Kaestner, J. James, T. Etter, H. Van Swygenhoven
Combining neutron diffraction and imaging for residual stress analysis in single crystal turbine blades
EUROMAT 2011, Symposium “Novel Diffraction and Scattering Techniques for Materials Characterization”, 12-15 September 2011, Montpellier, France

S. Pierret, A. Evans, A.M. Paradowska, A. Kaestner, J. James, T. Etter, H. Van Swygenhoven
Combining neutron diffraction and imaging for residual stress analysis in single crystal turbine blades
ECNS 2011, Symposium “Engineering Applications”, 17-22 July 2011, Praha, Czech Republic (Keynote talk)

S. Pierret, A. Evans, A.M. Paradowska, A. Kaestner, J. James, T. Etter, H. Van Swygenhoven
Combining neutron diffraction and imaging for residual stress analysis in single crystal turbine blades
TMS 2011, Symposium “Advances in Science-Based Processing of Superalloys for Cost and Sustainment”, 27 February-03 March 2011, San Diego, United States of America

J. Repper, W. Häußler, P. Böni, S.M. Shapiro
Spin glass relaxation studies on Fe_cCr_{1-c} *by neutron resonance spin echo*
ECNS 2011, Prague, Czech Republic, 17-22 July, 2011.

J. Repper, T. Keller, W.W. Schmahl
Phase transition in $LaAlO_3$ *by high-resolution neutron Larmor diffraction*
ECNS 2011, Prague, Czech Republic, 17-22 July, 2011.

J. Repper, T. Keller, M. Hofmann, C. Krempaszky, E. Werner, W. Petry
IN718 studies by Neutron Larmor Diffraction
Euromat2011, Montpellier, France, 12-15 September, 2011.

J. Repper, H. Van Swygenhoven
Residual stresses and mechanical behaviour explored by Neutrons of X-Ray diffraction
Medical Cluster - Morning Talks, Villigen, Switzerland, 9 November, 2011.

J. Repper, W. Häußler, P. Böni
The new NRSE coil concept at RESEDA
ECNS 2011, Prague, Czech Republic, 17-22 July, 2011 (Poster)

J. Repper, A. Ostermann, W. Häußler, P. Böni
Polarisation devices for the spin-echo spectrometer RESEDA
ECNS 2011, Prague, Czech Republic, 17-22 July, 2011 (Poster)

J. Repper, M. Hofmann, C. Krempaszky, W. Petry, E. Werner
Intergranular residual stresses in IN718 by neutron diffraction
Euromat2011, Montpellier, France, 12-15 September, 2011 (Poster)

S. Van Petegem, L. Li, P. Anderson, H. Van Swygenhoven
Evolution of residual strains in nanocrystalline metals studied by diffraction.
Materials Research Society Fall meeting, Boston, USA (November 28 - December 2, 2011)

S. Van Petegem, H. Van Swygenhoven
Laue microdiffraction to study single crystal plasticity: applications and limitations.
Euromat2011, Montpellier, France, (September 12-15, 2011).

S. Van Petegem, L. Li, P. Anderson, H. Van Swygenhoven
Microplasticity and inter-granular stress in nanocrystalline metals.
Euromat2011, Montpellier, France, (September 12-15, 2011).

S. Van Petegem, L. Li, P. Anderson, H. Van Swygenhoven
Deformation mechanisms in nanocrystalline metals: insights from in-situ diffraction and crystal plasticity modeling
Nanoplasticity, Lake Bostal, Germany (September 25-28, 2011) (Poster)

S. Van Petegem, L. Li, P. Anderson, H. Van Swygenhoven
Deformation Mechanisms in Nanocrystalline Metals: Insights from In-Situ Diffraction and Crystal Plasticity Modelling
Size-Strain VI, Hyères, France (October 17-20, 2011)

S. Van Petegem, V. Davydov, H. Van Swygenhoven
In-situ Neutron Diffraction Experiments as a Guide for Understanding Microstructural Evolution of Complex Metals
Size-Strain VI, Hyères, France (October 17-20, 2011) (Poster)

H. Van Swygenhoven, J. Zimmermann, C. Marichal, S. Van Petegem, C. Borca
Plasticity in bcc pillars: in-situ Laue diffraction
Materials Research Society Fall meeting, Boston, USA (November 28 - December 2, 2011)

M. Velasco, H. Van Swygenhoven, Chr. Brandl
Coupled grain boundary motion in a nanocrystalline grain boundary network
IMRC XX, Cancún, Mexico, 14 - 19 August, 2011

M. Velasco, H. Van Swygenhoven, Chr. Brandl
Coupled grain boundary motion in a nanocrystalline grain boundary network
EUROMAT, Montpellier, France, 12 - 15 September, 2011

P. Vontobel, E.H. Lehmann, Y. Dai, M. Grosse
Neutron imaging for non-destructive testing of nuclear materials.
TMS2011, 140th Annual Meeting, SanDiego, CA, US, Febr.27 - March,3 2011

M. Weisser, A. Evans, S. Van Petegem, S. R. Holdsworth, H. Van Swygenhoven
Deformation studies of a creep resistant bainitic 1%CrMoV steel using synchrotron and neutron diffraction
TMS, San Diego, USA, 27 Feb - 3 March, 2011

M. Weisser, A. Evans, S. Van Petegem, S. R. Holdsworth, H. Van Swygenhoven
Deformation studies of a creep resistant bainitic steel using synchrotron and neutron diffraction
MECA SENS VI, Hamburg, Germany, 7 – 9 Sept, 2011

M. Weisser, A. Evans, S. Van Petegem, S. R. Holdsworth, H. Van Swygenhoven
Deformation studies of a creep resistant bainitic steel using synchrotron and neutron diffraction
Euromat2011, Montepellier, France, 12 – 15 Sept, 2011 (Highlight talk)

LECTURES AND COURSES

A.P. Kaestner
- Principle of computed tomography, University of Palermo, Italy, April 2011
- Advanced filter methods, University of Palermo, Italy, April 2011

MEMBERSHIP IN INTERNAL COMMITTEES

H. Van Swygenhoven
- Member of PSI Foko

MEMBERSHIP IN EXTERNAL COMMITTEES

E. H. Lehmann
- President of the International Society for Neutron Radiology 2010-2014
- Referee Committee des FRM-II, TU München, D
- Member of the Beam Instrumentation Advisory Group of ANSTO, Australia
- Swiss Representative in COST-IE 0601, Member of the Steering Committee
- D. Mannes, Swiss Representative in COST-FP0904, Member of the Management Committee

A.P. Kaestner
- Board member of the International Society for Neutron Radiology 2010-2014

D. Mannes
- Swiss Representative in COST-FP0904, Member of the Management Committee

W. Wagner
- ESS Target-Technical Advisory committee (t-TAC), ESS, Lund, Sweden
- International Neutron Technology Advisory Committee of the CSNS China Spallation Neutron Source Project

Van Swygenhoven
- Member of the board of trustees of the Freiburg Materials Research center (FMF), Germany, since 2010
- Member of the Advisory Board for the Doctoral Training Centre (DTC) on Theory and Simulation of Materials (TSM) at Imperial College (see www.cmth.ph.ic.ac.uk/dtc/)
- Elected by the EC-commission as a member of the External Advisory Group (EAG) of the NMP program
- Member of the board of Interdisciplinary Center for Advanced Materials Modelling (ICAMS), Ruhr-University Bochum
- Vice chair of the International Committee of Strength of Materials (ICSMA)
- Member of the reviewing commission of the proposals for beam time at the instruments at FRM II

DISSERTATIONS

Julien Zimmermann
In-situ Laue Diffraction During Compression of Directionally Solidified Mo Micropillars.
EPFL Thesis, No 5196 (2011)

Ning Gao
Molecular Dynamics Simulations of Helium Atoms Clustering in bcc Iron.
EPFL Thesis, No 5230 (2011)

EXCHANGE STUDENTS

Elisabeth Matthews, Summer internship, University of Cambridge, UK, June-August 2011

Richard Simons, Summer internship, Imperial College London, UK, June – September 2011

Yann Todeschini, Summer internship, École Européenne d'Ingenieurs en Génie des Materiaux Nancy, France, June – August 2011

AWARDS

Van Swygenhoven, MRS Fellow

Condensed Matter Research with Neutrons and Muons

Laboratory of Muon Spectroscopy (LMU)

LIST OF PUBLICATIONS (PEER REVIEWED)

Bonilla CM, Marcano N, Herrero-Albillos J, Maisuradze A, Garcia LM, Bartolome F
muSR study of short-range magnetic order in the paramagnetic regime of ErCo2
PHYSICAL REVIEW B **84**, 184425 (2011)

Boris AV, Matiks Y, Benckiser E, Frano A, Popovich P, Hinkov V, Wochner P, Castro-Colin M, Detemple E, Malik VK, Bernhard C, Prokscha T, Suter A, Salman Z, Morenzoni E, Cristiani G, Habermeier HU, Keimer B
Dimensionality Control of Electronic Phase Transitions in Nickel-Oxide Superlattices
SCIENCE **332**, 940 (2011)

Bussmann-Holder A, Keller H, Khasanov R, Simon A, Bianconi A, Bishop AR
Isotope and interband effects in a multi-band model of superconductivity
NEW JOURNAL OF PHYSICS **13**, 093009 (2011)

Disseler S, Svensson J, Peter S, Byers C, Baines C, Amato A, Giblin S, Carretta P, Graf M
Competing interactions and magnetic frustration in Yb4LiGe4
PHYSICAL REVIEW B **84**, 174429 (2011)

Guguchia Z, Roos J, Shengelaya A, Katrych S, Bukowski Z, Weyeneth S, Muranyi F, Strassle S, Maisuradze A, Karpinski J, Keller H
Strong coupling between Eu2+ spins and Fe2As2 layers in EuFe1.9Co0.1As2 observed with NMR
PHYSICAL REVIEW B **83**, 144516 (2011)

Guguchia Z, Shermadini Z, Amato A, Maisuradze A, Shengelaya A, Bukowski Z, Luetkens H, Khasanov R, Karpinski J, Keller H
Muon-spin rotation measurements of the magnetic penetration depth in the iron-based superconductor Ba1-xRbxFe2As2
PHYSICAL REVIEW B **84**, 094513 (2011)

Hase M, Pomjakushin VYU, Sikolenko V, Keller L, Luetkens H, Doenni A, Kitazawa H
Negative magnetization of Li2Ni2Mo3O12: A spin system composed of distorted honeycomb lattices and linear chains
PHYSICAL REVIEW B **84**, 104402 (2011)

Herrera W, Dinola I, Baggio-Saitovitch E, Kraken M, Litterst J
Magnetic dynamics of dilute iron nano-clusters in silver films from Moessbauer spectroscopy and muon spin rotation
HYPERFINE INTERACTIONS **203**, 149 (2011)

Hodges JA, de Reotier PD, Yaouanc A, Gubbens PCM, King PJC, Baines C
Magnetic frustration in the disordered pyrochlore Yb2GaSbO7
JOURNAL OF PHYSICS-CONDENSED MATTER **23**, 164217 (2011)

Hord R, Cordier G, Hofmann K, Buckow A, Pascua G, Luetkens H, Alff L, Albert B
Transitions Between Lanthanum Cuprates: Crystal Structures of T ', Orthorhombic, and K2NiF4-type La2CuO4
ZEITSCHRIFT FUR ANORGANISCHE UND ALLGEMEINE CHEMIE **637**, 1114 (2011)

Ito TU, Higemoto W, Ninomiya K, Amato A, Sugai T, Haga Y, Suzuki HS
Possible Long-periodic Magnetic Structure in SmPb3
JOURNAL OF THE PHYSICAL SOCIETY OF JAPAN **80**, SA075 (2011)

Ito TU, Higemoto W, Ninomiya K, Luetkens H, Baines C, Sakai A, Nakatsuji S
mu-SR evidence of nonmagnetic order and 141Pr hyperfine-enhanced nuclear magnetism in the cubic Gamma 3 ground doublet system PrTi2Al20
JOURNAL OF THE PHYSICAL SOCIETY OF JAPAN **80**, 113703 (2011)

Ito TU, Higemoto W, Ninomiya K, Luetkens H, Sugai T, Haga Y, Suzuki HS
Incommensurate-to-Commensurate Magnetic Phase Transition in SmIn3 Observed by Muon Spin Relaxation
JOURNAL OF THE PHYSICAL SOCIETY OF JAPAN **80**, 033710 (2011)

Johnson RC, Chen KH, Giblin SR, Lord JS, Amato A, Baines C, Barbara B, Malkin BZ, Graf MJ
mu SR study of spin dynamics in LiY1-x HoxF4
PHYSICAL REVIEW B **83**, 174440 (2011)

Kawasaki Y, Gavilano JL, Keller L, Schefer J, Christensen NB, Amato A, Ohno T, Kishimoto Y, He ZZ, Ueda Y, Itoh M
Magnetic structure and spin dynamics of the quasi-one-dimensional spin-chain antiferromagnet BaCo2V2O8
PHYSICAL REVIEW B **83**, 064421 (2011)

Kermarrec E, Mendels P, Bert F, Colman RH, Wills AS, Strobel P, Bonville P, Hillier A, Amato A
Spin-liquid ground state in the frustrated kagome antiferromagnet MgCu3(OH)(6)Cl-2
PHYSICAL REVIEW B **84**, 100401 (2011)

Khasanov R, Sanna S, Prando G, Shermadini Z, Bendele M, Amato A, Carretta P, De Renzi R, Karpinski J, Katrych S, Luetkens H, Zhigadlo ND
Tuning of competing magnetic and superconducting phase volumes in LaFeAsO0.945F0.055 by hydrostatic pressure
PHYSICAL REVIEW B **84**, 100501 (2011)

Krzton-Maziopa A, Shermadini Z, Pomjakushina E, Pomjakushin V, Bendele M, Amato A, Khasanov R, Luetkens H, Conder K
Synthesis and crystal growth of Cs0.8(FeSe0.98)2: a new iron-based superconductor with Tc=27K
JOURNAL OF PHYSICS-CONDENSED MATTER **23**, 052203 (2011)

Lord JS, McKenzie I, Baker PJ, Blundell SJ, Cottrell SP, Giblin SR, Good J, Hillier AD, Holsman BH, King PJC, Lancaster T, Mitchell R, Nightingale JB, Owczarkowski M, Poli S, Pratt FL, Rhodes NJ, Scheuermann R, Salman Z
Design and commissioning of a high magnetic field muon spin relaxation spectrometer at the ISIS pulsed neutron and muon source
REVIEW OF SCIENTIFIC INSTRUMENTS **82**, 073904 (2011)

Maisuradze A, Guguchia Z, Graneli B, Ronnow HM, Berger H, Keller H
mu SR investigation of magnetism and magnetoelectric coupling in Cu2OSeO3
PHYSICAL REVIEW B **84**, 064433 (2011)

Maisuradze A, Shengelaya A, Amato A, Pomjakushina E, Keller H
Muon spin rotation investigation of the pressure effect on the magnetic penetration depth in YBa2Cu3Ox
PHYSICAL REVIEW B **84**, 184523 (2011)

Maroni B, Di Castro D, Hanfland M, Boby J, Vercesi C, Mozzati MC, Weyeneth S, Keller H, Khasanov R, Drathen C, Dore P, Postorino P, Malavasi L
Pressure Effects in the Isoelectronic REFe0.85Ir0.15AsO System
JOURNAL OF THE AMERICAN CHEMICAL SOCIETY **133**, 3252 (2011)

McKenzie I, Scheuermann R, Sedlak K, Stoykoy A
Molecular Dynamics in Rod-Like Liquid Crystals Probed by Muon Spin Resonance Spectroscopy
JOURNAL OF PHYSICAL CHEMISTRY B **115**, 9360 (2011)Morenzoni E, Wojek BM, Suter A,

Prokscha T, Logvenov G, Bozovic I
The Meissner effect in a strongly underdoped cuprate above its critical temperature
NATURE COMMUNICATIONS **2**, 272 (2011)

Mukai K, Sugiyama J, Kamazawa K, Ikedo Y, Andreica D, Amato A
Magnetic properties of the chemically delithiated LixMn2O4 with 0.07 <= x <= 1
JOURNAL OF SOLID STATE CHEMISTRY **184**, 1096 (2011)

Muramatsu T, Kanemasa T, Kagayama T, Shimizu K, Aoki Y, Sato H, Giovannini M, Bonville P, Zlatic V, Aviani I, Khasanov R, Rusu C, Amato A, Mydeen K, Nicklas M, Michor H, Bauer E
Reentrant quantum criticality in Yb2Pd2Sn
PHYSICAL REVIEW B **83**, 180404 (2011)

Owens FJ, Gladczuk L, Szymczak R, Dluzewski P, Wisniewski A, Szymczak H, Golnik A, Bernhard C, Niedermayer C
High temperature magnetic order in zinc sulfide doped with copper
JOURNAL OF PHYSICS AND CHEMISTRY OF SOLIDS **72**, 648 (2011)

Pomjakushin V, Pomjakushina E, Krzton-Maziopa A, Conder K, Shermadini Z
Room temperature antiferromagnetic order in superconducting XyFe2−xSe2(X=Rb, K): a neutron powder diffraction study
JOURNAL OF PHYSICS-CONDENSED MATTER **23**, 156003 (2011)

Pomjakushin VYU, Sheptyakov DV, Pomjakushina EV, Krzton-Maziopa A, Conder K, Chernyshov D, Svitlyk V, Shermadini Z
Iron-vacancy superstructure and possible room-temperature antiferromagnetic order in superconducting CsyFe2-xSe2
PHYSICAL REVIEW B **83**, 144410 (2011)

Pratt FL, Baker PJ, Blundell SJ, Lancaster T, Ohira-Kawamura S, Baines C, Shimizu Y, Kanoda K, Watanabe I, Saito G
Magnetic and non-magnetic phases of a quantum spin liquid
NATURE **471**, 612 (2011)

Rojas DP, Espeso JI, Fernandez JR, Sal JCG, Rusu C, Andreica D, Dudric R, Amato A
First-order nature of the ferromagnetism in CeIn2 investigated using muon spin rotation and by systematic substitution of La for Ce
PHYSICAL REVIEW B **84**, 024403 (2011)

Saadaoui H, Morris GD, Salman Z, Song Q, Chow KH, Hossain MD, Levy CDP, Parolin TJ, Pearson MR, Smadella M, Wang D, Greene LH, Hentges PJ, Kiefl RF, MacFarlane WA
Search for broken time-reversal symmetry near the surface of superconducting YBa2Cu3O7-delta films using beta-detected nuclear magnetic resonance
PHYSICAL REVIEW B **83**, 054504 (2011)

Salman Z, Smadella M, Macfarlane W, Patterson B, Willmott P, Chow K, Hossain M, Saadaoui H, Wang D, Kiefl R
Depth dependence of the structural phase transition of SrTiO3 studied with beta-NMR and grazing incidence x-ray diffraction
PHYSICAL REVIEW B **83**, 224112 (2011)

Sanna S, Carretta P, Bonfa` P, Prando G, Allodi G, De Renzi R, Shiroka T, Lamura G, Martinelli A, Putti M
Correlated Trends of Coexisting Magnetism and Superconductivity in Optimally Electron-Doped Oxypnictides
PHYSICAL REVIEW LETTERS **107**, 227003 (2011)

Schulz L, Nuccio L, Willis M, Desai P, Shakya P, Kreouzis T, Malik VK, Bernhard C, Pratt FL, Morley NA, Suter A, Nieuwenhuys GJ, Prokscha T, Morenzoni E, Gillin WP, Drew AJ
Engineering spin propagation across a hybrid organic/inorganic interface using a polar layer
NATURE MATERIALS **10**, 39 (2011)

Seyfarth G, Jaccard D, Pedrazzini P, Krzton-Maziopa A, Pomjakushina E, Conder K, Shermadini Z
Pressure cycle of superconducting Cs0.8Fe2Se2: A transport study
SOLID STATE COMMUNICATIONS **151**, 747-750 (2011)

Shermadini Z, Krzton-Maziopa A, Bendele M, Khasanov R, Luetkens H, Conder K, Pomjakushina E, Weyeneth S, Pomjakushin V, Bossen O, Amato A
Coexistence of Magnetism and Superconductivity in the Iron-Based Compound Cs0.8(FeSe0.98)2
PHYSICAL REVIEW LETTERS **106**, 117602 (2011)

Shiroka T, Lamura G, De Renzi R, Belli M, Emery N, Rida H, Cahen S, Mareche J-F, Lagrange P, Herold C
mu-SR investigation of the intercalated graphite superconductor CaC6
NEW JOURNAL OF PHYSICS **13**, 013038 (2011)

Shiroka T, Lamura G, Sanna S, Prando G, De Renzi R, Tropeano M, R Cimberle M, Martinelli A, Bernini C, Palenzona A, Fittipaldi R, Vecchione A, Carretta P, S Siri A, Ferdeghini C, Putti M
Long- to short-range magnetic order in fluorine-doped CeFeAsO
PHYSICAL REVIEW B **84**, 195123 (2011)

Song Q, Chow KH, Salman Z, Saadaoui H, Hossain MD, Kiefl RF, Levy CDP, Pearson MR, Parolin TJ, Smadella M, Wang D, Yu KM, Liu X, Furdyna JK, MacFarlane WA
beta-detected NMR of Li in Ga1-xMnxAs
PHYSICAL REVIEW B **84**, 054414 (2011)

Steele AJ, Lancaster T, Blundell SJ, Baker PJ, Pratt FL, Baines C, Conner MM, Southerland HI, Manson JL, Schlueter JA
Magnetic order in quasi-two-dimensional molecular magnets investigated with muon-spin relaxation
PHYSICAL REVIEW B **84**, 064412 (2011)

Stoykov A, Scheuermann R, Amato A, Bartkowiak M, Konter JA, Rodriguez J, Sedlak K
A lens-coupled scintillation counter in cryogenic environment
JOURNAL OF INSTRUMENTATION **6**, P02003 (2011)

Sugiyama J, Mansson M, Ofer O, Kamazawa K, Harada M, Andreica D, Amato A, Brewer JH, Ansaldo EJ, Ohta H, Michioka C, Yoshimura K
Successive magnetic transitions and static magnetic order in RCoAsO (R=La, Ce, Pr, Nd, Sm, Gd) confirmed by muon-spin rotation and relaxation
PHYSICAL REVIEW B **84**, 184421 (2011)

Suter A, Morenzoni E, Prokscha T, Wojek BM, Luetkens H, Nieuwenhuys G, Gozar A, Logvenov G, Bozovic I
Two-Dimensional Magnetic and Superconducting Phases in Metal-Insulator La2-xSrxCuO4 Superlattices Measured by Muon-Spin Rotation
PHYSICAL REVIEW LETTERS **106**, 237003 (2011)

Talanov Y, Salakhutdinov L, Giannini E, Khasanov R
Vortex Excitations Above T-c in the Cuprate Superconductor Bi2Sr2Ca2Cu3O10 as Revealed by ESR
APPLIED MAGNETIC RESONANCE **40**, 37 (2011)

Voss A, Pearson MR, Billowes J, Buchinger F, Chow K, Crawford J, Hossein M, Kiefl R, Levy C, Macfarlane W, Maneacute E, Morris G, Parolin T, Saadaoui H, Salman Z, Smadella M, Song Q, Wang D
The development of pure beta-NQR techniques for measurements of nuclear ground state quadrupole moments in lithium isotopes
JOURNAL OF PHYSICS: CONFERENCE SERIES **312**, 092063 (2011)

Voss A, Pearson MR, Billowes J, Buchinger F, Chow KH, Crawford JE, Hossein MD, Kiefl RF, Levy CDP, MacFarlane WA, Mane E, Morris GD, Parolin TJ, Saadaoui H, Salman Z, Smadella M, Song Q, Wang D
Nuclear electric quadrupole moment of Li-9 using zero-field beta-detected NQR
JOURNAL OF PHYSICS G-NUCLEAR AND PARTICLE PHYSICS **38**, 075102 (2011)

Wiesenmayer E, Luetkens H, Pascua G, Khasanov R, Amato A, Potts H, Banusch B, Klauss HH, Johrendt D
Microscopic Coexistence of Superconductivity and Magnetism in Ba1-xKxFe2As2
PHYSICAL REVIEW LETTERS **107**, 237001 (2011)

Wojek BM, Weyeneth S, Bosma S, Pomjakushina E, Puzniak R
Mixed state of La1.83Sr0.17CuO4 studied by means of muon-spin rotation and magnetization experiments in a low magnetic field
PHYSICAL REVIEW B **84**, 144521 (2011)

Yaouanc A, de Reotier PD, Chapuis Y, Marin C, Vanishri S, Aoki D, Fak B, Regnault LP, Buisson C, Amato A, Baines C, Hillier AD
Exotic transition in the three-dimensional spin-liquid candidate Tb2Ti2O7
PHYSICAL REVIEW B **84**, 184403 (2011)

Zhigadlo ND, Katrych S, Bendele M, Moll PJW, Tortello M, Weyneth S, Pomjakushin VYU, Kanter J, Puzniak R, Bukowski Z, Keller H, Gonnelli RS, Khasanov R, Karpinski J, Batlogg B
Interplay of composition, structure, magnetism, and superconductivity in SmFeAs1-xPxO1-x
PHYSICAL REVIEW B **84**, 134526 (2011)

CONFERENCE, WORKSHOP AND SEMINAR CONTRIBUTIONS

A. Amato et al.
The 9.5 T high magnetic field facility at PSI
Poster presentation at the 12th International Conference on Muon Spin Relaxation, Rotation and Resonance, Cancun, Mexico, May 16-20, 2011

A. Amato et al.
High-Field µSR instrument at PSI: detector solutions
Poster presentation at the 12th International Conference on Muon Spin Relaxation, Rotation and Resonance, Cancun, Mexico, May 16-20, 2011

A. Amato et al.
Muon-spin rotation measurements of the magnetic penetration depth in the Fe-based superconductors $Ba_{1-x}Rb_xFe_2As_2$
Poster presentation at the 12th International Conference on Muon Spin Relaxation, Rotation and Resonance, Cancun, Mexico, May 16-20, 2011

M. Bendele
Intrinsic and structural iron isotope effect on the superconducting transition temperature of $FeSe_{1-x}$
Talk at the SPS Joint Annual Meeting, Lausanne, Switzerland, June 15-17, 2011

M. Bendele
Iron isotope effect on the superconducting transition temperature and the crystal structure of $FeSe_{1-x}$
APS March Meeting, March 21, 2011

M. Bendele
Pressure induced static magnetic order in superconducting $FeSe_{1-x}$
Talk at the 12th International Conference on Muon Spin Rotation, Relaxation and Resonance, Cancun, Mexico, May 16-20, 2011
M. Bendele et al.
Iron isotope effects in superconducting $FeSe_{1-x}$
Poster at the EMRS 2011 fall meeting, Warsaw Poland, September 19-23, 2011.

M. Bendele et al.
Iron isotope effects in superconducting $FeSe_{1-x}$
Poster at the MaNEP meeting 2011, Les Diablerets, 29 June-01 July, 2011.

M. Bendele et al.
Interplay between the magnetism and superconductivity in $LaFeAsF_{0.945}O_{0.055}$
Poster at the 12th International Conference on Muon Spin Rotation, Relaxation and Resonance, Cancun Mexico, May 16-20, 2011.

H. Luetkens
Magnetic and Superconducting Properties of Iron-based Superconductors
Talk at the DFG Priority Program 1458 Meeting, Dresden, Germany, February 24-25, 2011

H. Luetkens
Coexistence of strong magnetism and high-Tc superconductivity in the Iron-based chalcogenides $A_{0.8}Fe_{2-y}Se_2$ with A = Cs, Rb, and K
Talk at the 12^{th} International Conference on Muon Spin Relaxation, Rotation and Resonance, Cancun, Mexico, May 16-20, 2011

A. Maisuradze
μSR investigation of pressure effect on superfluid density in $YBa_2Cu_33O_x$
Talk at the SPS Joint Annual Meeting, Lausanne, Switzerland, June 15-17, 2011

E. Morenzoni
Observation of enhanced nuclear spin-lattice relaxation rate by superconducting fluctuations in thin films
MaNEP Internal workshop, Neuchatel, 20.1.2011

E. Morenzoni
The Meissner effect in a strongly underdoped cuprate well above its critical Temperature
Oral presentation at the 12th International Conference on Muon Spin Relaxation, Rotation and Resonance, Cancun, Mexico, May 16-20, 2011

E. Morenzoni et al.
Observation of enhanced nuclear spin-lattice relaxation by superconducting fluctuations in thin films by β-NMR
Poster presentation at the 12th International Conference on Muon Spin Relaxation, Rotation and Resonance, Cancun, Mexico, May 16-20, 2011

E. Morenzoni et al.
The Meissner effect in a strongly underdoped cuprate well above its critical Temperature
Poster presentation at the 26th International Conference on Low Temperature Physics (LT26)., Bejing, China, August 10-17, 2011

E. Morenzoni et al.
Observation of enhanced nuclear spin-lattice relaxation by superconducting fluctuations in thin films by β-NMR
Poster presentation at the 26th International Conference on Low Temperature Physics (LT26)., Bejing, China, August 10-17, 2011

G. Pascua et al.
Interplay of Rare-Earth and Iron Sublattices in NdFeAsO
Poster presentation at the Swiss Workshop on Materials with Novel Electronic Properties, Les Diablerets, Switzerland, June 29-July 1, 2011
G. Pascua et al.
Structural and Magnetic Properties of the Parent Compound T'-La_2CuO_4 of Electron-doped Cuprates
Poster presentation at the The European School on Magnetism 2011, Târgoviste, Romania, August 22-September 2, 2011

G. Pascua
Magnetic and Superconducting Properties of Electron-Doped $La_{2-x}Ce_xCuO_4$ Bulk Samples
Talk at the BVRA 2011, µSR Users' Meeting, PSI, January 26, 2011

T. Prokscha
Low-energy µSR investigations of photo-induced effects in Si and Ge
Oral presentation at the 12th International Conference on Muon Spin Relaxation, Rotation and Resonance, Cancun, Mexico, May 16-20, 2011

T. Prokscha et al.
Muonium activation energies near semiconductor surfaces and at metal-semiconductor interfaces
Poster presentation at the 12th International Conference on Muon Spin Relaxation, Rotation and Resonance, Cancun, Mexico, May 16-20, 2011

T. Prokscha et al.
Monte-Carlo simulation of transitions between different muonium states
Poster presentation at the 12th International Conference on Muon Spin Relaxation, Rotation and Resonance, Cancun, Mexico, May 16-20, 2011

H. Saadaoui et al.
Spin relaxation of Low Energy Muons in ferromagnetic nickel in zero and low field,
Poster presentation at the 12th International Conference on Muon Spin Relaxation, Rotation and Resonance, Cancun, Mexico, May 16-20, 2011

H. Saadaoui et al.
The magnetic penetration depth of $Ba(Co_{0.074}F_{0.926})_2As_2$ measured by LEM,
Poster presentation at the 2011 Swiss Workshop on Materials with Novel Electronic Properties, Les Diablerets, 29 June - 1 July 2011.

H. Saadaoui et al.
Search for spontaneous magnetism near the surface of (110)-oriented YBCO films using LEM,
Poster presentation at the 2011 Swiss Workshop on Materials with Novel Electronic Properties, Les Diablerets, 29 June - 1 July 2011.

Z. Salman
Proximal magnetometry of monolayers of magnetic moments
Oral presentation at the 12th International Conference on Muon Spin Relaxation, Rotation and Resonance, Cancun, Mexico, May 16-20, 2011

Z. Salman et al.
Design and Simulation of a Spin Rotator for Longitudinal Field Measurements in the Low Energy Muons Spectrometer
Poster presentation at the 12th International Conference on Muon Spin Relaxation, Rotation and Resonance, Cancun, Mexico, May 16-20, 2011

K. Sedlak et al.
MusrSim and musrSimAna – Simulation Tools for μSR Instruments
Poster presentation at the 12th International Conference on Muon Spin Relaxation, Rotation and Resonance, Cancun, Mexico, May 16-20, 2011

Z. Shermadini et al.
Coexistence of strong magnetism and high-Tc superconductivity in the Iron-based chalcogenides $A_{0.8}(FeSe_{0.98})_2$ with A = Cs, Rb, and K
Poster presentation at the SPS Joint Annual Meeting, Lausanne, Switzerland, June 15-17, 2011

Z. Shermadini et al.
Coexistence of strong magnetism and high-Tc superconductivity in the Iron-based chalcogenides $A_{0.8}(FeSe_{0.98})_2$ with A = Cs, Rb, and K
Poster presentation at the10th PSI Summer School on Condensed Matter Research, Montana Zugerberg, Zug, Switzerland, August 13-22, 2011

Z. Shermadini et al.
Microscopic Study of the Superconducting State of the Iron Pnictide $RbFe_2As_2$
Poster presentation at the DFG Priority Program 1458 Meeting, Dresden, Germany, February 24-25, 2011

Z. Shermadini
Superconducting Properties of the Iron Pnictide $RbFe_2As_2$ under pressure
Talk at the BVRA 2011, μSR Users' Meeting, PSI, January 26, 2011

E. Stilp
Low-energy μSR investigations of photo induced effects on the magnetic state of $La_{2-x}Sr_xCuO_4$ at low doping ($x \leq 0.02$)
Talk at the SPS Joint Annual Meeting, Lausanne, Switzerland, June 15-17, 2011

E. Stilp
Photo persistent effects of $La_{2-x}Sr_xCuO_4$ at low doping ($x \leq 0.02$) by Low-energy μSR
Talk at the Swiss Workshop on Materials with Novel Electronic Properties, Les Diablerets, Switzerland, June 29 – July 1, 2011

E. Stilp et al.
Photo induced effect on La_2CuO_4
Poster presentation at the 10^{th} PSI Summer School on Condensed Matter Research, Zug, Switzerland, August 13-19, 2011

A. Suter et al.
musrfit: a free platform-independent framework for □SR data analysis
Poster presentation at the 12th International Conference on Muon Spin Relaxation, Rotation and Resonance, Cancun, Mexico, May 16-20, 2011

A. Suter et al.
Superconductivity in $La_{1.56}Sr_{0.44}CuO_4/La_2CuO_4$ Superlattices
Poster presentation at the 12th International Conference on Muon Spin Relaxation, Rotation and Resonance, Cancun, Mexico, May 16-20, 2011

A. Suter et al.
Antiferromagnetism in the 2D Limit and Interface Superconductivity in Metal-Insulator $La_{2-x}Sr_xCuO_4$ Superlattices
Poster presentation at the 56th International Conference on Magnetism & Magnetic Materials, Scottsdale October 30 – November 3, 2011

A. Suter et al.
Photo carrier induced effects on the magnetic ground state of La_2CuO_4
Poster presentation at the 56th International Conference on Magnetism & Magnetic Materials, Scottsdale October 30 – November 3, 2011

M. Thede et al.
Bond disorder in a quasi 1-d antiferromagnet
Poster presentation at the 12th International Conference on Muon Spin Relaxation, Rotation and Resonance, Cancun, Mexico, May 16-20, 2011

M. Thede
Bond disorder in a quasi 1-d antiferromagnet
Talk at the Swiss Workshop on Materials with Novel Electronic Properties, Les Diablerets, Switzerland, June 29-July 1, 2011

M. Thede
Effect of bond disorder in spin-1/2 antiferromagnetic Heisenberg chains
Talk at the BVRA 2011, µSR Users' Meeting, PSI, January 26, 2011

M. Thede et al.
Bond disorder in a quasi 1-d antiferromagnet
Poster presentation at the 6th International Conference on Low Temperature Physics (LT26), Beijing, China, August 8-17, 2011

INVITED TALKS

M. Bendele
Muon spin rotation and relaxation (µSR) studies on Fe-based superconductors - an introduction
Solid State Physics Seminar, Ulm University, Germany, February 17, 2011

M. Bendele
Superconducting and magnetic properties of the $FeSe_{1-x}$ system
JUM@P'11, PSI Villigen, September 15-16, 2011

R. Khasanov
Muon-spin rotation study of magnetic and superconducting properties of Fe-based superconductors
Seminar, MPI Stuttgart, December 21, 2011

H. Luetkens
Coexistence and competition of magnetism and high-Tc superconductivity in Iron-based pnictides and chalcogenides
International Conference on Functional Materials, Crimea, Ukraine, October 3-8, 2011

A. Maisuradze
µSR investigation of pressure effect on superfluid density in $YBa_2Cu_33O_x$
Seminar Solid State Physics, University of Zurich, November 9, 2011

E. Morenzoni
Local superconducting and magnetic properties of La2-xSrxCuO4 heterostructures
Swiss Swedish Meeting on "Quantum Materials and Devices", Les Diableret, Switzerland, January 7-9, 2011

E. Morenzoni
Accurate measurements of the absolute value and temperature dependence of the London penetration depth in unconventional superconductors
Swiss Swedish Meeting on "Quantum Materials and Devices", Stenungsbaden, Sweden, August 26-28, 2011

E. Morenzoni
The Meissner effect in a strongly underdoped cuprate well above its critical temperature
JUM@P'11, PSI Villigen, September 15-16, 2011

E. Morenzoni
SμS: Swiss Muon Source
12th International Conference on Muon Spin Relaxation, Rotation and Resonance, Cancun, Mexico, May 16-20, 2011

E. Morenzoni
μSR investigations of unconventional superconductors
IOP-PSI Joint Workshop, Bejing, China, 20-21 October 2011

H. Saadaoui
Introduction to musrfit,
TRIUMF Summer Institute 2011, Vancouver, Canada, August 8-19, 2011

Z. Salman
Single Molecule Magnets - From bulk to thin films and mono-layers
Institute of Physical Chemistry Seminar, University of Zurich, Zurich -Switzerland, November 2011

Z. Salman
Low Energy μSR and Physics at Interfaces
13th Annual Meeting of the Northwest Section of the American Physical Society (NW-APS 2011) Corvallis, Oregon USA, 20 – 28 October 2011.

Z. Salman
Measuring the Magnetic Properties of Monolayers and Thin Films of Single Molecule Magnets
First Euro Mediterranean Meeting on Functionalized Materials (EMM-FM 2011), Sousse, Tunisia, 05-09 September 2011.

LECTURES AND COURSES

R. Khasanov
Muon-spin rotation/relaxation: A tool to study magnetic and superconducting phenomena
PSI Summer School, Zug, Switzerland, August 13-22, 2011

R. Khasanov
μSR Practical Training
PSI Summer School, Zug/PSI, Switzerland, August 20-22, 2011

E. Morenzoni
Physik mit Myonen: von der Atomphysik zur Festkörperphysik, Vorlesungen und Übungen
Universität Zürich and ETH Zürich, FS-2011

E. Morenzoni
Praktikum: Myon Spin Rotationsspektroskopie
ETH Zürich, FS-2011

E. Morenzoni, A. Amato, R. Khasanov, H. Luetkens, T. Prokscha, A. Suter
Blockkurs: Myon Spin Rotationsspektroskopie
Universität Basel, 6.6. – 10.6.2011

E. Morenzoni
muSR spectroscopy vs. neutron scattering, Special Lecture in "Neutron Scattering in Condensed Matter Physics II course" (A. Zheludev)
ETH Zürich, FS-2011

MEMBERSHIP IN EXTERNAL COMMITTEES

A. Amato
- Member of the "Program Advisory Committee for Material and Life Science", RIKEN, Japan
- International Advisory Committee for the 12th International Conference on Muon Spin Rotation, Relaxation and Resonance
- Member of the "Facilities Subcommittee" of the International Society for µSR Spectroscopy (ISMS)

H. Luetkens
- Executive committee member of the International Society for µSR Spectroscopy (ISMS)
- International Advisory Committee for the 12th International Conference on Muon Spin Rotation, Relaxation and Resonance

E. Morenzoni
- Chairman Muon Scientific Advisory Committee J-PARC Center and KEK
- International Advisory Committee for the 12th International Conference on Muon Spin Rotation, Relaxation and Resonance
- Organization Committee 10th PSI summer school on condensed matter research: phase transitions Zug, Switzerland, 13-22 August 2011
- Member of the "Facilities Subcommittee" of the International Society for µSR Spectroscopy (ISMS)

T. Prokscha
- Editorial Board of ISRN Condensed Matter Physics

A. Suter
- ISIS Facility Access Panel

Z. Salman
- CERN's ISOLDE and Neutron Time-of-flight Committee (INTC)
- International advisory committee of the Euro-Mediterranean Meeting on Functionalized Materials (EMM-FM 2011)

AWARDS

A. Suter
Best poster award for the poster
Antiferromagnetism in the 2D Limit and Interface Superconductivity in Metal-Insulator $La_{2-x}Sr_xCuO_4$ Superlattices
Poster presentation at the 56th International Conference on Magnetism & Magnetic Materials, Scottsdale October 30 – November 3, 2011

DISSERTATIONS

M. Bendele
The superconducting and magnetic properties of the iron-chalcogenides
PSI/Univ. Zurich, 2011

B.M. Wojek
Superconductivity and Magnetism in Cuprate Single Crystals and Thin-Film Heterostructures
PSI/Univ. Zurich, 2011

Research with Neutrons and Muons

Laboratory for Developments and Methods (LDM)

LIST OF PUBLICATIONS (PEER REVIEWED)

Allieta M, Oliva C, Scavini M, Cappelli S, Pomjakushina E, Scagnoli V
Spin-lattice interaction in the insulator-to-metal transition of GdBaCo2O5+d
PHYSICAL REVIEW B **84**, 235144 (2011)

Atchison F, Blau B, Bodek K, van den Brandt B, Brys T, Daum M, Fierlinger P, Geltenbort P, Hautle P, Henneck R, Heule S, Holley A, Kasprzak M, Kirch K, Knecht A, Konter JA, Kuzniak M, Liu CY, Pichlmaier A, Plonka C, Pokotilovski Y, Saunders A, Tortorella D, Wohlmuther M, Young AR, Zejma J, Zsigmond G
Production of ultracold neutrons from cryogenic H-2(2), O-2, and (CH4)-H-2 converters
EPL **95**, 12001 (2011)

Babkevich P, Roessli B, Gvasaliya SN, Regnault LP, Freeman PG, Pomjakushina E, Conder K, Boothroyd AT
Spin anisotropy of the resonance peak in superconducting FeSe0.5Te0.5
PHYSICAL REVIEW B **83**, 180506 (2011)

Balagurov AM, Bobrikov IA, Pomjakushin VYU, Pomjakushina EV, Sheptyakov DV, Troyanchuk IO
Low-Temperature Structural Anomalies in Pr0.5Sr0.5CoO3
JETP LETTERS **93**, 263-268 (2011)

Bornet A, Jannin S, Konter JA, Hautle P, van den Brandt B, Bodenhausen G
Ultra high-resolution NMR: Substained induction decays of long-lived coherences
JOURNAL OF THE AMERICAN CHEMICAL SOCIETY **133**, 15644-15649 (2011)

Deng G, Pomjakushin V, Petricek V, Pomjakushina E, Kenzelmann M, Conder K
Structural evolution of one-dimensional spin-ladder compounds Sr14-xCaxCu24O41 with Ca doping and related evidence of hole redistribution
PHYSICAL REVIEW B **84**, 144111 (2011)

Deng G, Radheep DM, Thiyagarajan R, Pomjakushina E, Wang S, Niksersht N, Arumugam S, Conder K
High oxygen pressure single crystal growth of highly Ca-doped spin ladder compound Sr14-xCaxCu24O41 (x>12)
JOURNAL OF CRYSTAL GROWTH **327**, 182-188 (2011)

Furrer A, Pomjakushina E, Pomjakushin V, Embs JP, Straessle TH
Ferromagnetic and antiferromagnetic dimer splittings in LaMn0.1Ga0.9O3
PHYSICAL REVIEW B **83**, 174442 (2011)

Gnezdilov V, Pashkevich YUG, Berger H, Pomjakushina E, Conder K, Lemmens P
Helical fluctuations in the Raman response of the topological insulator Bi2Se3
PHYSICAL REVIEW B **84**, 195118 (2011)

Gupta M, Tayal A, Gupta A, Gupta R, Stahn J, Horisberger M, Wildes A
Iron and nitrogen self-diffusion in non-magnetic iron nitrides
JOURNAL OF APPLIED PHYSICS **110**, 123518 (2011)

Gupta M, Tayal A, Gupta A, Raghavendra Reddy V, Horisberger M, Stahn J
Study of non-magnetic iron mononitride thin films
JOURNAL OF ALLOYS AND COMPOUNDS **509**, 8283-8288 (2011)

Heiroth S, Frison R, Rupp JLM, Lippert TH, Barthazy Meier EJ, Mueller Gubler E, Doebeli M, Conder K, Wokaun A, Gauckler LJ
Crystallization and grain growth characteristics of yttria-stabilized zirconia thin films grown by pulsed laser depositon
SOLID STATE IONICS **191**, 12-23 (2011)

Kawano-Furukawa H, Bowell CJ, White JS, Heslop RW, Cameron AS, Forgan EM, Kihou K, Lee CH, Iyo A, Eisaki H, Saito T, Fukazawa H, Kohori Y, Cubitt R, Dewhurst CD, Gavilano JL, Zolliker M
Gap in KFe2As2 studied by small-angle neutron scattering observations of the magnetic vortex lattice
PHYSICAL REVIEW B **84**, 024507 (2011)

Krzton-Maziopa A, Pomjakushina E, Pomjakushin V, Sheptyakov D, Chernyshov D, Svitlyk V, Conder K
The synthesis, and crystal and magnetic structure of the iron selenide BaFe2Se3 with possible superconductivity at Tc=11K
JOURNAL OF PHYSICS-CONDENSED MATTER **23**, 402201 (2011)

Krzton-Maziopa A, Shermadini Z, Pomjakushina E, Pomjakushin V, Bendele M, Amato A, Khasanov R, Luetkens H, Conder K
Synthesis and crystal growth of Cs0.8(FeSe0.98)2: a new iron-based superconductor with Tc=27K
JOURNAL OF PHYSICS-CONDENSED MATTER **23**, 052203 (2011)

Lefmann K, Filges U, Treue F, Kirkensgard JJK, Plesner B, Hansen KS, Kleno KH
Optimal shape of a cold-neutron triple-axis spectrometer
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **634**, S1 (2011)

Maisuradze A, Shengelaya A, Amato A, Pomjakushina E, Keller H
Muon spin rotation investigation of the pressure effect on the magnetic penetration depth in YBa2Cu3Ox
PHYSICAL REVIEW B **84**, 184523 (2011)

Medarde M, Moormann R, Frison R, Puzniak RJ, Pomjakushina E, Conder K, Platacis E, Dai Y, Kiselev D, Zanini L, Torok S, Zagyvai P, Heinitz S, Neuhausen J, Schumann D, Thomsen K
Lead-gold eutectic: An alternative liquid target material candidate for high power spallation neutron sources
JOURNAL OF NUCLEAR MATERIALS **411**, 72 (2011)

Muehlbauer S, Gvasaliya SN, Pomjakushina E, Zheludev A
Double-k phase of the Dzyaloshinskii-Moriya helimagnet Ba2CuGe2O7
PHYSICAL REVIEW B **84**, 180406(R) (2011)

Mulders AM, Bartkowiak M, Hester JR, Pomjakushina E, Conder K
Ferrolectric charge order stabilized by antiferromagnetism in multiferroic LuFe2O4
PHYSICAL REVIEW B **84**, 140403 (2011)

Piegsa FM, van den Brandt B, Hautle P, Konter JA
The neutron spin phase imaging technique applied to dia-and paramagnetic samples
PHYSICA B **406**, 2409-2411 (2011)

Pikart PH, Hugenschmidt CH, Horisberger M, Matsukawa Y, Hatakeyama M, Toyama T, Nagai Y
Positron annihilation in Cr, Cu, and Au layers embedded in Al and quantum confinement of positrons in Au clusters
PHYSICAL REVIEW B **84**, 014106 (2011)

Podlesnyak A, Ehlers G, Frontzek M, Sefat AS, Furrer A, Straessle TH, Pomjakushina E, Conder K, Demmel F, Khomskii DI
Effect of carrier doping on the formation and collapse of magnetic polarons in lightly hole-doped La1-xSrxCoO3
PHYSICAL REVIEW B **83**, 134430 (2011)

Pomjakushin V, Pomjakushina E, Krzton-Maziopa A, Conder K, Shermadini Z
Room temperature antiferromagnetic order in superconducting XyFe2−xSe2(X=Rb, K): a neutron powder diffraction study
JOURNAL OF PHYSICS-CONDENSED MATTER **23**, 156003 (2011)

Pomjakushin VYU, Sheptyakov DV, Pomjakushina EV, Krzton-Maziopa A, Conder K, Chernyshov D, Svitlyk V, Shermadini Z
Iron-vacancy superstructure and possible room-temperature antiferromagnetic order in superconducting CsyFe2-xSe2
PHYSICAL REVIEW B **83**, 144410 (2011)

Scherrer B, Harvey AS, Tanasescu S, Teodorescu F, Botea A, Conder K, Nicholas Grundy A, Martynczuk J, Gauckler LJ
Correlation between electrical properties and thermodynamic stability of ACoO3-d perovskites (A=La, Pr, Nd, Sm, Gd)
PHYSICAL REVIEW B **84**, 085113 (2011)

Seyfarth G, Jaccard D, Pedrazzini P, Krzton-Maziopa A, Pomjakushina E, Conder K, Shermadini Z
Pressure cycle of superconducting Cs0.8Fe2Se2: A transport study
SOLID STATE COMMUNICATIONS **151**, 747-750 (2011)

Shermadini Z, Krzton-Maziopa A, Bendele M, Khasanov R, Luetkens H, Conder K, Pomjakushina E, Weyeneth S, Pomjakushin V, Bossen O, Amato A
Coexistence of Magnetism and Superconductivity in the Iron-Based Compound Cs0.8(FeSe0.98)2
PHYSICAL REVIEW LETTERS **106**, 117602 (2011)

Simmen F, Foelske-Schmitz A, Verma P, Horisberger M, Lippert TH, Novak P, Schneider CW, Wokaun A
Surface layer formation on Li1+xMn2O4-d thin films electrodes during electrochemical cycling
ELECTROCHIMICA ACTA **56**, 8539-8544 (2011)

Simmen F, Horisberger M, Seyfang B, Lippert T, Novak P, Doebeli M, Mallepell M, Schneider CW, Wokaun A
Glassy carbon- A promising substrate material for pulsed laser deposition of thin Li1+xMn2O4-d electrodes
APPLIED SURFACE SCIENCE **257**, 5347-5353 (2011)

Speller SC, Britton TB, Hughes G, Lozano-Perez S, Boothroyd AT, Pomjakushina E, Conder K, Grovenor CRM
Analysis of local chemical and structural inhomogeneities in FeySe1xTex single crystals
APPLIED PHYSICS LETTERS **99**, 192504 (2011)

Stahn J, Panzner T, Filges U, Marcelot C, Boeni P
Study on a focusing, low-background neutron delivery system
NUCLEAR INSTRUMENTS AND METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **634**, S12 (2011)

Stoykov A, Scheuermann R, Amato A, Bartkowiak M, Konter JA, Rodriguez J, Sedlak K
A lens-coupled scintillation counter in cryogenic environment
JOURNAL OF INSTRUMENTATION **6**, P02003 (2011)

Svitlyk V, Chernyshov D, Pomjakushina E, Krzton-Maziopa A, Conder K, Pomjakushin V, Dmitriev V
Temperature and Pressure Evolution of the Crystal Structure of Ax(Fe1-ySe)2(A=Cs,Rb,K) Studied by Synchrotron Powder Diffraction
INORGANIC CHEMISTRY **50**, 10703-10708 (2011)

Thiyagarajan R, Deng G, Arumugam S, Mohan Radheep D, Devarajan U, Murugeswari A, Mandal P, Pomjakushina E, Conder K
Effect of magnetic field and pressure on charge-orbital ordering in Pr(Sr1xCax)2Mn2O7 (x=0.4 and 0.9) single crystals
JOURNAL OF APPLIED PHYSICS **110**, 093905 (2011)

Udby L, Willendrup PK, Knudsen E, Niedermayer C, Filges U, Christensen NB, Farhi E, Wells BO, Lefmann K
Analysing neutron scattering data using McStas virtual experiments
NUCLEAR INSTRUMENTS & METHODS IN PHYSICS RESEARCH SECTION A-ACCELERATORS SPECTROMETERS DETECTORS AND ASSOCIATED EQUIPMENT **634**, S138 (2011)

Wojek BM, Weyeneth S, Bosma S, Pomjakushina E, Puzniak R
Mixed state of La1.83Sr0.17CuO4 studied by means of muon-spin rotation and magnetization experiments in a low magnetic field
PHYSICAL REVIEW B **84**, 144521 (2011)

Zhou KJ, Radovic M, Schlappa J, Strocov V, Frison R, Mesot J, Patthey L, Schmitt T
Localized and delocalized Ti 3d carriers in LaAlO3/SrTiO3 superlattices revealed by resonant inelastic x-ray scattering
PHYSICAL REVIEW B **83**, 201402 (2011)

INVITED TALKS

K. Conder
Synthesis and crystal growth of the new iron-based superconductor $Cs_{0.8}(FeSe_{0.98})_2$ with TC=27K
MaNEP Meeting
Geneva, Switzerland, May 30, 2011

K. Conder
Crystal growth of cuprate and iron chalcogenide superconductors by travelling floating zone and Bridgman methods
Seminar at Shanghai Jiao Tong University
Shanghai, China, June 3, 2011

K. Conder, E. Pomjakushina
Crystal growth of complex oxides by Travelling Solvent Floating Zone (TSFZ) method
SLS Symposium on Crystal Growth and Charactrization
PSI Villigen, Switzerland, September 6, 2011

K. Conder, G. Deng, E. Pomjakushina
Crystal growth of cuprate spin ladder compounds by Optical Floating Zone Technique
Seminar at Bharathidasan University
Tiruchirappalli, India, October 3, 2011

M. Kenzelmann
Multiple-order phases in materials close to a quantum critical point
Spectroscopy Workshop on Novel Materials
Beatenberg, Switzerland, March 3-7, 2011

M. Kenzelmann
Magnetically-driven electric polarization in magneto-electrics and multiferroics
Novel Phenomena in Frustrated Systems
Santa Fe, USA, May 22-27, 2011

M. Kenzelmann
Magnetically-driven electric polarization in magneto-electrics and multiferroics
Joined CIfAR/FCM meeting (Canadian Institute for Advanced Research/Japanese network of Frustration in Condensed Matter Physics)
Vancouver, Canada, May 28-31, 2011

M. Kenzelmann
Magnetically-driven electric polarization in magneto-electrics and multiferroics
International Symposium on Integrated Functionalities (ISIF)
Cambridge, United Kingdom, July 31 - August 4, 2011

M. Kenzelmann
Introduction to multiferroic materials
10th PSI Summer School
Zugerberg, Switzerland, August 13-22, 2011

M. Kenzelmann
Neutron scattering at the Paul Scherrer Institut
Hanaro Neutron group
Daejeon, South Korea, August 22, 2011

M. Kenzelmann
Multifunctionality in magnetic ferroelectrics
Institute of Physics (Bejing)-PSI joint workshop
Beijing, China, October 20-21, 2011

M. Koennecke
The State of NeXus
APS Seminar
Zurich, Switzerland, February 24-28, 2011

M. Medarde
Solid-solid and solid-liquid phase transitions in lead-gold eutectic
Workshop on time of flight instrument for powder diffraction, small angle scattering and imaging (TIPSI)
Sønderborg, Denmark, September 9-11, 2011

M. Medarde
The metal-insulator transition in $RNiO_3$ perovskites
International Meeting on Materials for Electronic Applications
Agadir, Morocco, September 14-16, 2011

E. Pomjakushina, A. Krzton-Maziopa, K. Conder, V.Yu. Pomjakushin
FeSe-based superconductors (11, 122-type): phase diagram, synthesis and crystal growth, structural and magnetic properties
EMRS Fall Meeting 2011
Warsaw, Poland, September 19-23, 2011

E. Pomjakushin, K. Conder, V.Yu. Pomjakushin, M. Bendele, R. Khasanov
FeSe-based superconductors (11, 122-type): phase diagram, synthesis and crystal growth, structural and magnetic properties
SLS Symposium on Crystal Growth and Charactrization
PSI, Villigen, Switzerland, September 6, 2011

P. Hautle
DNP using photo-excited triplet states
3rd International Symposium on Dynamic Nuclear Polarization
EPFL
Lausanne, Switzerland, September 7-10, 2011

P. Hautle
DNP using photo-excited triplet states and its application to spin filter neutrons
EU Workshop FP7 SPINMAP
Linz, Germany, December 6-8, 2011

CONFERENCE, WORKSHOP AND SEMINAR CONTRIBUTIONS, POSTERS

M. Bartkowiak, U. Filges, T. Panzner
Neutron optics in cryogenic sample environment
5th European Conference on Neutron Scattering (ECNS 2011)
Prague, Czech Republic, July 17–22, 2011, poster

M. Bartkowiak, M. Zolliker
Sample environment news
JUM@P'11: Joint Users' Meeting at PSI
Villigen PSI, Switzerland, September 15-16, 2011, poster

K. Conder, E. Pomjakushina, A. Krzton-Maziopa, M. Bendele, R. Khasanov, V.Yu. Pomjakushin
Fe_{1+y} Se_xTe_{1-x} *superconductors: synthesis, crystal growth, structural, superconducting and magnetic properties, isotope effect*
MRS Spring Meeting
San Francisco, USA, April 25-29, 2011, talk

K. Conder, G. Deng, E. Pomjakushina
Crystal growth of cuprate spin ladder compounds by Optical Floating Zone Technique
EMRS Fall Meeting 2011
Warsaw, Poland, September 19-23, 2011, talk

K. Conder, G. Deng, E. Pomjakushina
Crystal growth of cuprate spin ladder compounds by Optical Floating Zone Technique
International Conference on High Pressure Science and Technology
Mumbai, India, September 25-30, 2011, talk

T.R. Eichhorn, M. Haag, B. van den Brandt, A. Comment, P. Hautle
Dynamic nuclear polarization via the photo-excited triplet state of pentacene-doped naphthalene crystals
Joint Annual Meeting of the Swiss Physical Society and Austrian Physical Society
Lausanne, Switzerland, June 15-17, 2011, poster

T.R. Eichhorn, M. Haag, B. van den Brandt, A. Comment, P. Hautle
A setup for triplet-state DNP on pentacene-doped naphthalene crystals
3rd International Symposium on Dynamic Nuclear Polarization
Lausanne, EPFL
Switzerland, September 7-10, 2011, poster

U. Filges, P. Hautle, M. Haag, T.R. Eichhorn, B. van den Brandt, M. Schneider, T. Panzner
Present status and first experiments at the new SINQ Beamline BOA
JUM@P'11: Joint Users' Meeting at PSI
PSI Villigen, Switzerland, September 15-16, 2011, poster

Th. Gahl, U. Greuter, M. Kenzelmann, M. Schild, E. Schmid, G. Theidel
The new PSI-DAQ - A core part of the 2nd generation instruments control electronics at SINQ
5th European Conference on Neutron Scattering (ECNS 2011)
Prague, Czech Republic, July 17–22, 2011, poster

M. Haag
A novel method to polarize protons and its application as a neutron spin filter
Joint Annual Meeting of the Swiss Physical Society and Austrian Physical Society
Lausanne, Switzerland, June 15-17, 2011, talk

M. Haag, T.R. Eichhorn, B. van den Brandt, P. Hautle
Polarizing protons using photoexcited triplet states and its application to build a neutron spin filter
3rd International Symposium on Dynamic Nuclear Polarization
EPFL
Lausanne, Switzerland, September 7-10, 2011, poster

M. Haag, T.R. Eichhorn, B. van den Brandt, P. Hautle
Polarizing protons using photoexcited triplet states and its application to build a neutron spin filter
JUM@P'11: Joint Users' Meeting at PSI
PSI Villigen, Switzerland, September 15-16, 2011, poster

A. Krzton-Maziopa, E. Pomjakushina, V. Pomjakushin, K. Conder
Crystal growth, structure and superconducting properties of alkali metal intercalated 122-iron selenides
Swiss Workshop on Materials with Novel Electronic Properties Basic research and applications
Les Diablerets, Switzerland, June 29 - July 1, 2011, poster

A. Krzton-Maziopa, E. Pomjakushina, V. Pomjakushin, K. Conder
Micro-XRF studies of alkali metal intercalated iron-chalcogenide superconductors
E-MRS 2011 Fall Meeting
Warsaw, Poland, September 19-23, 2011, poster

A. Krzton-Maziopa, E. Pomjakushina, V. Pomjakushin, K. Conder
Crystal growth and superconductivity of alkali metal intercalated iron-chalcogenides
XV Krajowa Szkola Nadprzewodnictwa
Kazimierz Dolny/ Lublin, Poland, October 9-13, 2011, poster

M. Medarde, R. Frison, E. Pomjakushina, K. Conder, L. Keller, L. Josic, E. Lehmann
Lead gold eutectic: an alternative liquid target material for spallation neutron sources
5th European Conference on Neutron Scattering (ECNS 2011)
Prague, Czech Republic, July 17-22, 2011, talk

T. Panzner, U. Filges, Y. Bodenthin, J. Stahn, M. Wohlmuther, A. Bollhalder, Th. Muehlebach, M. Schild
The new beamline for neutron optics and other approaches – BOA
5th European Conference on Neutron Scattering (ECNS 2011)
Prague, Czech Republic, July 17–22, 2011, talk

T. Panzner, J. Stahn, U. Filges
Report from PSI
NMI3 general assembly, Workshop Neutron Optics
Rom, Fiumicino, Italy, November 8–9, 2011, talk

E. Pomjakushina, A. Krzton-Maziopa, K. Conder, V.Yu. Pomjakushin,
FeSe-based superconductors (11, 122-type): phase diagram, synthesis and crystal growth and characterization
IUCR 2011
Madrid, Spain, August 22 -30, 2011, poster

E. Pomjakushina, A. Krzton-Maziopa, K. Conder
New alkali metal intercalated FeSe superconductors (122-type) with TC around 30K
5th European Conference on Neutron Scattering (ECNS 2011)
Prague, Czech Republic, July 17-22, 2011, poster

E. Pomjakushina
$Fe_{1+y}Se_xTe_{1-x}$ *superconductors: phase diagram, crystal growth, structural and magnetic properties*
MaNEP Workshop
Neuchâtel, Switzerland, January 17-18, 2011, talk

M. Schneider, C. Schanzer, T. Panzner, Y. Bodenthin, U. Filges, P. Boeni, J. Stahn, M. Kenzelmann
Adpative optics for neutrons
5th European Conference on Neutron Scattering (ECNS 2011)
Prague, Czech Republic, July 17–22, 2011, poster

S. Wang, E. Pomjakushina, Ch. Ruegg, H.M. Ronnow, K. Conder
Crystal growth and characterization of the dilutable frustrated spin-lader compound $Bi(Cu_{1-X}Zn_X)_2PO_6$
TIT-EPFL Workshop
Chateau-d'Oex, Switzerland, March 13-16, 2011, invited talk and poster

S. Wang, E. Pomjakushina, Ch. Ruegg, H.M. Ronnow, K. Conder
Crystal growth and characterization of the dilutable frustrated spin-lader compound $Bi(Cu_{1-X}Zn_X)_2PO_6$
MANEP Workshop
Les Diablerets, Switzerland, June 27 - July 1, 2011, poster

AWARDS, PRIZES AND NOMINATION:

K. Conder
Titular Professor
ETHZ D-MATL, Zurich, Switzerland

BOOKS/ BOOK CHAPTERS/ REPORTS

S. Wang, H.M. Ronnow
Bose-Einstein condensation of degenerate incommensurate magnons in $BiCu_2PO_6$
CNRS Annual Process Report (2011-not yet published)

MEMBERSHIP IN EXTERNAL COMMITTEES

H. Grimmer
- Consultant Commission on mathematical and theoretical Crystallography International Union of Crystallography, (2008-2011)
- General Editorial Board Member Journal “Symmetry” (since 2009)

M. Kenzelmann

- Executive Committee of the NIST Center for Neutron Research User Group, Member at large NIST, US Department of Commerce, Gaithersburg, USA (since 2008)
- Swiss Neutron Scattering Society, Board Member (since 2009) Swiss Neutron Scattering Society, Villigen PSI, Switzerland
- Executive Committee, HYSPEC instrument development team (since 2010) Oak Ridge National Laboratory, Oak Ridge, USA (since 2010)
- Organizer, European School on Multiferroics 5, Ascona (2012)
- Organizing committee, JUM@P Joint Users' Meeting 2011, Villigen PSI
- Organizing committee, 10th PSI Summer School 2011, Zugerberg, Switzerland
- On-site reviewer, Condensed Matter Physics, Brookhaven National Lab, USA (2011).
- Ph.D. examiner, Shane M. Lawrence, Curtin Technical University, Perth.

M. Könnecke

- NeXus International Advisory Committee, Chairman, FRM-II Munich, Germany (2008-2011)

M. Medarde

- PhD (Aura Janeth Barón González, *Study of the electronic mechanisms in the Cobalt perovskites* $Pr_{0.5}Ca_{0.5}CoO_3$, *(Pr,Y,Ca)*CoO_3 *and* La_2MnCoO_6*)*, Universidad Autónoma de Barcelona, Bellaterra, Spain

CONGRESSES ORGANIZED

M. Könnecke
Pan-data Data Format Workshop
Paris, France, February 9, 2011

Mark Koennecke / P. Jemian
NeXus Code Camp
Argonne, USA, October 20-22, 2011

DEPARTMENT OF BIOLOGY AND CHEMISTRY

BIOMOLECULAR RESEARCH
CENTER FOR RADIOPHARMACEUTICAL SCIENCES
RADIOCHEMISTRY AND ENVIRONMENTAL CHEMISTRY

BIOMOLECULAR RESEARCH

LIST OF PUBLICATIONS

Peer-reviewed articles

J.P. Abrahams, R. Apweiler, R. Balling, M.G. Bertero, J.M. Bujnicki, N.E. Chayen, P. Chene, G.L. Corthals, T. Dylag, F. Forster, A.J. Heck, P.J. Henderson, R. Herwig, P. Jehenson, S.J. Kokalj, E. Laue, P. Legrain, L. Martens, C. Migliorini, A. Musacchio, M. Podobnik, G.F. Schertler, G. Schreiber, T.K. Sixma, A.B. Smit, D. Stuart, D.I. Svergun, M.J. Taussig
"4D Biology for health and disease" workshop report
N Biotechnol **28**, 291-293 (2011)

A. Akhmanova, M.O. Steinmetz
Microtubule end binding: EBs sense the guanine nucleotide state
Curr Biol **21**, R283-285 (2011)

E. Arbely, E. Natan, T. Brandt, M.D. Allen, D.B. Veprintsev, C.V. Robinson, J.W. Chin, A.C. Joerger, A.R. Fersht
Acetylation of lysine 120 of p53 endows DNA-binding specificity at effective physiological salt concentration
Proc Natl Acad Sci USA **108**, 8251-8256 (2011)

K. Ballmer-Hofer, A.E. Andersson, L.E. Ratcliffe, P. Berger
Neuropilin-1 promotes VEGFR-2 trafficking through Rab11 vesicles thereby specifying signal output
Blood **118**, 816-826 (2011)

M. Balsera, R.M. Buey, X.D. Li
Quaternary structure of the oxaloacetate decarboxylase membrane complex and mechanistic relationships to pyruvate carboxylases
J Biol Chem **286**, 9457-9467 (2011)

N. Beecher, A.M. Roseman, T.A. Jowitt, R. Berry, H. Troilo, R.A. Kammerer, C.A. Shuttleworth, C.M. Kielty, C. Baldock
Collagen VI, conformation of A-domain arrays and microfibril architecture
J Biol Chem **286**, 40266-40275 (2011)

P. Berger, K. Ballmer-Hofer
The reception and the party after: how vascular endothelial growth factor receptor 2 explores cytoplasmic space
Swiss Med Wkly **141**, w13318 (2011)

P. Berger, K. Tersar, K. Ballmer-Hofer, U. Suter
The CMT4B disease-causing proteins MTMR2 and MTMR13/SBF2 regulate AKT signalling
J Cell Mol Med **15**, 307-315 (2011)

F. Bourquin, G. Capitani, M.G. Grutter
PLP-dependent enzymes as entry and exit gates of sphingolipid metabolism
Protein Sci **20**, 1492-1508 (2011)

M.S. Brozzo, S. Bjelic, K. Kisko, T. Schleier, V.M. Leppanen, K. Alitalo, F.K. Winkler, K. Ballmer-Hofer
Thermodynamic and structural description of allosterically regulated VEGF receptor 2 dimerization
Blood, Dec 29. [Epub ahead of print] (2011)

R.M. Buey, R. Mohan, K. Leslie, T. Walzthoeni, J.H. Missimer, A. Menzel, S. Bjelic, K. Bargsten, I. Grigoriev, I. Smal, E. Meijering, R. Aebersold, A. Akhmanova, M.O. Steinmetz
Insights into EB1 structure and the role of its C-terminal domain for discriminating microtubule tips from the lattice
Mol Biol Cell **22**, 2912-2923 (2011)

K.H. Bui, G. Pigino, T. Ishikawa
Three-dimensional structural analysis of eukaryotic flagella/cilia by electron cryo-tomography
J Synchrotron Radiat **18**, 2-5 (2011)

S. Demarche, K. Sugihara, T. Zambelli, L. Tiefenauer, J. Voros
Techniques for recording reconstituted ion channels
Analyst **136**, 1077-1089 (2011)

X. Deupi, J. Standfuss
Structural insights into agonist-induced activation of G-protein-coupled receptors
Curr Opin Struct Biol **21**, 541-551 (2011)

X. Deupi, P. Edwards, A. Singhal, B. Nickle, D. Oprian, G. Schertler, J. Standfuss
Stabilized G protein binding site in the structure of constitutively active metarhodopsin-II
Proc Natl Acad Sci U S A 109, 119-24. (2011)

S. Eustermann, H. Videler, J.C. Yang, P.T. Cole, D. Gruszka, D. Veprintsev, D. Neuhaus
The DNA-binding domain of human PARP-1 interacts with DNA single-strand breaks as a monomer through its second zinc finger
J Mol Biol **407**, 149-170 (2011)

D.M. Glubb, E. Cerri, A. Giese, W. Zhang, O. Mirza, E.E. Thompson, P. Chen, S. Das, J. Jassem, W. Rzyman, M.W. Lingen, R. Salgia, F.R. Hirsch, R. Dziadziuszko, K. Ballmer-Hofer, F. Innocenti
Novel functional germline variants in the VEGF receptor 2 gene and their effect on gene expression and microvessel density in lung cancer
Clin Cancer Res **17**, 5257-5267 (2011)

A. Gonzalez, T. Perez-Acle, L. Pardo, X. Deupi
Molecular basis of ligand dissociation in beta-adrenergic receptors
PLoS One **6**, e23815 (2011)

Z. Guo, N. Hauser, A. Moreno, T. Ishikawa, P. Walde
AOT vesicles as templates for the horseradish peroxidase-triggered polymerization of aniline
Soft Matter **7**, 180-193 (2011)

A. Huwiler, F. Bourquin, N. Kotelevets, O. Pastukhov, G. Capitani, M.G. Grutter, U. Zangemeister-Wittke
A prokaryotic S1P lyase degrades extracellular S1P in vitro and in vivo: implication for treating hyperproliferative disorders
PLoS One **6**, e22436 (2011)

K. Kisko, M.S. Brozzo, J. Missimer, T. Schleier, A. Menzel, V.M. Leppanen, K. Alitalo, T. Walzthoeni, R. Aebersold, K. Ballmer-Hofer
Structural analysis of vascular endothelial growth factor receptor-2/ligand complexes by small-angle X-ray solution scattering
FASEB J **25**, 2980-2986 (2011)

D. Kitagawa, I. Vakonakis, N. Olieric, M. Hilbert, D. Keller, V. Olieric, M. Bortfeld, M.C. Erat, I. Fluckiger, P. Gonczy, M.O. Steinmetz
Structural basis of the 9-fold symmetry of centrioles
Cell **144**, 364-375 (2011)

V.M. Leppanen, M. Jeltsch, A. Anisimov, D. Tvorogov, K. Aho, N. Kalkkinen, P. Toivanen, S. Yla-Herttuala, K. Ballmer-Hofer, K. Alitalo
Structural determinants of vascular endothelial growth factor-D receptor binding and specificity
Blood **117**, 1507-1515 (2011)

S. Maeda, T. Tsukihara
Structure of the gap junction channel and its implications for its biological functions
Cell Mol Life Sci **68**, 1115-1129 (2011)

F.M. Megli, E. Conte, T. Ishikawa
Cholesterol attenuates and prevents bilayer damage and breakdown in lipoperoxidized model membranes. A spin labeling EPR study
Biochim Biophys Acta **1808**, 2267-2274 (2011)

R. Melero, S. Rajagopalan, M. Lazaro, A.C. Joerger, T. Brandt, D.B. Veprintsev, G. Lasso, D. Gil, S.H. Scheres, J.M. Carazo, A.R. Fersht, M. Valle
Electron microscopy studies on the quaternary structure of p53 reveal different binding modes for p53 tetramers in complex with DNA
Proc Natl Acad Sci USA **108**, 557-562 (2011)

R. Moukhametzianov, T. Warne, P.C. Edwards, M.J. Serrano-Vega, A.G. Leslie, C.G. Tate, G.F. Schertler
Two distinct conformations of helix 6 observed in antagonist-bound structures of a beta1-adrenergic receptor
Proc Natl Acad Sci USA **108**, 8228-8232 (2011)

S. Nakagawa, X.Q. Gong, S. Maeda, Y. Dong, Y. Misumi, T. Tsukihara, D. Bai
Asparagine 175 of connexin32 is a critical residue for docking and forming functional heterotypic gap junction channels with connexin26
J Biol Chem **286**, 19672-19681 (2011)

G. Pigino, K.H. Bui, A. Maheshwari, P. Lupetti, D. Diener, T. Ishikawa
Cryoelectron tomography of radial spokes in cilia and flagella
J Cell Biol **195**, 673-687 (2011)

C. Rajendran, E.C. Gerhardt, S. Bjelic, A. Gasperina, M. Scarduelli, F.O. Pedrosa, L.S. Chubatsu, M. Merrick, E.M. Souza, F.K. Winkler, L.F. Huergo, X.D. Li
Crystal structure of the GlnZ-DraG complex reveals a different form of PII-target interaction
Proc Natl Acad Sci USA **108**, 18972-18976 (2011)

M. Rossmann, M. Sukumaran, A.C. Penn, D.B. Veprintsev, M.M. Babu, I.H. Greger
Subunit-selective N-terminal domain associations organize the formation of AMPA receptor heteromers
EMBO J **30**, 959-971 (2011)

K. Sansuk, X. Deupi, I.R. Torrecillas, A. Jongejan, S. Nijmeijer, R.A. Bakker, L. Pardo, R. Leurs
A structural insight into the reorientation of transmembrane domains 3 and 5 during family A G protein-coupled receptor activation
Mol Pharmacol **79**, 262-269 (2011)

M.A. Scharer, A.C. Eliot, M.G. Grutter, G. Capitani
Structural basis for reduced activity of 1-aminocyclopropane-1-carboxylate synthase affected by a mutation linked to andromonoecy
FEBS Lett **585**, 111-114 (2011)

J. Standfuss, P.C. Edwards, A. D'Antona, M. Fransen, G. Xie, D.D. Oprian, G.F. Schertler
The structural basis of agonist-induced activation in constitutively active rhodopsin
Nature **471**, 656-660 (2011)

H. Stehr, S.H. Jang, J.M. Duarte, C. Wierling, H. Lehrach, M. Lappe, B.M. Lange
The structural impact of cancer-associated missense mutations in oncogenes and tumor suppressors
Mol Cancer **10**, 54 (2011)

M.J. Stroud, R.A. Kammerer, C. Ballestrem
Characterization of G2L3 (GAS2-like 3), a new microtubule- and actin-binding protein related to spectraplakins
J Biol Chem **286**, 24987-24995 (2011)

R.M. Stroud, G.F. Schertler
Membranes
Curr Opin Struct Biol **21**, 495-496 (2011)

A. Studer, S. Demarche, D. Langenegger, L. Tiefenauer
Integration and recording of a reconstituted voltage-gated sodium channel in planar lipid bilayers
Biosens Bioelectron **26**, 1924-1928 (2011)

E.E. Tarttelin, M.P. Fransen, P.C. Edwards, M.W. Hankins, G.F. Schertler, R. Vogel, R.J. Lucas, J. Bellingham
Adaptation of pineal expressed teleost exo-rod opsin to non-image forming photoreception through enhanced Meta II decay
Cell Mol Life Sci **68**, 3713-3723 (2011)

M. van Breugel, M. Hirono, A. Andreeva, H.A. Yanagisawa, S. Yamaguchi, Y. Nakazawa, N. Morgner, M. Petrovich, I.O. Ebong, C.V. Robinson, C.M. Johnson, D. Veprintsev, B. Zuber
Structures of SAS-6 suggest its organization in centrioles
Science **331**, 1196-1199 (2011)

B. van der Vaart, C. Manatschal, I. Grigoriev, V. Olieric, S.M. Gouveia, S. Bjelic, J. Demmers, I. Vorobjev, C.C. Hoogenraad, M.O. Steinmetz, A. Akhmanova
SLAIN2 links microtubule plus end-tracking proteins and controls microtubule growth in interphase
J Cell Biol **193**, 1083-1099 (2011)

C. Vehlow, H. Stehr, M. Winkelmann, J.M. Duarte, L. Petzold, J. Dinse, M. Lappe
CMView: interactive contact map visualization and analysis
Bioinformatics **27**, 1573-1574 (2011)

T. Warne, R. Moukhametzianov, J.G. Baker, R. Nehme, P.C. Edwards, A.G. Leslie, G.F. Schertler, C.G. Tate
The structural basis for agonist and partial agonist action on a beta(1)-adrenergic receptor
Nature **469**, 241-244 (2011)

G. Xie, A.M. D'Antona, P.C. Edwards, M. Fransen, J. Standfuss, G.F. Schertler, D.D. Oprian
Preparation of an activated rhodopsin/transducin complex using a constitutively active mutant of rhodopsin
Biochemistry **50**, 10399-10407 (2011)

BOOK CHAPTERS

T. Ishikawa
Organization of dyneins and associated regulatory systems in the axoneme
In "Dyneins: Structure, Biology and Disease", edited by S. M. King, Academic Press of Elsevier Science & Technology, London, ISBN: 978-0123820044 (2011)

PATENT

L. Tiefenauer, E. Müller, I. Imhof, H. Schift
A method for producing a polymer-based microfluidics system for bioanalytics using biological membranes
Application No: 11 163 710.4: E. P. Office (2011)

Non-peer-reviewed articles

A. Kriz, K. Schmid, K. Ballmer-Hofer, P. Berger
Integration of multiple expression cassettes into mammalian genomes in a single step
Nature protocol exchange, doi:10.1038/ protex.2011.249 (2011)

A. Kriz, K. Schmid, K. Ballmer-Hofer, P. Berger
MultiLabel: Multigene Expression in Mammalian Cells
G.I.T. Laboratory Journal **15 (3-4)**, 12 - 13 (2011)

A. Kriz, K. Schmid, K. Ballmer-Hofer, P. Berger
MultiLabel: Multigenexpression in Säugerzellen
GIT Labor-Fachzeitschrift **55**, 776 - 777 (2011)

CONFERENCE PROCEEDINGS

Daiju Kitagawa, Ioannis Vakonakis, Olieric Natacha, Hilbert Manuel, Debora Keller, Vincent Olieric, Miriam Bortfeld, Michèle C. Erat, Isabelle Flückiger, Pierre Gönczy, Michel O. Steinmetz
9th Symposium of the NCCR Structural Biology 2011
Zürich, Switzerland, September 1-2, 2011
Poster presentation: Structural Basis of the 9-fold Symmetry of Centrioles

Daiju Kitagawa, Ioannis Vakonakis, Olieric Natacha, Hilbert Manuel, Debora Keller, Vincent Olieric, Miriam Bortfeld, Michèle C. Erat, Isabelle Flückiger, Pierre Gönczy, Michel O. Steinmetz
EMBO Conference Series Centrosomes and Spindle Pole Bodies
Barcelona, Spain, October 2–6, 2011
Poster presentation: Structural Basis of the 9-fold Symmetry of Centrioles

In-situ reconstitution of proteobilayer in nanopores
S. Demarche, K. Sugihara, L. Tiefenauer, J. Vörös
Europ. Sci. Foundations, *Biological Surfaces and Interfaces*, Sant Feliu de Guixols (Costa Brava) Spain, June 26 – July 1, 2011.

Reconstitution of transporters into planar lipid bilayers within microfluidic systems
I. Imhof , S. Demarche, S. Krämer, L. Tiefenauer
Membrane transporters in drug discovery, Grindelwald, Switzerland, August 7-11, 2011

Caroline AC Hyde, Alexandra Giese, Edward Stuttfeld, Kurt Ballmer-Hofer
8th International Symposium on the Biology of Endothelial Cells
Zurich, Switzerland, June 15-18, 2011
Poster presentation: VEGR-2 inhibition by specific extracellular domain binders

Invited Talks

T. Ishikawa
3D structural analysis of eukaryotic flagella/cilia to reveal their bending mechanism
6th Electron Tomography Conference, EMBL, Heidelberg, Germany, May 7, 2011

T. Ishikawa
3D structural analysis of flagella/cilia by cryo-electron tomography
Kazato-prize award ceremony, Fukuoka, Japan, May 16, 2011

T. Ishikawa
3D structure of axonemal dynein revealed by electron cryo-tomography
Gordon Research Conference in Muscle and Molecular Motors, New London, NH, USA, July 12, 2011

T. Ishikawa
In situ structural analysis of axonemal dyneins in flagella/cilia by electron cryotomography
Ninth international conference of AAA proteins, Kumamoto, Japan, November 9, 2011

T. Ishikawa
Structural analysis of eukaryotic flagella/cilia
12th RIES-Hokudai Symposium, Sapporo, Japan, November 22, 2011

T. Ishikawa
Electron cryo-tomography reveals the three-dimensional ultrastructure of flagella
The Neuroscience Seminar Series, CAESAR, Bonn, Germany, November 29, 2011

M.O. Steinmetz
Mechanisms of centriole formation
Annual meeting of the American Society of Nephrology 2011
Philadelphia, USA, November 10, 2011

M.O. Steinmetz
Mechanisms of centriole formation
EMBO Members Meeting 2011
Heidelberg, Germany, October 26-28, 2011

M.O. Steinmetz
Molecular mechanisms of microtubule tip tracking and centriole formation
Biochemie Zentrum Heidelberg, University of Heidelberg
Heidelberg, Germany, November 28, 2011

M.O. Steinmetz
Molecular mechanisms of microtubule tip tracking and centriole formation
Mari Lowe Seminar Series, University of Pennsylvania
Philadelphia, USA, November 9, 2011

M.O. Steinmetz
Molecular mechanisms of microtubule tip tracking and centriole formation
Pathology and Cell Biology Seminar Series, Columbia University
New York, USA, November 7, 2011

M.O. Steinmetz
Molecular mechanisms of microtubule tip tracking and centriole formation
Biozentrum, University of Basel
Basel, Switzerland, June 21, 2011

M.O. Steinmetz
Molecular mechanisms of microtubule tip tracking and centriole formation
Institute for Atomic and Molecular Physics
Amsterdam, The Netherlands, June 10, 2011

M.O. Steinmetz
Molecular mechanisms of microtubule tip tracking and centriole formation
Instituto Gulbenikan de Ciencia
Oeiras, Portugal, May 20, 2011

M.O. Steinmetz
Structure-function relationship of proteins regulating the microtubule cytoskeleton
Cancer Research UK
London, UK, April 12, 2011

N. Olieric
Structural Basis of the 9-fold Symmetry of Centrioles
Max Plank Institute of Biochemistry
Martinsried, Germany, January 17, 2011

S. Bjeliċ
Towards quantifying protein-protein interactions using synchrotron-based oxidative footprinting
Swiss Light Source, PSI
Villigen-PSI, Switzerland, June 7, 2011

S. Bjelić
Towards quantifying protein-protein interactions using synchrotron-based oxidative footprinting
25th Rhine-Knee Regional Meeting on X-ray Crystallography of Biomacromolecules
Sursee, Switzerland, September 28-30, 2011

S. Bjelić
Exploring Wet Interfaces: Role of Solvent for the EB1-p150n Interaction
Biacore and MicroCal User Meeting - Milan
Milano, Italy, September 21-22, 2011

I. Imhof
Development of a polymer-based microfluidic system for the bioanalysis of membrane proteins
NanoBioEurope Conference
Cork, Ireland, June 21-23, 2011

L. Tiefenauer
Measuring membrane proteins reconstituted in planar lipid bilayers
MPI Biophysik
Frankfurt, Germany, December 16, 2011

P. Berger
"Neuropilin-1 promotes VEGFR-2 trafficking through Rab11 vesicles"
Angiogenesis Gordon Research Conference 2011
Salve Regina University, Newport, USA

P. Berger
"MultiLabel: A new tool for multigene expression in mammalian cells"
CAPRI2010 EC workshop
Center for proteomics, Rijeka, Croatia, October, 2011

K. Ballmer
Inhibitors of Angiogenesis: design, synthesis and biological exploitation
COST CM0602, Bratislava Slovakia June 11-14, 2011

K. Ballmer
Structural and functional analysis of VEGF receptor 2; the role of distinct extracellular domains in receptor activation, and the design of new allosteric inhibitors of VEGF signaling
EC8 ETHZ 8th International Symposium on the biology of Endothelial Cells
Zurich, June 15-18, 2011

K. Ballmer
Protein Kinases and Protein Phosphorylation
FASEB summer research conferences, Snowmass, Colorado USA, July 17-22, 2011

K. Ballmer
TOR, PI3K and Akt – 20 Years On, Basel, September 11-13, 2011, Chair: Nuts and Bolts of Signaling

K. Ballmer
Von der Molekülstruktur zum Therapieansatz: Entwicklung neuer Inhibitoren zur Blockierung der Angiogenese beim Tumorwachstum und bei der Makuladegeneration
Jahrestagung der Schweiz. Ges. der Offiziere der Sanitätstruppen, Basel, September 17, 2011

K. Ballmer
Structural and functional analysis of VEGF receptor 2; the role of the membrane proximal extracellular and the transmembrane domain in receptor activation, and the design of new allosteric inhibitors of VEGF signaling
Novartis Pharma, Basel, November 3, 2011

J. Standfuss
Structures of active and inactive GPCRs: Implications for ligand binding and activation
25 years of Biostructure Research at Roche
Basel, Switzerland, November 17, 2011

J. Standfuss
Crystal Structure of Constitutively Active Rhodopsins: How an agonist can activate its GPCR
DiscoverX Technology Symposium
Strasbourg, France, September 27, 2011

J. Standfuss
Structural basis of agonist induced activation in constitutively active rhodopsin
P-cube Workshop on Mammalian Expression Technologies
Oxford, UK, April 5, 2011

J. Standfuss
Crystal structure of Metarhodopsin-II: A fully activated GPCR
Keystone Symposium "Transmembrane Signaling by GPCRs and Channels"
Taos, USA, January 24, 2011

G. Capitani
Is It Biologically Relevant? An Evolutionary Method for Distinguishing Biological Interfaces from Crystal Contacts
3DSIG 2011 Structural Bioinformatics and Computational Biophysics meeting
Vienna, Austria, July 14, 2011

G. Capitani
An evolutionary method for distinguishing biological interfaces from crystal contacts: applications to structure-based networks
EMBO|EMBL Symposium on Structure and Dynamics of Protein Networks
Heidelberg, Germany, October 14, 2011

X. Deupi
Structural basis of biased agonism in GPCRs
Experimental Biology 2011 (American Society for Pharmacology and Experimental Therapeutics)
Washington, DC (USA), 2011

MEMBERSHIPS IN EXTERNAL COMMITTEES

T. Ishikawa
BSM (Biomolecular Structure and Mechanism) PhD course in Zurich, selection committee
Associate member, EMEZ (Electron Microscopy Center, ETH Zurich)

G. Schertler
Scientific Advisory Board, Heptares Pharmaceuticals
Scientific advisory committee of MAX IV Laboratory, Sweden

UNIVERSITY LEVEL AND OTHER TEACHING

M.O. Steinmetz
Mechanisms of Microtubule Associated Proteins
Biozentrum of the University of Basel, Switzerland
November 23, 2011

G. Capitani
Lecturer in the course "Introduction to Bioinformatics: Concepts and Applications" (551-1295-00L)
ETH Zurich
HS 2011

G. Schertler
X-Ray Crystallographic Structure Determination and Biophysics.
Fundamentals of Biology IIA: Cell Biology
ETHZ 2011

Veprintsev
X-Ray Crystallographic Structure Determination and Biophysics.
ETHZ 2011

P. Berger
Cancer PhD Course
UniZH, Switzerland

K. Ballmer
Cancer PhD Course
UniZH, Switzerland

K. Ballmer
Cell signaling, Molecular virology, Experimental Cancer Research, Cancer Biology Network
Universität Basel, Switzerland

T. Ishikawa
Correlative Structural Biology with a Main Focus on Electron Microscopy, Biophysics and Macromolecular Mechanisms, CIMST Interdisciplinary Summer School on Bio-Medical Imaging, Structure Determination of Biological Macromolecules by X-ray Crystallography and NMR, Macromolecular Structure and Biophysics
ETHZ 2011

CENTER FOR RADIOPHARMACEUTICAL SCIENCES

LIST OF PUBICALTIONS

S. Däpp , E. García Garayoa, V. Maes, L. Brans, DA Tourwé, C. Müller, R. Schibli
PEGylation of (99m)Tc-labeled bombesin analogues improves their pharmacokinetic properties
Nucl Med Biol. Oct; 38(7):997-1009. (2011)

S. Lehenberger, C. Barkhausen, S. Cohrs, E. Fischer, J. Grünberg, A. Hohn, U. Köster, R. Schibli, A. Türler, K. Zhernosekov
The low-energy β(-) and electron emitter (161)Tb as an alternative to (177)Lu for targeted radionuclide therapy
Nucl Med Biol. Aug;38(6):917-24 (2011)

E. Fischer, J. Grünberg, S. Cohrs, A. Hohn, K. Waldner-Knogler, S. Jeger, K. Zimmermann, I. Novak-Hofer, R. Schibli
L1-CAM-targeted antibody therapy and (177) Lu-Radioimmunotherapy of disseminated ovarian cancer
Int J Cancer. Jul 27. doi: 10.1002/ijc.26321 (2011)

C. Müller, I.R. Iontcho, H.K.R. Santhapuram, C.P. Leamon, R. Schibli
" Tumor Targeting Using ^{67}Ga-DOTA-Bz-Folate – Investigations of Methods to Improve the Tissue Distribution of Radiofolates"
Nuclear Medicine & Biology 2011, 38 (5): 715-723

C. Müller, IR Vlahov, HK Santhapuram, CP. Leamon, R. Schibli
Tumor targeting using 67Ga-DOTA-Bz-folate--investigations of methods to improve the tissue distribution of radiofolates
Nucl Med Biol. Jul;38(5):715-23 (2011)

TM. Piscaer, C. Müller, TL. Mindt, E. Lubberts, JA. Verhaar, EP. Krenning, E. Schibli, M. De Jong, H. Weinans
Imaging of activated macrophages in experimental osteoarthritis using folate-targeted animal single-photon-emission computed tomography/computed tomography
Arthritis Rheum. Jul;63(7):1898-907. doi: 10.1002/art.30363 (2011)

S. Lehmann, E. Garayoa, A. Blanc, R. Keist, R. Schibli, M. Rudin
Recording intracellular molecular events from the outside: glycosylphosphatidylinositol-anchored avidin as a reporter protein for in vivo imaging
J Nucl Med. 2011 Mar;52(3):445-52. Feb 14 (2011)

C. Müller, R. Schibli
8 Folic acid conjugates for nuclear imaging of folate receptor-positive cancer
J Nucl Med. Jan;52(1):1-4 (2011)

C.R. Dias, S. Jeger, J.A. Osso Jr, C. Müller, Ch. De Pasquale, A. Hohn, R. Waibel, R. Schibli
"Radiolabeling of Rituximab with ^{188}Re and ^{99m}Tc Using the Tricarbonyl Technology"
Nuclear Medicine & Biology, 38: 19-28 (2011)

M. Behe, K. Alt, F. Deininger, P. Bühler, U. Wetterauer, WA.Weber, U. Elsässer-Beile, P. Wolf
In vivo testing of 177Lu-labelled anti-PSMA antibody as a new radioimmunotherapeutic agent against prostate cancer.
In Vivo Jan-Feb;25(1):55-9. PubMed PMID: 21282735 (2011)

M. Brom, L. Joosten, P. Laverman, WJ. Oyen, M. Béhé, M. Gotthardt, OC. Boerman
Preclinical evaluation of 68Ga-DOTA-minigastrin for the detection of cholecystokinin-2/gastrin receptor-positive tumors.
Mol Imaging. 10(2):144-52. PubMed PMID: 21439259; PubMed Central PMCID: PMC3123532 (2011)

T. Heidt, F. Deininger, K. Peter, J. Goldschmidt, A. Pethe, CE. Hagemeyer, I. Neudorfer, A. Zirlik, WA. Weber, C. Bode, PT. Meyer, M. Behe, C. von Zur Mühlen
Activated platelets in carotid artery thrombosis in mice can be selectively targeted with a radiolabeled single-chain antibody.
PLoS One. Mar 30;6(3):e18446. PubMed PMID: 21479193; PubMed Central PMCID: PMC3068185 (2011)

D. Wild, M. Fani, M. Behe, I. Brink, JE. Rivier, JC. Reubi, HR. Maecke, WA. Weber
First clinical evidence that imaging with somatostatin receptor antagonists is feasible
J Nucl Med. Sept;52(9):1412-7 (2011)

E. Laabs, M. Béhé, S. Kossatz, W. Frank, WA. Kaiser, I. Hilger
Optical imaging of CCKb/gastrin receptor-positive tumors with a minigastrin near-infrared probe.
Invest Radiol. Mar;46(3):196-201 (2011)

L.O. Dialer, S.V. Selivanova, S.D. Krämer, A. Müller, R. Schibli, S.M. Ametamey, T. Stellfeld, K. Graham, S. Borkowski, L.M. Dinkelborg, A. Srinivasan
"^{18}F-Labeling, in vitro and in vivo studies of a bombesin analogue for the imaging of GRP receptor-positive prostate cancer"
J of Labelled Compounds and Radiopharmaceuticals, vol.54, p.S177, (2011)

NS. Loktionova, A.N. Belozub, D.V. Filosofov, K.P. Zhernosekov, T. Wagner, A. Türler, F. Rosch
Improved column-based radiochemical processing of the generator produced 68Ga
Appl Radiat Isot, 69(7): p. 942-6 (2011)

UNIVERSITY LEVEL AND OTHER TEACHING

R. Schibli
Einführung in die Pharmazeutischen Wissenschaften I&II
ETH Zürich

R. Schibli
Radiopharmazeutische Chemie
ETH Zürich

R. Schibli
Seminars on Drug Discovery and Development
ETH Zürich

R. Schibli
CIMST Interdisciplinary Summer School on Bio-Medical Imaging
ETH Zürich

C. Müller
Vitamine in der Vorsorge und Therapie
ETH Zürich

C. Müller
Einführung in die Pharmazeutischen Wissenschaften for Students of the First Year in Pharmaceutical Science: "Entwicklung von Pharmazeutika – die Präklinische Phase
ETH Zürich

C. Müller
Modul III of the Education of Nuclear Physicians, Swiss Society for Radiopharmacy and Radiopharmaceutical Chemistry (SGRRC), "Preparation and Quality Control of ^{99m}Tc-Radiopharmaceuticals"
ETH Zürich

M. Behe
Invited student lecture at the Unversite Strasbourg "Radiometals" in modul radiochemistry and –pharmacy
Université Strasbourg

S. M. Ametamey
Einführung in die pharmazeutischen Wissenschaften I
ETH Zürich

S. M. Ametamey
Einführung in die pharmazeutischen Wissenschaften II
ETH Zürich

S. M. Ametamey
Radiopharmazeutische Chemie
ETH Zürich

S. M. Ametamey
CIMST Interdisciplinary Summer school
ETH Zürich

CONTRIBUTIONS TO CONFERENCE, WORKSHOPS AND SEMINARS

C. Müller
"Assessment of $^{67/68}$Ga-DOTA-Bz-Folate for SPECT and PET Imaging of Folate Receptor Positive Cancer"
The European Society for Molecular Imaging (ESMI) June 2011, Leiden, The Netherlands

C. Müller
"Evalution of a Novel DOTA-Bz-Folate Conjugate Labeled with Radiometals for SPECT and PET Imaging and for Targeted Radionuclide Therapy"
MC and Working Group Meeting of COST Action BM0607 "Targeted Radionuclide Therapy" April 2011, Innsbruck/Igls, Austria

C. Müller
"Folic Acid Conjugates for Folate Receptor Targeted Radioimaging and Radionuclide Therapy"
Center Hospitalier Universitaire Vaudois – CHUV Lausanne, Department of Nuclear Medicine, Lausanne, Switzerland

E. Fischer
Radiopharmazie-neue Perspektive im Kampf gegen den Krebs
Tag der offenen Tür PSI

E. Fischer
Tailoring monoclonal antibodies for radionuclide delivery
BioValley Meet & Match Antibody Technologies, Basel

J. Grünberg
„Das L1 Zelladhäsionsmolekül (L1-CAM): ein vielversprechendes Zielmolekül für Radioimmuntherapie"^{68}Ge/^{68}Ga Radionuclides Generators & Synthesis Modules"
Pre Symposium, 1st World Congress on Gallium-68 and Peptide Receptor Radionuclide therapy (PRRNT).
Bad Berka, Germany

J. Grünberg, A. Friedli, K. Knogler, S. Cohrs, K. Zimmermann, R. Schibli. E. Fischer
Anti-L1CAM antibody chCE7: A potentially powerful tool for growth inhibition and radioimmunotherapy of ovarian cancer metastasis
Dreiländertagung Bregenz, Österreich

M. Alf, M.T. Wyss, S.D. Krämer, B. Weber, R. Schibli
Cross-Validation of Coincidence Beta-Probe and Ensemble-Learning
Dreiländertagung Bregenz, Österreich

TL. Ross, C. Müller, M. Honer, A. Bettio, TL. Mindt, V. Groehn, R. Schibli, SM. Ametamey
F-*18-markierte Folsäurederivate für die Visualisierung von Folatrezeptor-positiver Tumore mittels PET,*
Dreiländertagung Bregenz, Österreich

R. Waibel, P. Bläuenstein, N. Schäfer, I. Burger, L. von Boehmer, A. Knuth, E. Nexo, R. Schibli
Clinical pilot study with a novel radiolabelled vitamin B12 derivative for detection of neoplastic tissue
Dreiländertagung Bregenz, Österreich

T. Betzel, CR. Fischer, C. Müller, V. Groehn, A. Müller, SD. Krämer, SM. Ametamey. R. Schibli
Radiosynthese eines ^{18}F-markierten Folsäurekonjugats mittels „click-Reaktion
19. Jahrestagung der Arbeitsgemeinschaft Radiochemie / Radiopharmazie, 15.-17. September 2011, Ochsenfurt

J. Reber, H. Struthers, T. Betzel, A. Hohn, R. Schibli, C. Müller
Evaluation eines neuen radioiodierten Folsäurederivates für die Diagnose von Folatrezeptor-positiven Tumoren mittels SPECT
19. Jahrestagung der Arbeitsgemeinschaft Radiochemie / Radiopharmazie, 15.-17. September 2011, Ochsenfurt

H. Dorrer, A. Türler, R. Schibli, C. Müller, K. Zhernosekov
Production of Terbium-radioisotopes for diagnostic and therapeutic applications in nuclear medicine
19. Jahrestagung der Arbeitsgemeinschaft Radiochemie / Radiopharmazie, 15.-17. September 2011, Ochsenfurt

C. Campanile, W. Born, J. Hodler, R. Schibli, B. Fuchs
Evaluation of the Diagnostic Power of Six PET Tracers in an Orthotopic Intratibial Osteosarcoma Mouse Model,
International Skeletal Society meeting September, San Diego.

C. Müller, K. Zhernosekov, A.H. Hohn, C.P.L. Leamon, R. Schibli
Evaluation of 67/68Ga-DOTA-Bz-Folate for SPECT and PET Imaging of Folate Receptor Positive Cancer
EMIM June 2011, Leiden, Holland.

L. Mu, C. Fischer, J. Becaud, P.A. Schubiger, R. Schibli, S.M. Ametamey
^{18}F-LABELING OF UNACTIVATED AROMATIC COMPOUDS USING TRIARYLSULFONIUM SALTS
19th International Symposium on Radiopharmaceutical Sciences (ISRS) Amsterdam, NL.

R. Schibli
Radiopharmacy in the Era of Personalized Medicine:A Chemical Perspective
first Bern Cylcotron meeting, June.

R. Schibli
Diagnose und Therapie mit „Licht" am Ende des Spektrums
Collegium Helveticum, May, Zürich.

C. Campanile, M. Arlt, M. Honer, SD Krämer, SM Ametamey, R. Schibli, W. Born, B. Fuchs
Diagnostic power of PET Tracers in two intratibial metastasizing osteosarcoma mouse models
EANM Annual Meeting 2011 Birmingham, UK

R. Schibli
Radiopharmaka Basis für molekulare Diagnostik und Therapie
Eröffnungsfeier Radiopharmazie Labors, Innsbruck, Österreich.

R. Schibli
Progress and Trends in Radiometal-Based Diagnostics and Therapeutics
International Symposium on Applied Bioinorganic Chemistry, Barcelona, Spain, 2-5 December, 2011.

R. Schibli
Radiopharmacy in the Era of Personalized Medicine
Seminar D-ITET ETHZ, Zürich.

S. Geistlich
„Radiopharmazie: Arzneimittel für Diagnose und Therapie - Klinische Routine und neue Entwicklungen"
Info-Disk-Veranstaltung der Kantonsapotheke Zürich am Mittwoch, 14. September, 2011
POSTER

A. Burggraf, S. Cohrs, K. Zimmermann, R. Schibli, E. Fischer, J. Grünberg
In vitro studies with cold anti-L1-CAM antibody chCE7 and Lutetium-177-DOTA chCE7 in combination with paclitaxel and carboplatin in SKOV3ip human ovarian cancinoma cells
Dreiländertagung Bregenz, Österreich.

E. Furger, R. Waibel, J. Grünberg, R. Schibli, E. Fischer
Radiolabelled Haptocorrin-specific molecules for tumour imaging or therapy
Dreiländertagung Bregenz, Österreich.

R. Hesselmann, A. Johayem, U. Özdemir, M. Dragic, A. Blainc, L. Mu, R. Schibli
Improving Radiochemical purity and quality control of 68Ga-DOTATATE
1st World Congress on Gallium-68 and Peptide Receptor Radionuclide Therapy (PRRNT), Bad Berka, Germany, June 23-26, 2011

J. Reber, H. Struthers, A. Hohn, R. Schibli, C. Müller
Evaluation of a Novel Radioiodinated Folic Acid Derivative for Imaging and Potential Therapeutic Application of Cancer
Pharma Poster Day, June, Zürich.

C. Müller, HR. Struthers, R. Schibli
Evaluation of a Folic Acid Radioconjugate with Improved in Vivo Properties for Folate Receptor-Targeted Radionuclide Therapy of Cancer Diseases
19th International Symposium on Radiopharmaceutical Sciences (ISRS) Amsterdam, NL.

M. Nobst, Th. Nauser, P.A. Schubiger, R. Schibli, SM. Amethamey
Small stand-alone unit for automated delivery of liquid radioactive isotopes
19th International Symposium on Radiopharmaceutical Sciences (ISRS) Amsterdam, NL.

LO. Dialer, S. Selivanova, SD. Krämer, A. Müller, R. Schibli, SM. Ametamey
^{18}F-Labeling, in vitro and in vivo studies of a bombesin analogue for the imaging of GRP receptor-positive prostate cancer
19th International Symposium on Radiopharmaceutical Sciences (ISRS) Amsterdam, NL.

R. Schibli, MA Alf, SD. Krämer, MW. Wyss, BW. Weber, SM. Ametamey
Coincidence Beta-Probe versus Ensemble-Learning ICA for Input Function Measurement in Rodents
EMIM June 2011, Leiden, Holland.

R. Schibli, SM. Ametamey, C. Müller, T. Betzel, C. Fischer, R. Moser, V. Groehn
Development of a ^{18}F-PET Folate Tracer for Diagnosis and Therapy Planning of Cancer Diseases
CTI MEDTECH EVENT, Bern.

BOOK CHAPTER

C. Müller, R. Schibli
"Folate Receptor Targeted Radionuclide Imaging Agents"
Chapter 4, 65-92, Targeted Drug Strategies for Cancer and Inflammation (Editors: Prof. A. Jackman and Dr. C.P. Leamon), DOI: 10.1007/978-1-4419-8417-3_4, Springer.

THESIS

Ursina Müller
C-6 Pyrimidine Analogs for the PET Imaging of HSV1-Thymidine Kinase Expression
Diss., Eidgenössische Technische Hochschule ETH Zürich, Nr. 19997, 2011

AWARDS

E. Furger
Poster Award, 2. Preis.
Foundation of the Association of Bernese Pharamcists (AKB),Swiss Pharma Science Day

P. Dennler
Beste Masterarbeit ETH
Amedis Förderpreis

RADIOCHEMISTRY AND ENVIRONMENTAL CHEMISTRY

LIST OF PUBLICATIONS

HEAVY ELEMENTS

J. Even, J. Ballof, W. Brüchle, R.A. Buda, Ch.E. Düllmann, K. Eberhardt, A. Gorshkov, E. Gromm, D. Hild, E. Jäger, J. Khuyagbaatar, J.V. Kratz, J. Krier, D. Liebe, M. Mendel, D. Nayak, K. Opel, J.P. Omtvedt, P. Reichert, J. Runke, A. Sabelnikov, F. Samadani, M. Schädel, B. Schausten, N. Scheid, E. Schimpf, A. Semchenkov, P. Thörle-Pospiech, A. Toyoshima, A. Türler, V. Vilas, N. Wiehl, T. Wunderlich, A. Yakushev
The recoil transfer chamber-An interface to connect the physical preseparator TASCA with chemistry and counting setups
Nucl. Instrum. Methods Phys. Res. Sect. A 638, 157–164 (2011).

H.W. Gäggeler
Gas chemical properties of heaviest elements
Radiochim. Acta **99** (7-8): 503-513 (2011).

J.M. Gates, Ch.E. Düllmann, M. Schädel, A. Yakushev, A. Türler, K. Eberhardt, J.V. Kratz, D. Ackermann, L.L. Andersson, M. Block, W. Brüchle, J. Dvorak, H.G. Essel, P.A. Ellison, J. Even, U. Forsberg, J. Gellanki, A. Gorshkov, R. Graeger, K.E. Gregorich, W. Hartmann, R.D. Herzberg, F.P. Heßberger, D. Hild, A. Hübner, E. Jäger, J. Khuyagbaatar, B. Kindler, J. Krier, N. Kurz, S. Lahiri, D. Liebe, B. Lommel, M. Maiti, H. Nitsche, J.P. Omtvedt, E. Parr, D. Rudolph, J. Runke, H. Schaffner, B. Schausten, E. Schimpf, A. Semchenkov, J. Steiner, P. Thörle-Pospiech, J. Uusitalo, M. Wegrzecki, N. Wiehl
First superheavy element experiments at the GSI recoil separator TASCA: The production and decay of element 114 in the ^{244}Pu(^{48}Ca,3-4n) reaction
Phys. Rev. C 83, 054618 (2011).

W. Maneschg, L. Baudis, R. Dressler, K. Eberhardt, R. Eichler, H. Keller, R. Lackner, B. Praast, R. Santorelli, J. Schreiner, M. Tarka, B. Wiegel, A. Zimbal
Production and characterization of a custom-made Th-228 source with reduced neutron source strength for the borexino experiment
arXiv.org (2011).

A. Serov, N.V. Aksenov, G.A. Bozhikov, R. Eichler, R. Dressler, V.Y. Lebedev, O. Petrushkin, D. Piguet, S. Shishkin, E. Tereshatov, A. Türler, A. Vögele, D. Wittwer, H.W. Gäggeler
Adsorption interaction of astatine species with quartz and gold surfaces
Radiochim. Acta **99** (9): 593-600 (2011).

A. Serov, R. Eichler, R. Dressler, D. Piguet, A. Türler, A. Vögele, D. Wittwer, H.W. Gäggeler
Gas chromatography of indium in macroscopic and carrier-free amounts using quartz and gold as stationary phases
Radiochim. Acta **99** (2): 95-101 (2011).

D. Wittwer, R. Dressler, R. Eichler, H.W. Gäggeler, D. Piguet, A. Serov, A. Türler, A. Vögele
The thermal release of scandium from titanium metal – a simple way to produce pure SC-44 for pet application
Radiochim. Acta **99** (3): 193-196 (2011).

L. Canella, P. Kudejova, R. Schulze, A. Türler, J. Jolie
Characterisation and optimisation of the new Prompt Gamma-ray Activation Analysis (PGAA) facility at FRM II
Nucl. Instrum. Methods Phys. Res. Sect. A 638, 108–113 (2011).

Surface Chemistry

T. Bartels-Rausch, G. Krysztofiak, A. Bernhard, M. Schläppi, M. Schwikowski, M. Ammann
Photoinduced reduction of divalent mercury in ice by organic matter
Chemosphere **82** (2): 199-203 (2011).

T. Bartels-Rausch, T. Ulrich, T. Huthwelker, M. Ammann
A novel synthesis of the N-13 labelled atmospheric trace gas peroxynitric acid
Radiochim. Acta **99** (5): 285-292 (2011).

F. Enzmann, M.M. Miedaner, M. Kersten, N. von Blohn, K. Diehl, S. Borrmann, M. Stampanoni, M. Ammann, T. Huthwelker
3-D imaging and quantification of graupel porosity by synchrotron-based micro-tomography
Atmos. Meas. Tech. **4** (10): 2225-2234 (2011).

M. Shiraiwa, M. Ammann, T. Koop, U. Pöschl
Gas uptake and chemical aging of semisolid organic aerosol particles
Proc. Nat. Acad. Sci. **108** (27): 11003-11008 (2011).

M. Shiraiwa, Y. Sosedova, A. Rouvière, H. Yang, Y. Zhang, J.P.D. Abbatt, M. Ammann, U. Pöschl
The role of long-lived reactive oxygen intermediates in the reaction of ozone with aerosol particles
Nat. Chem. **3** (4): 291-295 (2011).

Y. Sosedova, A. Rouviere, T. Bartels-Rausch, M. Ammann
UVA/VIS-induced nitrous acid formation on polyphenolic films exposed to gaseous NO_2
Photochem. Photobiol. **10** (10): 1680-1690 (2011).

D.E. Starr, D. Pan, J.T. Newberg, M. Ammann, E.G. Wang, A. Michaelides, H. Bluhm
Acetone adsorption on ice investigated by X-ray spectroscopy and density functional theory
Phys. Chem. Chem. Phys. **13** (44): 19988-19996 (2011).

V. Zelenay, M. Ammann, A. Křepelová, M. Birrer, G. Tzvetkov, M.G.C. Vernooij, J. Raabe, T. Huthwelker
Direct observation of water uptake and release in individual submicrometer sized ammonium sulfate and ammonium sulfate/adipic acid particles using X-ray microspectroscopy
J. Aerosol Sci **42** (1): 38-51 (2011).

V. Zelenay, T. Huthwelker, A. Křepelová, Y. Rudich, M. Ammann
Humidity driven nanoscale chemical separation in complex organic matter
Environ. Chem. **8** (4): 450-460 (2011).

V. Zelenay, M.E. Monge, B. D'Anna, C. George, S.A. Styler, T. Huthwelker, M. Ammann
Increased steady state uptake of ozone on soot due to UV/VIS radiation
J. Geophys. Res. **116** (D11): D11301 (2011).

Analytical Chemistry

N. Bukowiecki, P. Zieger, E. Weingartner, Z. Jurányi, M. Gysel, B. Neininger, B. Schneider, C. Hueglin, A. Ulrich, A. Wichser, S. Henne, D. Brunner, R. Kaegi, M. Schwikowski, L. Tobler, F.G. Wienhold, I. Engel, B. Buchmann, T. Peter, U. Baltensperger
Ground-based and airborne in-situ measurements of the Eyjafjallajökull volcanic aerosol plume in Switzerland in spring 2010
Atmos. Chem. Phys. **11** (19): 10011-10030 (2011).

A. Eichler, W. Tinner, S. Brütsch, S. Olivier, T. Papina, M. Schwikowski
An ice-core based history of siberian forest fires since AD 1250
Quat. Sci. Rev. **30** (9-10): 1027-1034 (2011).

J. Gabrieli, G. Cozzi, P. Vallelonga, M. Schwikowski, M. Sigl, J. Eickenberg, L. Wacker, C. Boutron, H.W. Gäggeler, P. Cescon, C. Barbante
Contamination of alpine snow and ice at Colle Gnifetti, Swiss/Italian alps, from nuclear weapons tests
Atmos. Environ. **45** (3): 587-593 (2011).

S.D. Kaspari, M. Schwikowski, M. Gysel, M.G. Flanner, S. Kang, S. Hou, P.A. Mayewski
Recent increase in black carbon concentrations from a Mt. Everest ice core spanning 1860-2000 AD
Geophys. Res. Lett. **38** (4): L04703 (2011).

S. Maus, S. Müller, J. Büttner, S. Brütsch, T. Huthwelker, M. Schwikowski, F. Enzmann, A. Vähätolo
Ion fractionation in young sea ice from Kongsfjorden, Svalbard
Ann. Glaciology **52** (57): 301-310 (2011).

O. Sidorova, M. Saurer, V. Myglan, A. Eichler, M. Schwikowski, A. Kirdyanov, M. Bryukhanova, O. Gerasimova, I. Kalugin, A. Daryin, R. Siegwolf
A multi-proxy approach for revealing recent climatic changes in the Russian Altai
Clim. Dyn. **38** (1-2): 175-188 (2011).

RADWASTE ANALYTICS

S. Heinitz, J. Neuhausen, D. Schumann
Alkaline extraction of polonium from liquid lead bismuth eutectic
J. Nucl. Mater. **414** (2): 221-225 (2011).

M. Medarde, R. Moormann, R. Frison, R. J. Puźniak, E. Pomjakushina, K. Conder, E. Platacis, Y. Dai, D. Kiselev, L. Zanini, S. Török, P. Zagyvai, S. Heinitz, J. Neuhausen, D. Schumann, K. Thomsen
Lead–gold eutectic: An alternative liquid target material candidate for high power spallation neutron sources
J. Nucl. Mater. **411** (1-3): 72-82 (2011).

J. Neuhausen, D. Schumann
Vapour phase concentrations of volatile nuclear reaction products in the Megapie cover gas
J. Nucl. Mater. **415** (3): 361-366 (2011).

J. Neuhausen, D. Schumann, R. Dressler, B. Eichler, S. Lüthi, S. Horn, T. Stora, M. Eller
Radiochemical aspects of liquid mercury spallation targets
J. Nucl. Mat. 2011, doi:10.1016/j.jnucmat.2011.11.019.

E. Noah, V. Boutellier, R. Brütsch, R. Catherall, D. Gavillet, J. Krbanjevic, H.P. Linder, M. Martin, J. Neuhausen, D. Schumann, T. Stora, L. Zanini
Post-irradiation analysis of the tantalum container of an ISOLDE LBE target
J. Nucl. Mat. 2011, doi: 10.1016/j.jnucmat.2011.11.034.

D. Schumann, J. Neuhausen, R. Michel, V. Alfimov, H.A. Synal, J.C. David, A. Wallner
Excitation functions for the production of long-lived residue nuclides in the reaction nat Bi(p;xn,yp)Z
J. Phys. G: Nucl. Part. Phys. **38** (6): 065103 (2011).

ENVIRONMENTAL RADIONUCLIDES UNIVERSITÄT BERN

D. Ceburnis, A. Garbaras, S. Szidat, M. Rinaldi, S. Fahrni, N. Perron, L. Wacker, S. Leinert, V. Remeikis, M.C. Facchini, A.S.H. Prevot, S.G. Jennings, M. Ramonet, C.D. O'Dowd
Quantification of the carbonaceous matter origin in submicron marine aerosol by C-13 and C-14 isotope analysis
Atmos. Chem. Phys. **11** (16): 8593-8606 (2011).

S. Farooq, S.A. Eqani, R.N. Malik, A. Katsoyiannis, G. Zhang, Y.L. Zhang, J. Li, X. Liu, K.C. Jones, Z.K. Shinwari
Occurrence, finger printing and ecological risk assessment of polycyclic aromatic hydrocarbons (PAHs) in the Chenab River, Pakistan
J. Environ. Monit., 13, 3207-3215 (2011).

J. Li, Q.L. Li, R. Gioia, Y.L. Zhang, G. Zhang, X.D. Li, B. Spiro, R.S. Bhatia, K.C. Jones
PBDEs in the atmosphere over the Asian marginal seas, and the Indian and Atlantic oceans.
Atmos Environ, 2011, 45(37): 6622-6628. DOI: 10.1016/j.atmosenv.2011.09.010.

S.F.L. Mertens, M. Gara, A.S. Sologubenko, J. Mayer, S. Szidat, K.W. Krämer, T. Jacob, D.J. Schiffrin, T. Wandlowski
Au@Hg nanoalloy formation through direct amalgamation: Structural, spectroscopic, and computational evidence for slow nanoscale diffusion
Adv. Funct. Mater. **21** (17): 3259-3267 (2011).

M.C. Minguillón, N. Perron, X. Querol, S. Szidat, S.M. Fahrni, A. Alastuey, J.L. Jimenez, C. Mohr, A.M. Ortega, D.A. Day, V.A. Lanz, L. Wacker, C. Reche, M. Cusack, F. Amato, G. Kiss, A. Hoffer, S. Decesari, F. Moretti, R. Hillamo, K. Teinilä, R. Seco, J. Peñuelas, A. Metzger, S. Schallhart, M. Müller, A. Hansel, J.F. Burkhart, U. Baltensperger, A.S.H. Prévôt
Fossil versus contemporary sources of fine elemental and organic carbonaceous particulate matter during the Daure campaign in northeast spain
Atmos. Chem. Phys. **11** (23): 12067-12084 (2011).

Y.L. Zhang, X.Q. Lee, F. Cao
Chemical characteristics and sources of organic acids in precipitation at a semi-urban site in Southwest China
Atmos. Environ. **45**, 413-419, doi:10.1016/j.atmosenv.2010.09.067 (2011).

Y.L. Zhang, X.Q. Lee, F. Cao, D.K. Huang
Seasonal variation and sources of low molecular weight organic acids in precipitation in the rural area of Anshun
Chinese Science Bulletin **56**, 1005-1010, doi:10.1007/s11434-011-4411-5 (2011).

RADIONUCLIDE DEVELOPMENT - CHEMISTRY

S. Lehenberger, C. Barkhausen, S. Cohrs, E. Fischer, J. Grünberg, A. Hohn, U. Köster, R. Schibli, A. Türler, K. Zhernosekov
The low-energy β− and electron emitter Tb-161 as an alternative to Lu-177 for targeted radionuclide therapy
Nuclear medicine and biology **38** (6): 917-924 (2011).

N.S. Loktionova, A.N. Belozub, D.V. Filosofov, K. Zhernosekov, T. Wagner, A. Türler, F. Rösch
Improved column-based radiochemical processing of the generator produced Ga-68
Appl. Radiat. Isot. **69** (7): 942-946 (2011).

REPORTS AND TECHNICAL NOTES

Y. Dai, J. Neuhausen, D. Schumann, C. Zumbach, H. Leu, H. Schweikert, A. Spahr
Specimen extraction plan for MEGAPIE PIE
MPR-11-DY34-001-3, 13.01.2011, Villigen, Switzerland.

J. Neuhausen, M. Wohlmuther
Betrachtungen zur Verdampfung von Po-Isotopen und Hg-194 bei Fräsvorgängen
TM-24-11-01/0, MPR-11-NJ24-001/0, 21.03.2011, Villigen, Switzerland.

P. Suter, Ch. Zumbach, M. Wohlmuther, J. Neuhausen, D. Schumann, V. Boutellier
Anforderungen an die Werkzeuge zur Probenerzeugung aus dem MEGAPIE Target im Hotlabor des PSI
MPR-1-WM85-019/2, 03.05.2011, Villigen, Switzerland.

M. Wohlmuther, J. Neuhausen, D. Schumann
Betrachtungen zu den Aktivitätsmengen bei Reinigung der MEGAPIE PIE-Proben in Öl sowie HNO_3
MPR-1-WM85-046/1, 09.05.2011, Villigen, Switzerland.

L. Zanini, N. Baluc, A. De Simone, R. Eichler, S. Joray, E. Manfrin, M. Pouchon, S. Rabaioli, D. Schumann, J. Welte, K. Zhernosekov
Conceptual Design, Neutronic and Radioprotection Study of a Fast Neutron Irradiation Station at SINQ
PSI-Report Nr. 11-04, December 2011, ISSN 1019-0643, Villigen, Switzerland.

CONTRIBUTIONS TO CONFERENCES, WORKSHOPS AND SEMINARS

HEAVY ELEMENTS

R. Eichler
Chemistry with the newly discovered Superheavy Elements
General Physics Seminar, University Aarhus, Denmark, 3 March, 2011.

R. Eichler
First foot prints of chemistry on the shore of The Island of SHE
4th International Conference on the Chemistry and Physics of the Transactinide Elements (TAN'11), Sochi, Russia, 7 September, 2011.

H.W. Gäggeler, J. Dvorak
Deep inelastic transfer studies at GSI: Historical reminiscences & New developments. Department of Nuclear Physics, Australian National University (ANU), Canberra, Australia, 25 March, 2011.

H.W. Gäggeler
Heavy ion production of heaviest elements and recent achievements in their chemical studies , Institute of Modern Physics of the Chinese Academy of Sciences, Lanchou, China, 22 August, 2011.

H.W. Gäggeler, J.V. Kratz, M. Schädel
Revival of deep inelastic transfer reactions for production of neutron-rich isotopes of heavy elements
4th International Conference on the Chemistry and Physics of the Transactinide Elements (TAN'11), Sochi, Russia, 5-9 September, 2011.

H.W. Gäggeler
Recent achievements in chemical studies of heaviest elements at FLNR in Dubna
XXXII Mazurian Lakes Conference of Nuclear Physics, Piaski, Poland, 11-18 September, 2011.

D. Wittwer
Thermal release of p-elements from metal matrice
4th International Conference on the Chemistry and Physics of the Transactinide Elements (TAN'11), Sochi, Russia, 9 September, 2011.

I. Usoltsev
Attempts to produce intermetallic targets for heavy ion irradiations
4th International Conference on the Chemistry and Physics of the Transactinide Elements (TAN'11), Sochi, Russia, September 2011.

P. Steinegger
Diamond Detectors for α-Spectroscopy at High Temperatures
4th International Conference on the Chemistry and Physics of the Transactinide Elements (TAN'11), Sochi, Russia, September 2011.

P. Steinegger
Diamond Detectors for Transactinide Chemistry
3rd CARAT Workshop, GSI Darmstadt, Germany, 11-13 December, 2011.

J. Neuhausen, D. Schumann, R. Dressler, B. Eichler, S. Heinitz, B. Hammer, F. von Rohr, L. Zanini, V. Boutellier, M. Rüthi, J. Eikenberg, E. Noah
Radiochemical aspects of liquid metal spallation targets
DAE-BRNS Symposium on Nuclear and Radiochemistry, Visakhapatnam, India, Feburary, 2011.

R. Dressler
Chemical investigation of element 114 - Indication for a massive relativistic effect in chemistry
International Conference on Advances in Radioactive Isotope Science (ARIS), Leuven, Belgium, June, 2011.

R. Dressler, P. Rassmussen
pureCOLD fast electronics for β-α pile-up suppression first on-line measurements
4th International Conference on the Chemistry and Physics of the Transactinide Elements (TAN'11), Sochi, Russia, September, 2011.

R. Dressler
Plan to measure the half-life and neutron capture cross section of ^{53}*Mn*
ERAWAST II workshop, PSI, Villigen, Switzerland, August – September, 2011.

M. Ayranov, M. Bunka, R. Dressler, I. Günther-Leopold, S. Heinitz, N. Kivel, S. Lüthi, D. Schumann, T. Stowasser, A. Vögele, D. Wittwer, M. Wohlmuther
Repetition of the re-measurement of the ^{60}*Fe half-life*
ERAWAST II workshop, PSI, Switzerland, August – September, 2011.

A. Türler, R. Eichler, H.W. Gäggeler, A. Yakushev, C.E. Düllmann, M. Schädel, S.N. Dimitriev, J.V. Kratz, K.J. Moody, H. Nitsche, N. Trautmann
Chemical Properties of Element 114
241st ACS National Meeting & Exposition, 2011, Anaheim, California, USA, 27-31 March, 2011.

A. Türler for a TUM, GSI, JINR, Mainz, JAEA, LBNL, UCB, Oslo, Lund, IET, IMP, PSI collaboration
Nuclear and Chemical Studies with Hassium Isotopes
4th International Conference on the Chemistry and Physics of the Transactinide Elements (TAN'11), Sochi, Russia, September, 2011.

SURFACE CHEMISTRY

M. Ammann
The ice - air interface in snow - the molecular to micron scale perspective
Third workshop on Air-Ice Chemical Interactions (AICI), New York, USA, 6-8 June, 2011.

M. Ammann
Reactivity at the sea salt - air interface: Spectroscopy and kinetics
American Chemical Society 242nd National Meeting & Exposition, Denver, USA, 28 August - 1 September, 2011.

M. Ammann
Ambient pressure photoelectron spectroscopy for basic surface science studies related to urea-scr technology
NADiP Workshop, PSI, Villigen, Switzerland, 21 October, 2011.

T. Bartels-Rausch, F. Riche, S. Wren, S. Schreiber, J. Donaldson, M. Schneebeli, M. Ammann
The microstructure of ice and effective diffusion of VOCs in snow: A laboratory study
European Geoscience Union General Assembly, Vienna, Austria, 3-8 April, 2011.

T. Bartels-Rausch
Parameterizing trace gas - ice interactions: A look into laboratories
Snow Chemistry Modelling Workshop, New York, USA, 8 June, 2011.

T. Bartels-Rausch, S. Schreiber, T. Ulrich, F. Riche, G. Krysztofiak, M. Brigante, Y.F. Elshorbany, S. Wren,
A. Bernhard, B. D'Anna, M. Ndour, K. Stemmler, M. Schläppi, C. George, J. Kleffmann, M. Schneebeli,
M. Schwikowski, M. Ammann
How chemistry in snow alters the atmospheric composition
EuCheMS International Conference on Chemistry and the Environment, Zürich, Switzerland, 11-15 September, 2011.

M. Brown, M. Ammann, J. v. Bokhoven
Fast moving liquid interfaces for Swissfel studies: Spectroscopy, scattering and diffraction experiments
Workshop on hard X-ray instrumentation at the SwissFEL X-ray Free Electron Laser facility, Zürich, Switzerland,
12 September, 2011.

M. Lampimäki
X-ray microscopy and photoelectron spectroscopy studies on iron oxide particles
Seminar of the Laboratory of Radiochemistry and Environmental Chemistry, Paul Scherrer Institute and University of Berne,
Switzerland, 25 March, 2011.

M. Lampimäki, V. Zelenay, A. Křepelová, S. Steimer, M. Ammann
Nanostructure and hygroscopicity of tannic acid particles: Influence of O3 and UV-radiation
ECASIA'11: 14th European Conference on Applications of Surface and Interface Analysis, Cardiff, UK,
4-9 September, 2011.

M. Lampimäki, V. Zelenay, A. Křepelová, S. Steimer, M. Ammann
Mineral dust and iron oxide particles studied under oxidizing and acidic conditions
JUM@P'11: Joint Users' meeting at PSI, Villigen, Switzerland, 15-16 September, 2011.

S. Steimer, M. Lampimäki, V. Zelenay, A. Křepelová, M. Ammann
Morphology and composition of individual tannic and shikimic acid particles studied at oxidizing environmental conditions
JUM@P'11: Joint Users' meeting at PSI, Villigen, Switzerland, 15-16 September, 2011.

T. Ulrich, M. Ammann, S. Leutwyler, T. Bartels-Rausch
The adsorption of HNO_4 on ice and its temperature dependence
Seminar of the Laboratory of Radiochemistry and Environmental Chemistry, Paul Scherrer Institute and University of Berne,
Switzerland, 25 March, 2011

T. Ulrich, M. Ammann, S. Leutwyler, T. Bartels-Rausch
The adsorption of HNO_4 on ice
European Geoscience Union General Assembly, Vienna, Austria, 3-8 April, 2011.

V. Zelenay, T. Tritscher, A. Krepelova, M.F. Heringa, R. Chirico, A.S.H. Prévôt, E. Weingartner, U. Baltensperger, J. Dommen, B. Watts, J. Raabe, T. Huthwelker, M. Ammann
The climate effect of soot particles caught in act
15th ETH Conference on Combustion Generated Nanoparticles, Zurich, Switzerland, 26-29 June, 2011.

ANALYTICAL CHEMISTRY

E. Bühlmann
Particulate matter and its influence on the albedo of Plaine Morte glacier
Seminar of the Laboratory of Radiochemistry and Environmental Chemistry, Paul Scherrer Institut, Switzerland, 21 October, 2011.

E. Bühlmann
Influence of particulate matter on observed albedo reductions on Plaine Morte glacier, Swiss Alps
Swiss Geoscience Master Congress, ETH Zurich, Switzerland, 10 November, 2011.

F. Cao, S. Szidat, M. Schwikowski
Radiocarbon analysis of organic carbon and elemental carbon in ice/firn samples
The first TTORCH Summer School, Hyytiälä Forestry Field Station, Finland, 27 September - 4 October, 2011.

A. Eichler, S. Kaspari, M. Gysel, M. Schwikowski, M.G. Flanner, S. Kang, S. Hou, P.A. Mayewski
Ice core derived changes in Black Carbon concentrations
15th ETH-Conference on Combustion Generated Nanoparticles, Zurich, Switzerland, 26-29 June, 2011.

A. Eichler, M. Schwikowski
Climate reconstructions from high-alpine ice cores.
Conference on „Climate Change in High Mountain Regions - from Understanding of the past to Modelling of the Future, Salzburg, Austria, 29 August - 1 September 2011.

H.W. Gäggeler
Ice core dating
Lecture, Graduate students, Nanjing University, China, 26 September, 2011.

H.W. Gäggeler
Pollution records and climate information deduced from alpine ice cores
Nanjing University, China, 28 September, 2011.

H.W. Gäggeler, M. Schwikowski, A. Eichler, L. Tobler, S. Olivier, T. Papina
Isotope and chemical studies of a firn/ice core from Belukha, Russian Altai
Int. Symp. on Changing Cryosphere, Water Availability and Sustainable Development in Central Asia, Urumqi, China, 8-10 October, 2011.

H.W. Gäggeler
Pollution records and climate information deduced from ice cores from the Andes, Alps, and Altai
Cold and Arid Environmental Research Institute, Lanzhou, China, 13 October, 2011.

H.W. Gäggeler
Pollution records and climate information deduced from ice cores from the Andes, Alps, and Altai
Institute of Tibetan Plateau (ITP) of CAS, Beijing, China, 29 October, 2011.

H.W. Gäggeler
Drei Jahrzehnte Umweltforschung auf alpinen Gletschern, Fachvortrag
Prix de Quervin Verleihung, Naturhistorisches Museum Bern, Switzerland, 3 November, 2011.

P.A. Herren
An ice-core based history of the Siberian forest fires since AD 1250
Seminar of the Laboratory of Radiochemistry and Environmental Chemistry, Paul Scherrer Institut, Switzerland, 6 May, 2011.

P.A. Herren, S. Brütsch, A. Eichler, S. Olivier, T. Papina, W. Tinner, M. Schwikowski
An ice-core based history of Siberian forest fires since AD 1250
XVIII INQUA Congress Bern, Switzerland, 21-27 July, 2011.

P.A. Herren, A. Eichler, J. Eikenberg, H. Machguth, T. Papina, L. Tobler, E. Vogel, A. Zapf, M. Schwikowski
Ice core based climate reconstruction of the Mongolian Altai
9th Swiss Geoscience Meeting, ETH Zurich, Switzerland, 11-13 November, 2011.

S. Kaspari, M. Schwikowski, M. Gysel, T.H. Painter
Spatial and seasonal variations in black carbon concentrations in snow and ice in the Solu-Khumbu
Nepal, AGU Fall Meeting, San Francisco, USA, 5-9 December, 2011.

T. Kirchgeorg, J. Gabrieli, A. Dreyer, Z. Xie1, M. Sigl, M. Schwikowski, C. Barbante, C. Boutron, R. Ebinghaus,
Perfluorinated compounds in ice core samples from the Alps
SETAC meeting "Ecosystem Protection in a Sustainable World: a Challenge for Science and Regulation", Milan, Italy, 15-19 May, 2011.

I. Mariani, T. Jenk, M. Sigl, M. Schwikowski
Ice core proxies as indicators of moisture source areas for the Alps
European Research Course on Atmospheres (ERCA), Grenoble, France, 10 January – 11 February, 2011.

I. Mariani
Precipitation and temperature signals from two ice cores in the Alps
Seminar of the Laboratory of Radiochemistry and Environmental Chemistry, Paul Scherrer Institut, Switzerland, 6 May, 2011.

I. Mariani, M. Sigl, A. Eichler, J. Gabrieli, D. Bolius, C. Barbante, C. Boutron, H.W. Gäggeler, M. Schwikowski
A 1000-year record of Saharan dust from an Alpine ice core
9th Swiss Geoscience Meeting, ETH Zurich, Switzerland, 11-13 November, 2011.

P. Pavlova, P. Schmid, M. Schwikowski
Accelerated release of persistent organic pollutants from Alpine glaciers
EAWAG Summer school 2011: "Sediments as archives of environmental change", Kastanienbaum, Switzerland, 4-15 July, 2011.

P. Pavlova
Accelerated release of POPs from Alpine glaciers: PCB/DDT record from lake sediments
Seminar of the Laboratory of Radiochemistry and Environmental Chemistry, Paul Scherrer Institut, Switzerland, 21 October, 2011.

P. Pavlova, P. Schmid, M. Schwikowski
Accelerated release of persistent organic pollutants from Alpine glaciers: PCB/DDT record from lake sediments
Internal seminar of the Analytical chemistry department, Empa, Dübendorf, Switzerland, 8 November, 2011.

M. Schwikowski
Palaeo climate reconstructions derived from high-alpine ice cores
Seminar Geography Universität Bern, Switzerland, 2 March, 2011.

M. Schwikowski, E. Bühlmann, P.A. Herren
Effects of soot, algae, and mineral dust on the albedo of the Plaine Morte Glacier, Switzerland
IASC Workshop on the use of automated measuring systems on glaciers, Pontresina, Switzerland, 23-26 March, 2011.

M. Schwikowski
Klimawandel - auf Spurensuche in hochalpinen Gletschern
Vortragsreihe “Forschung live erleben”, Paul Scherrer Institut, Villigen, Switzerland, 6 April, 2011.

M. Schwikowski
Effects of impurities on the albedo of snow and ice
PhD disputation Kimberly Ann Casey, University of Oslo, Oslo, 15 September, 2011.

M. Schwikowski, P.A. Pavlova
Accelerated release of persistent organic pollutants (POPs) from Alpine glaciers
OCCR WP3 fall meeting, Zollikofen, Switzerland, 20 October, 2011.

I. Wendl, E. Isaksson, M. Schwikowski
Study of a new Svalbard ice core
9th Swiss Geoscience Meeting, ETH Zurich, Switzerland, 11-13 November, 2011.

I. Wendl
Black carbon analysis in ice cores
Seminar of the Laboratory of Radiochemistry and Environmental Chemistry, Paul Scherrer Institut, Villigen, Switzerland, 9 December, 2011.

A. Zapf
Radiocarbon dating of ice cores
Seminar of the Laboratory of Radiochemistry and Environmental Chemistry, Paul Scherrer Institut, Villigen, Switzerland, 6 May, 2011.

A. Zapf, S. Szidat, M. Schwikowski
Radiocarbon Dating of Ice Cores, "Pushing the size limits of Radiocarbon Analysis", An International Exploratory Workshop
ETH Zurich, Switzerland, 13-16 September, 2011.

A. Zapf, S. Szidat, M. Schwikowski
Radiocarbon dating of glacier ice, 9th Swiss Geoscience Meeting
ETH Zurich, Switzerland, 11-13 November, 2011.

A. Zapf
Radiocarbon dating of high alpine glaciers, Seminar of the Laboratory of Ion Beam Physics
ETH Zurich, Switzerland, 21 December, 2011.

RADWASTE ANALYTICS

M. Ayranov, D. Schumann, R. Dressler
Preparation of ^{60}Fe, ^{44}Ti, ^{53}Mn, ^{26}Al and $^{7/10}$Be samples for astrophysical experiments
Nuclear Physic in Astrophysic 5, Eilat, Israel, 5-9 April, 2011.

M. Ayranov, D. Schumann, R. Dressler, N. Kivel
Exotic radionuclides extraction from proton irradiated copper beam dump and SINQ cooling water
ERAWAST II workshop, PSI, Switzerland, 29 August - 2 September, 2011.

D. Bemmerer, T. Al-Abdullah, R. Dressler, D. Schumann
Is it possible to study the $^{44}Ti(\alpha,p)^{47}V$ reaction with a radioactive target?
ERAWAST II workshop, Paul Scherrer Institut, Villigen, Switzerland, August - September, 2011.

R. Dressler, D. Schumann
Plans to measure neutron capture cross-sections and half-lives of cosmogenic radio-nuclides
Annual n_TOF meeting Lisbon, Portugal, December, 2011.

D. Kiselev, P. Baumann, M. Gandel, Y.J. Lee, D. Schumann, A. Strinning, A. Konobeyev
Examination of a copper collimator irradiated in the 590 MeV proton beam line at PSI
4th High Power Targetry Workshop, Malmö, Schweden, 2-6 May, 2011.

W. Kutschera, K. Buzcak, O. Forstner, R. Golser, A. Priller, P. Steier, A. Wallner, D. Schumann, R. Dressler, G. Wallner, M. Bichler, G. Steinhauser, P. Collon, M. Bowers, K. Chamberlin, M. Couder, W. Lu, D. Robertson, M. Troy, A. Stoltz, S. Austin, I. Ahmad, J. Green, D. Graczyk, M. Paul
The half-life of ^{60}Fe revisited
ERAWAST II workshop, Paul Scherrer Institut, Villigen, Switzerland, August - September, 2011.

T. Lorenz, B. Hammer
www.Nucleonica.net - web driven nuclear science
ASI Seminar, Villigen, Switzerland, 11 October, 2011.

J. Neuhausen, H. Glasbrenner, S. Heinitz, M. Jolkkonen, Y. Kurata, T. Obara, N. Thiolliere, L. Zanini
Chapter 5: Properties of irradiated LBE and Pb
Meeting of the WPFC Expert Group on Heavy Liquid Metal Technologies
OECD, NEA offices, Issy-les-Moulineaux, France, 17-18 January, 2011.

J. Neuhausen
Release of volatiles from liquid Pb-alloy: PSI-radiochemistry contribution to Myrrha
Preparation Meeting for the FP7-Project SEARCH, Brussels, Belgium, 3 February, 2011.

J. Neuhausen, D. Schumann, R. Dressler, B. Eichler, S. Heinitz, B. Hammer, F. von Rohr, L. Zanini, V. Boutellier, M. Rüthi, J. Eikenberg, E. Noah
Radiochemical aspects of liquid metal spallation targets
Proceedings of DAE-BRNS Symposium on Nuclear and Radiochemistry, Visakhapatnam, India, 22-26 February, 2011.

J. Neuhausen, M. Wohlmuther
Betrachtungen zur Verdampfung von Po-Isotopen und Hg-194 bei Schmelz- und Trennvorgängen
Fachgespräch zu Sicherheit und Entsorgung im Rahmen der MEGAPIE-Nachuntersuchungen, ENSI, Brugg, Switzerland, 28 April, 2011.

J. Neuhausen, D. Schumann, V. Boutellier, Ch. Zumbach, M. Dubs
Sampling and radiochemical investigations of the MEGAPIE-Target
MEGAPIE PSC/PCG-Meeting, Villigen, Switzerland, 30 June, 2011.

J. Neuhausen, M. Wohlmuther, D. Gavillet
Evaluation of Po and Hg-194 evaporation during melting and cutting of MEGAPIE samples
MEGAPIE PSC/PCG-Meeting, Villigen, Switzerland, 30 June, 2011.

J. Neuhausen
Spallation product release and distribution in a liquid target: Possible PSI-Radiochemistry contributions to ESS
ESS WP6-Meeting, Riga, Latvia, 26 October, 2011.

J. Neuhausen
SEARCH WP6: Release and capture of volatiles from liquid LBE
Overview: Objectives, Structure, Budget
SEARCH Kick-off Meeting, Brussels, Belgium, 23 November, 2011.

J. Neuhausen
SEARCH WP6: Release and capture of volatiles from liquid LBE
PSI-contribution – Task 6.1
SEARCH Kick-off Meeting, Brussels, Belgium, 23 November, 2011.

J. Neuhausen
Radiochemical aspects of liquid metal spallation targets
Meeting of the Myrrha-LBE Conditioning and Chemistry group, Mol, Belgium, 25 November, 2011

M. Rizzi, J. Neuhausen
Polonium evaporation studies from liquid metal spallation targets
4th High Power Targetry Workshop 2011, hosted by European Spallation Source (ESS)
Malmö, Schweden, 2-6 May, 2011.

D. Schumann
ERAWAST – Nuclear Chemistry for Nuclear Science
2nd ERAWAST workshop, Villigen, Switzerland, 29 August - 2 September, 2011.

D. Schumann, M. Ayranov, R. Dressler
Possibilities for the preparation of exotic targets at PSI
Annual n_TOF meeting, Lisbon, Portugal, 13-15 December, 2011.

S. Söllradl, L. Canella, P. Kudejova, Zs. Reva, R. Dressler, D. Schumann, M. Ayranov, A. Türler
Plan to measure the neutron capture cross-section of ^{60}Fe with cold neutrons at the PGAA facility in munich
ERAWAST II workshop, PSI, Switzerland, August - September, 2011.

A. Wallner, K. Buczak, A. Plompen, D. Schumann, V. Semkova
New exotic and non-standard radionuclides in AMS
12th Accelerator Mass Spectrometry Conference, Wellington, New Zealand, 20-25 March, 2011.

RADIONUCLIDE DEVELOPMENT

M. Bunka, K. Zhernosekov, A. Hohn, R. Schibli, A. Türler
Entwicklung von ^{44}Ti-Produktion für ^{44}Ti/^{44}Sc Radionuklidgenerator
GDCh-Wissenschaftsforum 2011, Bremen, Germany, 4-7 September, 2011.

H. Dorrer, K. Zhernosekov, U. Köster, K. Johnston, R. Schibli, A. Türler
Herstellung von Terbium-Radioisotopen für diagnostische und therapeutische Anwendungen in der Nuklearmedizin
GDCh-Wissenschaftsforum, Bremen, Germany, 4-7 September, 2011.

H. Dorrer, U. Köster, C. Müller, K. Johnston, R. Schibli, A. Türler, K. Zhernosekov
Herstellung von Terbium-Radioisotopen für diagnostische und therapeutische Anwendungen in der Nuklearmedizin
19. Jahrestagung der Arbeitsgemeinschaft Radiochemie/Radiopharmazie, Ochsenfurt bei Würzburg, Germany,
15-17 September, 2011.

K. Zhernosekov, S. Geistlich, A. Blanc, H. Dorrer, S. Landolt, A. Türler, R. Schibli
^{177}Lu quality and limitations analysis for an efficient preparation of ^{177}Lu -labeled compounds
Gemeinsame Jahrestagung der Deutschen, Österreichischen und Schweizerischen Gesellschaft für Nuklearmedizin
Bregenz, Austria, 13-16 April, 2011.

K. Zhernosekov
^{68}Ge/^{68}Ga radionuclides generators & synthesis modules
Pre Symposium, 1st World Congress on Gallium-68 and Peptide Receptor Radionuclide therapy (PRRNT).
Bad Berka, Germany, 27-29 June, 2011.

ENVIRONMENTAL RADIONUCLIDES UNIVERSITÄT BERN

D. Ceburnis, A. Garbaras, S. Szidat, K.E. Yttri, V. Remeikis, C.D. O'Dowd
Source apportionment of ambient particulate carbonaceous matter at Mace Head during the joint EMEP/EUCAARI intensive measurement periods in fall 2008 and spring 2009
European Aerosol Conference 2011, Manchester, U.K., 4-9 September, 2011.

U. Dusek, M. Monaco, M. Prokopiou, F. Gongriep, R. Holzinger, S. Szidat, R. Hitzenberger, T. Röckmann
Thermal separation and purification of organic and elemental carbon from small aerosol samples for ^{14}C analysis
International Workshop on Small Scale Radiocarbon Analysis, Zurich, Switzerland, 13-16 September, 2011.

S.M. Fahrni, S. Szidat, H.A. Synal, L. Wacker
Improving a gas ion source for ^{14}C AMS
International Workshop on Small Scale Radiocarbon Analysis, Zurich, Switzerland, 13-16 September, 2011.

M. Furger, M. Crippa, F. Freutel, L. Poulain, S. Visser, S. Szidat, P. Zotter, A.S.H. Prevot, U. Baltensperger
Regional vs. local aerosol sources during the MEGAPOLI Paris campaigns
25th General Assembly of the International Union of Geodesy and Geophysics (IUGG), Melbourne, Australia,
28 June - 7 July, 2011.

S. Szidat
New infrastructure at the Oeschger Centre: ^{14}C Accelerator Mass Spectrometry
Plenary Meeting Oeschger Centre 2011, Bern, Switzerland, 16 February, 2011.

S. Szidat, S.M. Fahrni, N. Perron, A.S.H. Prévôt, M. Rzaca, H. Bauer, H. Puxbaum, L. Wacker
Compound-specific ^{14}C analysis of acidic aerosol components
12th Accelerator Mass Spectrometry Conference, Wellington, New Zealand, 20-25 March, 2011.

S. Szidat, S.M. Fahrni, L. Wacker, H.A. Synal
Improving and understanding a gas ion source for ^{14}C AMS
12th Accelerator Mass Spectrometry Conference, Wellington, New Zealand, 20-25 March, 2011.

S. Szidat, Y.L. Zhang, N. Perron , A.S.H. Prévôt, L. Wacker
Radiocarbon measurements of carbonaceous aerosols: the new sample preparation line at University of Bern
12th Accelerator Mass Spectrometry Conference, Wellington, New Zealand, 20-25 March, 2011.

S. Szidat, S.M. Fahrni, N. Perron, A.S.H. Prévôt, L. Wacker, M. Rzaca, H. Bauer, H. Puxbaum
^{14}C source apportionment of dicarboxylic acids and humic-like substances in atmospheric aerosols
10th International Conference on Carbonaceous Particles in the Atmosphere, Vienna, Austria, 26-29 June, 2011.

S. Szidat
Radiocarbon analysis of black and brown carbon: what can we learn?
23rd International Symposium on Polycyclic Aromatic Compounds, Münster, Germany, 4-8 September, 2011.

S. Szidat
^{14}C accelerator mass spectrometry: status of the new installations at University of Bern
Oeschger Centre WP3 Meeting 2011, Zollikofen, Switzerland, 20 October, 2011.

L. Wacker, S. Bernasconi, A. Birkholz, S. Fahrni, M. Gigera, I. Hajdas, N. Perron, M. Ruff, T. Schulze-Koenig, R. Smittenberg, H.A. Synal, S. Szidat, Y.L. Zhang
A versatile gas interface for routine radiocarbon analyses with a gas ion source
12th Accelerator Mass Spectrometry Conference, Wellington, New Zealand, 20-25 March, 2011.

Y.L. Zhang, N. Perron, A.S.H. Prévôt, L. Wacker, S. Szidat
Radiocarbon measurements of carbonaceous aerosols: the new sample preparation line at University of Bern
12th Swiss Global Change Day, Bern, Switzerland, 19 April, 2011.

Y.L. Zhang
On the quantification of OC and EC and their isolation for ^{14}C measurement: a modified thermal-optical method
Seminar Laboratory of Atmospheric Chemistry, PSI, Switzerland, 2 May, 2011.

Y.L. Zhang, N. Perron, A.S.H. Prévôt, L. Wacker, S. Szidat
On the quantification of OC and EC and their isolation for ^{14}C measurement: a modified thermal-optical method
10th International Conference on Carbonaceous Particles in the Atmosphere, Vienna, Austria, 26-29 June, 2011.

Y.L. Zhang, A. Zapf, M. Schwikowski, A.S.H. Prévôt, S. Fahrni, L. Wacker, S. Szidat
Microgram level radiocarbon determination on carbonaceous aerosol particles in the environment
International Workshop on Small Scale Radiocarbon Analysis, Zurich, Switzerland, 13-16 September, 2011.

Y.L. Zhang
Source appointment of carbonaceous aerosol by C-14 analysis: method development and applications
Seminar of the Laboratory of Radiochemistry and Environmental Chemistry, Paul Scherrer Institut, Villigen, Switzerland, 11 November, 2011.

P. Zotter, A.S.H. Prévôt, Y.L. Zhang, S. Szidat, X. Zhang, Y.H. Lin, P. Hayes, J. Schnelle-Kreis, G. Seibert, R. Zimmermann, J.D. Surratt, J.L. Jimenez, R. Weber, U. Baltensperger
Diurnal cycle of fossil and non-fossil total carbon using ^{14}C analyses during CalNex
CalNex Data Analysis Workshop, Sacramento, USA, 16-19 May, 2011.

P. Zotter, A.S.H. Prévôt, Y. Zhang, S. Szidat, X. Zhang, Y.H. Lin, P. Hayes, J. D. Surratt, J.L. Jimenez, R. Weber, J. Slowik, U. Baltensperger
Diurnal cycle of fossil and non-fossil total carbon using ^{14}C analyses during CalNex
European Aerosol Conference 2011, Manchester, U.K., 4-9 September, 2011.

P. Zotter, A.S.H. Prévôt, Y.L. Zhang, S. Szidat, X. Zhang, Y.H. Lin, P. Hayes, J.D. Surratt, J.L. Jimenez, R. Weber, U. Baltensperger
Diurnal cycle of fossil and non-fossil total carbon using ^{14}C analyses during CalNex
International Workshop on Small Scale Radiocarbon Analysis, Zurich, Switzerland, 13-16 September, 2011.

P. Zotter, A.S.H. Prévôt, S. Szidat, J. Surratt, J.L. Jimenez, R. Weber, Y.L. Zhang, S. Szidat, X. Zhang, Y.H. Lin, P. Hayes, U. Baltensperger
Diurnal cycle of fossil and non-fossil total carbon using ^{14}C analyses in Pasadena
American Association for Aerosol Research (AAAR) 30th Annual Conference, Orlando, USA, 3-7 October, 2011.

LECTURES AND COURSES

Prof. Dr. A. Türler
Universität Bern, FS2011:
Bachelor
Instrumentalanalytik II (with Dr. K. Krämer and Prof. M. Schwikowski)
Allgemeine Chemie (Einführung Radioaktivität) (with Prof. R. Hähner and Prof. J. Hulliger)

Universität Bern, HS2011:
Bachelor
Physikalische Chemie IV (with Prof. T. Wandlowski)
Praktikum Phys. Chemie II (with others)
Biochemische Methoden I (with others)

Master
Nuclear and Radiochemistry (with R. Eichler)
Lab course: Nuclear and Radiochemistry at Bern, Basel, ETHZ and PSI (with others)
Seminar Radio- und Umweltchemie in collaboration with Paul Scherrer Institut
(organized by D. Schumann FS2011 and S. Szidat HS2011)

Prof. Dr. M. Schwikowski
Universität Bern, FS2011:
Bachelor
Instrumentalanalytik II (with Prof. A. Türler and Dr. K. Krämer)

Master
Summer Course am Paul Scherrer Institut. 2months International Summer Student Programme
(with Prof. A. Türler)

Universität Bern, HS2011
Master
Atmospheric and Aerosol Chemistry

Dr. M. Ammann
ETH Zürich, FS2011:
Systempraktikum Atmosphäre und Klima,

Dr. T. Bartels-Rausch
Universität Bern, HS2011
Master
Lab course: Nuclear and Radiochemistry at the PSI (with Prof. A. Türler and S. Szidat) (4 ECTS)

Dr. R. Dressler
Course for PhD students at PSI
Nuclear Radiation Measurement Part 1
Nuclear Radiation Measurement Part 2

Dr. R. Eichler
Universität Bern, HS2011:
Praktikum Phys. Chemie II (with Prof. A. Türler)
Master Lab course Radiochemistry
Lab course: Nuclear and Radiochemistry (with Prof. A. Türler and S. Szidat)

Prof. Dr. H.W. Gäggeler
University Lanzhou, China, HS 2011:
Introduction into Radiochemistry and some applications

Dr. J. Neuhausen
Universität Bern, HS2011:
Praktikum Physikalische Chemie II (with Prof. A. Türler)

Dr. D. Schumann
FS2011:
Seminar Radio- und Umweltchemie in collaboration with Paul Scherrer Institut

PD Dr. S. Szidat
Universität Bern, FS2011:
Ergänzungen zur analytischen Chemie für Pharmazeuten

Universität Bern, HS2011:
Chemie für Studierende der Veterinärmedizin (with C. Leumann)
Environmental Radionuclides and Nuclear Dating
Praktikum Physikalische Chemie II (with others)
Lab Course Nuclear and Radiochemistry (with A. Türler and R. Eichler)
Seminar Radio- und Umweltchemie in collaboration with Paul Scherrer Institut

MEMBERS OF SCIENTIFIC COMMITTEES EXTERNAL ACTIVITIES

Dr. Markus Ammann:
Atmospheric Chemistry and Physics: member of editorial board
Member of the IUPAC Subcommittee on gas kinetic data evaluation
PSI internal research commission (FoKo), member

Dr. Thorsten Bartels-Rausch:
Air-Ice Chemical Interactions (AICI), Member of Steering Committee

Dr. Robert Eichler:
PSI internal research commission (FoKo), member
Associate Editor of the International Journal of Modern Physics E (IJMPE)
World Scientific Publishing

Dr. Dorothea Schumann:
Member of the Nuklearforum Schweiz
Member of the Schweizerische Gesellschaft der Kernfachleute
Member of the PSI internal Neutron Source Development Group

Prof. Dr. Margit Schwikowski:
Member of the Coordinating Committee of the Pages/IGBP initiative LOTRED SA
(Long-Term climate Reconstruction and Diagnosis of (southern) South America)
Schweizerische Gesellschaft für Schnee, Eis und Permafrost (SEP), board member
Member of the Oeschger Centre for Climate Change Research (OCCR)
Council of the International Glaciological Society, elective member
PhD thesis committee Kimberley Ann Casey, Supraglacial dust and debris characterization via in situ and optical remote sensing methods, University of Oslo, 15 September 2011
PhD thesis committee Irene Wientjes, A study of the dark region in the western ablation zone of the Greenland ice sheet, Utrecht University, 7 October 2011

PD Dr. Sönke Szidat:
Member of the Oeschger Centre for Climate Change Research (OCCR)
Treasurer of the Bernese Chemical Society (Berner Chemische Gesellschaft, BCG)

Prof. Dr. Andreas Türler:
Eidgenössische Kommission für Strahlenschutz und Überwachung der Radioaktivität (KSR), member
GSI Helmholtzzentrum für Schwerionenforschung GmbH, member of the General Program Advisory Committee (G-PAC) and GSI Users Group, member of the Executive Committee (UEC)
Gesellschaft Deutscher Chemiker (GDCh), Fachgruppe Nuklearchemie, Vorstands-Beirat
Radiochimica Acta, member of the advisory board
Oeschger Centre for Climate Change Research (OCCR), Mitglied des Wissenschaftlichen Ausschusses
Nuklearforum Schweiz, Mitglied des Vorstandes

DOCTORAL THESIS

Veronika Zelenay
Water uptake and chemical composition in single submicron particles analyzed by X-ray microspectroscopy
Prof. Dr. T. Peter / ETHZ
Dr. M. Ammann / PSI
January 201 1

Simon Fahrni
New methods for radiocarbon measurements of atmospheric di- and polycarboxylic acids with accelerator mass spectrometry
Prof. Dr. H. W. Gäggeler / PSI & Uni Bern
PD Dr. S. Szidat / Uni Bern
February 2011

Yulia Sosedova
Heterogenous chemistry of nitrogen dioxide and its impact on atmospheric nitrous acid
Prof. Dr. H. W. Gäggeler / PSI & Uni Bern
Dr. M. Ammann / PSI
May 2011

C. Barkhausen
Production of non carrier added (n.c.a.) ^{177}Lu for radiopharmaceutical Applications
PhD thesis at TU Munich
Prof. Dr. A. Türler / PSI & Uni Bern
Dr. K. Zhernosekov / PSI
September 2011

MASTER THESIS

Eva Bühlmann
Influence of particulate matter on observed albedo reductions on Plaine Morte glacier, Swiss Alps
Prof. Dr. M. Schwikowski / PSI & Uni Bern
Prof. Dr. M. Hoelzle / University of Fribourg
October 2011

Emanuel Hammer
Calculation and interpretation of cloud peak supersaturations at the Jungfraujoch
Prof. Dr. Urs Baltensperger / PSI
Dr. E. Weingartner / PSI
Prof. Dr. M. Schwikowski / PSI & Uni Bern
March 2011

Christine Ketterer
Investigation of the planetary boundary layer using remote sensing and in-situ measurements at the Kleine Scheidegg and at the Jungfraujoch
Dr. E. Weingartner / PSI
Prof. Dr. M. Schwikowski / PSI & Uni Bern
December 2011

BACHELOR THESIS

Yvonne Hari
System set-up for the isolation of humic-like substances from aerosols
PD Dr. S. Szidat / Uni Bern
June 2011

AWARD

P.A. Herren, A. Eichler, J. Eikenberg, H. Machguth, T. Papina, L. Tobler, E. Vogel, A. Zapf, M. Schwikowski
First Prize for Young Researchers of the Swiss Snow, Ice and Permafrost Society (SEP)
Ice core based climate reconstruction of the Mongolian Altai
9th Swiss Geoscience Meeting, ETH Zurich, 11-13 November 2011

LIST OF PUBLICATIONS: 2011

NES – Nuclear Energy and Safety

Publications in Scientific and Technical Journals

AIMOZ L., CURTI E., MÄDER U.
"Iodide interaction with natural pyrite", J. Radioanal. Nucl. Chem. (ISSN 0236-5731), **288**(2), 517-524 (2011)

BARTEN W., JASIULEVICIUS A., ZERKAK O., MACIAN-JUAN R.
"Analysis of the UMSICHT Water Hammer Benchmark Experiment 329 using TRACE and RELAP5", Multiphase Sci. Technol. (ISSN 0276-1459), **23**(1), 1-27 (2011)

BERTOLOTTO D., MANERA A., MACIAN-JUAN R., CHAWLA R.
"Improvement of the one-dimensional dissolved-solute convection equation using the QUICKEST–ULTIMATE algorithm", Nucl. Eng. Des. (ISSN 0029-5493), **241**(1), 245-256 (2011)

BIRCHLEY J., STUCKERT S.
"Analysis of QUENCH-ACM Experiments using SCDAP/RELAP5", J. Energy and Power Engineering, **5**, 918-927 (2011)

BRADBURY M.H., BAEYENS B.
"Predictive sorption modelling of Ni(II), Co(II), Eu(III), Th(IV) and U(VI) on MX-80 bentonite and Opalinus Clay: a 'bottom-up' approach", Appl. Clay Sci. (ISSN 0169-1317), **52**(1-2), 27-33 (2011)

CARAVATI S., COLLEONI D., MAZZARELLO R., KÜHNE T.D., KRACK M., BERNASCONI M., PARRINELLO M.
"First-principles study of nitrogen doping in cubic and amorphous $Ge_2Sb_2Te_5$", J. Physics: Condensed Matter (ISSN 0953-8984), **23**, 265801, 13 pages (2011)

CHAHINE E., LABORDE P, RENARD Y.
"A non-conformal eXtended Finite Element approach: Integral matching Xfem", Appl. Num. Math. (ISSN 0168-9274), **62**, 322-343 (2011)

CHENU A., MIKITYUK K., CHAWLA R.
"Pressure drop modeling and comparisons with experiments for single- and two-phase sodium flow", Nucl. Eng. Des. (ISSN 0029-5493), **241**(9), 3898-3909 (2011)

CHURAKOV S.V., GIMMI T.
"Up-scaling of molecular diffusion coefficients in clays: A two-step approach", J. Phys. Chem. C (ISSN 1932-7447), **115**(14), 6703–6714 (2011)

CRIPPS R.C., GÜNTAY S., JÄCKEL B.
"The PSIodine Code: A computer program to model experimental data on iodine and other species in irradiated CsI solutions sparged with argon, air, or nitrous oxide", Nucl. Eng. Des. (ISSN 0029-5493), **241**(10), 4306-4325 (2011)

CRIPPS R. C., JÄCKEL B., GÜNTAY S.
"On the radiolysis of iodide, nitrate and nitrite ions in aqueous solution: An experimental and modelling study", Nucl. Eng. Des. (ISSN 0029-5493), **241**(8), 3333-3347 (2011)

DÄHN R., BAEYENS B., BRADBURY M.H.
"Investigation of the different binding edge sites for Zn on montmorillonite using P-EXAFS – the strong/weak site concept in the 2SPNE SC/CE sorption model", Geochim. Cosmochim. Acta (ISSN 0016-7037), **75**(18), 5154-5168 (2011)

DÄHN R., VESPA M., TYLISZCZAK T., WIELAND E., SHUH D.K.
"Soft X-ray spectroscopy of cobalt uptake by cement", Environ. Sci. Technol. (ISSN 0013-936X), **45**(5), 2021-2027 (2011)

DEGUELDRE C., BERTSCH J., KURI G., MARTIN M.
"Nuclear fuel in generation II and III reactors: research issues related to high burn-up", Energy Environ. Sci. (ISSN 1754-5692), **4**(5), 1651-1661 (2011)

DEGUELDRE C., MARTIN M., KURI G., GROLIMUND D., BORCA C.
"Plutonium–uranium mixed oxide characterization by coupling micro-X-ray diffraction and absorption investigations", J. Nucl. Mater. (ISSN 0022-3115), **416**(1-2), 142-150 (2011)

DEHBI A.
"Prediction of Extrathoracic Aerosol Deposition using RANS-Random Walk and LES Approaches", Aerosol Science and Technology (ISSN 0278-6826), **45**(5), 555-569 (2011)

DEHBI A., DE CRECY F.
"Validation of the Langevin particle dispersion model against experiments on turbulent mixing in a T-junction", Powder Technology (ISSN 0032-5910), **206**(3), 312-321 (2011)

DEHBI A., MARTIN S.
"CFD Simulation of Particle Deposition on an Array of Spheres using an Euler/Lagrange Approach", Nucl. Eng. Des. (ISSN 0029-5493), **241**(8), 3121-3129 (2011)

DILNESA B., LOTHENBACH B., LE SAOUT G., RENAUDIN G., MESBAH A., FILINCHUK Y., WICHSER A., WIELAND E.
"Iron in carbonate containing AFm phases", Cem. Concr. Res. (ISSN 0008-8846), **41**(3), 311-323 (2011)

ERKAN N., KAPULLA R., MIGNOT G., ZBORAY R., PALADINO D.
"Experimental investigation of spray-induced gas stratification break-up and mixing in two interconnected vessels", Nucl. Eng. Des. (ISSN 0029-5493), **241**(9), 3935-3944 (2011)

FREIXA J., MANERA A.
"Verification of a TRACE EPR™ model on the basis of a scaling calculation of an SBLOCA ROSA test", Nucl. Eng. Des. (ISSN 0029-5493), **241**(3), 888-896 (2011)

FROIDEVAL A., BADILLO A., BERTSCH J., CHURAKOV S., DÄHN R., DEGUELDRE C., LIND T., PALADINO D., PATTERSON B.D.
"Towards possible opportunities in nuclear materials science and technology at an X-ray Free Electron Laser research facility", J. Nucl. Mater. (ISSN 0022-3115), **416**(1-2), 242–251 (2011)

GAO N., VAN SWYGENHOVEN H., VICTORIA M., CHEN J.
"Formation of dislocation loops during He clustering in bcc Fe", J. Phys.: Condens. Matter (ISSN 0953-8984), **23**(44), 442201, 5 pages (2011)

GAO N., VICTORIA M., CHEN J., VAN SWYGENHOVEN H.
"Helium-vacancy cluster in a single bcc iron crystal lattice", J. Phys.: Condens. Matter (ISSN 0953-8984), **23**(24), 245403, 8 pages (2011)

GAONA X., DÄHN R., TITS J., SCHEINOST A.C., WIELAND E.
"Uptake of Np(IV) by C-S-H phases and cement paste: An EXAFS study", Environ. Sci. Technol. (ISSN 0013-936X), **45**(20), 8765-8771 (2011)

GIMMI T., KOSAKOWSKI G.
"How mobile are sorbed cations in clays and clay rocks?", Environ. Sci Technol. (ISSN 0013-936X), **45**(4), 1443-1449 (2011)

GLAUS M.A., FRICK S., ROSSÉ R., VAN LOON L.R.
"Consistent interpretation of the results of through-, out-diffusion and tracer profile analysis for tracer anion diffusion in compacted montmorillonite", J. Contam. Hydrol. (ISSN 0169-7722), **123**(1-2), 1-10 (2011)

HAYEK M., KOSAKOWSKI G., CHURAKOV S.V.
"Exact analytical solution for coupled reactive transport problem with feedback of porosity change", Water Resourc. Res. (ISSN 0043-1397), **47**, W07545, 13 pages (2011)

HERRANZ L.E., VALLEJO I., KHVOSTOV G., SERCOMBE J., ZHOU G.
"Assessment of fuel rod performance codes under ramp scenarios investigated within the SCIP project", Nucl. Eng. Des. (ISSN 0029-5493), **241**(3), 815-825 (2011)

HONG Y., QIAN G.
"Effect of aqueous environment on high cycle and very-high-cycle fatigue behavior for a structural steel", Key Eng. Mater. (ISSN 1013-9826), **462-463**, 355-360 (2011)

HONG Y., ZHAO A., QIAN G., ZHOU C.
"Fatigue strength and crack initiation mechanism of very-high-cycle fatigue for low alloy steels", Metall. Mater. Trans. A (ISSN 1073-5623), doi: 10.1007/s11661-011-0816-7, 10 pages (2011)

HOSEMANN P., STERGAR E., PENG L., DAI Y., MALOY S.A., POUCHON M.A., SHIBA K., HAMAGUCHI D., LEITNER H.
"Macro and microscale mechanical testing and local electrode atom probe measurements of STIP irradiated F82H, Fe–8Cr ODS and Fe–8Cr–2W ODS", J. Nucl. Mater. (ISSN 0022-3115), **417**(1-3), 274-278 (2011)

IDHIL A., BORCA C.N., ULDRY A.-C., VICTORIA M., SAMARAS M.
"Investigating the structure of iron–chromium alloys using synchrotron based X-ray microanalysis", J. Nucl. Mater. (ISSN 0022-3115), **416**(1-2), 65-69 (2011)

IDHIL A., BORCA C.N., ULDRY A.-C., ZEMA N., TURCHINI S., CATONE D., FOELSKE A., GROLIMUND D., SAMARAS M.
"The influence of Cr-composition on the local magnetic structure of FeCr alloys", Nucl. Instrm. Meth. B (ISSN 0168-583X), doi:10.1016/j.nimb.2011.08.071 (2011)

ISPÁNOVITY P.D., BAKÓ B., WEYGAND D., HOFFELNER W., SAMARAS M.
"Impact of gamma′ particle coarsening on the critical resolved shear stress of nickel-base superalloys with low aluminium and/or titanium content", J. Nucl. Mater. (ISSN 0022-3115), **416**(1-2), 55-59 (2011)

ISPANOVITY P.D., GROMA I., GYÖRGYI G., SZABO P., HOFFELNER W.
"Criticality of Relaxation in Dislocation Systems", Phys. Rev. Lett. (ISSN 0031-9007), **107**(8), 085503, 4 pages (2011)

ISPÁNOVITY P.D., GROMA I., HOFFELNER W., SAMARAS M.
"Abnormal subgrain growth in a dislocation-based model of recovery", Modelling Simul. Mater. Sci. Eng. (ISSN 0965-0393), **19**(4), 045008, 16 pages (2011)

JANSSENS K.G.F.
"Case study of the applicability of cyclic hardening material descriptions in finite element simulation of cyclic thermal shocks", Fatigue Fract. Eng. Mater. Struct. (ISSN 8756-758X), **34**(8), 562-572 (2011)

JORDAN K.A., PERRET G.
"A delayed neutron technique for measuring induced fission rates in fresh and burnt LWR fuel", Nucl. Instrum. Meth. A (ISSN 0168-9002), **634**(1), 91-100 (2011)

JUNG P., KLEIN H., HENRY J., CHEN J.
"Effect of implanted deuterium on tensile properties of helium-doped RAFM EUROFER97", J. Nucl. Mater. (ISSN 0022-3115), **417**(1-3), 1013-1017 (2011)

KHVOSTOV G., MIKITYUK K., ZIMMERMANN M.A.
"A model for fission gas release and gaseous swelling of the uranium dioxide fuel coupled with the FALCON code", Nucl. Eng. Des. (ISSN 0029-5493), **241**(8), 2983-3007 (2011)

KHVOSTOV G., WIESENACK W., ZIMMERMANN M.A., LEDERGERBER G.
"Some insights into the role of axial gas flow in fuel rod behaviour during the LOCA based on HALDEN tests and calculations with the FALCON-PSI code", Nucl. Eng. Des. (ISSN 0029-5493), **241**(5), 1500-1507 (2011)

KICKHOFEL J., ZBORAY R., DAMSOHN M., KAESTNER A., LEHMANN E., PRASSER H.-M.
"Cold neutron tomography of annular coolant flow in a double subchannel model of a boiling water reactor", Nucl. Inst. Meth. A. (ISSN 0168-9002), **651**(1), 297-304 (2011)

KOLBE E., VASILIEV A., FERROUKHI H.
"Assessment of the JEFF-3.1.1 Neutron Data Library for CSE of LWR Fuel Storage Pools", J. Korean Phys. Soc. (ISSN 1976-8524), **59**(2), 1174-1178 (2011)

KULIK D.A.
"Improving the structural consistency of C-S-H solid solution thermodynamic models", Cem. Concr. Res. (ISSN 0013-936X), **41**(5), 477-495 (2011)

LIAO Y., GÜNTAY S., SUCKOW D.
"The Once-Through Mode of Steam Generator Reflux Condensation in Loss-of-Coolant Accident Scenarios", Nucl. Technol. (ISSN 0029-5450), **175**(3), 510-519 (2011)

LIND T., SUCKOW D., DEHBI A., GÜNTAY S.
"Aerosol Retention in the Flooded Steam Generator Bundle during SGTR", Nucl. Eng. Des. (ISSN 0029-5493), **241**(1), 357-365 (2011)

MAGNUSSON P., CHEN J., HOFFELNER W.
"High temperature creep of a helium-implanted titanium aluminide alloy", J. Nucl. Mater. (ISSN 0022-3115), **416**(1-2), 60-64 (2011)

MANDALIEV P., STUMPF T., TITS J., DÄHN R., WALTHER C., WIELAND E.
"Uptake of Eu(III) by 11Å tobermorite and xonotlite: a TRLFS and EXAFS study", Geochim. Cosmochim. Acta (ISSN 0013-936X), **75**(8), 2017-2029 (2011)

MAZUREK M., ALT-EPPING P., BATH A., GIMMI T., WABER H.N., BUSCHAERT S., DE CANNIÈRE P., DE CRAEN M., GAUTSCHI A., SAVOYE S., VINSOT A., WEMAERE I., WOUTERS L.
"Natural tracer profiles across argillaceous formations", Appl. Geochem. (ISSN 0883-2927), **26**(7), 1035–1064 (2011)

MIESZCZYNSKI C., DEGUELDRE C., KURI G., BERTSCH J., BORCA C.N.
"Investigation of irradiated uranium-plutonium mixed oxide fuel by synchrotron based microX-ray diffraction", Prog. Nucl. Energy (ISSN 0149-1970), doi: jpnucene.2011.11.012 (2011)

MIKITYUK K., SHESTOPALOV A.
"FRED fuel behaviour code: main models and analysis of Halden IFA-503.2 tests", Nucl. Eng. Des. (ISSN 0029-5493), **241**(7), 2455-2461 (2011)

NIKITIN K., MANERA A.
"Analysis of an ADS spurious opening event at a BWR/6 by means of the TRACE code", Nucl. Eng. Des. (ISSN 0029-5493), **241**(6), 2240-2247 (2011)

ORLOV A., DEGUELDRE C., WIESE H., LEDERGERBER G., VALIZADEH S.
"Corrosion product deposits on boiling-water reactor cladding: experimental and theoretical investigation of magnetic properties", J. Nucl. Mater. (ISSN 0022-3115), **416**(1-2), 117-124 (2011)

PALADINO D., ANDREANI M., ZBORAY R., DREIER J.
"Toward a CFD quality database addressing LWR containment phenomena", Nucl. Eng. Des. (ISSN 0029-5493), doi:10.1016/j.nucengdes.2011.08.064

PALADINO D., AUBAN O., HUGGENBERGER M., DREIER J.
"A PANDA Integral Test on the Effect of Light Gas on a Passive Containment Cooling System (PCCS)", Nucl. Eng. Des. (ISSN 0029-5493), **241**(11), 4551-4561 (2011)

PALADINO D., DREIER J.
"PCCS response with DGRS activated during a postulated LOCA", Nucl. Eng. Des. (ISSN 0029-5493), **241**(9), 3925-3934 (2011)

PELLONI S., MIKITYUK K.
"A new cross-section generation model in the FAST code system and its application to gas- and sodium-cooled Generation IV fast reactors", Ann. Nucl. Energy (ISSN 0306-4549), **38**(1), 1-13 (2011)

PEREZ M., REVENTOS F., BATET L., GUBA A., TÓTH I., MIEUSSET T., BAZIN P., DE CRÉCY A., BORISOV S., SKOREK T., GLAESER H., JOUCLA J., PROBST P., UI A., CHUNG B.D., OH D.Y., PERNICA R., KYNCL M., MACEK J., MANERA A., FREIXA J., PETRUZZI A., D'AURIA F., DEL NEVO A.
"Uncertainty and sensitivity analysis of a LBLOCA in a PWR Nuclear Power Plant: results of the Phase V of the BEMUSE programme", Nucl. Eng. Des. (ISSN 0029-5493), **241**(10), 4206-4222 (2011)

PETROV V., MANERA A.
"Effect of pump-induced cold-leg swirls on the flow field in the RPV of the EPR™: CFD investigations and comparison with experimental results", Nucl. Eng. Des. (ISSN 0029-5493), **241**(5), 1478-1485 (2011)

PFINGSTEN W., BRADBURY M.H., BAEYENS B.
"The influence of Fe(II) competition on the sorption and migration of Ni(II) in MX-80 bentonite", Appl. Geochem. (ISSN 0883-2927), **26**(8), 1414-1422 (2011)

PHAM M.S., SOLENTHALER C., JANSSENS K.G.F., HOLDSWORTH S.R.
"Dislocation structure evolution and its effects on cyclic deformation response of AISI 316L stainless steel", Mater. Sci. Eng. A (ISSN 0921-5093), **528**(7-8), 3261-3269 (2011)

PITTARELLO R., VASILIEV A., FERROUKHI H., CHAWLA R.
"Refined Monte Carlo analysis of the H.B. Robinson-2 reactor pressure vessel dosimetry benchmark", Ann. Nucl. Energy (ISSN 0306-4549), **38**(9), 1842-1851 (2011)

PROFF C., ABOLHASSANI S., LEMAIGNAN C.
"Oxidation behaviour of binary zirconium alloys containing intermetallic precipitates", J. Nucl. Mater. (ISSN 0022-3115), **416**(1-2), 125-134 (2011)

PURAGLIESI R., DEHBI A., LERICHE E., SOLDATI A., DEVILLE M.O.
"DNS of buoyancy-driven flows and Lagrangian particle tracking in a square cavity at high Rayleigh numbers", Int. J. Heat Fluid Flow (ISSN 0142-727X), **32**(5), 915–931 (2011)

QIAN G., NIFFENEGGER M.
"Probabilistic fracture assessment of piping systems based on FITNET FFS procedure", Nucl. Eng. Des. (ISSN 0029-5493), **241**(3), 714-722 (2011)

QIAN G., NIFFENEGGER M., LI S.
"Probabilistic analysis of pipelines with corrosion defects by using FITNET FFS procedure", Corros. Sci. (ISSN 0010-938X), **53**(3), 855-861 (2011)

RAMESH M., LEBER H., DIENER M., SPOLENAK R.
"Conducting thermomechanical fatigue test in air at light water reactor relevant temperature intervals", J. Nucl. Mater. (ISSN 0022-3115), **415**(1), 23-30 (2011)

RAMESH M., LEBER H., JANSSENS K.G.F., DIENER M., SPOLENAK R.
"Thermomechanical and isothermal fatigue behavior of 347 and 316L austenitic stainless tube and pipe steels", Int. J. Fatigue (ISSN 0142-1123), **33**, 683-691 (2011)

RÄTZ D., JORDAN K.A., MURPHY M., PERRET G., CHAWLA R.
"Comparison of measured and calculated reaction rate distributions in an SCWR-like test lattice", Ann. Nucl. Energy (ISSN 0306-4549), **38**(4), 794-801 (2011)

RÄTZ D., JORDAN K.A., PERRET G., CHAWLA R.
"Experimental validation of control rod related perturbations of moderator regions in an SCWR-like fuel lattice", Ann. Nucl. Energy (ISSN 0306-4549), **38**(11), 2319-2332 (2011)

RIHS S., PRUNIER J., THIEN B., LEMARCHAND D., PIERRET M.-C., CHABAUX F.
"Using short-lived nuclides of the U- and Th-series to probe the kinetics of colloid migration in forested soils", Geochim. Cosmochim. Acta (ISSN 0016-7037), **75**(23), 7707–7724 (2011)

ROZOV K.B., BERNER U., KULIK D.A., DIAMOND L.W.
"Solubility and thermodynamic properties of carbonate-bearing hydrotalcite-pyroaurite solid solutions with a 3:1 Mg/(Al+Fe) mole ratio", Clays Clay Miner. (ISSN 0009-8604), **59**(3), 215-232 (2011)

SATO Y., NICENO B.
"A conservative local interface sharpening scheme for the constrained interpolation profile method", Int. J. Num. Meth. Fluids (ISSN 1097-0363), doi: 10.1002/fld.2695 (2011)

SCHULENBERG T., STARFLINGER J., MARSAULT P., BITTERMANN D., MARÁCZY C., LAURIEN E., LYCKLAMA À NIJEHOLT J.A., ANGLART H., ANDREANI M., RUZICKOVA M., TOIVONENJ M.
"European supercritical water cooled reactor", Nucl. Eng. Des. (ISSN 0029-5493), **241**(9), 3505-3513 (2011)

SMITH B.L.
"On the Establishment of a Web Portal for the Assessment of CFD in Reactor Safety Analysis", Nucl. Tech. (ISSN 0029-5450), **175**(3), 663-680 (2011)

STAINSBY R., PEERS K., MITCHELL C., POETTE C., MIKITYUK K., SOMERS J.
"Gas cooled fast reactor research in Europe", Nucl. Eng. Des. (ISSN 0029-5493), **241**(9), 3481-3489 (2011)

STUCKERT J., BIRCHLEY J., GROSSE M., JÄCKEL B., STEINBRÜCK M.
"Experimental and calculation results of the integral reflood test QUENCH15 with ZIRLOTM cladding tubes in comparison with results of previous QUENCH tests", Nucl. Eng. Des. (ISSN 0029-5493), **241**(8), 3224–3233 (2011)

SUN K., KREPEL J., MIKITYUK K., PELLONI S., CHAWLA R.
"Void reactivity decomposition for the Sodium-cooled Fast Reactor in equilibrium fuel cycle", Ann. Nucl. Energy (ISSN 0306-4549), **38**(7), 1645-1657 (2011)

TITS J., GEIPEL G., MACÉ N., EILZER M., WIELAND E.
"Determination of uranium(VI) sorbed species in calcium silicate hydrate phases: a laser-induced luminescence spectroscopy and batch sorption study", J. Colloid Interf. Sci. (ISSN 0029-9797), **359**(1), 248-256 (2011)

TOURNASSAT C., ALT-EPPING P., GAUCHER E.C., GIMMI T., LEUPIN O.X., WERSIN P.
"Biogeochemical processes in a clay formation in-situ experiment: Part F – reactive transport modelling", Appl. Geochem. (ISSN 0883-2927), **26**(6), 1009-1022 (2011)

VALIZADEH S., LEDERGERBER G., ABOLHASSANI S, JÄDERNÄS D., DAHLBÄCK M., MADER E.V., ZHOU G., WRIGHT J., HALLSTADIUS L.
"Effects of Secondary Phase Particle Dissolution on the In-Reactor Performance of BWR Cladding", J. ASTM Int. (ISSN 1546-926X), **8**(2), Paper ID JAI103025, 16 pages (2011)

VASILIEV A., KOLBE E., FERROUKHI H., PITTARELLO R.
"Comparison of Neutron Data Libraries for the Analysis of the 'H.B.Robinson-2 Pressure Vessel Benchmark' with the MCNPX Code", J. Korean Phys. Soc. (ISSN 1976-8524), **59**(2), 2047-2050 (2011)

VINAI P., MACIAN-JUAN R., CHAWLA R.
"Propagation of void fraction uncertainty measures in the RETRAN-3D simulation of the Peach Bottom turbine trip", Ann. Nucl. Energy (ISSN 0306-4549), **38**(2-3), 358-370 (2011)

WABER H.N., GIMMI T., SMELLIE J.A.T.
"Effects of drilling and stress release on transport properties and porewater chemistry of crystalline rocks", J. Hydrol. (ISSN 0022-1694), **405**(3-4), 316–332 (2011)

WANG H.A.O., GROLIMUND D., VAN LOON L.R., BARMETTLER K., BORCA C.N., AESCHLIMANN B., GÜNTHER D.
"Quantitative chemical imaging of element diffusion into heterogeneous media using laser ablation inductively coupled plasma mass spectrometry, synchrotron micro-X-ray fluorescence, and extended X-ray absorption fine structure spectroscopy", Anal. Chem. (ISSN 0003-2700), **83**(16), 6259-6266 (2011)

YLÖNEN A., BISSELS W., PRASSER H.-M.
"Single-phase cross-mixing measurements in a 4x4 rod bundle", Nucl. Eng. Des. (ISSN 0029-5493), **241**(7), 2484-2493 (2011)

YUN Y., RUSZ R., SUZUKI M.-T., OPPENEER P.M.
"First-principles investigation of higher oxides of uranium and neptunium: U3O8 and Np2O5", Phys. Rev. B (ISSN 1098-0121), **83**(7), 075109, 10 pages (2011)

ZBORAY R., KICKHOFEL J., DAMSOHN M., PRASSER H.-M.
"Cold-neutron tomography of annular flow and functional spacer performance in a model of a Boiling Water Reactor fuel rod bundle", Nucl. Eng. Des. (ISSN 0029-5493), **241**(8), 3201-3215 (2011)

ZBORAY R., PRASSER H.-M.
"On the relevance of low side flows for thermal loads in T-junctions", Nucl. Eng. Des. (ISSN 0029-5493), **241**(8), 2881-2888 (2011)

ZERKAK O., FERROUKHI H.
"Vessel coolant mixing effects on a PWR Main Steam Line Break transient", Ann. Nucl. Energy (ISSN 0306-4549), **38**(1), 60-71 (2011)

Publications in Books

DENECKE M.A., DE NOLF W., RACK A., TUCOULOU R., VITOVA T., FALKENBERG G., ABOLHASSANI S., CLOETENS P., KIENZLER B.
"Speciation of Actinides in Granite Subjected by Tracer Studies", in S.N. Kalmykov, M.A. Denecke (eds.): Actinide Nanoparticle Research, Springer Verlag, pp 413-436, 2011 (ISBN 3-642-11431-8)

HOFFELNER W., BRATTON R., MEHTA H., HASEGAWA K., MORTON D.K.
"New Generation Reactors", in I.K.R. Rao (ed.): Energy and Power Generation Handbook, ASME Press, pp. 23.1-23.34, 2011 (ISBN 978-0-7918-5955-1)

Keynote Lectures at International Conferences

CAVEDON J.-M.
"Nuclear Research Policy in the Evolving Political Context of Switzerland", 4th Int. Symp. on Material Testing Reactors (ISMTR-4), 5-9 Dec. 2011, Oarai, Japan

CHURAKOV S.V.
"Multi-scale modelling of ions and water diffusion in clays", Goldschmidt Conf. 2011, 14-19 Aug. 2011, Prague, Czech Republic, Min. Mag. **75**(3), p675, 2011

CHURAKOV S.V., GIMMI T., TYAGI M.
"Two step up-scaling of molecular diffusion coefficients in clays", Goldschmidt Conf. 2011, 14-19 Aug. 2011, Prague, Czech Republic, Min. Mag. **75**(3), p675, 2011

DEGUELDRE C.
"Groundwater colloid generation and detection: from pseudo-equilibrium in quasi-stagnant aquifer to transients induced by flow variation or seismic features", 35th Int. Symp.: scientific basis for nuclear waste management (MRS 2011), 2-7 Oct. 2011, Buenos Aires, Argentina

GROLIMUND D., BORCA C.N., WANG H.A.O., VAN LOON R., MARONE F., DIAZ N., JAKOB A., CHURAKOV S., GIMMI T., HARTMANN A., VONTOBEL P.
"Imaging chemistry (and physics) in space and time: towards a 3D live view on reactive transport", 13th Int. Conf. on the Chemistry and Migration Behaviour of Actinides and Fission Products in the Geosphere (MIGRATION 2011), 18-23 Sept. 2011, Beijing, China

VAN LOON L.R.
"Ion diffusion in low permeability clay rocks: an overview", Goldschmidt Conf. 2011, 14-19 Aug. 2011, Prague, Czech Republic, Min. Mag. **75**(3), p2070, 2011

ZIMMERMANN M.A.
"Can We Measure Changes of Safety Margins in Nuclear Power Plants?", Workshop on DPSA-Deterministic/Probabilistic Safety Analysis, 3-5 Oct., 2011, Helsinki, Finland

International Conferences with Proceedings

ADAMSSON C., LE CORRE J.-M.
"VIPRE-W/MEFISTO-T – a Mechanistic Tool for Transient Prediction of Dryout in BWR Fuel", Paper 229, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

ADAMSSON C., LE CORRE J.-M.
"On a Best-Estimate Approach to Calculation of Dryout Probability during BWR Transients", Paper 230, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

AIMOZ L., WIELAND E., TAVIOT-GUÉHO C., VESPA M., DÄHN R.
"Iodine K-edge EXAFS spectroscopy of iodine-bearing AFm-(Cl_2,CO_3,SO_4)", 10th Int. Congr. for Applied Mineralogy (ICAM 2011), 1-5 Aug. 2011,Trondheim, Norway, pp. 1-7, CD-ROM, 2011

ANDREANI M., BITTERMANN D., MARSAULT PH., ANTONI O., KERESZTÚRI A., SCHLAGENHAUFER M., MANERA A., SEPPÄLA M., KURKI J.
"Evaluation Of A Preliminary Safety Concept For The HPLWR", Paper P068, 5th Int. Symp. Supercritical Water Reactors (ISSCWR-5), 13-16 Mar. 2011, Vancouver, Canada, CD-ROM, 2011 (ISBN 978-1-926773-02-5)

ANDREANI M., MIGNOT G.
"Analyses of Large Scale Tests addressing the performance of a Containment Cooler and its effect on Gas Distribution", Paper 200, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

BADILLO A.
"Quantitative Phase Field Modeling of Boiling Phenomena", Paper 818, 20th Int. Conf. on Nuclear Energy for New Europe (NENE 2011), 12-15 Sept. 2011, Bovec, Slovenia, CD-ROM, 2011

BIRCHLEY J.
"Air oxidation of Zircaloy: phenomenology and modelling", 16th Int. QUENCH Workshop, 22-24 Nov. 2011, Karlsruhe, Germany, CD-ROM, 2011

BIRCHLEY J., MOGUEL L.F.
"Assessment of SCDAP/RELAP5 Modeling of Top-down Reflood, issuing PARAMETER Bundle Experiments", Paper 11031, Int. Congr. on Advances in Nuclear Power Plants (ICAPP 2011), 2-5 May 2011, Nice, France, CD-ROM, 2011

BREIMESSER M., RITTER S., SEIFERT H.-P., SUTER T., VIRTANEN S.
"IG SCC of Austenitic Steel: Characteristic Current Signals Measured by the Electrochemical Microcapillary Technique", Ann. Mtg. of the Eur. Cooperative Group on Corrosion Monitoring of Nucl. Materials (ECG-COMON), June 20-21, Helsinki, Finland, CD-ROM, 2011

CABANES-SEMPERE M., CATALÁ-CIVERA J.M., COZZO C., VAUCHER S., POUCHON M.A.
"Innovative production of nuclear fuel by Microwave Internal Gelation: theoretical microwaves-microspheres interaction", pp. 231-234, 13th Int. Conf. on Microwave and High Frequency Heating (AMPERE 2011), 5-9 Sept. 2011, Toulouse, France (ISBN 978.2.85428.978.7)

CHAHINE E.
"On the mathematical analysis of XFEM and some of its variants", Int. Conf. on the Extended Finite Element Method (XFEM 2011), 29 June – 1 July 2011, Cardiff, UK, CD-ROM, 2011

CHAWLA R., ANSERMET J.P., CAVEDON J.-M., HIRT P., KRÖGER W., MIAZZA P., PRASSER H.-M., TRAN M.Q.
"Experience Acquired During the First Three Years of the Swiss Master in Nuclear Engineering", Nucl. Eng. Training Conf. (NESTet 2011), 15-18 May 2011, Prague, Czech Republic, CD-ROM, 2011

CHAWLA R., CAVEDON J.-M., PRASSER H.-M.
"A Nuclear Engineering Master with a National Laboratory as Research Base", Ann. Mtg. Am. Nucl. Soc., 26-30 June 2011, Hollywood, FL, USA, CD-ROM, 2011

CHENU A., MIKITYUK K., ADAMS R., CHAWLA R.
"Analysis of Phénix Core Response to an Increase of the Core Inlet Sodium Temperature with a TRACE Point Kinetic Model", Paper 443, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

CHENU A., MIKITYUK K., CHAWLA R.
"TRACE Analyis of Selected ISPRA Experiments on Dryout in Sodium Two-phase Flow", Paper 11289, Int. Congr. on Advances in Nuclear Power Plants (ICAPP 2011), 2-5 May 2011, Nice, France, CD-ROM, 2011

Cozzo C., Vaucher S., Ishizaki K., Megias-Alguacil D., Pouchon M.A.
"Chemistry of uranium surrogate during microwave assisted internal gelation for fuel fabrication", Paper 392501, GLOBAL 2011: Toward and Over the Fukushima Daiichi Accident, 11-16 Dec. 2011, Chiba, Japan, CD-ROM, 2011

Degueldre C., Cozzo C., Kuri G., Bertsch J., Martin M.
"Characterisation of Plutonium-Uranium Mixed Oxide Fuel by Synchrotron Radiation Techniques", 2011 Water Reactor Fuel Performance Mtg. (WRFPM 2011), 11-14 Sept. 2011, Chengdu, China, CD-ROM, 2011

Dehbi A., Badreddine H.
"Scaling of a PWR Steam Generator Simulator", Paper 306, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

Fiorina C., Franceschini F., Krepel J., Mikityuk K.
"Comparative Analysis of Uranium and Thorium Fuel Cycles in a Lead-Cooled Fast Reactor from the Perspective of Safety and Waste Management", Paper 519691, GLOBAL 2011: Toward and Over the Fukushima Daiichi Accident, 11-16 Dec. 2011, Chiba, Japan, CD-ROM, 2011

Freixa J., Bertolotto D., Manera A.
"Testing of the QUICKEST-ULTIMATE Algorithm to Solve the Dissolved Convection Equation during a Boron Dilution Test at the PKL Facility", Paper 476, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

Freixa J., Kim T.-W., Manera A.
"Post-Test Thermal-Hydraulic Analysis of two Intermediate LOCA Tests at the ROSA Facility including Uncertainty Evaluation", Paper 470, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

Güntay S.
"An Overview of Past and Present Activities in the Severe Accident Domain within the Framework of WGAMA", Paper 580, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

Ihalainen M., Lind T., Güntay S., Jokiniemi J.
"Break-up of agglomerated TiO2 particles due to impaction", Paper 685, Eur. Aerosol Conf. (EAC2011), 4-9 Sept. 2011, Manchester, UK, CD-ROM, 2011

Joseph C., Van Loon L.R., Jakob A., Schmeide K., Sachs S., Bernhard G.
"Effect of temperature and humic acid on the U(VI) diffusion in compacted Opalinus Clay", 6th Int. Conf. Uranium Mining Hydrology (UMH VI), 18-22 Sept. 2011, Freiberg, Germany, Proc. in: Merkel B.J., Schipek M. (eds.), The New Uranium Mining Boom, Springer Verlag, Berlin (ISBN 9783642221217)

Kalilainen J., Lind T., Auvinen A., Rantanen P., Dehbi A., Güntay S., Jokiniemi J.
"Experimental work on particle motion inside a differentially heated cavity", Paper 323, Eur. Aerosol Conf. (EAC2011), 4-9 Sept. 2011, Manchester, UK, CD-ROM, 2011

Kapulla R., Hoang P., Szijarto R., Fokken J.
"Parameter Sensitivity of Optical Flow Applied to PIV Images", Fachtagung: Lasermethoden in der Strömungsmesstechnik, 6-8 Sept. 2011, Ilmenau, Germany, CD-ROM, 2011

Kapulla R., Mignot G., Paladino D., Erkan N., Zboray R.
"Thermal-Hydraulic Phenomena Caused by the Interaction of Steam and Steam-Helium Mixture Wall Jets with a Containment Cooler", Paper 11093, Int. Congr. on Advances in Nuclear Power Plants (ICAPP 2011), 2-5 May 2011, Nice, France, CD-ROM, 2011

Karastoyanov V., Ramar A., Ritter S., Abolhassani-Dadras S., Günther-Leopold I., Kivel N.
"In-Situ Pt Deposition on Stainless Steel under Simulated Boiling Water Reactor Conditions – Effect of Injection Rate on the Corrosion Potential and Pt Distribution", Paper 4858, Eur. Corrosion Congr. (EUROCORR 2011), Eur. Fed. Corrosion (EFC), 4-8 Sept. 2011, Stockholm, Sweden, CD-ROM, 2011

Karastoyanov V., Ritter S., Ramar A., Abolhassani-Dadras S., Günther-Leopold I., Kivel N.
"Laboratory Scale On-Line Noble Metal Deposition Experiments Simulating BWR Plant Conditions", VGB Conf.: Chemistry in Power Plants 2011, 26-27 Oct. 2011, CD-ROM, 2011

Khvostov G., Kolstad E., Ledergerber G., Zimmermann M.A., Wiesenack W., Bremond O., Restani R., Wiese H., Martin M.
"Pre-calculation using the Falcon fuel behaviour code of the fuel rod design parameters and the test-conditions for a two-run Halden LOCA test with KKL BWR high-burnup fuel", Paper F2.7, Enlarged Halden Programme Group Mtg. (EHPGM 2011), Sandefjord, Norway, 2-7 Oct. 2011, CD-ROM, 2011

KHVOSTOV G., WIESENACK W., OBERLÄNDER B.C., KOLSTAD E., LEDERGERBER G., ZIMMERMANN M.A.
"Post-test Analysis of the Halden LOCA experiment IFA-650.7 the FALCON Code", Paper F2.2, Enlarged Halden Programme Group Mtg. (EHPGM 2011), Sandefjord, Norway, 2-7 Oct. 2011, CD-ROM, 2011

KHVOSTOV G., ZIMMERMANN M.A., PYTEL M., LYON W.
"Towards advanced modeling of MPS-assisted cladding failure during power ramps using the FALCON code", Paper T2-030, 2011 Water Reactor Fuel Performance Mtg./LWR/Top Fuel, 11-14 Sept. 2011, Chengdu, China, CD-ROM, 2011

KIM T.-W., MANERA A.
"Prediction of Void Fraction in a Subchannel and Bundle Geometry with FLICA4 and TRACE", Paper 332, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

KOLBE E., GRIMM P., VASILIEV A., FERROUKHI H.
"Assessment of MCNPX/CINDER for burnup calculations", Paper 7-21, Int. Conf. on Nuclear Criticality (ICNC 2011), Edinburgh, UK, 19-22 Sept. 2011, CD-ROM, 2011

KOLBE E., GRIMM P., VASILIEV A., FERROUKHI H.
"Criticality Safety Evaluation of a Swiss Wet Storage Pool Including Limited BUC and Uncertainty Analysis", Paper 7-22, Int. Conf. on Nuclear Criticality (ICNC 2011), Edinburgh, UK, 19-22 Sept. 2011, CD-ROM, 2011

KREPEL J., SALIBA J., MIKITYUK K., CHAWLA R.
"Comparison of safety-related parameters in the equilibrium closed cycle for Generation-IV fast reactors", Paper 501552, GLOBAL 2011: Toward and Over the Fukushima Daiichi Accident, 11-16 Dec. 2011, Chiba, Japan, CD-ROM, 2011

LE CORRE J.-M., ADAMSSON C., ALVAREZ P.
"Transient Void pressure Drop and Critical Power BFBT Benchmark Analysis and Results with VIPRE-W/MEFISTO-T", Paper 11214, Int. Congr. on Advances in Nuclear Power Plants (ICAPP 2011), 2-5 May 2011, Nice, France, CD-ROM, 2011

MALLIPUDI V., VALANCE S., BERTSCH J.
"Modeling the effect of hydrogen on the creep behavior of Zircaloy-4 cladding", Int. Conf. on Simulation and Modeling Methodologies, Technologies and Applications (SIMULTECH 2011), 29-31 July 2011, Noordwijkerhout, NL, CD-ROM, 2011 (ISBN 978-989-8425-78-2)

MANERA A., PRASSER H.-M., LEYER S.
"Analysis of the Performance of the KERENA Emergency Condenser", Paper 471, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

MIGNOT G., KAPULLA R., ERKAN N., ZBORAY R., PALADINO D.
"Containment Cooler Performance in the Presence of Light Non-Condensable Gas with Cooler Location as a Primary Parameter", Paper 609, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

MOGUEL L.F., BIRCHLEY J.
"Planning Support and Preliminary Post-test Analysis of QUENCH-L0 using SCDAP/RELAP and SCDAP/Sim", Paper 11030, Int. Congr. on Advances in Nuclear Power Plants (ICAPP 2011), 2-5 May 2011, Nice, France, CD-ROM, 2011

NAKAMURA H., TOTH I., SANDERVAG O., UMMINGER K., DREIER J., PRIOR R., ALONSO J.R., MUELLNER N., D'AURIA F.S., AMRI A., MÜHLEISEN A.
"Effectiveness of Core Exit Thermocouple (CET) Temperature Indication in Accident Management of Light Water Reactors", Paper 275, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

NICENO B., LUMPP T., APANASEVICH P., LUKAS D.
"Reynolds-averaged Navier-Stokes (RANS) and Large Eddy Simulations (LES) of the air-water TOPFLOW-PTS experiment", Paper 608, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

NIKITIN K., JUDD J., GRANDI G.M., MANERA A., FERROUKHI H.
"OECD/NEA Main Steam Line Break PWR Benchmark Simulation by TRACE/S3K Coupled Code", Paper 612, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

PALADINO D., DREIER J.
“The Combined effect of PCCS Response and DGRS Activation in a Postulated Severe Accident with Release of Non-condensables”, Paper 11261, Int. Congr. on Advances in Nuclear Power Plants (ICAPP 2011), 2-5 May 2011, Nice, France, CD-ROM, 2011

PALADINO D., MIGNOT G., ERKAN N., ZBORAY R., KAPULLA R., ANDREANI M.
“Sudden Discharge of Gas Mixture in Confined Multi-Compartments”, Paper 90, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

PELLONI S., MIKITYUK K., RIMPAULT G.
“Nuclear Data Uncertainty Analysis for the Generation IV Sodium-cooled Fast Reactor Core with Fresh Oxide Fuel”, Paper 11285, Int. Congr. on Advances in Nuclear Power Plants (ICAPP 2011), 2-5 May 2011, Nice, France, CD-ROM, 2011

PERRET G., JORDAN K.A.
“On the combination of delayed neutron and delayed gamma techniques for fission rate measurement in nuclear fuel”, Paper 1189, 2nd Int. Conf. on Advancements in Nuclear Instrumentation, Measurement Methods and their Applications (ANIMMA), Ghent, Belgium, 6-8 June 2011, CD-ROM, 2011

PERRET G., JORDAN K.A.
“Fission Rates of Spent Fuel Measured in a Zero-power Reactor using Delayed Neutrons and their Predictions using Measured Isotopic Compositions”, Paper 11-A-464, 52nd Annual Mtg. Inst. Nucl. Mater. Management (INMM 52), Desert Springs, CA, USA, 17-21 July 2011, CD-ROM, 2011

PETURAUD P., HAMPEL U., BARBIER A., DREIER J., DUBOIS F., HERVIEU E., MARTIN A., PRASSER H,-M.
“General Overview of the TOPFLOW-PTS Experimental Program”, Paper 492, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

POUCHON M., NICENO B., KREPEL J.
“Innovate Pin Design for Sphere-Pac Fuel in Sodium Cooled Fast Reactors”, Paper 358351, GLOBAL 2011: Toward and Over the Fukushima Daiichi Accident, 11-16 Dec. 2011, Chiba, Japan, CD-ROM, 2011

POUCHON M.A., REBAC T., CHEN J., DAI Y., HOFFELNER W.
“Ceramics composites for next generation nuclear reactors”, Paper 358363, GLOBAL 2011: Toward and Over the Fukushima Daiichi Accident, 11-16 Dec. 2011, Chiba, Japan, CD-ROM, 2011

RITTER S., HORNER D.A., BOSCH R.-W.
“Corrosion Monitoring Techniques for the Detection of Crack Initiation under Simulated Light Water Reactor Conditions”, Paper 4853, Eur. Corrosion Congr. (EUROCORR 2011), Eur. Fed. Corrosion (EFC), 4-8 Sept. 2011, Stockholm, Sweden, CD-ROM, 2011

RITTER S., KARASTOYANOV V., RAMAR A., GÜNTHER-LEOPOLD I., ABOLHASSANI-DADRAS S., KIVEL N., SEIFERT H.-P.
“Noble Metal Deposition Behaviour in Boiling Water Reactors – the NORA Project”, Paper G05, Ann. Mtg. Int. Coop. Group on Environmentally Assisted Cracking of Water Reactor Materials (ICG-EAC), 8-13 May 2011, Dresden, Germany, CD-ROM, 2011

RITTER S., SEIFERT H.-P.
“Application of the EN Technique: Effect of Chloride on SCC Initiation in Low-Alloy Steel under BWR Conditions”, Paper WG2-6, Ann. Mtg. Eur. Coop. Group on Corrosion Monitoring of Nuclear Materials, June 20-21 2011, Helsinki, Finland, CD-ROM, 2011

RITTER S., SEIFERT H.-P.
“Suitability of the Electrochemical Noise Technique for the Detection of SCC in Stainless Steel”, Paper 428, 18th ICC Int. Corrosion Congr., Perth, Australia, 20-24 Nov. 2011, CD-ROM, 2011

RITTER S., SEIFERT H.-P.
“Environmentally-Assisted Crack Initiation Behaviour of Low-Alloy Steel in Simulated BWR Environment – Effect of Chloride’, Paper 429, 18th ICC Int. Corrosion Congr., Perth, Australia, 20-24 Nov. 2011, CD-ROM, 2011

ROELOFS F., ROHDE M., OTIC I., BRILLANT G., TISELJ I., ANGLART H., NICENO B., BRICTEUX L., ANGELI D., AMBROSINI D., LAKEHAL D., BAGLIETTO E., HASSAN Y., CHENG X.
“European Developments In Single Phase Turbulence For Innovative Reactors”, Paper 63, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

SATO Y., NICENO B.
“A New Conservative Phase Change Model for Nucleate Boiling”, Paper 802, 20th Int. Conf. on Nuclear Energy for New Europe (NENE 2011), 12-15 Sept. 2011, Bovec, Slovenia, CD-ROM, 2011

SEIFERT H.-P., RITTER S., LEBER H.
"Effect of Static Load Hold Periods on Corrosion Fatigue of Austenitic SS", Paper F05, Ann. Mtg. Int. Coop. Group on Environmentally Assisted Cracking of Water Reactor Materials (ICG-EAC), 8-13 May 2011, Dresden, Germany, CD-ROM, 2011

SEIFERT H.-P., RITTER S., LEBER H.
"Effect of Static Load Hold Periods on the Corrosion Fatigue Behavior of Austenitic Stainless Steels in Simulated BWR Environments", Paper 0547, pp. 547-560, 15th Int. Conf. on Environmental Degradation of Materials in Nuclear Systems – Water Reactors, 7-11 Aug. 2011, Colorado Springs, USA (ISBN 978-1-11813-241-8)

SEIFERT H.-P., RITTER S., LEBER H.
"Environmental Assisted Fatigue in Austenitic Stainless Steels under Light Water Reactor Conditions", Paper 10, 37th MPA-Seminar, Stuttgart, Germany, 6-7 Oct. 2011, CD-ROM, 2011

SHARABI M., ANDREANI M.
"Analyses of light gas stratification erosion and break-up under the effect of a vertical jet: CFD simulations for a common test in the PANDA and MISTRA facilities", Paper 60, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

SMITH B.L.
"Some Safety Studies of the MEGAPIE Spallation Source Target Performed using Computational Fluid Dynamics", Paper 145, Int. Conf. on Mathematics and Computational Methods Applied in Nuclear Science and Engineering (M&C 2011), 8-12 May 2011, Rio de Janeiro, Brazil, CD-ROM, 2011 (ISBN 978-85-63688-00-2)

SMITH B.L., MAHAFFY J.H., ANGELE K.
"A CFD Benchmarking Exercise based on Flow Mixing in a T-Junction", Paper 145, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

SMITH B.L., MAHAFFY J.H., BESTION, D., ZIGH G.
"An Overview of Past and Present CFD Activities within the Framework of WGAMA", Paper 333, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

STAINSBY R., GARNIER J.C., GUEDENY P., MIKITYUK K., MIZUNO T., POETTE C., POUCHON M., RINI M., SOMERS J., TOURON E.
"The Generation IV Gas-cooled Fast Reactor", Paper 11321, Int. Congr. on Advances in Nuclear Power Plants (ICAPP 2011), 2-5 May 2011, Nice, France, CD-ROM, 2011

SUN K., KREPEL J., MIKITYUK K., CHAWLA R.
"An Optimization Study for the Safety and Performance Parameters of a 3600 MWth Sodium-cooled FAST Reactor", Paper 11304, Int. Congr. on Advances in Nuclear Power Plants (ICAPP 2011), 2-5 May 2011, Nice, France, CD-ROM, 2011

TITS J., GAONA X., MACÉ N., KULIK D.A., STUMPF T., WALTHER C., GEIPEL G., WIELAND E.
"Immobilisation of Uranium(VI) in cementitious materials: evidence for structural incorporation in calcium silicate hydrates and solid solution formation", 10th Int. Congr. for Applied Mineralogy (ICAM 2011), 1-5 Aug. 2011, Trondheim, Norway, pp. 699-706, CD-ROM, 2011

VALANCE S.
"Formulation non-locale du problème level-set",10e Colloque National en Calcul des Structures (CSMA 2011), 9-13 May 2011, Giens, France, (available online: hal.archives-ouvertes.fr)

VASILIEV A., WIESELQUIST W., FERROUKHI H., CANEPA S., HELDT J., LEDERGERGER G.
"Development and Test Validation of a Computational Scheme for High-Fidelity Fluence Estimations of the Swiss BWR's", Int. Conf. on Mathematics and Computational Methods Applied in Nuclear Science and Engineering (M&C 2011), 8-12 May 2011, Rio de Janeiro, Brazil, CD-ROM, 2011 (ISBN 978-85-63688-00-2)

WIERINK G., GONIVA C., NICENO B., HEISKANEN K.
"Mechanistic modeling of particle-interface interaction in three-phase flows", 8th Int. Conf. on CFD in the Oil & Gas, Metallurgical and Process Industries, 21-23 June 2011, Trondheim, Norway, CD-ROM, 2011

WIESELQUIST W., FERROUKHI H., BERNATOWICZ K.
"A Trend Analysis Methodology for Enhanced Validation of 3-D LWR Core Simulations", Int. Conf. on Mathematics and Computational Methods Applied in Nuclear Science and Engineering (M&C 2011), 8-12 May 2011, Rio de Janeiro, Brazil, CD-ROM, 2011 (ISBN 978-85-63688-00-2)

WIESELQUIST W., VASILIEV A., FERROUKHI H.
"Towards an Uncertainty Quantification Methodology with CASMO-5", Int. Conf. on Mathematics and Computational Methods Applied in Nuclear Science and Engineering (M&C 2011), 8-12 May 2011, Rio de Janeiro, Brazil, CD-ROM, 2011 (ISBN 978-85-63688-00-2)

YANCEY K., MIKITYUK K., KREPEL J.
"Development and Application of a Comprehensive Model of a Lead-cooled Fast Reactor Using the FAST Code System", 2011 ANS Winter Mtg., 30 Oct. – 3 Nov. 2011, Washington DC, USA, CD-ROM, 2011

YLÖNEN A., PRASSER H.-M.
"Two-phase flow and cross-mixing measurements in a rod bundle", Paper 68, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

ZBORAY R., GUETG M., KICKHOFEL J., BARTHEL F., SPREWITZ U., HAMPEL U., PRASSER H.-M.
"Investigating Annular Flows and the Effect of Functional Spacers in an Adiabatic Double-Subchannel Model of a BWR Fuel Bundle by Ultra-Fast X-Ray Tomography", Paper 281, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

ZERKAK O., GAJEV I., MANERA A., KOZLOWSKI T., GOMMLICH A., ZIMMER S., KLIEM S., CROUZET N., ZIMMERMANN M.A.
"Revisiting temperal accuracy in neutronics/T-H code coupling using the NURESIM LWR simulation platform", Paper 484, 14th Int. Topical Mtg. on Nuclear Thermal Hydraulics (NURETH-14), 25-30 Sept. 2011, Toronto, Canada, CD-ROM, 2011 (ISBN 978-1-926773-05-6)

NES and ENE Colloquia

DÄHN R., CHURAKOV S.
"The strong and weak sites concept in Zn uptake by montmorillonite. A combined XAFS and molecular modeling study", 18 May 2011

KOEBERL O.
"Thorium reactors: potential and benefits", 17 Nov. 2011

KURI G., WIELAND E.
"Nickel speciation in nuclear materials", 24 Feb. 2011

PALADINO D.
"Investigations of gas-stratification break-up in containment for reactor safety issues", 13 Jan. 2011

PERRET G.
"Reactor.Physics@PROTEUS.ch", 6 Sept. 2011

PORTIER S., CHRISTEL M.
"Secondary Ion Mass Spectrometry vs Accelerator Mass Spectrometry", 20 Oct. 2011

SIMONI E.
"Molecular approach of the actinide speciation at mineral surfaces", 7 July 2011

University Level Teaching

BIRCHLEY J.
"Beyond Design-Basis Safety", Lectures given in the EPFL/ETHZ Nuclear Engineering Master Program, 3rd Semester Block Course, PSI, Switzerland, Autumn Semester, 2011

CAVEDON J.-M.
Course: From Nuclear Structure to Nuclear Energy (402-0627-002), ETHZ, Zurich, Switzerland, Autumn Semester 2011

CANEPA S.
"Nuclear Computations Lab", Lecture given in the EPFL/ETHZ Nuclear Engineering Master Program, 3rd Semester Block Course, PSI, Switzerland, Autumn Semester, 2011

DEGUELDRE C.
Lecture Course: Comportement des radionuclides dans l'environnement, Centre des sciences naturelles de l'environnement, University of Geneva, Switzerland, Summer Semester, 2011

DEHBI A.
"Lagrangian particle tracking (one way, two way coupling, random walk techniques)", "Constitutive laws for particle flows", "Boundary conditions for the particle-wall interactions", "Reactor safety applications", Lectures given in the Masters Course: Computational Multiphase Thermal Fluid Dynamics (151-0170-00L), ETHZ, Zurich, Switzerland, Spring Semester. 2011

DOKHANE A.
“Nuclear Computations Lab”, Lecture given in the EPFL/ETHZ Nuclear Engineering Master Program, 3rd Semester Block Course, PSI, Switzerland, Autumn Semester, 2011

FERROUKHI H.
“Nuclear Computations Lab”, Lecture given in the EPFL/ETHZ Nuclear Engineering Master Program, 3rd Semester Block Course, PSI, Switzerland, Autumn Semester, 2011

FREIXA J.
“Nuclear Computations Lab”, Lecture given in the EPFL/ETHZ Nuclear Engineering Master Program, 3rd Semester Block Course, PSI, Switzerland, Autumn Semester, 2011

GIMMI T.
“Geochemical Modelling II: Reactive transport”, Master Course in Environmental and Resource Geochemistry, University of Berne, Switzerland, Spring Semester, 2011

GIUST F.
“Neutron transport theory and Light Water Reactor (LWR) lattice calculations”, “LWR core modeling”, “Reactor shielding”, Lectures given in the Masters Course: Special Topics in Reactor Physics (15-0166-00L), ETHZ, Zurich, Switzerland, Spring Semester, 2011

GÜNTAY S.
“Beyond Design-Basis Safety”, Lectures given in the EPFL/ETHZ Nuclear Engineering Master Program, 3rd Semester Block Course, PSI, Switzerland, Autumn Semester, 2011

GÜNTHER-LEOPOLD I.
Lectures given in the Course: Nuclear Energy Systems (151-0160-00L), ETHZ, Zurich, Switzerland, Spring Semester, 2011

GÜNTHER-LEOPOLD I.
“Kernbrennstoffe”, Strategic Exercise given in the Course: Analytische Chemie V, ETHZ, Zurich, Switzerland, Autumn Semester, 2011

HUMMEL W.
“Radioactve Waste Disposal”, Lectures and exercises given in the Course: Nuclear Energy Systems (151-0160-00L), ETHZ, Zurich, Switzerland, Spring Semester, 2011

HUMMEL W.
“Landfilling, nuclear repositories and contaminated sites”, Lectures given for the degree of Master in Environmental Sciences and Master of Environmental Engineering, ETHZ, Zurich, Switzerland, Autumn Semester 2011

JÄCKEL B.
“Beyond Design-Basis Safety”, Lectures given in the EPFL/ETHZ Nuclear Engineering Master Program, 3rd Semester Block Course, PSI, Switzerland, Autumn Semester, 2011

KOLBE E.
“Radioisotopes and Radiation Applications”, Lectures given in the EPFL/ETHZ Nuclear Engineering Masters Programme, Lausanne, Switzerland, Autumn Semester, 2011

KOLBE E.
“Theoretische Kernphysik”, Lecture Course, University of Basel, Switzerland, Autumn Semester 2011

KOSAKOWSKI G.
“Statistics in Earth Sciences”, Lecture Course: Master of Applied Environmental Geoscience, University of Tèbingen, Germany, Autumn Semester, 2011

KOSAKOWSKI G.
“Reactive transport modelling”, Lectures given at the Helmholtz Interdisciplinary GRADuate School for Environmental Research (HIGRADE), Helmholtz Centre for Environmental Research – UFZ, Leipzig, Germany, 4-7 Nov. 2011

LIND T.
“Beyond Design-Basis Safety”, Lectures given in the EPFL/ETHZ Nuclear Engineering Master Program, 3rd Semester Block Course, PSI, Switzerland, Autumn Semester, 2011

MAZUREK M., CURTI E.
Lectures with exercises given in the Course: Geological disposal of radioactive waste, University of Berne, Spring Semester 2011

MIKITYUK K.
"Coupled calculations for reactor dynamics", "Generation IV fast reactor systems", Lectures given in the Course: Special Topics in Reactor Physics (151-0166-00L), ETHZ, Zurich, Switzerland, Spring Semester, 2011

MIKITYUK K.
"Core neutronics aspects: designing inherent safety features", Lecture given at ESFR workshop: Engineering aspects for SFRs, University of Rome, 21-25 Nov., 2011

NICENO, B.
"Essentials of Multiphase Flows", "Continuum Phase Modeling", "Wall Modeling", "Introduction to Multiphase Flow Modeling", "Two-fluid Model", "Interface Tracking Techniques", "Mechanistic Modeling of Boiling", Lectures given in Masters Course: Computational Multiphase Thermal Fluid Dynamics (151-0170-00L), ETHZ, Zurich, Switzerland, Spring Semester. 2011

PELLONI S.
"Fast reactor neutronics and perturbation theory", Lecture given in the Course: Special Topics in Reactor Physics (151-0166-00L), ETHZ, Zurich, Switzerland, Spring Semester, 2011

PFINGSTEN W.
Lectures given in the Course: Modelling of processes in soils and aquifers (701-1334-00L), ETHZ, Zurich, Spring Semester 2011

POUCHON M.A.
"Nuclear Materials (5)", Nuclear Materials (6)", Lectures given in the Course: Nuclear Fuels and Materials (151-2017-00L), ETHZ, Switzerland, Spring Semester, 2011

SMITH B.L.
"Introduction to Computational Fluid Dynamics", "Governing Equations, Turbulence Modelling and Numerical Procedures", "Identification of Nuclear Reactor Safety Issues where Single-Phase CFD can Bring Real Benefits", "Error Control, Verification, Validation and Best Practice Guidelines", "Assessment Databases for Single-Phase CFD Applications with Emphasis on Nuclear Reactor Safety Issues", Lectures given at IAEA National Workshop on the Use of CFD Codes in Safety Analyses, Nuclear and Radiation Safety Centre, Beijing, China, 7-11 Nov., 2011

STREIT M.
"Post irradiation examination of CONFIRM", Lecture given in the Workshop: Fairfuels, KTH, Stockholm, Sweden, 10 Feb. 2011

WIESELQUIST W.
"Nuclear Computations Lab", Lecture given in the EPFL/ETHZ Nuclear Engineering Master Program, 3rd Semester Block Course, PSI, Switzerland, Autumn Semester, 2011

ZIMMERMANN M.A.
"Nuclear Fuels and Materials", Lecture given in the EPFL/ETHZ Nuclear Engineering Master Program, ETHZ, Zurich, Switzerland, Spring Semester, 2011

ZIMMERMANN M.A.
"Advanced Topics in Nuclear Reactor Materials", Lecture given in the EPFL/ETHZ Nuclear Engineering Master Program, ETHZ, Zurich, Switzerland, Autumn Semester, 2011

Habilitation, Doctoral, Master and Bachelor Theses

BAYARD A.S.
"Transferability of Measurements in the PROTEUS SCWR-like Test Lattice to the Validation of Alternative SCWR Assembly Designs", MS Thesis, EPFL/ETHZ, Feb. 2011

BERTOLOTTO D.
"Coupling a System Code with Computational Fluid Dynamics for the Simulation of Complex Coolant Reactivity Effects", Doctoral Thesis No. 5227, EPFL, Lausanne, 2011

CHENU A.
"Single- and Two-Phase Flow Modeling for Coupled Neutronics/Thermal-Hydraulics Transient Analysis of Advanced Sodium-Cooled Fast Reactors", Doctoral Thesis No. 5172, EPFL, Lausanne, 2011

DIETLER R.
"Characterization and Qualification of a Measurement Station for Neutron Assay of Burnt Fuel", EPFL/ETHZ MS Thesis, Aug. 2011

DUFRESNE A.
"Development of MCNPX Computational Scheme for High-Energy Fluence Estimations of PWR Control Rod Tips", EPFL/ETHZ MS Thesis, Aug. 2011

GAO N.
"Molecular dynamics simulation of helium atoms clustering in bcc iron", Doctoral Thesis No. 5230, EPFL, Lausanne, 2011

KRÖHNERT H.
"Fission Rates Measured Using High-Energy Gamma-Rays from Short-Life Fission Products in Fresh and Spent Nuclear Fuel", Doctoral Thesis No. 4934, EPFL, Lausanne, 2011

ORLOV A.
"Corrosion product deposition on fuel element surfaces of a boiling water reactor", Doctoral Thesis No. 20127, ETHZ, Zurich, 2011

PATTUPARA R.
"Monte Carlo Analysis of PROTEUS-GCFR Experiments", EPFL/ETHZ MS Thesis, Apr. 2011

PROFF C.
"Aspects microstructuraux de l'oxydation d'alliages de zirconium / microstructural aspects of the oxidation of zirconium alloys", Doctoral Thesis, University of Grenoble, France, 2011

SALIBA J.
"Comparative Decomposition Analysis of Reactivity Effects for the Mian Gen-IV Fast Reactors", EPFL/ETHZ MS Thesis, Apr. 2011

PSI and Other Reports

BRADBURY M.H., BAEYENS B
"Physico-chemical characterisation data and sorption measurements of Cs, Ni, Eu, Th, U, Cl, I and Se on MX-80 bentonite", PSI Bericht 11-05 and NTB 09-08, Nagra, Wettingen, Switzerland, 2011

DREIER J., SMITH B.L.
"NES Scientific Highlights 2010", Paul Scherrer Institute, Switzerland, Sept. 2011 (ISSN 1663-7380)

SMITH B.L., MAHAFFY J.H., ANGELE K., WESTIN J.
"Report of the OECD/NEA – Vattenfall T-Junction Benchmark Exercise", OECD Nuclear Energy Agency Report, CSNI/R(2011)5, 2011

General Communications and Public Relations

CAVEDON J.-M.
"Nuclear Energy Research at the Paul Scherrer Institute", NRF National Research Foundation, Singapore, 13 June 2011

CAVEDON J.-M.
"Apport des maquettes critiques pour les réacteurs de puissance", SFEN Journée Technique, Cadarache, France, 20 Sept. 2011

HUMMEL W.
"Wohin mit unseren radioaktiven Abfällen?", Universitäre Vorlesungen Winterthur, Switzerland, 9 Nov. 2011, Senioren-Kolleg Liechtenstein, Mauren, Liechtenstein, 17 Nov. 2011, Senioren-Universität, Zürich, Switzerland, 6 Dec. 2011

STREIT M.
"Nukleartechnik und Reaktorsicherheit", Forum für Universität und Gesellschaft Universität Bern, Berne, Switzerland, 1 Apr. 2011

STREIT M.
"Ein Blick hinter die Steckdose-Stromproduktionsmethode und deren Potenzial", Grundlagenseminar der Schweizerischen Gesellschaft der Kernfachleute (SGK), Magglingen, Switzerland, 19-21 Apr. 2011

STREIT M.
"Der Strom kommt aus der Steckdose-Handel und Netz", "Der Strom kommt aus der Steckdose-Produktion", "Der Strom kommt aus der Steckdose-Kernkraftwerke", "Unfälle in Kernkraftwerken I & II", "Organisation im Bereich Kernenergie", Grundlagenseminar der Schweizerischen Gesellschaft der Kernfachleute (SGK), Magglingen, Switzerland, 3-5 Oct. 2011

Awards

BAEYENS B., MARQUES FERNANDES M., BRADBURY M.H.
Best poster: "Sorption competition on illite: experiments and modelling", 13th Int. Conf. on the Chemistry and Migration Behaviour of Actinides and Fission Products in the Geosphere (MIGRATION 2011), Beijing, China, 18-23 Sept. 2011

NIFFENEGGER M.
swissnuclear Projekt des Jahres 2010: "PLiM-Forschung auf dem Gebiet der Thermomechanischen Ermüdung", awarded 5 Sept. 2011

WANG H.A.O., GROLIMUND D., VAN LOON L.R., BORCA C.N., GÜNTHER D.
SCS-Metrohm prize for best oral presentation in Analytical Chemistry Division: "Quantitative microscopic studies with high spatial resolution of contaminant diffusion into Opalinus clay rock", Fall Mtg. of the Swiss Chemical Society (SCS), Lausanne, Switzerland, 9 Sept. 2011

Membership of External Committees

CAVEDON J.-M.

- Member of the KNS (Swiss Federal Nuclear Safety Commission)
- Member of the Advisory Board of the French Institut de Radioprotection et de Sûreté Nucléaire (IRSN)
- Member of the Bureau of OECD/NEA/CSNI (Committee on the Safety of Nuclear Installations)
- Swiss representative to the Policy Group of the Generation IV International Forum
- Member of the Board of the Swiss Nuclear Forum

CHAWLA R.

- Vice Chairman of the OECD/NEA Nuclear Science Committee (NSC)
- Member of the Editorial Board of Annals of Nuclear Energy
- Member of the Training and Academic Affairs Committee of the European Nuclear Education Network (ENEN)
- Member of the Board of the Swiss Nuclear Forum

GÜNTAY S.

- Member of the CSNI/WGAMA Bureau

MANERA A.

- Member of the Editorial Board: Science and Technology of Nuclear Installations

RITTER S.

- Vice Chairman of the Executive Committee of the European Cooperative Group on Corrosion Monitoring of Nuclear Materials (ECG-COMON)

SEIFERT H.-P.

- Member of the Executive Committee of the International Cooperative Group on Environmentally Assisted Cracking of Water Reactor Materials (ICG-EAC)

SMITH B.L.

- Chairman of Governing Board, THINS, EU 7th FWP
- Chairman of the OECD/NEA Working Group on the Analysis and Management of Accidents (WGAMA) CFD Special Group
- Chairman of the IAEA Special Group on the Application of CFD Codes for NPP Design and Safety Analyses

STREIT M.

- President of the European Nuclear Society
- Program Committee Member of the European Nuclear Society
- Vice President of the Swiss Nuclear Society
- Member of the Board of Directors of the International Youth Nuclear Congress

ZIMMERMANN M.A.

- Swiss representative to the Committee on the Safety of Nuclear Installations (OECD/NEA/CSNI)
- Member of the Comité de Visite de l'Institut de Radioprotection et Sûreté Nucleaire (IRSN)
- Swiss representative to the GIF International Expert Group

LIST OF PUBLICATIONS 2011

LEA – Laboratory for Energy Systems Analysis

Publications in Scientific and Technical Journals

ALNIS J., SCHLIESSER A., WANG C.Y., HOFER J., KIPPENBERG T.J., HÄNSCH T.W.
"Thermal-noise-limited crystalline whispering-gallery-mode resonator for laser stabilization", Phys. Rev. A (ISSN 1050-2947), **84**(1), 011804(R), 4 pages (2011)

KIM JA., KIM JO., PARK J., JANG S.C., SHIN Y.C.
"Some empirical insights on diagnostic performance of the operating crew in a computer-based advanced control room", Human Factors and Ergonomics in Manufacturing and Service Industries (ISSN 1090-8471), **21**(4), 379-396 (2011)

KYPREOS S., TURTON H.
"Climate Change Scenarios and Technology Transfer Protocols", Energy Policy (ISSN 0301-4215), **39**(2), 844-853 (2011)

SIMONS A., FIRTH S.K.
"Life-cycle assessment of a 100% solar fraction thermal supply to a European apartment building using water-based sensible heat storage", Energy and Buildings (ISSN 0378-7788), **43**(6), 1231-1240 (2011)

WILHELM E., FOWLER M., FRASER R., STEVENS M.
"In-the-loop Validation of Fuel Cell Vehicle Control", Int. J. Powertrains (ISSN 1742-4267), **1**(2), 162-178 (2011)

Keynote Lectures at International Conferences

BAUER C.
"Evaluation of fossil power plants with CCS: Methodology & Results", 2nd Int. Conf. on Energy Process Engineering, 20-22 June 2011, Frankfurt/Main, Germany

HIRSCHBERG S.
"Comparative Assessment of Severe Accidents in the Energy Sector", Gas and Nuclear Energy Forum, 30-31 May 2011, Jachranka, Poland

HIRSCHBERG S.
"Life Cycle Assessment of Options for Current and Future Electricity Supply", XXIe Congrès Général de la Société Francaise de Physique, 4-8 July 2011, Bordeaux, France

International Conferences with Proceedings

BURGHERR P., ECKLE P., HIRSCHBERG S.
"Hazards and accident risks of fossil, nuclear and renewable energy technologies", Eur. Safety and Reliability Conf. (ESREL 2011), 18-22 Sept. 2011, Troyes, France, CD-ROM, 2011, also in: Advances in Safety, Reliability and Risk Management, Bérenguer, C., Grall, A., Guedes Soares, C. (eds.), CRC Press, Taylor & Francis Group, London, UK, 2011, Vol. 1, pp. 2593-2600, 2011 (ISBN 978-0-415-68379-1)

KARANKI D.R., DANG V.N., KIM T.W.
"Discrete Dynamic Event Tree Analysis of MLOCA Using ADS-TRACE", Paper 223, ANS Int. Topical Mtg. on Probabilistic Safety Assessment and Analysis (PSA 2011), 13-17 Mar. 2011, Wilmington, USA, CD-ROM, 2011

KIM J., DANG V.N.
"Impact of Advanced Alarm Systems and Information Displays on Human Reliability in the Digital Control Room of Nuclear Power Plants", Int. Symp. on Future I&C for Nuclear Power Plants (ICI 2011), 21-25 Aug. 2011, Daejon, Korea, CD-ROM, 2011

MARCUCCI A., TURTON H.
"Implications of global challenges and uncertainties for regional energy strategies", World Engineers' Convention, 4-9 Sept. 2011, Geneva, Switzerland, USB-Stick, 2011

MEYER N.K., HECK T.
"Wood combustion emissions in Switzerland and associated impact assessments", Paper 662, Eur. Aerosol Conf. (EAC2011), 4-9 Sept. 2011, Manchester, UK, CD-ROM, 2011

PODOFILLINI L., DANG V.N., NUSBAUMER O., DRES D.
"First Results from a Study for Errors of Commission for a Boiling Water Reactor", ANS Int. Topical Mtg. on Probabilistic Safety Assessment and Analysis (PSA 2011), 13-17 Mar. 2011, Wilmington, USA, CD-ROM, 2011

SIMONS A., BAUER C.
"Life-cycle assessment of hydrogen use in passenger vehicles", Int. Advanced Mobility Forum, 8-9 Mar. 2011, Geneva, Switzerland, USB-Stick, 2011

STEMPFEL Y., DANG V.N.
"Developing and Evaluating the Bayesian Belief Network as a Human Reliability Model Using Artificial Data", Eur. Safety and Reliability Conf. (ESREL 2011), 18-22 Sept. 2011, Troyes, France, CD-ROM, 2011, also in: Advances in Safety, Reliability and Risk Management, Bérenguer, C., Grall, A., Guedes Soares, C. (eds.), CRC Press, Taylor & Francis Group, London, UK, 2011 , Vol. 1, pp. 2593-2600, 2011 (ISBN 978-0-415-68379-1)

WILHELM E., HOFER J., SCHENLER W.
"Multi-Criteria Analysis of Driver Preference for New Vehicle Technologies to Identify Robust Alternatives", Int. Advanced Mobility Forum, 8-9 Mar. 2011, Geneva, Switzerland, USB-Stick, 2011

WILHELM E., WOKAUN A.
"Multi-Criteria Decision Analysis of Heuristically Designed Light-Duty Vehicles Today and in 2035", Paper 2011-01-0727, SAE World Congress 2011, 12-14 Apr. 2011, Detroit, USA, CD-ROM, 2011

ZIMMERMANN M.A., DANG V.N., LANORE J.-M., PROBST P., HORTAL J., AMRI A.
"Insights from the SM2A pilot study towards quantification of a change of plant safety margin after a hypothetical power up-rate", ANS Int. Topical Mtg. on Probabilistic Safety Assessment and Analysis (PSA 2011), 13-17 Mar. 2011, Wilmington, USA, CD-ROM, 2011

Publications in Books

BAUER C.
"Local and regional air pollution", Chapter 9.3.4.2, in J. Sathaye, O. Lucon, A. Rahman, J. Christensen, F. Denton, J. Fujino, G. Heath, S. Kadner, M. Mirza,H. Rudnick, A. Schlaepfer, A. Shmakin, 2011: Renewable Energy in the Context of Sustainable Energy, in IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation [O. Edenhofer, R. Pichs-Madruga, Y. Sokona, K. Seyboth, P. Matschoss, S. Kadner, T. Zwickel, P. Eickemeier, G. Hansen, S. Schlömer, C. von Stechow (eds)], Cambridge University Press, Cambridge, UK and New York, USA, pp. 736-742, 2011 (ISBN 978-1-107-60710-1)

BURGHERR P.
"Accidents and risks", Chapter 9.3.4.7, in: J. Sathaye, O. Lucon, A. Rahman, J. Christensen, F. Denton, J. Fujino, G. Heath, S. Kadner, M. Mirza,H. Rudnick, A. Schlaepfer, A. Shmakin, 2011: Renewable Energy in the Context of Sustainable Energy. In IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation [O. Edenhofer, R. Pichs-Madruga, Y. Sokona, K. Seyboth, P. Matschoss, S. Kadner, T. Zwickel, P. Eickemeier, G. Hansen, S. Schlömer, C. von Stechow (eds)], Cambridge University Press, Cambridge, UK and New York, USA, pp. 745-747, 2011 (ISBN 978-1-107-60710-1)

GÜL T., TURTON H.
"Long-term Scenarios of the Global Energy and Transport System", in E. Wilhelm, A. Wokaun (eds.), Transition to Hydrogen: Pathways to Clean Transportation, Cambridge University Press, pp. 177-211, 2011 (ISBN 978-0-52119-288-0)

HECK T., HIRSCHBERG S.
"China: economic impacts of air pollution in the country", in J.O. Nriagu (ed.), Encyclopedia of Environmental Health, Burlington, Elsevier, Vol. 1, pp. 625–640, 2011 (ISBN 978-0-444-52273-3)

SCHENLER W.
"Chapter 1: Introduction", in Transition to Hydrogen: Pathways Toward Clean Transportation, Cambridge University Press, pp. 1-12, 2011 (ISBN 978-0-52119-288-0)

SIMONS A., BAUER C.
"Life Cycle Assessment of Hydrogen Production", in E. Wilhelm and A. Wokaun (eds.), in Transition to Hydrogen: Pathways Toward Clean Transportation, Cambridge University Press, pp.13-57, 2011 (ISBN 978-0-52119-288-0)

WILHELM E.
"Technical Characterization and Multi-Criteria Analysis of Light-Duty Vehicles", in Transition to Hydrogen: Pathways Toward Clean Transportation, Cambridge University Press, pp. 58-95, 2011 (ISBN 978-0-52119-288-0)

WOKAUN A., WILHELM E.
Transition to Hydrogen, Pathways Toward Clean Transportation, A. Wokaun, E. Wilhelm (eds.), Cambridge University Press, 2011 (ISBN 978-0-52119-288-0)

NES and ENE Colloquia

DIETRICH P., HIRSCHBERG S.
"Synergy between hydrogen and electricity in transportation", 9 June 2011

University Level Teaching

BAUER C.
"Environmental aspects of CCS – Life Cycle Assessment", Lecture given in the Course: Carbon Dioxide Capture and Storage (CCS), ETHZ, Zurich, Switzerland, 23 May 2011

HIRSCHBERG S.
"Life-Cycle Assessment", "Sustainability Assessment", "Energy Supply Challenges and Role of Nuclear Energy", "Energy-related Severe Accident Risks: a Comparative Perspective", Lectures given in the Course: Nuclear Energy Systems (151-0160-00L), ETHZ, Zurich, Switzerland, Spring Semester, 2011

HIRSCHBERG S., BAUER C., WOKAUN A.
"Life-Cycle Analysis and other Approaches for Sustainability Assessment", Lecture given in the Course: Renewable Energy Technology I (529-0193-00L), ETHZ, Zurich, Switzerland, 29 Nov., 2011

PODOFILLINI L.
"Human Reliability Analysis (HRA) – an Introduction", ZHAW Kompetenzzentrum für Sicherheit und Risikoprävention, Master Program in Integrated Risk Management, ZHAW, Zurich, Switzerland, 22 Mar. 2011

Habilitation, Doctoral, Master and Bachelor Theses

LOOSER R.
"Life-Cycle Assessment of Fuel Cell Hybrid Electric Passenger Vehicles", Bachelor Thesis, ETHZ, Zurich, Switzerland, June 2011

MICHAUX E.
"Oil spill risk analysis", Master Thesis, ETHZ, Zurich, Switzerland, Nov. 2011

STEMPFEL Y.
"Factor correlation and interaction in Human Reliability - an assessment of the potential predictive performance of Bayesian Network models", EPFL/ETHZ MS Thesis, Mar. 2011

VOLKART K.
"Carbon Dioxide Capture and Storage (CCS) in Germany ─ a Technology Assessment in Consideration of Environmental, Economic and Social Aspects", Masters Thesis, ETHZ, Zurich, Switzerland, Feb. 2011

WILHELM E.
"Multi-criteria analysis of heuristically designed vehicles", Doctoral Thesis No. 19692, ETHZ, Zurich, Switzerland, 2011

PSI and Other Reports

BYE A., LOIS E., DANG V.N., PARRY G.W., FORESTER J., MASSAIU S., BORING R., BRAARUD P.O., BROBERG H., JULIUS J., MÄNNISTÖ I., NELSON P.
"International HRA Empirical Study – Phase 2 Report, Results from Comparing HRA Methods to HAMMLAB Simulator Data on SGTR Scenarios", NUREG/IA-0216, Vol. 2, U.S. Nuclear Regulatory Commission, Washington D.C., USA, Aug. 2011

KANNAN R., TURTON H.
"Documentation on the development of the Swiss TIMES Electricity Model (STEM-E)", PSI-Bericht Nr. 11-03 (ISSN 1019-0643)

MARCUCCI A., TURTON H.
"Analyzing energy technology options for Switzerland in the face of global uncertainties: an overview of the MERGE model", NCCR Climate WP4 Working Paper 2011/05, 2011

MOELLENCAMP S., KANNAN R., TURTON H.
"Initial Documentation on Model Input Data", report submitted to the Swiss Federal Office of Energy for the project Swiss TIMES Energy system Model (STEM) for transition scenario analyses, Nov. 2011

TURTON H.
"Scenarios Review", Energy 2050 Roadmap: Contribution of Nuclear Energy, Part 1, Eur. Atomic Forum (FORATOM 2011), Brussels, Belgium, Feb. 2011

General Communications and Public Relations

BAUER C.
"Saubere Energie für die Schweiz: Utopie oder bald Realität?", Generalversammlung der Elektrizitätsgenossenschaft Schneisingen, Schneisingen, Switzerland, 1 Apr. 2011

BAUER C.
"LCA von Elektroautos – wie ökologisch sind sie im Vergleich zu konventionellen Fahrzeugen?", 2. Novatlantis Mobilitätsforum: Elektromobilität – Vom Konzept in die Praxis, Basel, Switzerland, 16 Nov. 2011

BAUER C.
"Mobilität aus ökologischer Perspektive: die Umweltbilanz des Individualverkehrs", Veranstaltung "Klima & Atmosphäre 10", KKL, Leibstadt, Switzerland, 30 Nov. 2011

BURGHERR P.
"Grössere mögliche Konsequenzen", Interview, Profil (R. Buchacher), 4 Apr. 2011

HIRSCHBERG S.
"CO_2-arme Energietechnologien gegen den Klimawandel: ökonomische & ökologische Perspektiven", Veranstaltung "Klima & Atmosphäre, Der Klimawandel als wirtschafliche Herausforderung", KKL, Leibstadt, Switzerland, 12 Jan. 2011

HIRSCHBERG S.
"Energietechnologien für die Schweiz: Heute und Morgen", Kurs 07, Energieszenarien des 21. Jahrhunderts, Volkshochschule Region Brugg, Switzerland, 19 Jan. 2011

HIRSCHBERG S.
"Nachhaltigkeitsbewertung und Energieszenarien für die Schweiz", Kurs 07, Energieszenarien des 21. Jahrhunderts, Volkshochschule Region Brugg, Switzerland, 26 Jan. 2011

HIRSCHBERG S.
"Nachhaltige Entwicklung im Energie- & Stromsektor", Enics-Technikforum, Turgi, Switzerland, 28 Apr. 2011

HIRSCHBERG S.
"Energiebedarf und Stellenwert von erneuerbaren Energieträger in der Schweiz", Eidgenössische Natur- und Heimatschutzkommission und Eidgenössische Denkmalschutzkommission Arbeitstagung, Kartause Ittingen, Switzerland, 18-19 May 2011

HIRSCHBERG S.
"Technology Assessment – Burdens, Impacts & Risks", "Sustainability Assessment of Energy Systems", Presentations for the Energy Committee of the Royal Swedish Committee of Sciences, Stockholm, Sweden, 20 May 2011

HIRSCHBERG S.
"Die wahren Kosten der Stromerzeugung", NZZ am Sonntag, pp. 56-57, 22 May 2011

HIRSCHBERG S.
"Interdisciplinary Energy Systems Analysis: Support of Informed Decision-Making", NRF National Research Foundation, Singapore, 13 June 2011

HIRSCHBERG S.
"Chancen und Herausforderungen der Technologien zur Stromproduktion", VSE Tagung, Berne, Switzerland, 30 June 2011

HIRSCHBERG S.
"Optionen für die Elektrizitätsversorgung in der Schweiz: Stärken und Schwächen", 5. Walliseller Symp., Thema: Energie, Wallisellen, Switzerland, 30 June 2011

HIRSCHBERG S.
"Overview of Energy Systems Analysis at PSI", Forschungszentrum Jülich, Germany, 1 Sept. 2011

HIRSCHBERG S.
"Nachhaltige Elektrizität: Wunschdenken oder bald Realität?", Business & Professional Women Club, Zurich, Switzerland, 21 Sept. 2011

HIRSCHBERG S.
“Stärken und Schwächen von Energietechnologien”, Forum Vera 15, Weiterbildungskurs: Energieszene Schweiz 2050, Spiez, Switzerland, 23-24 Sept. 2011

HIRSCHBERG S.
“State-of-the-art Technology-centered Assessment of Electricity Supply Options”, Presentation for the Energy Committee of the Royal Swedish Committee of Sciences, Stockholm, Sweden, 28 Oct. 2011

HIRSCHBERG S.
“Gefahren und Chancen von Zukunfttechnologien”, Verein Risiko und Sicherheit, St. Imier/Mont Soleil, Switzerland, 4 Nov. 2011

HIRSCHBERG S., SCHENLER W.
“Wie konkurrenzfähig Kernkraftwerke wirklich sind”, side article to “Die wahren Kosten der Stromerzeugung”, NZZ am Sonntag, pp. 56-57, 22 May 2011

Awards

VOLKART K.
Anna Barbara Reinhard Prize 2011 for Female Student Excellence from the Institution of Engineering and Technology (IET), May 2011

Membership of External Committees

DANG V.N.

- Member of the Board of the International Association for Probabilistic Safety Assessment and Management (IAPSAM)

HIRSCHBERG S.

- Individual Member of Swiss Academy of Technical Sciences
- Member of the Advisory Board “Technology, Innovation and Society” Programme of Helmholtz Association
- Member of the Editorial Board of the International Journal of Risk Assessment and Management
- Vice-chair of the ecoinvent Board of Directors

PODOFILLINI L.

- Chairman of the Technical Committee on Human Factors and Human Reliability of the European Safety and Reliability Association (ESRA)
- Member of the Board of the Human Reliability Analysis Society

LIST OF PUBLICATIONS 2011

GENERAL ENERGY RESEARCH DEPARTMENT

PROJECT COLLABORATIONS WITH EXTERNAL PARTNERS

Bayerische Forschungsstiftung (BFS)

Projektleiter: O. Kröcher, Ch. Gerhart[1]
NO_x -Reduzierung in motorischem Abgas mit Guanidinsalzen
Prof. Dr. Th. Sattelmayer, Lehrstuhl für Thermodynamik, TU München, Germany
Prof. Dr. G. Wachtmeister, Lehrstuhl für Verbrennungskraftmaschinen, TU München, Germany
AlzChem Trostberg GmbH, Germany
NIGU Chemie GmbH, Germany
[1] AlzChem Trostberg GmbH, Germany

BAFU

Projektleiter: A.S.H. Prévôt
Filtermessungen mit dem Aerosolmassenspektrometer, Machbarkeitsstudie

Projektleiter: A.S.H. Prévôt
Messung der flüchtigen Anteile von PM1 in Zürich und Quellenzuordnung der organischen Masse über den Verlauf eines ganzen Jahres

Projektleiter: A.S.H. Prévôt
Aerosolmassenspektrometer mit 2.5 Mikrometer Einlass

Projektleiterin: S. Aksoyoglu
Luftschadstoff-Modellierung von Szenarien im Rahmen der Revision des Göteborgprotokolls

Projektleiterin: S. Aksoyoglu
Modellrechnungen zum Importanteil von sekundärem Aerosol

BAFU / Mehrere Kantone

Projektleiter: A.S.H. Prévôt
^{14}C-analyses of EC and OC in Switzerland

BFE

Projektleiter: S.M.A. Biollaz, T.J. Schildhauer
Entwicklung der ingenieurwissenschaftlichen Grundlagen der schwefel-resistenten Methanierung

Projektleiter: F.N. Büchi
X-ray micro-tomography of polymer electrolyte fuel cells

Projektleiter: F.N. Büchi
Gas-analysis in polymer electrolyte fuel cells

Projektleiter: T. Gerber
Molecular data of combustion relevant radicals

Projektleiter: L. Gubler, I.A. Schneider
go.*PEF-CH: Enhancing PEFC durability and reliability under application-relevant conditions*
with Berner Fachhochschule Technik und Informatik (BFH-TI, Biel), CEKAtec Elektrowerkzeuge AG & Co. KG (Wattwil), MES SA (Stabio)

Projektleiter: L. Gubler
Lebensdauer Limitierungen von Brennstoffzellen- Membranen: Mechanismen, Methoden und Innovationen

Projektleiterinnen: R. Kaufmann-Hayoz, S. Ulli-Beer
E-Scooter, Marktentwicklung, Analyse der Akteure, E-Scooter Technologie, Ladestationen, LCA, Verbrauchsmessungen, Auswertung von Alltagserfahrungen, Fördermassnahmen
Forschungsprojekt New Ride with Uni Bern, Interface, Empa, U. Schwegler

Projektleiter: J. Mantzaras
Modeling of Energy Conversion Processes at the Microscale with Application to PEFCs

Projektleiter: A. Meier
IEA-SolarPACES (International Energy Agency – Solar Power and Chemical Energy Systems)
IEA Implementing Agreement

Projektleiter: A. Meier
Solar Production of Zinc and Hydrogen – Reactor Optimisation for Scale-up
R&D Project

Projektleiter: A. Meier
Towards Industrial Solar Production of Zinc and Hydrogen – 100 kW Pilot Reactor for ZnO Dissociation
P&D Project

Projektleiter: J. Roth
S_Chain fundamentals
with ZHAW Winterthur and Belenos Clean Power AG

BFE / BAFU

Projektleiter: A.S.H. Prévôt
Sekundärer Feinstaub vom Verkehr

CCEM

Projektleiterin: S. Aksoyoglu
Project part: Process Analysis, Optimisation and Impact
NO_x Abatement in Diesels

Projektleiter: F.N. Büchi
hy.muve: Development of hydrogen powered municipal vehicle
with Empa Dübendorf and Industrial Partners

Projektleiter: C. Ludwig
SunCHem: Bio-synthetic natural gas from microalgae

Projektleiter: S. Ulli-Beer, F.N. Büchi
Technische und wirtschaftliche Datenanalyse eines wasserstoffbetriebenen Brennstoffzellen-Fahrzeuges im Alltagstest
with hy.muve, BFE

Projektleiter: M. Zimmermann[1], S. Ulli-Beer
Project part: Diffusion dynamics of energy efficient renovations
Advanced Energy-Efficient Renovation of Buildings
with IEA, SNF, BFE, Stadt Zürich, Novatlantis
[1] Empa Dübendorf

CCEM / Swisselectric

Projektleiter: S.M.A. Biollaz
ARRMAT (*Attrition resistante reactive bed materials)*
Empa

Teilprojektleiter: S.M.A. Biollaz
WOODGAS-SOFC II - Verfahrenstechnik
EPFL, Empa

Projektleiter: S.M.A. Biollaz
Syngas Diagnosis

Projektleiter: P. Jansohn
CELaDE (Clean and Efficient Large Diesel Engines)

Projektleiter: P. Jansohn
SP2: Pre-combustion capture
CarMa (Carbon Management in Power Generation)

COST

Projektleiter: C. Ludwig
CM0903: Utilisation of biomass for sustainable fuels and chemicals (UBIOCHEM)
Efficient recycling of nutrient solutions from an algae biofuel production process

COST / SFB

Projektleiter: R. Siegwolf
Carbon cycling in alpine soils in a warmer world

Energie Trialog Schweiz

Projektleiter: A. Wokaun, P. Dietrich, S. Hirschberg
Studies on Energy Efficiency, Renewable Electricity, Scenarios, Multi-Criteria Decision Analysis

ESA

Projektleiter: U. Baltensperger, P.Zieger
ESA Aerosol CCI

ETH-Rat

Projektleiter: M. Nachtegaal
Establishing X-ray emission spectroscopy to determine the structure of the catalytic active site and reaction intermediates in supported metal catalysts
ETH Zürich

Projektleiter: A. Wokaun, S.F. Lienin, S. Ulli-Beer, C. Bach[1]
Erlebnisraum Mobilität: Aufbau einer sozio-technologischen Feldversuchsumgebung
Novatlantis – Nachhaltigkeit im ETH Bereich
[1] Empa Dübendorf

EU

Projektleiter: U. Baltensperger, J. Dommen
EUROCHAMP-2 (Integration of European Simulation Chambers for Investigating Atmospheric Processes)

Projektleiter: U. Baltensperger, E. Weingartner, M. Gysel
EUSAAR (European Supersites for Atmospheric Aerosol Research)

Projektleiter: U. Baltensperger, E. Weingartner, M. Gysel, A.S.H. Prévôt
ACTRIS (Aerosols, Clouds, and Trace gases Research Infrastructure Network)

Projektleiter: U. Baltensperger, A.S.H. Prévôt, E. Weingartner
EUCAARI (European Integrated project on Aerosol Cloud Climate and Air Quality Interactions)

Projektleiter: U. Baltensperger, E. Weingartner
CLOUD-ITN (Cosmics Leaving OUtdoor Droplets, Initial Training Network)

Projektleiter: U. Baltensperger, A.S.H. Prévôt, E. Weingartner
PEGASOS (Pan-european Gas-Aerosols-Climate Interaction Study)

Teilprojektleiter: S.M.A. Biollaz
BRISK (Biofuels Research Infrastructure for Sharing Knowledge)

Projektleiter: F.N. Büchi
JTI FCH: Auto-Stack: Automotive fuel cell stack cluster initiative for Europe
with auto-stack consortium

Projektleiter: P. Delaporte[1], Work Package Leader: T. Lippert
eLIFT (Laser printing of organic/inorganic material for the fabrication of electronic devices)
[1] Université de la Méditerranée, Marseille, France

Projektleiter: P. Jansohn
HERCULES-B (High efficiency engine R&D on combustion with ultra low emissions for ships)

Projektleiter: P. Jansohn
H_2-IGCC (Low emission gas turbine technology for hydrogen-rich syngas)

Projektleiter: P. Jansohn, J. Mantzaras
H_2-IGCC (Hydrogen Integrated Gasification Combined Cycle Plants)

Member of MC: R. Kötz
Hybrid energy storage devices and systems for mobile and stationary applications
COST Action MP1004

Projektleiter: P. Novák
MAHEATT (materials for high energy accumulators in traction and tools)

Projektleiter: A.S.H. Prévôt
CIRCE (Climate change and Impact Research: The Mediterranean Environment)

Projektleiter: A.S.H. Prévôt, E. Weingartner
EUROSTARS (Fast and loading compensated Aethalometer-an instrument for real time measurement of light absorbing carbonaceous aerosol)

Projektleiter: I.A. Schneider, T.J. Schmidt
DEMMEA (Understanding the degradation mechanisms of membrane-electrode-assembly for high temperature PEMFCs and optimization of individual components)

Projektleiter: O. Sidorova, R. Siegwolf
EU-ISOTREC (Climatic and environmental changes in the Eurasian Subarctic inferred from tree-ring and stable isotope chronologies for the past and recent periods)

Projektleiter: A. Steinfeld
TCS Power (Thermochemical Energy Storage for Concentrated Solar Power Plants)

Projektleiter: E. Weingartner, U. Baltensperger
GeoMon (Global Earth Observation and Monitoring of the atmosphere)

Projektleiter: C. Wieckert
SFERA (Solar Facilities for the European Research Area)

Forschungsvereinigung Verbrennungskraftmaschinen (FVV)

Projektleiter: O. Kröcher
Differenzierte Mikroanalytik von Particulate Matter (PM)

Industry

Projektleiter: P. Boillat, I.A. Schneider
Diagnostics of polymer electrolyte fuel cells
Automotive Industry

Teilprojektleiter: F.N. Büchi
Developments for mobile fuel cell systems
S_Chain

Projektleiter: P. Dietrich
S_Chain (Research and development for a Swiss H_2-O_2 fuel cell system)
Belenos Clean Power AG, Biel

Projektleiter: M. Elsener
Thermal stability of vanadium oxide species on V_2O_5/WO_3-TiO_2 SCR catalysts
MTU Friedrichshafen GmbH, Germany
Porzellanfabrik Frauenthal GmbH, Vienna, Austria

Projektleiter: J.L. Gómez-Cámer
Graphite für Lithiumionen-Batterien
TIMCAL SA, Bodio

Teilprojektleiter: L. Gubler
Development of components for fuel cells
S_Chain

Projektleiter: O. Kröcher, E. Rohart[1]
Development of SCR catalysts based on mixed rare earth metal oxides
[1] Rhodia, Aubervillier Cedex, France

Projektleiter: O. Kröcher
Investigation of the decomposition of urea in the SCR process
TOTAL, Paris, France

Projektleiter: P. Novák
Projekt HE-Lion (Hochenergie-Lithiumionenbatterien für die Zukunft)
BASF SE, Ludwigshafen, Germany

Projektleiter: P. Novák
Forschungsnetzwerk „Elektrochemie und Batterien"
BASF SE, Ludwigshafen, Germany

Projektleiter: S. Urbonaite
Kohlenstoffe
Heraeus Quarzglas GmbH & Co. KG, Kleinostheim, Germany

KTI

Projektleiter: P. Dietrich
Swiss Fuel Cell (Development of a 25 kW Hydrogen/Oxygen Fuel Cell system) Projekt-Nr. 10050.2 PFIW-IW
with Belenos Clean Power AG, Biel and Asulab, Marin

Projektleiter: C. Wieckert
SOLSYN (Solar process for high quality syngas from low grade fuels or from wastes as fuel for cement kilns)

METEO SCHWEIZ

Projektleiter: U. Baltensperger, E. Weingartner, N. Bukowiecki
GAW-CH (Aerosol Monitoring Programm auf dem Jungfraujoch)

Projektleiter: E. Weingartner, U. Baltensperger
GAW-Plus (Continuous Measurement of Number Size Distributions and Cloud Condensation Nuclei at Jungfraujoch Research Station)

Nationalfonds

Projektleiter: U. Baltensperger, J. Dommen
Investigation of Secondary Organic Aerosol Formation in the PSI Smog Chamber

Projektleiter: U. Baltensperger, E. Weingartner
FORCE, Investigation of Secondary Organic Aerosol Formation in the PSI Smog Chamber and at CERN

Projektleiterin: A. Foelske-Schmitz
Degradation mechanisms of electro-catalysts used in polymer electrolyte fuel cells

Projektleiter: M. Furger
Using trace elements in aerosol samples for source identification

Projektleiter: T. Gerber
Non linear fs spectroscopy and time resolved PES, NCCR-MUST (National Competence Centre of Research-Molecular Ultrafast Science and Technology)

Projektleiter: L. Gubler
Antioxidant strategies for the stabilization of fuel cell membranes against oxidative stress

Projektleiter: M. Gysel
Soot Nanoparticles in the Past and Present Atmosphere

Projektleiter: P. Jansohn, A. Denisov
Investigation of Collisional Processes Relevant for Laser-Induced Fluorescence of Nitric Oxide and Oxygen in High Pressure Combustion

Projektleiter: R. Kötz
Graphite oxides and graphene for electrochemical energy storage

Projektleiter: O. Kröcher
Investigation of the selective catalytic reduction of NO_x on diesel soot

Projektleiter: T. Lippert, L. Gauckler[1]
Single crystalline films of ion conductors
[1] ETH Zürich

Projektleiter: J. Mantzaras, I. Czekaj
Computational Modeling of Pd/PdOx Transformation in Redox Catalytic Cycles

Projektleiter: J. Mantzaras
Direct Numerical Simulation of Turbulent Catalytic Combustion

Projektleiter (MaNEP-III): C. Niedermayer, C.W. Schneider (as subcontractor)
Novel phenomena at interfaces and in superlattices: conducting interfaces

Projektleiter: P. Novák
Synthetic solid electrolyte interphase on carbon electrodes for lithium-ion batteries

Projektleiter: P. Novák
New oxyphosphates as high specific charge electrode materials for lithium-ion batteries

Projektleiter: F. Nüesch[1], M. Nagel[1], T. Lippert, A. Wokaun
Fabrication of patterned organic multilayer devices using dynamic release layer assisted Laser Induced Forward Transfer
[1] Empa Dübendorf

Projektleiter: A.S.H. Prévôt
Source Attribution of Particulate Matter in Alpine Valleys

Projektleiter: M. Rossi
Elementary Chemistry at the Gas-condensed Phase Interface: Implications for Atmospheric Science

Projektleiter: M. Saurer
SCOPES (Tree growth and forest ecosystem functioning in Eurasia under changing climate)

Projektleiter: M. Saurer
Understanding the isotope signal of trees growing on continuous permafrost in northern Siberia

Projektleiter: J. Slowik
Production and Processing of Atmospheric Aerosols from Biogenic and Biomass Burning Sources

Projektleiter: E. Weingartner
Interaction of Aerosols with Clouds and Radiation

Projektleiter: A. Wokaun, T. Lippert
Negative ions: the overlooked species in thin film growth by pulsed laser deposition

Projektleiter: A. Wokaun, T. Lippert
Thin metal oxide films by PLD: "Tracing" the oxygen and understanding its role

NATO

Projektleiter: M. Dinescu[1], E. Verona[2], T. Lippert
Polymers based piezoelectric sensor array for chemical warfare agents detection
NATO
[1] National Institute for Lasers, Plasma and Radiation Physics, Bucharest, Romania
[2] CNR-IDAC Rome, Italy

Science and Technology Cooperation Programme (Leadinghouse University of Geneva)

Projektleiter: P.P. Radi
Investigations of stable and transient molecules in the gas phase by spectrally and temporally resolved non-linear laser spectroscopy
St. Petersburg State University, Russia and A.M. Prokhorov General Physics Institute, Moscow, Russia

Swisselectric Research

Projektleiter: I. Mantzaras, P. Jansohn
Technologies for Gas Turbine Power Generation with CO_2 Mitigation

TEACHING ACTIVITIES (LECTURES)

University Level Teaching

Prof. Dr. U. Baltensperger, Prof. Dr. H. Burtscher[1], Dr. C. Marcolli[2]
Aerosole II
ETH Zürich, FS 2011.
[1] University of Applied Sciences, Windisch
[2] ETH Zürich

Prof. Dr. U. Baltensperger, Prof. Dr. H. Burtscher[1], Dr. C. Marcolli[2]
Aerosole I
ETH Zürich, HS 2011.
[1] University of Applied Sciences, Windisch
[2] ETH Zürich

Prof. Dr. K. Boulouchos[1], Dr. O. Kröcher
IC-Engines and propulsion systems II
ETH Zürich, FS 2011.
[1] ETH Zürich

Dr. P. Dietrich
IC-Engines and Propulsion Systems
ETH Zürich, HS 2011.

Dr.-Ing. P. Jansohn
Gasturbinen: Prozesse und Verbrennungssysteme
ETH Zürich, FS 2011.

Prof. Dr. C. Körner[1], Dr. R. Siegwolf
Pflanzenökologie, Part Stable Isotopes
Institute of Botany, University of Basel, 2011.
[1] University of Basel

Prof. Dr. M. Lehmann[1], Dr. R. Siegwolf
Isotopengeochemie, Part: Pflanzenökologie
University of Basel, 2011.
[1] University of Basel

PD Dr. T. Lippert
Mikro- und Nanostrukturen: Laseranwendungen in Industrie und Forschung
ETH Zürich, HS 2011.

Prof. Dr. C. Ludwig
Advanced solid waste treatment
EPF Lausanne, HS 2011.

Prof. Dr. C. Ludwig, Dr. F. De Alencastro[1]
Analyse des polluants dans l'environnement
EPF Lausanne, HS 2011.
[1] EPF Lausanne

PD Dr. J. Mantzaras, Dr. C. Frouzakis[1]
Theoretical and Numerical Combustion
ETH Zürich, FS 2011.
[1] ETH Zürich

Prof. Dr. P. Novák
Elektrochemie
ETH Zürich, HS 2011.

Dr. A.S.H. Prévôt, Prof. Dr. J. Staehelin[1]
Tropospheric Chemistry
ETH Zürich, 2011.
[1] ETH Zürich

Prof. Dr. J.-L. Scartezzini[1], Prof. Dr. C. Ludwig, A.-G. Dumont[1], Prof. Dr. R. Schlaepfer[1], Dr. M. Soutter[1], Dr. D. Robinson[1], Dr. P. Tosolini[1]
Quartiers urbains, infrastructures et aménagements durables
EPF Lausanne, FS 2011.
[1] EPF Lausanne

PD Dr. C.W. Schneider, PD Dr. T. Lippert
Inorganic Thin Films: Processing, Properties and Applications
ETH Zürich, FS 2011.

Prof. Dr. A. Steinfeld, Prof. Dr. R. Abhari
Energy Systems and Power Engineering
ETH Zürich, FS 2011.

Prof. Dr. A. Steinfeld, Prof. Dr. R. Abhari
Thermodynamics III
ETH Zürich, HS 2011.

Prof. Dr. A. Steinfeld, Dr. A. Z’Graggen
Radiation Heat Transfer
ETH Zürich, HS 2011.

Dr. R. Werner[1], Prof. Dr. N. Buchmann[1], Dr. R. Siegwolf
Stable Isotope Ecology of Terrestrial Ecosystems
ETH Zürich 2011.
[1] ETH Zürich

Prof. Dr. A. Wokaun, Dr. G.G. Scherer, Prof. Dr. K. Boulouchos, Dr. F. Noembrini
Renewable Energy Technologies II
ETH Zürich, FS 2011.

Prof. A. Wokaun, Dr. P. Loutzenhiser
Renewable Energy Technologies I
ETH Zürich, HS 2011.

Lecture Courses at Other Schools

Dr. P. Dietrich
Antriebssysteme und Verbrennungsmotoren
BFH-HTI Biel, HS 2011.

Dr. P. Dietrich
Minor Elektrizitätswirtschaft
FHNW Windisch, FS 2011.

Contributions to Courses at Universities, FHL, and Other Institutes

Dr. S.M.A. Biollaz
Biomass: Options for technical use
Renewable Energy Technologies I, ETH Zürich, December 6, 2011.

Dr. S.M.A. Biollaz
Biomass: Fuel production
Renewable Energy Technologies I, ETH Zürich, December 13, 2011.

Prof. Dr. C. Ludwig
The role of thermal processes in energy and materials flow management
All just rubbish - Sustainability summer school 2011, ETH Zürich, June 29, 2011.

Dr. M. Nachtegaal
Cook and look: Synchrotron techniques
Biogeochemistry and pollution dynamics, ETH Zürich, June 6 – July 7, 2011.

Dr. M. Nachtegaal
Practical summer school on functional materials
PSI Villigen, August 20-22, 2011.

Dr. T.J. Schildhauer
How can methods of chemical reaction engineering help to improve or develop a chemical process? Producing SNG from wood, a case study
Heterogeneous reaction technology, ETH Zürich, May 11, 2011.

Prof. Dr. T.J. Schmidt
Renewable Energy Technologies II
ETH Zürich, March 29, 2011.

Prof. Dr. T.J. Schmidt
Strategische Übungen in analytischer Chemie
ETH Zürich, December 6, 2011.

Dr. I.A. Schneider
Renewable Energy Technologies II
ETH Zürich, April 12/19, 2011.

Dr. S. Ulli-Beer
Systeme, Komplexität – und wie Menschen damit umgehen können
Einführung in Allgemeine Ökologie – Systemansätze, Interfakultäre Koordinationsstelle für Allgemeine Ökologie, Universität Bern, November 14/21, 2011.

PUBLICATIONS

Books and Reviewed Book Chapters

P. Boillat, G.G. Scherer
Neutron imaging
PEM Fuel Cell Durability Handbook – Vol. II: PEM Diagnostic Tools, edited by H. Wang, H. Li, X.T. Yuan
ISBN: 9781439839218, ISBN 10: 1439839212, CRC Press - Taylor & Francis Group, Chapter 12 (2011).

S. Karagiannidis
Catalytic microreactors for portable power generation
Springer Outstanding Ph.D. Theses
ISBN: 978-3-642-17667-8, Springer-Verlag, Berlin (2011).

Polymer electrolyte fuel cells 11
Edited by H. Gasteiger[1], F.N. Büchi, V. Ramani[1], A. Weber[1], P. Shirvanian[1], T. Fuller[1], S. Narayanan[1], A. Davenport[1], H. Nakagawa[1], M. Edmundson[1], D. Jones[1], H. Uchida[1], C. Lamy[1], P. Strasser[1], S. Mukerjee[1], R. Mantz[1], K. Swider-Lyons[1], T.J. Schmidt
ISBN: 978-1-60768-255-4, ECS Transactions **41** (2011), 220th ECS Meeting, Boston, USA, October 9–14 (2011).
[1] external editors

J. Mantzaras
Transient modeling in heterogeneous combustion
Heterogeneous Combustion
ISBN: 978-1-61761-324-1, Nova Publ., New York, USA, Chapter 1 (2011).

J. Mantzaras
Evaluation of models for heterogeneous catalysis
Modeling and Simulation of Heterogeneous Catalytic Reactions: From the Molecular Process to the Technical System
ISBN 10: 3527321209, Wiley-VCH, New York, USA, Chapter 7 (2011).

A. Meier
Direct Solar Energy
IPCC Special Report on Renewable Energy Sources and Climate Change Mitigation, edited by O. Edenhofer, R. Pichs Madruga, Y. Sokona, K. Seyboth, P. Matschoss, S. Kadner, T. Zwickel, P. Eickemeier, G. Hansen, S. Schlömer, C. v. Stechow
ISBN 978-1-107-02340-6, Cambridge University Press, Cambridge, UK and New York, USA, Contributing Author to Chapter 3 (2011).

S. Ulli-Beer, M. Bosshardt, A. Wokaun
Regional fleet simulation
Transition to Hydrogen: Pathways Toward Clean Transportation
ISBN 978-0-521-19288-0, Cambridge University Press, Cambridge, UK, 128-167 (2011).

A. Wokaun
Integrated assessment of hydrogen in transportation
Transition to Hydrogen: Pathways Toward Clean Transportation
ISBN 978-0-521-19288-0, Cambridge University Press, Cambridge, UK, 212-221 (2011).

Transition to Hydrogen – Pathways toward clean transportation
Edited by A. Wokaun, E. Wilhelm
ISBN 978-0-521-19288-0, Cambridge University Press, Cambridge, UK (2011).

S. Ulli-Beer, A. Wokaun
Towards a methodical synthesis of innovation system modelling
Operations Research Proceedings 2010. Selected Papers of the Annual International Conference of the German Operations Research Society, edited by B. Hu, K. Morasch, S. Pickl, M. Siegle
Springer, Dordrecht, Heidelberg, London, New York, 583-588 (2011).

E. Weingartner, H. Burtscher[1], C. Hüglin[2], K. Ehara[3]
Semi-continuous mass measurement
Aerosol Measurement: Principles, Techniques, and Applications, by P.S. Kulkarni, P.A. Baron, K. Willeke
John Wiley & Sons, Inc., 255-268 (2011).
[1] University of Applied Sciences, Windisch
[2] Empa Dübendorf
[3] National Institute of Advanced Industrial Science and Technology, Tsukuba, Japan

Peer Reviewed Papers

B. Abulimiti[1], R. Zhu[2], J. Long[1], Y. Xu[1], Y. Liu, A.Y. Ghazal[1], M. Yang[1], B. Zhang
Study of ultrafast dynamics of 2-picoline by time-resolved photoelectron imaging
J. Chem. Phys. **134**, 23 (2011).
[1] Chinese Acad Sci, Wuhan Inst Phys & Math, Wuhan, Peoples R China
[2] Harbin Inst Technol Shenzhen, Shenzhen, Peoples R China

T.W. Adam[1], R. Chirico, M. Clairotte[1], M. Elsasser[1], U. Manfredi[1], G. Martini[1], M. Sklorz[1], T. Streibel[1], M.F. Heringa, P.F. DeCarlo, U. Baltensperger, G. De Santi[1], A. Krasenbrink[1], R. Zimmermann[1], A.S.H. Prévôt, C. Astorga[1]
Application of modern online instrumentation for chemical analysis of gas and particulate phases of exhaust at the European Commission Heavy-Duty Vehicle Emission Laboratory
doi:10.1021/ac101859u, Anal. Chem. **83**, 67-76 (2011).
[1] external member of Ispra Emission Team

S. Aksoyoglu, J. Keller, I. Barmpadimos, D. Oderbolz, V.A. Lanz, A.S.H. Prévôt, U. Baltensperger
Aerosol modelling in Europe with a focus on Switzerland during summer and winter episodes
doi:10.5194/acp-11-7355-2011, Atmos. Chem. Phys. **11**, 7355-7373 (2011).

I. Alxneit
Measuring temperatures in a high concentration solar simulator – Demonstration of the principle
Sol. Energy **85**, 516-522 (2011).

F. Amato[1], M. Pandolfi[1], T. Moreno[1], M. Furger, J. Pey[1], A. Alastuey[1], N. Bukowiecki, A.S.H. Prévôt, U. Baltensperger, X. Querol[1]
Sources and variability of inhalable road dust particles in three European cities
doi:10.1016/j.atmosenv.2011.06.003, Atmos. Environ. **45**, 6777-6787 (2011).
[1] IDAEA-CSIC, Barcelona, Spain

F. Amato[1], M. Viana[1], A. Richard, M. Furger, A.S.H. Prévôt, S. Nava[2], F. Lucarelli[2], N. Bukowiecki, A. Alastuey[1], C. Reche[1], T. Moreno[1], M. Pandolfi[1], J. Pey[1], X. Querol[1]
Size and time-resolved roadside enrichment of atmospheric particulate pollutants
Atmos. Chem. Phys. **11**, 2917-2931 (2011).
[1] IDAEA-CSIC, Barcelona, Spain
[2] University of Florence, Sesto Fiorentino, Italy

E. Andrews[1], J.A. Ogren[1], P. Bonasoni[1], A. Marinoni[1], E. Cuevas[1], Rodríguez[1], J.Y. Sun[1], D.A. Jaffe[1], E.V. Fischer[1], U. Baltensperger, E. Weingartner, M. Collaud[1], S. Sharma[1], A.M. Macdonald[1], W.R. Leaitch[1], N.-H. Lin[1], P. Laj[1], T. Arsov[1], I. Kalapov[1], A. Jefferson[1], P. Sheridan[1]
Climatology of aerosol radiative properties in the free troposphere
doi:10.1016/j.atmosres.2011.08.017, Atmos. Res. **102**, 365–393 (2011).
[1] external member of the GAW project

A. Asmi[1], A. Wiedensohler[1], P. Laj[1], A.-M. Fjaeraa[1], K. Sellegri[1], W. Birmili[1], E. Weingartner, U. Baltensperger, V. Zdimal[1], N. Zikova[1], J.-P. Putaud[1], A. Marinoni[1], P. Tunved[1], H.-C. Hansson[1], M. Fiebig[1], N. Kivekäs[1], H. Lihavainen[1], E. Asmi[1], V. Ulevicius[1], P.P. Aalto[1], E. Swietlicki[1], A. Kristensson[1], N. Mihalopoulos[1], N. Kalivitis[1], I. Kalapov[1], G. Kiss[1], G.d. Leeuw[1], B. Henzing[1], R.M. Harrison[1], D. Beddows[1], C. O'Dowd[1], S.G. Jennings[1], H. Flentje[1], K. Weinhold[1], F. Meinhardt[1], L. Ries[1], M. Kulmala[1]
Number size distributions and seasonality of submicron particles in Europe 2008–2009
Atmos. Chem. Phys. **11**, 5505-5538 (2011).
[1] external member of the EUSAAR project

R. Bader[1], A. Pedretti[2], A. Steinfeld
A 9m-aperture solar parabolic trough concentrator based on a multilayer polymer membrane mounted on a concrete structure
ASME J. Sol. Energy Eng. **133**, 031016 1-12 (2011).
[1] ETH Zürich
[2] Airlight Energy, Biasca

C. Baduel[1], M.E. Monge[2], D. Voisin[1], J.-L. Jaffrezo[1], C. George[2], I. El Haddad, N. Marchand[3], B. D'Anna[2]
Oxidation of atmospheric humic like substances by ozone: A kinetic and structural analysis approach
doi: 10.1021/es200587z, Environ. Sci. Technol. **45**, 5238-5244 (2011).
[1] UJF-Grenoble, France
[2] Université de Lyon, France
[3] Université d'Aix-Marseille/CNRS, France

T. Baer[1], A. Guerrero[1], J.Z. Davalos[1], A. Bodi
Dissociation of energy selected $Sn(CH_3)_4^+$, $Sn(CH_3)_3Cl^+$, and $Sn(CH_3)_3Br^+$ ions: evidence for isolated excited state dynamics
Phys. Chem. Chem. Phys. **13**, 17791-17801 (2011).
[1] CSIC, Inst Quim Fis Rocasolano, Madrid, Spain
[2] University of North Carolina, Chapel Hill, USA

S. Balog, U. Gasser, K. Mortensen[1], H. Ben youcef, L. Gubler, G.G. Scherer
Nano-scale morphology in graft copolymer proton-exchange membranes cross-linked with DIPB
doi: 10.1016/j.memsci.2011.08.031, J. Membr. Sci. **383**, 50-59 (2011).
[1] University of Copenhagen, Denmark

I. Barmpadimos, C. Hueglin[1], J. Keller, S. Henne[1], A.S.H. Prévôt
Influence of meteorology on PM10 trends and variability in Switzerland from 1991 to 2008
doi:10.5194/acp-11-1813-2011, Atmos. Chem. Phys. **11**, 1813-1835 (2011).
[1] Empa Dübendorf

I. Barmpadimos, M. Nufer, D.C. Oderbolz, J. Keller, S. Aksoyoglu, C. Hueglin[1], U. Baltensperger, A.S.H. Prévôt
The weekly cycle of ambient concentrations and traffic emissions of coarse (PM(10)-PM(2.5)) atmospheric particles
doi:10.1016/j.atmosenv.2011.05.068, Atmos. Environ. **45**, 4580-4590 (2011).
[1] Empa Dübendorf

R. Beghin[1], P. Cherubini[2], G. Battipaglia[2], R. Siegwolf, M. Saurer, G. Bovio[1]
Tree-ring growth and stable isotopes ^{13}C and ^{15}N detect effects of wildfires on tree physiological processes in Pinus sylvestris L
doi:10.1007/s00468-011-0539-9, Trees – Structure and Function **25**, 627-636 (2011).
[1] University of Torino, Italy
[2] WSL Birmensdorf

H. Ben youcef, L. Gubler, A. Foelske-Schmitz, G.G. Scherer
Improvement of homogeneity and interfacial properties of radiation grafted membranes for fuel cells using diisopropenylbenzene crosslinker
doi: 10.1016/j.memsci.2011.07.021, J. Membr. Sci. **381**, 102-109 (2011).

A.M. Bernhard, I. Czekaj, M. Elsener, A. Wokaun, O. Kröcher
Evaporation of urea at atmospheric pressure
doi: 10.1021/jp112066m, J. Phys. Chem. A **115**, 2581-2589 (2011).

J. Bernard, M. Hofer, U. Hannesen[1], A. Toth[2], A. Tsukada, F.N. Büchi, P. Dietrich
Fuel cell/battery passive hybrid power source for electric powertrains
doi:10.1016/j.jpowsour.2011.03.015, J. Power Sources **196**, 5867-5872 (2011).
[1] Belenos Clean Power AG, Biel
[2] Swatch Group, Biel

P. Bernardo, J. Dentzer[1], R. Gadiou[1], W. Märkle, D. Goers[2], P. Novák, M.E. Spahr[2], C. Vix-Guterl[1]
Influence of graphite surface properties on the first electrochemical lithium intercalation
doi:10.1016/j.carbon.2011.07.007, Carbon **49**, 4867-4876 (2011).
[1] Institute for Material Science of Mulhouse, Mulhouse, France
[2] TIMCAL SA, Bodio

I. Bilecka[1], A. Hintennach, M.D. Rossell[1], D. Xie[1], P. Novák, M. Niederberger[1]
Microwave-assisted solution synthesis of doped $LiFePO_4$ with high specific charge and outstanding cycling performance
doi:10.1039/c0jm03476b, J. Mater. Chem. **21**, 5881-5890 (2011).
[1] ETH Zürich

A. Bodi, W.R. Stevens[1], T. Baer[1]
Understanding the complex dissociation dynamics of energy selected dichloroethylene Ions: Neutral isomerization energies and heats of formation by imaging photoelectron-photoion coincidence
J. Phys. Chem. A **115**, 5, 726-734 (2011).
[1] University of North Carolina, Chapel Hill, USA

S.W. Bond[1], T. Gül[2], S. Reimann[1], B. Buchmann[1], A. Wokaun
Emissions of anthropogenic hydrogen to the atmosphere during the potential transition to an increasing H_2-intensive economy
J. of Hydrogen Energy **36**, 1122-1135 (2011).
[1] Empa Dübendorf
[2] International Energy Agency IEA/OECD, Paris

P. Boillat, P. Oberholzer, B.C. Seyfang, A. Kaestner, R. Perego, G.G. Scherer, E.H. Lehmann, A. Wokaun
Using ^2H labeling with neutron radiography for the study of solid polymer electrolyte water transport properties
doi:10.1088/0953-8984/23/23/234108, J. Phys. Condens. Matter **23**, 234108 (2011).

P. Bornhauser, Y. Sych, G. Knopp, T. Gerber, P.P.P. Radi
Shedding light on a dark state: The energetically lowest quintet state of C_2
doi:10.1063/1.3526747, J. Chem. Phys. **134**, 044302 (2011).

S. Borkar[1], B. Sztaray[1], A. Bodi
Dissociative photoionization mechanism of methanol isotopologues (CH_3OH, CH_3OH, CH_3OD and CD_3OD) by iPEPICO: energetics, statistical and non-statistical kinetics and isotope effects
Phys. Chem. Chem. Phys. **13**, 13009-13020 (2011).
[1] University of the Pacific, Stockton, USA

S. Brandenberger, O. Kröcher, A. Tissler[1], R. Althoff[1]
Effect of structural and preparation parameters on the activity and hydrothermal stability of metal-exchanged ZSM-5 in the selective catalytic reduction of NO by NH_3
doi:10.1021/ie101771e, Ind. Eng. Chem. Res. **50**, 4308-4319 (2011).
[1] Süd-Chemie AG, München, Germany

S. Brandenberger, M. Casapu, O. Kröcher, A. Tissler[1], R. Althoff[1]
Hydrothermal deactivation of Fe-ZSM-5 catalysts for the selective catalytic reduction of NO with NH_3
doi:10.1016/j.apcatb.2010.11.006, Appl. Catal. B **101**, 649-659 (2011).
[1] Süd-Chemie AG, München, Germany

M. Bruska, I. Czekaj, B. Delley, I. Mantzaras, A. Wokaun
Electronic structure and oxygen vacancies in PdO and ZnO: validation of DFT models
doi: 10.1039/c1cp20923j, Phys. Chem. Chem. Phys. **13**, 15947-15954 (2011).

N. Bukowiecki, P. Zieger, E. Weingartner, Z. Jurányi, M. Gysel, B. Neininger[1], B. Schneider[1], C. Hueglin[1], A. Ulrich[1], A. Wichser[1], S. Henne[1], D. Brunner[1], R. Kaegi[1], M. Schwikowski, L. Tobler, F.G. Wienhold[1], I. Engel[1], B. Buchmann[1], T. Peter[1], U. Baltensperger
Ground-based and airborne in-situ measurements of the Eyjafjallajökull volcanic aerosol plume in Switzerland in spring 2010
Atmos. Chem. Phys. **11**, 10011-10030 (2011).
[1] external member of the Swiss Eyja In-Situ team

S. Canulescu[1], E. Papadopoulou[2], D. Anglos[2,3], T. Lippert, M.J. Montenegro[4], S. Georgiou[2], M. Döbeli[5], A. Wokaun
Plume emission induced by fs and ns laser ablation of $La_{0.6}Ca_{0.4}CoO_3$ target: Comparisons between plume dynamics
Appl. Phys. A **105**, 167-176 (2011).
[1] Technical University of Denmark, Roskilde, Denmark
[2] Institute of Electronic Structure and Laser, Heraklion, Greece
[3] University of Crete, Heraklion, Greece
[4] ALSTOM AG, Birr
[5] ETH Zürich

W. Cao[1], M. Kavcic[2], J.-Cl. Dousse[1], K. Bucar[2], J. Hoszowska[1], Y.-P. Maillard[1], J. Szlachetko, M. Zitnik[2]
High-resolution KMM radiative Auger x-ray emission spectra of calcium induced by synchrotron radiation
Phys. Rev. A **83**, 042513 (2011).
[1] University of Fribourg
[2] J. Stefan Institute, Ljubljana, Slovenia

M. Casapu, A. Bernhard, D. Peitz, M. Mehring, M. Elsener, O. Kröcher
A niobia-ceria based multi-purpose catalyst for selective catalytic reduction of NO_x, urea hydrolysis and soot oxidation in diesel exhaust
doi:10.1016/j.apcatb.2011.01.011, Appl. Catal. B **103**, 79-84 (2011).

D. Ceburnis[1], A. Garbaras[1], S. Szidat[1], M. Rinaldi[1], S. Fahrni[1], N. Perron, L. Wacker[1], S. Leinert[1], V. Remeikis[1], M.C. Facchini[1], A.S.H. Prévôt, S.G. Jennings[1], M. Ramonet[1], C.D. O'Dowd[1]
Quantification of the carbonaceous matter origin in submicron marine aerosol by ^{13}C and ^{14}C isotope analysis
doi:10.5194/acp-11-8593-2011, Atmos. Chem. Phys. **11**, 8593-8606 (2011).
[1] external ^{13}C and ^{14}C team

D. Cericola, P. Novák, A. Wokaun, R. Kötz
Hybridization of electrochemical capacitors and rechargeable batteries: An experimental analysis of the different possible approaches utilizing activated carbon, $Li_4Ti_5O_{12}$ and $LiMn_2O_4$
doi: 10.1016/j.jpowsour.2011.07.032, J. Power Sources **196**, 10305-10313 (2011).

D. Cericola, P. Novák, A. Wokaun, R. Kötz
Mixed bi-material electrodes based on $LiMn_2O_4$ and activated carbon for hybrid electrochemical energy storage devices
doi: 10.1016/j.electacta.2011.07.029, Electrochim. Acta **56**, 8403-8411 (2011).

D. Cericola, P.W. Ruch, A. Foelske-Schmitz, D. Weingarth, R. Kötz
Effect of water on the aging of activated carbon based electrochemical double layer capacitors during constant voltage load tests
Int. J. Electrochem. Sci. **6**, 988-996 (2011).

D. Cericola, R. Kötz, A. Wokaun
Effect of electrode mass ratio on aging of activated carbon based supercapacitors utilizing organic electrolytes
doi: 10.1016/j.jpowsour.2010.11.157, J. Power Sources **196**, 3114-3118 (2011).

D. Cericola, P. Novák, A. Wokaun, R. Kötz
Segmented bi-material electrodes of activated carbon and $LiMn_2O_4$ for electrochemical hybrid storage devices: Effect of mass ratio and C-rate on current sharing
doi: 10.1016/j.electacta.2010.10.016, Electrochim. Acta **56**, 1288-1293 (2011).

R. Chirico, A.S.H. Prévôt, P.F. DeCarlo, M.F. Heringa, R. Richter, E. Weingartner, U. Baltensperger
Aerosol and trace gas vehicle emission factors measured in a tunnel using an aerosol mass spectrometer and other on-line instrumentation
Atmos. Environ. **45**, 2182-2192 (2011).

C. Chou[1], O. Stetzer[1], E. Weingartner, Z. Juranyi, Z.A. Kanji[1], U. Lohmann[1]
Ice nuclei properties within a Saharan dust event at the Jungfraujoch in the Swiss Alps
doi: 10.5194/acp-11-4725-2011, Atmos. Chem. Phys. **11**, 4725-4738 (2011).
[1] ETH Zürich

D. Chylarecka, T. Kim, K. Tarafder[1], K. Mueller, K. Goedel[2], I. Czekaj, C. Waeckerlin, M. Cinchetti[2], M.E. Ali[1], C. Piamonteze, F. Schmitt[2], J.-P. Wuestenburg[2], C. Ziegler[2], F. Nolting, M. Aeschlimann[2], P. Oppeneer[1], N. Ballav, T. Jung
Indirect magnetic coupling of manganese-porphyrin to ferromagnetic cobalt substrate
doi: 10.1021/jp106822s, J. Phys. Chem. C **115**, 1295-1301 (2011).
[1] University of Uppsala, Sweden
[2] University of Kaiserslautern, Germany

M. Collaud[1], E. Weingartner, M. Furger, S. Nyeki[2], A.S.H. Prévôt, M. Steinbacher[3], U. Baltensperger
Planetary boundary influence at the Jungfraujoch analyzed by aerosol cycles and synoptic weather types
doi:10.5194/acp-11-5931-2011, Atmos. Chem. Phys. **11**, 5931–5944 (2011).
[1] MeteoSwiss, Payerne
[2] Physikalisch-Meteorologisches Observatorium Davos and Word Radiation Center, Davos
[3] Empa Dübendorf

T. Cooper[1], A. Steinfeld
Derivation of the angular dispersion error distribution of mirror surfaces for Monte Carlo ray-tracing applications
ASME J. Sol. Energy Eng. **133**, 044501 1-1 (2011).
[1] ETH Zürich

P. Coray, W. Lipinski[1], A. Steinfeld
Spectroscopic goniometry system for determining thermal radiative properties of participating media
Exp. Heat Transfer **24**, 300-312 (2011).
[1] University of Minnesota, Minneapolis, USA

I. Czekaj, R.P.W.J. Struis, J. Wambach, S.M.A. Biollaz
Sulphur poisoning of Ni catalysts used in the SNG production from biomass: computational studies
doi:10.1016/j.cattod.2010.10.078, Catal. Today **176**, 429-432 (2011).

S. Daniele, P. Jansohn, J. Mantzaras, K. Boulouchos[1]
Turbulent flame speed for syngas and methane at gas-turbine relevant conditions
doi:10.1016/j.proci.2010.05.057, Proc. Combust. Inst. **33**, 2237-2944 (2011).
[1] ETH Zürich

G. da Silva[1], A. J. Trevitt[2], M. Steinbauer[3], P. Hemberger
Pyrolysis of fulvenallene (C_7H_6) and fulvenallenyl (C_7H_5): Theoretical kinetics and experimental product detection
doi:10.1016/j.cplett.2011.10.026, Chem. Phys. Lett. **517**, 144-148 (2011).
[1] University of Melbourne, Australia
[2] University of Wollongong, Australia
[3] University of Würzburg, Germany

V. Dinca[1], A. Palla-Papavlu[1], I. Paraico[2], T. Lippert, A. Wokaun, M. Dinescu[1]
2D spatially controlled polymer micro patterning for cellular behavior studies
Appl. Surf. Sci. **257**, 5250-5254 (2011).
[1] NILPRP, National Institute for Lasers, Plasma and Radiation Physics, Bucharest, Romania
[2] Carol Davila University of Medicine and Pharmacy, Bucharest, Romania

S.M. Dockheer[1], L. Gubler, A. Wokaun, W.H. Koppenol[1]
Damage to fuel cell membranes: reaction of $SO_4^{\bullet -}$ with an oligomer of poly(sodium styrene sulfonate)
doi: 10.1039/c1cp20499h, Phys. Chem. Chem. Phys. **13**, 12429-12434 (2011).
[1] ETH Zürich

J. Duplissy, P.F. DeCarlo, J. Dommen, M.R. Alfarra[1], A. Metzger, I. Barmpadimos, A.S.H. Prévôt, E. Weingartner, T. Tritscher, M. Gysel, A.C. Aiken[1], J.L. Jimenez[1], M. Canagaratna[1], D.R. Worsnop[1], D.R. Collins[1], J.M. Tomlinson[1], U. Baltensperger
Relating hygroscopicity and composition of organic aerosol particulate matter
doi:10.5194/acp-11-1155-2011, Atmos. Chem. Phys. **11**, 1155-1165 (2011).
[1] External member of the SOA characterization team

M. Ebert[1], A. Worringen[1], N. Benker[1], S. Mertes[2], E. Weingartner, S. Weinbruch[1]
Chemical composition and mixing-state of ice residuals sampled within mixed phase clouds
Atmos. Chem. Phys. **11**, 2805-2816 (2011).
[1] Technical University Darmstadt, Germany
[2] Leibnitz-Institute for Tropospheric Research, Leipzig, Germany

J. Eller, T. Rosén, F. Marone, M. Stampanoni[1], A. Wokaun, F.N. Büchi
Progress in in situ x-ray tomographic microscopy of liquid water in gas diffusion layers of PEFC
doi: 10.1149/1.3596556, J. Electrochem. Soc. **158**, B963-B970 (2011).
[1] Institute for Biomedical Engineering, University and ETH Zürich

M. Esposito, M. Bator, M. Döbeli[1], T. Lippert, C.W. Schneider, A. Wokaun
Negative ions: The overlooked species in thin film growth by pulsed laser deposition
Appl. Phys. Letters **99**, 191501 (2011).
[1] ETH Zurich

A. Eyssler[1], E. Kleymenov, A. Kupferschmid[1], M. Nachtegaal, M.S. Kumar[1], P. Hug[1], A. Weidenkaff[1], D. Ferri[1]
Improvement of catalytic activity of LaFe0.95Pd0.05O3 for methane oxidation under transient conditions
J. Phys. Chem. C **115**, 1231-1239 (2011).
[1] Empa Dübendorf

R. Figi[1], O. Nagel[1], M. Tuchschmid[1], P. Lienemann[2], U. Gfeller[1], N. Bukowiecki
A tough nut to crack: Quantitative analysis of heavy metals in automotive brake linings
doi:10.2533/chimia.2011.275, Chimia **65**, 275-275 (2011).
[1] Empa Dübendorf
[2] ZHAW Wädenswil

K.H. Fischer[1], I. Fischer[1], A. Bodi
Threshold photoelectron spectrum of isolated NTCDA
J. Res. Phys. Chem. Chem. Phys. **225**, 715-721 (2011).
[1] University of Würzburg, Germany

R. Flückiger, F. Marone, M. Stampanoni[1], A. Wokaun, F.N. Büchi
Investigation of liquid water in gas diffusion layers of polymer electrolyte fuel cells using x-ray tomographic microscopy
doi:10.1016/j.electacta.2010.12.016, Electrochim. Acta **56**, 2254-2262 (2011).
[1] Institute for Biomedical Engineering, University and ETH Zürich

A. Foelske-Schmitz, D. Weingarth, R. Kötz
XPS analysis of activated carbon supported ionic liquids: Enhanced purity and reduced charging
doi: 10.1016/j.susc.2011.07.016, Surf. Sci. **605**, 1979-1985 (2011).

A. Foelske-Schmitz, D. Weingarth, R. Kötz
Quasi in situ XPS study of electrochemical oxidation and reduction of HOPG in [EMIM][BF_4] electrolytes
doi: 10.1016/j.electacta.2011.03.064, Electrochim. Acta **56**, 10321-10331 (2011).

K. Föttinger[1], J.A. van Bokhoven, M. Nachtegaal, G. Rupprechter[1]
Dynamic structure of a working methanol steam reforming catalyst: In situ quick-EXAFS on Pd/ZnO nanoparticles
doi: 10.1021/jz101751s, J. Phys. Chem. Lett. **2**, 428-433 (2011).
[1] TU, Vienna, Austria

R. Francke[1], D. Cericola, R. Kötz, G. Schnakenburg[2], S.R. Waldvogel[1]
Bis(2,2'-biphenoxy)borates for electrochemical double-layer capacitor electrolytes
doi: 10.1002/chem.201003449, Chem. Eur. J. **17**, 3082–3085 (2011).
[1] Mainz University, Mainz, Germany
[2] Bonn University, Bonn, Germany

P. Frank[1], J. Shaw Stewart, T. Lippert, J. Boneberg[1], P. Leiderer[1]
Laser-induced ablation dynamics and flight of thin polymer films
Appl. Phys. A **104**, 579-582 (2011).
[1] University of Konstanz, Germany

E.J. Freney[1], K. Sellegri[1], F. Canonaco, J. Boulon[1], M. Hervo[1], R. Weigel[1], J. M. Pichon[1], A. Colomb[1], A.S.H. Prevot, and P. Laj[1]
Seasonal variations in aerosol particle composition at the puy-de-Dôme research station in France
Atmos. Chem. Phys., **11**, 13047-13059 (2011).
[1] CNRS, Clermont Ferrand, France

S.A. Freunberger[1], Y. Chen[1], Z. Peng[1], J.M. Griffin[1], L.J. Hardwick[1], F. Bardé[2], P. Novák, P.G. Bruce[1]
Reactions in the rechargeable lithium-O_2 battery with alkyl carbonate electrolytes
doi:10.1021/ja2021747, J. Am. Chem. Soc. **133**, 8040-8047 (2011).
[1] University of St. Andrews, Scotland
[2] Toyota Motor Europe, Zaventem, Belgium

M. Frosch[1], M. Bilde[1], P.F. DeCarlo[2], Z. Jurányi, T. Tritscher, J. Dommen, N.M. Donahue[3], M. Gysel, E. Weingartner, U. Baltensperger
Relating cloud condensation nuclei activity and oxidation level of α-pinene secondary organic aerosols
doi:10.1029/2011JD016401, J. Geophys. Res. **116**, D22212 (2011).
[1] University of Copenhagen, Denmark
[2] Drexel University, Philadelphia, Pennsylvania, USA
[3] Carnegie Mellon University, Pittsburgh, Pennsylvania, USA

A. Gallice[1], F.G. Wienhold[1], C.R. Hoyle, F. Immler[2], T. Peter[1]
Modeling the ascent of sounding balloons: Derivation of the vertical air motion
Atmos. Meas. Tech. **4**, 2235-2253 (2011).
[1] ETH Zürich
[2] Richard Assmann Observatory, German Meteorological Service (DWD), Lindenberg, Germany

M. Gassner, F. Vogel, G. Heyen[1], F. Maréchal[2]
Process design of SNG production by hydrothermal gasification of waste biomass: Thermoeconomic process modeling and integration
Energy Environ. Sci. **4**, 1726-1741 (2011).
[1] TU Delft, The Netherlands
[2] EPF Lausanne

M. Gassner, F. Vogel, G. Heyen[1], F. Maréchal[2]
Process design of SNG production by hydrothermal gasification of waste biomass: Process optimisation for selected substrates
Energy Environ. Sci. **4**, 1742-1758 (2011).
[1] TU Delft, The Netherlands
[2] EPF Lausanne

C. Gebald[1], J. Wurzbacher[1], P. Tingaut[2], T. Zimmermann[2], A. Steinfeld
Amine-based nanofibrillated cellulose as adsorbent for CO_2 capture from air
Environ. Sci. Technol. **45**, 9101-9108 (2011).
[1] ETH Zürich
[2] Empa Dübendorf

A.Y. Ghazal[1], Y. Liu, Y. Wang[1], C. Hu[1], B. Zhang[1]
Photodissociation studies of cyclopentyl bromide at 234 and 266 nm using velocity ion imaging technique
Chem. Phys. Lett. **511**, 39-44 (2011).
[1] Chinese Acad Sci, Wuhan Inst Phys & Math, Wuhan, Peoples R China

Y. Ghermay, J. Mantzaras, R. Bombach, K. Boulouchos[1]
Homogeneous combustion of fuel lean $H_2/O_2/N_2$ mixtures over platinum at elevated pressures and preheats
doi:10.1016/j. Combust. Flame **158**, 1491-1506 (2011).
[1] ETH Zürich

Y. Ghermay, J. Mantzaras, R. Bombach
Experimental and numerical investigation of hetero-/homogeneous combustion of $CO/H_2/O_2/N_2$ mixtures over platinum at pressures up to 5 bar
doi:10.1016/j.proci.2010.06.135, Proc. Combust. Inst. **33**, 1827-1835 (2011).

N.J.D. Gonzalez[1], A.K. Borg-Karlson[2], J. Pettersson Redeby[2], B. Noziere[1], R. Krejci[1], Y. Pei[2], J. Dommen, A.S.H. Prévôt
New method for resolving the enantiomeric composition of 2-methyltetrols in atmospheric organic aerosols
J. Chromatogr. A, **1218**, 9288-9294 (2011).
[1] Stockholm University, Sweden
[2] Royal Institute of Technology, Stockholm, Sweden

V. A. Godbole, J.-F. Colin, P. Novák
Study of overcharge behavior of $Li_{1+x}(Ni_{1/3}Mn_{1/3}Co_{1/3})_{1-x}O_2$ using in situ and ex situ X-ray synchrotron diffraction
doi:10.1149/1.3607982, J. Electrochem. Soc. **158**, A1005-A1010 (2011).

D. Goers[1], M.E. Spahr[1], A. Leone[1], W. Märkle, P. Novák
The influence of the local current density on the electrochemical exfoliation of graphite in lithium-ion battery negative electrodes
doi:10.1016/j.electacta.2011.02.046, Electrochim. Acta **56**, 3799-3808 (2011).
[1] TIMCAL SA, Bodio

L. Gubler, S.M. Dockheer[1], W.H. Koppenol[1]
Radical ($HO^{\bullet}$, $H^{\bullet}$ and $HOO^{\bullet}$) formation and ionomer degradation in polymer electrolyte fuel cells
doi: 10.1149/1.3581040, J. Electrochem. Soc. **158**, B755-B769 (2011).
[1] ETH Zürich

R. Guerrieri[1], M. Mencuccini[1], L.J. Sheppard[1], M. Saurer, M.P. Perks[1], P. Levy[1], M.A. Sutton[1], M. Borghetti[2], J. Grace[1]
The legacy of enhanced N and S deposition as revealed by the combined analysis of $\delta^{13}C$, $\delta^{18}O$ and $\delta^{15}N$ in tree rings
doi:10.1111/j.1365-2486.2010.02362.x, Global Change Biol. **17**, 1946-1962 (2011).
[1] University of Edinburgh, UK
[2] University of Basilicata, Potenza, Italy

V.A. Guzenko, J. Ziegler, A. Savouchkina, C. Padeste, C. David
Fabrication of large scale arrays of metallic nanodots by means of high resolution e-beam lithography
doi: 10.1016/j.mee.2011.02.042, Microelectron. Eng. **88,** 1972 -1974 (2011).

M. Gysel, M. Laborde, J.S. Olfert[1], R. Subramanian[2], A.J. Gröhn[3]
Effective density of Aquadag and fullerene soot black carbon reference materials used for SP2 calibration.
doi:10.5194/amt-4-2851-2011, Atmos. Meas. Tech. **4**, 2851-2858, 2011.
[1] University of Alberta, Edmonton, Canada
[2] Droplet Measurement Technologies, Boulder CO, USA
[3] Swiss Federal Institute of Technology, Zürich

O. Haas[1], C. Ludwig, U. Bergmann[2], R.N. Singh[3], A. Braun[4], T. Graule[4]
X-ray absorption investigation of the valence state and electronic structure of $La_{1-x}Ca_xCoO_{3-\delta}$ in comparison with $La_{1-x}Sr_xCoO_{3-\delta}$ and $La_{1-x}Sr_xFeO_{3-\delta}$
J. Solid State Chem. **184**, 3163-3171 (2011).
[1] Energy and Material Research Consulting, Minusio
[2] SLAC, Menlo Park, USA
[3] Banaras Hindu University, Varanasi, India
[4] Empa Dübendorf

H. Hagendorfer[1,2], R. Kaegi[3], J. Traber[3], S.F. Mertens[4], R. Scherrers[5], C. Ludwig, A. Ulrich[1]
Application of an asymmetric flow field flow fractionation (AF4) multi-detector approach for metallic ENP characterization - prospects and limitations demonstrated on Au nanoparticles
Anal. Chim. Acta **706**, 367-378 (2011).
[1] Empa Dübendorf
[2] EPF Lausanne
[3] Eawag Dübendorf
[4] K.U. Leuven, Heverlee, Belgium
[5] Wyatt Europe, Dernbach, Germany

M. Halmann[1], A. Frei, A. Steinfeld
Vacuum carbothermic reduction of Al_2O_3, BeO, MgO-CaO, TiO_2, ZrO_2, HfO_2+ZrO_2, SiO_2, SiO_2+Fe_2O_3, and GeO_2 to the metals. A thermodynamic study
Miner. Process. Extr. Metall. Rev. **32**, 247-266 (2011).
1 The Weizmann Institute of Science, Rehovot, Israel

M. Hänchen, S. Brückner[1], A. Steinfeld
High-temperature thermal storage using a packed bed of rocks – Heat transfer analysis and experimental validation
Appl. Therm. Eng. **31**, 1798-1806 (2011).
1 ETH Zürich

M.M. Hantel, V. Presser[1], R. Kötz, Y. Gogotsi[1]
In situ electrochemical dilatometry of carbide-derived carbons
doi:10.1016/j.elecom.2011.08.039, Electrochem. Commun. **13**, 1221–1224 (2011).
[1] Drexel University, Philadelphia, USA

M.M. Hantel, T. Kaspar[1], R. Nesper[1], A. Wokaun, R. Kötz
Partially reduced graphite oxide for supercapacitor electrodes: Effect of graphene layer spacing and huge specific capacitance
doi: 10.1016/j.elecom.2010.11.021, Electrochem. Commun. **13,** 90-92 (2011).
[1] ETH Zürich

S. Heiroth, R. Frison[1], J.L.M. Rupp[1], T. Lippert, E.J. Barthazy Meier[1], E. Müller Gubler[1], M. Döbeli[1],
K. Conder, A. Wokaun, L.J. Gauckler[1]
Crystallization and grain growth characteristics of yttria-stabilized zirconia thin films grown by pulsed laser deposition
Solid State Ionics **191**, 12-23 (2011).
[1] ETH Zürich

S. Heiroth, R. Ghisleni[1], T. Lippert, A. Wokaun, J. Michler[1]
Optical and mechanical properties of amorphous and crystalline YSZ coatings prepared by pulsed laser deposition
Acta Mat. **59**, 2330-2340 (2011).
[1] Empa Thun

M.F. Heringa, P.F. DeCarlo, R. Chirico, T. Tritscher, J. Dommen, E. Weingartner, R. Richter, G. Wehrle,
A.S.H. Prévôt, U. Baltensperger
Investigations of primary and secondary particulate matter of different wood combustion appliances with a high-resolution time-of-flight aerosol mass spectrometer
doi:10.5194/acp-11-5945-2011, Atmos. Chem. Phys. **11**, 5945-5957 (2011).

L. Hildebrandt[1], E. Kostenidou[2], V.A. Lanz, A.S.H. Prévôt, U. Baltensperger, N. Mihalopoulos,
A. Laaksonen[3], N.M. Donahue[1], S.N. Pandis[1]
Sources and atmospheric processing of organic aerosol in the Mediterranean: Insights from aerosol mass spectrometer factor analysis
doi:10.5194/acp-11-12499-211, Atmos. Chem. Phys. **11**, 12499-12515 (2011).
[1] Carnegie Mellon University, Pittsburgh, USA
[2] FORTH, Patra, Greece
[3] University of Crete, Greece
[4] FMI, Helsinki, Finland

A. Hintennach, P. Novák
A novel combinative Raman and SEM mapping method for the detection of exfoliation of graphite in electrodes at very positive potentials
doi:10.1002/jrs.2930, J. Raman Spectrosc. **42**, 1754-1760 (2011).

C.R. Hoyle, V. Pinti[1], A. Welti[1], B. Zobrist[1], C. Marcolli[1], B. Luo[1], A. Hoskuldsson[2], H.B. Mattsson[1], O. Stetzer[1], T. Thorsteinsson[2], G. Larsen[2], T. Peter[1]
Ice nucleation properties of volcanic ash from Eyjafjallajokull
doi:10.5194/acp-11-9911-2011, Atmos. Chem. Phys. **11**, 9911-9926 (2011).
[1] ETH Zürich
[2] University of Iceland, Reykjavik, Iceland

W. Hubschmid, R. Bombach
Electrostrictive laser-induced gratings for time-resolved observation of translational-rotational energy transfer in H_2
doi:10.1007/s00340-010-4341-y, Appl. Phys. B **103**, 933-939 (2011).

C.H. Jeong[1], M.L. McGuire[1], K.J. Godri[1], J.G. Slowik, P.J.G. Rehbein[1], G.J. Evans[1]
Quantification of aerosol chemical composition using continuous single particle measurements
Atmos. Chem. Phys. **11**, 7027-7044 (2011).
[1] University of Toronto, Canada

Z. Jurányi, M. Gysel, E. Weingartner, N. Bukowiecki, L. Kammermann, U. Baltensperger
A 17 month climatology of the cloud condensation nuclei number concentration at the high alpine site Jungfraujoch
doi:10.1029/2010JD015199, J. Geophys. Res. **116**, D10204 (2011).

S. Karagiannidis, J. Mantzaras, K. Boulouchos[1]
Stability of hetero-/homogeneous combustion in propane and methane fueled catalytic microreactors: Channel confinement and molecular transport effects
doi:10.1016/j.proci.2010.05.107, Proc. Combust. Inst. **33**, 3241-3249 (2011).
[1] ETH Zürich

S.D. Kaspari[1], M. Schwikowsk, M. Gysel, M.G. Flanner[1], S. Kang[1], S. Hou[1], P.A. Mayewski[1]
Recent increase in black carbon concentrations from a Mt. Everest ice core spanning 1860-2000 AD
doi:10.1029/2010GL046096, Geophys. Res. Lett. **38**, L04703 (2011).
[1] external member of the Mt. Everest ice core team

J. Kirkby[1], J. Curtius[1], J. Almeida[1], E. Dunne[1], J. Duplissy[1], S. Ehrhart[1], A. Franchin[1], S. Gagne[1], L. Ickes[1], A. Kurten[1], A. Kupc[1], A. Metzger[1], F. Riccobono, L. Rondo[1], S. Schobesberger[1], G. Tsagkogeorgas[1], D. Wimmer[1], A. Amorim[1], F. Bianchi, M. Breitenlechner[1], A. David[1], J. Dommen, A. Downard[1], M. Ehn[1], R.C. Flagan[1], S. Haider[1], A. Hansel[1], D. Hauser[1], W. Jud[1], H. Junninen[1], F. Kreissl[1], A. Kvashin[1], A. Laaksonen[1], K. Lehtipalo[1], J. Lima[1], E.R. Lovejoy[1], V. Makhmutov[1], S. Mathot[1], J. Mikkila[1], P. Minginette[1], S. Mogo[1], T. Nieminen[1], A. Onnela[1], P. Pereira[1], T. Petaja[1], R. Schnitzhofer[1], J.H. Seinfeld[1], M. Sipila[1], Y. Stozhkov[1], F. Stratmann[1], A. Tome[1], J. Vanhanen[1], Y. Viisanen[1], A. Vrtala[1], P.E. Wagner[1], H. Walther, E. Weingartner, H. Wex[1], P.M. Winkler[1], K.S. Carslaw[1], D.R. Worsnop[1], U. Baltensperger, M. Kulmala[1]
Role of sulphuric acid, ammonia and galactic cosmic rays in atmospheric aerosol nucleation
Nature **476**, 7361, 429-433 (2011).
[1] external member of the CLOUD consortium

E. Kleymenov, J.A. van Bokhoven, C. David, P. Glatzel[1], M. Janousch, R. Alonso-Mori[2], M. Studer, M. Willimann, A. Bergamaschi, B. Henrich, M. Nachtegaal
Five-element johann-type x-ray emission spectrometer with a single-photon-counting pixel detector
Rev. Sci. Instrum. **82,** 065107 (2011).
[1] ESRF, Grenoble, France
[2] SLAC, Menlo Park, USA

G. Knopp, P.P.P. Radi, T. Gerber
Dispersed fs-FWM for Iinvestigations of low frequency vibrations of transient species in combustion
Chimia **65**, 339-341 (2011).

G. Knopp, P.P.P. Radi, Y. Sych, T. Gerber
Dissection of dispersed off-resonant femtosecond degenerate four-wave mixing of O_2
J. Raman Spectrosc. **42**, 1848-1853 (2011).

C. Knote[1], D. Brunner[1], H. Vogel[1], J. Allan[1], A. Asmi[1], M. Äijälä[1], S. Carbone[1], H.D. van der Gon[1], J.L. Jimenez[1], A. Kiendler-Scharr[1], C. Mohr, L. Poulain[1], A.S.H. Prévôt, E. Swietlicki[1], B. Vogel[1]
Towards an online-coupled chemistry-climate model: Evaluation of trace gases and aerosols in COSMO-ART
doi:10.5194/gmd-4-1077-2011, Geosci. Model Dev. **4**, 1077-1102 (2011).
[1] external member EMEP modeling team

J. Kopyscinski, T.J. Schildhauer, S.M.A. Biollaz
Methanation in a fluidized bed reactor with high initial CO partial pressure: Part I - Experimental investigation of hydrodynamics, mass transfer effects, and carbon deposition
Chem. Eng. Sci. **66**, 924-934 (2011).

J. Kopyscinski, T.J. Schildhauer, S.M.A. Biollaz
Methanation in a fluidized bed reactor with high initial CO partial pressure: Part II - Modeling and sensitivity study
Chem. Eng. Sci. **66**, 1612-1621 (2011).

J. Kopyscinski, T.J. Schildhauer, S.M.A. Biollaz
Fluidized-bed methanation: interaction between kinetics and mass transfer
Ind. Eng. Chem. Res. **50**, 2781 (2011).

T. Kowalski, J. Judex, C. Ludwig, T.J. Schildhauer,
Transmission of alkali aerosols through sampling systems
Chem. Eng. Technol. **34**, 42-48 (2011).

D. Koziej[1], M.D. Rossell[1], B. Ludi[1], A. Hintennach, P. Novák, J.-D. Grunwaldt[2], M. Niederberger[1]
Interplay between size and crystal structure of molybdenum dioxide nanoparticles – synthesis, growth mechanism, and electrochemical performance
doi:10.1002/smll.201001606, Small **7**, 377-387 (2011).
[1] ETH Zürich
[2] Karlsruhe Institute of Technology, Karlsruhe, Germany

P. Kreider[1], H. Funke[1], K. Cuche[2], M. Schmidt[2], A. Steinfeld, A.W. Weimer[1]
Manganese oxide based thermochemical hydrogen production cycle
Int. J. Hydrogen Energy **36**, 7028-7037 (2011).
[1] University of Colorado, Boulder, USA
[2] ETH Zürich

M. Krüsi[1], M.E. Galvez[1], M. Halmann[2], A. Steinfeld
Solar aluminum production by vacuum carbothermal reduction of alumina – Thermodynamic and experimental analyses
Metall. Mater. Trans. B **42B**, 254-260 (2011).
[1] ETH Zürich
[2] The Weizmann Institute of Science, Rehovot, Israel

M. Kulmala[1], A. Asmi[1], H.K. Lappalainen[1], U. Baltensperger, J.-L. Brenguier[1], M.C. Facchini[1], H.-C. Hansson[1], Ø. Hov[1], C.D. O'Dowd[1], U. Pöschl[1], A. Wiedensohler[1], R. Boers[1], O. Boucher[1], G. de Leeuw[1], H.A.C. Denier[1] van der Gon[1], J. Feichter[1], R. Krejci[1], P. Laj[1], H. Lihavainen[1], U. Lohmann[1], G. McFiggans[1], T. Mentel[1], C. Pilinis[1], I. Riipinen[1], M. Schulz[1], A. Stohl[1], E. Swietlicki[1], E. Vignati[1], C. Alves[1], M. Amann[1], M. Ammann[1], S. Arabas[1], P. Artaxo[1], H. Baars[1], D.C.S. Beddows[1], R. Bergström[1], J.P. Beukes[1], M. Bilde[1], J.F. Burkhart[1], F. Canonaco, S.L. Clegg[1], H. Coe[1], S. Crumeyrolle[1], B. D'Anna[1], S. Decesari[1], S. Gilardoni[1], M. Fischer[1], A.M. Fjaeraa[1], C. Fountoukis[1], C. George[1], L. Gomes[1], P. Halloran[1], T. Hamburger[1], R.M. Harrison[1], H. Herrmann[1], T. Hoffmann[1], C. Hoose[1], M. Hu[1], A. Hyvärinen[1], U. Hõrrak[1], Y. Iinuma[1], T. Iversen[1], M. Josipovic[1], M. Kanakidou[1], A. Kiendler-Scharr[1], A. Kirkevåg[1], G. Kiss[1], Z. Klimont[1], P. Kolmonen[1], M. Komppula[1], J.-E. Kristjánsson[1], L. Laakso[1], A. Laaksonen[1], L. Labonnote[1], V. A. Lanz[1], K.E.J. Lehtinen[1], L.V. Rizzo[1], R. Makkonen[1], H. E. Manninen[1], G. McMeeking[1], J. Merikanto[1], A. Minikin[1], S. Mirme[1], W.T. Morgan[1], E. Nemitz[1], D. O'Donnell[1], T.S. Panwar[1], H. Pawlowska[1], A. Petzold[1], J.J. Pienaar[1], C. Pio[1], C. Plass-Duelmer[1], A.S.H. Prévôt, S. Pryor[1], C. L. Reddington[1], G. Roberts[1], D. Rosenfeld[1], J. Schwarz[1], Ø. Seland[1], K. Sellegri[1], X.J. Shen[1], M. Shiraiwa[1], H. Siebert[1], B. Sierau[1], D. Simpson[1], J.Y. Sun[1], D. Topping[1], P. Tunved[1], P. Vaattovaara[1], V. Vakkari[1], J.P. Veefkind[1], A. Visschedijk[1], H. Vuollekoski[1], R. Vuolo[1], B. Wehner[1], J. Wildt, S. Woodward, D.R. Worsnop, G.-J. van Zadelhoff, A.A. Zardini, K. Zhang[1], P.G. van Zyl[1], V.-M. Kerminen[1], K.S. Carslaw[1], S.N. Pandis[1]
General overview: European Integrated project on Aerosol Cloud Climate and Air Quality interactions (EUCAARI) – integrating aerosol research from nano to global scales
Atmos. Chem. Phys., **11**, 13061-13143 (2011).
[1] International EUCAARI Team

S. Lahlil[1], M. Cotte[1,2], I. Biron[1], J. Szlachetko[3], M. Menguy[4], J. Susini[2]
Synthesizing lead antimonate in ancient and modern opaque glass
J. Anal. At. Spectrom. **26**, 1040 (2011).
[1] Centre de Recherche et de Restauration des Musees de France, Paris, France
[2] ESRF, Grenoble, France
[3] Institute of Physics, University of Kielce, Poland
[4] IMPMC, Paris, France

W.R. Leaitch[1], A.M. Macdonald[1], P.C. Brickell[1], J. Liggio[1], S.J. Sjostedt[1], A. Vlasenko[1], J.W. Bottenheim[1], L. Huang[1], S.-M. Li[1], P.S.K. Liu[1], D. Toom-Sauntry[1], K.A. Hayden[1], S. Sharma[1], N.C. Shantz[1], H.A. Wiebe[1], W. Zhang[1], J.P.D. Abbatt[1], J.G. Slowik, R.Y.W. Chang[1], L.M. Russell[1], R.E. Schwartz[1], S. Takahama[1], J.T. Jayne[1], N.L. Ng[1]
Temperature response of the submicron organic aerosol from temperate forests
Atmos. Environ. **45**, 6696-6704 (2011).
[1] External member of the Biogenic Organic Aerosol collaboration

Y. Liu, J. Long[1], C. Qin[1], A.Y. Ghazal[1], Y. Wang[1], B. Zhang[1]
Ultrafast photodissociation dynamics of n-butyl iodide in the A-band
J. At. Mol. Sci. **83**, (2011).
[1] Chinese Acad Sci, Wuhan Inst Phys & Math, Wuhan, Peoples R China

Y. Liu, C.-C. Qin[1], S. Zhang[1], Y.-M. Wang[1], B. Zhang[1]
Ultrafast dynamics of the first excited state of chlorobenzene
Acta Physico-Chimica Sinica **27**, 965-970 (2011).
[1] Chinese Acad Sci, Wuhan Inst Phys & Math, Wuhan, Peoples R China

N. Linse, G.G. Scherer, A. Wokaun, L. Gubler
The effect of platinum on carbon corrosion behavior in polymer electrolyte fuel cells
doi: 10.1016/j.electacta.2011.06.093, Electrochim. Acta **56**, 7541-7549 (2011).

G. Lonati[1], M. Crippa, V. Gianelle[2], R. Van Dingenen[3]
Daily patterns of the multi-modal structure of the particle number size distribution in Milan, Italy
doi:10.1016/j.atmosenv.2011.02.003, Atmos. Environ. **45**, 2434-2442 (2011).
[1] Politecnico di Milano, Italy
[2] ARPA Lombardia, Milano, Italy
[3] JRC Ispra, Italy

J. Long[1], Y. Liu, C. Qin[1], S. Zhang[1], B. Zhang[1]
Real-time visualization of the dynamic evolution of CS_2 4d and 6s Rydberg wave packet components
Opt. Express **19**, 4542-4552 (2011).
[1] Chinese Acad Sci, Wuhan Inst Phys & Math, Wuhan, Peoples R China

J. Long[1], C. Qin[1], Y. Liu, S. Zhang[1], B. Zhang[1]
Direct imaging of the Fermi resonance interaction in para-difluorobenzene: A special insight into energy redistribution in the S1 low-energy regime
Phys. Rev. A **84** (2011).
[1] Chinese Acad Sci, Wuhan Inst Phys & Math, Wuhan, Peoples R China

P.G. Loutzenhiser[1], A. Stamatiou[1], W. Villasmil, A. Meier, A. Steinfeld
Concentrated solar energy for thermochemically producing liquid fuels from CO_2 and H_2O
J. Metals **63**, 32-34 (2011).
[1] ETH Zürich

P.G. Loutzenhiser[1], F. Barthel[1], A. Stamatiou[1], A. Steinfeld
CO_2 reduction with Zn particles in a packed-bed reactor
AIChE J. **57**, 2529-2534 (2011).
[1] ETH Zürich

P.G. Loutzenhiser[1], A. Steinfeld
Solar syngas production from CO_2 and H_2O in a two-step thermochemical cycle via Zn/ZnO redox reactions: Thermodynamic cycle analysis
Int. J. Hydrogen Energy **36**, 12141-12147 (2011).
[1] ETH Zürich

G. Maag[1], C. Falter[1], A. Steinfeld
Temperature of a quartz/sapphire window in a solar cavity-receiver
ASME J. Sol. Energy Eng. **133**, 014501 1-4 (2011).
[1] ETH Zürich

W. Märkle, C.-Y. Lu, P. Novák
Morphology of the solid electrolyte interphase on graphite in dependency on the formation current
doi: 10.1149/2.077112jes, J. Electrochem. Soc. **158**, A1478-A1482 (2011).

M.Z. Markovic[1], K.L. Hayden[2], J.G. Murphy[1], P.A. Makar[2], R.A. Ellis[1], R.Y.W. Chang[1], J.G. Slowik, C. Mihele[2], J. Brook[2]
The effect of meteorological and chemical factors on the agreement between observations and predictions of fine aerosol composition in southwestern Ontario during BAQS-Met
doi:10.5194/acp-11-3195-2011, Atmos. Chem. Phys. **11**, 3195-3210 (2011).
[1] University of Toronto, Canada
[2] Environment Canada, Toronto, Canada

I. Marozau, A. Shkabko[1], M. Döbeli[2], T. Lippert, M. Mallepell[2], C.W. Schneider, A. Weidenkaff[1], A. Wokaun
Pulsed laser deposition and characterisation of perovkite-type $LaTiO_{3-x}N_x$ thin films
Acta Mat. **59**, 7145-7154 (2011).
[1] Empa Dübendorf
[2] ETH Zürich

M.L. McGuire[1], C.H. Jeong[1], J.G. Slowik, R.Y.W. Chang[1], J.C. Corbin[1], G. Lu[2], C. Mihele[2], P.J.G. Rehbein[1], D.M.L. Sills[1], J.P.D. Abbatt[1], J.R. Brook[2], G.J. Evans[1]
Elucidating determinants of aerosol composition through particle-type-based receptor modeling
Atmos. Chem. Phys. **11**, 8133-8155 (2011).
[1] University of Toronto, Canada
[2] Environment Canada, Toronto, Canada

M. Mehring, M. Elsener, O. Kröcher
Mikroanalytik und Reaktivität von Dieselpartikeln
Motorentechnische Zeitschrift (MTZ) **72**, 690-696 (2011).

M. Mehring, M. Elsener, O. Kröcher
Micro-analytics and reactivity of diesel particulate matter
Motorentechnische Zeitschrift (MTZ) worldwide edition **09**, 52-58 (2011).

M. Mehring, M. Elsener, O. Kröcher
Development of a TG-FTIR system for investigations with condensable and corrosive gases
doi:10.1007/s10973-010-1178-x, J. Therm. Anal. Calorim. **105**, 545-552 (2011).

M.C. Minguillón, N. Perron, X. Querol[1], S. Szidat[1], S.M. Fahrni[1], A. Alastuey[1], J.L. Jimenez[1], C. Mohr[1], A.M. Ortega[1], D.A. Day[1], V.A. Lanz[1], L. Wacker[1], C. Reche[1], M. Cusack[1], F. Amato[1], G. Kiss[1], A. Hoffer[1], S. Decesari[1], F. Moretti[1], R. Hillamo[1], K. Teinilä[1], R. Seco[1], J. Peñuelas[1], A. Metzger[1], S. Schallhart[1], M. Müller[1], A. Hansel[1], J.F. Burkhart[1], U. Baltensperger, A.S.H. Prévôt
Fossil versus contemporary sources of fine elemental and organic carbonaceous particulate matter during the DAURE campaign in Northeast Spain
doi:10.5194/acp-11-12067-2011, Atmos. Chem. Phys. **11**, 12067-12084 (2011).
[1] External member of DAURE Barcelona team

C. Mohr, R. Richter, P.F. DeCarlo, A.S.H. Prévôt, U. Baltensperger
Spatial variation of chemical composition and sources of submicron aerosol in Zurich during wintertime using mobile aerosol mass spectrometer data
Atmos. Chem. Phys. **11**, 7465-7482 (2011).

T. Moreno[1], X. Querol[1], A. Alastuey[1], C. Reche[1], M. Cusack[1], F. Amato[1], M. Pandolfi[1], J. Pey[1], A. Richard, A.S.H. Prévôt, M. Furger, W. Gibbons[2]
Variations in time and space of trace metal aerosol concentrations in urban areas and their surroundings
Atmos. Chem. Phys. **11**, 9415-9430 (2011).
[1] IDAEA-CSIC, Barcelona, Spain
[2] AP 23075, Barcelona, Spain

T. Müller[1], J.S. Henzing[1], G. de Leeuw[1], A. Wiedensohler[1], A. Alastuey[1], H. Angelov[1], M. Bizjak[1], M.C. Coen[1], J.E. Engström[1], C. Gruening[1], R. Hillamo[1], A. Hoffer[1], K. Imre[1], P. Ivanow[1], G. Jennings[1], J.Y. Sun[1], N. Kalivitis[1], H. Karlsson[1], M. Komppula[1], P. Laj[1], S.-M. Li[1], C. Lunder[1], A. Marinoni[1], S.M. de Santos[1], M. Moerman[1], A. Nowak[1], J.A. Ogren[1], A. Petzold[1], J.M. Pichon[1], S. Rodriquez[1], S. Sharma[1], P.J. Sheridan[1], K. Teinilä[1], T. Tuch[1], M. Viana[1], A. Virkkula[1], E. Weingartner, R. Wilhelm[1], Y.Q. Wang[1]
Characterization and intercomparison of aerosol absorption photometers: Result of two intercomparison workshops
doi:10.5194/amt-4-245-2011, Atmos. Meas. Tech. **4**, 245-268 (2011).
[1] external member of the EUSAAR project

T. Müller[1], M. Laborde, G. Kassell[2], A. Wiedensohler[1]
Design and performance of a three-wavelength LED-based total scatter and backscatter integrating nephelometer
doi:10.5194/amt-4-1291-2011, Atmos. Meas. Tech. **4**, 1291-1303 (2011).
[1] Leibniz Institute for Tropospheric Research, Leipzig, Germany
[2] Ecotech Pty Ltd, Knoxfield, Australia

F.P. Nagel, S. Ghosh, C. Pitta, T.J. Schildhauer, S.M.A. Biollaz
Biomass integrated gasification fuel cell systems - Concept development and experimental results
Biomass Bioenergy **35**, 354-362 (2011).

P. Nesvadba[1], L. Bugnon Folger[1], P. Maire, P. Novák
Synthesis of a polymeric 2,5-di-t-butyl-1,4-dialkoxybenzene and its evaluation as a novel cathode material
doi:10.1016/j.synthmet.2010.11.030, Synthetic Metals **161**, 259-262 (2011).
[1] BASF SE, Basel

B. Noziere[1], N.J.D. Gonzalez[1], A.K. Borg-Karlson[1], Y.X. Pei[1], J.P. Redeby[1], R. Krejci[1], J. Dommen, A.S.H. Prévôt, T. Anthonsen[1]
Atmospheric chemistry in stereo: A new look at secondary organic aerosols from isoprene
doi:10.1029/2011gl047323, Geophys. Res. Lett. **38**, L11807 (2011).
[1] Stereochemistry Group

C. Offermann[1], J.P. Ferrio[1], J. Holst[1], R. Grote[1], R. Siegwolf, Z. Kayler[1], A. Gessler[1]
The long way down - are carbon and oxygen isotope signals in the tree ring uncoupled from canopy physiological processes?
doi:10.1093/treephys/tpr093, Tree Physiology **31**, 1088-1102 (2011).
[1] Plant Isotope Water consortium

A. Palla-Papavlu[1], I. Paraico[2], J. Shaw Stewart, V. Dinca[1], T. Savopol[2], E. Kovacs[2], T. Lippert, A. Wokaun, M. Dinescu[1]
Liposome Micropatterning Based on Laser Induced Forward Transfer
Appl. Phys. A **102**, 651-659 (2011).
[1] NILPRP, National Institute for Lasers, Plasma and Radiation Physics, Bucharest, Romania
[2] Carol Davila University of Medicine and Pharmacy, Bucharest, Romania

A. Palla-Papavlu[1], V. Dinca[1], T. Lippert, M. Dinescu[1]
Laser Induced Forward Transfer for Materials Patterning
Rom. Rep. Phys. **63**, 1285-1301 (2011).
[1] NILPRP, National Institute for Lasers, Plasma and Radiation Physics, Bucharest, Romania

S.A. Pauli, S.J. Leake, B. Delly, M. Björck, C.W. Schneider, C.M. Schlepütz, D. Martoccia, S. Paetel[1], J. Mannhart[1], P.R. Willmott
Evolution of the Interfacial Structure of $LaAlO_3$ on $SrTiO_3$
Phys. Rev. Lett. **106**, 036101 (2011).
[1] University of Augsburg, Germany

D. Peitz, A. Bernhard, M. Elsener, O. Kröcher
Laboratory test reactor for the investigation of liquid reducing agents in the selective catalytic reduction of NO_x
doi:10.1063/1.3617463, Rev. Sci. Instrum. **82**, 084101 (2011).

Z. Peng[1], S.A. Freunberger[1], L.J. Hardwick[1], Y. Chen[1], V. Giordani[1], F. Bardé[2], P. Novák, D. Graham[1], J.-M. Tarascon[3], P.G. Bruce[1]
Oxygen reactions in a non-aqueous Li^+ electrolyte
doi:10.1002/anie.201100879, Angew. Chem. Int. Ed. **50**, 6351-6355 (2011).
[1] University of St. Andrews, St. Andrews, Scotland
[2] Toyota Motor Europe, Zaventem, Belgium
[3] Université de Picardie Jules Verne, Amiens, France

N. Piatkowski[1], C. Wieckert, A.W. Weimer[2], A. Steinfeld
Solar-driven gasification of carbonaceous feedstock – A review
Energy Environ. Sci. **4**, 73-82 (2011).
[1] ETH Zürich
[2] University of Colorado, Boulder, USA

N. Piatkowski[1], A. Steinfeld
Solar gasification of carbonaceous waste feedstocks in a packed-bed reactor – Dynamic modeling and experimental validation
AIChE J. **57**, 3522-3533 (2011).
[1] ETH Zürich

R. Pitz-Paal[1], N. Botero[1], A. Steinfeld
Heliostat field layout optimization for high-temperature solar thermochemical processing
Sol. Energy **85**, 334-343 (2011).
[1] DLR Köln, Germany

N.I. Prasianakis, S. Ansumali[1]
Microflow simulations via the lattice Boltzmann method
doi:10.4208/cicp.301009.271010s, Comput. Phys. Commun. **9**, 1128-1136 (2011).
[1] J. Nehru Centre for Scientific Research, Bangalore, India

C. Qin[1], Y. Liu, S. Zhang[1], Y. Wang[1], Y. Tang[1], B. Zhang[1]
Direct observation of field-free alignment of asymmetric molecules in excited states
Phys. Rev. A **83,** 33423 (2011).
[1] Chinese Acad Sci, Wuhan Inst Phys & Math, Wuhan, Peoples R China

L. Rapp[1], C. Cibert[1], S. Nénon[2], A.P. Alloncle[1], M. Nagel[3], T. Lippert, C. Videlot-Ackermann[2], F. Fages[2], P. Delaporte[1]
Improvement in semiconductor laser printing using sacrificial protecting layer for Organic Thin-film Transistors fabrication
Appl. Surf. Sci. **257**, 5245-5249 (2011).
[1] CNRS – Université de la Méditerranée Marseille, France
[2] CINaM – CNRS – Université Aix Marseille, Marseille, France
[3] Empa Dübendorf

C. Reche[1], X. Querol[1], A. Alastuey[1], M. Viana[1], J. Pey[1], T. Moreno[1], S. Rodriguez[1], Y. Gonzalez[1], R. Fernandez-Camacho[1], A.M.S. de la Campa[1], J. de la Rosa[1], M. Dall'Osto[1], A.S.H. Prévôt, C. Hueglin[1], R.M. Harrison[1], P. Quincey[1]
New considerations for PM, black carbon and particle number concentration for air quality monitoring across different European cities
doi:10.5194/acp-11-6207-2011, Atmos. Chem. Phys. **11**, 6207-6227 (2011).
[1] External member European black carbon / particle number team

C. Reche[1], M. Viana[1], T. Moreno[1], X. Querol[1], A. Alastuey[1], J. Pey[1], M. Pandolfi[1], A. Prévôt, C. Mohr, A. Richard, B. Artinano[1], F.J. Gomez-Moreno[1], N. Cots[1]
Peculiarities in atmospheric particle number and size-resolved speciation in an urban area in the western Mediterranean: Results from the DAURE campaign
doi:10.1016/j.atmosenv.2011.06.059, Atmos. Environ. **45**, 5282-5293 (2011).
[1] External DAURE project team

C.L. Reddington[1], K.S. Carslaw[1], D.V. Spracklen[1], M.G. Frontoso[1], L. Collins[1], J. Merikanto[1], A. Minikin[1], T. Hamburger[1], H. Coe[1], M. Kulmala[1], P. Aalto[1], H. Flentje[1], C. Plass-Dülmer[1], W. Birmili[1], A. Wiedensohler[1], B. Wehner[1], T. Tuch[1], A. Sonntag[1], C.D. O'Dowd[1], S.G. Jennings[1], R. Dupuy[1], U. Baltensperger, E. Weingartner, H.C. Hansson[1], P. Tunved[1], P. Laj[1], K. Sellegri[1], J. Boulon[1], J.P. Putaud[1], C. Gruening[1], E. Swietlicki[1], P. Roldin[1], J.S. Henzing[1], M. Moerman[1], N. Mihalopoulos[1], G. Kouvarakis[1], V. Zdímal[1], N. Zíková[1], A. Marinoni[1], P. Bonasoni[1], R. Duchi[1]
Primary versus secondary contributions to particle number concentrations in the European boundary layer
Atmos. Chem. Phys. **11**, 12007-12036 (2011).
[1] External member of the EUCAARI consortium

A. Richard, M.F.D. Gianini[1], C. Mohr, M. Furger, N. Bukowiecki, M.C. Minguillon[1], P. Lienemann[1], U. Flechsig, K. Appel[1], P.F. DeCarlo[1], M.F. Heringa, R. Chirico[1], U. Baltensperger, A.S.H. Prévôt
Source apportionment of size and time resolved trace elements and organic aerosols from an urban courtyard site in Switzerland
Atmos. Chem. Phys. **11**, 8945-8963 (2011).
[1] External member of the RDI-SR-XRF Consortium

I. Riipinen[1], J.R. Pierce[1], T. Yli-Juuti[2], T. Nieminen[2], S. Hakkinen[2], M. Ehn[2], H. Junninen[2], K. Lehtipalo[2], T. Petaja[2], J. Slowik, R. Chang[3], N.C. Shantz[3], J. Abbatt[3], W.R. Leaitch[3], V.M. Kerminen[2], D.R. Worsnop[2], S.N. Pandis[1], N.M. Donahue[1], M. Kulmala[2]
Organic condensation: A vital link connecting aerosol formation to cloud condensation nuclei (CCN) concentrations
doi:10.5194/acp-11-3865-2011, Atmos. Chem. Phys. **11**, 3865-3878 (2011).
[1] CAPS collaboration
[2] Hyytiala collaboration
[3] Egbert 2007 team

K. Rodrigo[1], S. Heiroth, N. Pryds[1], L. Theil Kuhn[1], V. Esposito[1], S. Linderoth[1], J. Schou[1], T. Lippert
The effects of thermal annealing on the structure and the electrical transport properties of ultrathin gadolinia-doped ceria films grown by pulsed laser deposition
Appl. Phys. A **104**, 845-850 (2011).
[1] Technical University of Denmark, Roskilde, Denmark

K. Rodrigo[1], H.-J. Wang[1], S. Heiroth, N. Pryds[1], L. Theil Kuhn[1], V. Esposito[1], S. Linderoth[1], J. Schou[1], T. Lippert
Nanostructured PLD-prepared gadolinia doped ceria: chemical and structural characterization by transmission electron microscopy techniques
Appl. Surf. Sci. **257**, 5341-5346 (2011).
[1] Technical University of Denmark, Roskilde, Denmark

M. Roesle[1], V. Coskun[1], A. Steinfeld
Numerical analysis of heat loss from a parabolic trough absorber tube with active vacuum system
ASME J. Sol. Energy Eng. **133**, 031015 1-5 (2011).
[1] ETH Zürich

E. Rohart[1], O. Kröcher, M. Casapu, R. Marques[1], D. Harris[2], C. Jones[2]
Acidic zirconia mixed oxides for NH_3-SCR catalysts for PC and HD applications
doi:10.4271/2011-01-1327, SAE Technical Paper Series **2011-01-1327** (2011).
[1] Rhodia, Aubervilllier Cedex, France
[2] MEL Chemicals, Manchester, UK

A.A. Rouff, S. Rabe, F. Vogel
Phase transitions in hydrothermal K_2HPO_4 solutions
J. Supercrit. Fluids **57**, 207-212 (2011).

J. Sà[1], C. Kartusch[1], M. Makosch[1], C. Paun[1], J.A. van Bokhoven, E. Kleymenov, J. Szlachetko, M. Nachtegaal, H.G. Manyar[2], C. Hardacre[2]
Evaluation of Pt and Re oxidation state in a pressurized reactor: Difference in reduction between gas and liquid phase
Chem. Commun. **47**, 6590-6592 (2011).
[1] ETH Zürich
[2] Queens University, Belfast, UK

J. Sà[1], A. Goguet[1], S.F.R. Taylor[1], R. Tiruvalam[2], C.J. Kiely[2], M. Nachtegaal, G.J. Hutchings[3], C. Hardacre[1]
Influence of Methyl Halide treatment on gold nanoparticles supported on activated carbon
doi: 10.1002/ange.201102066, Angewandte Chemie **123**, 9074-9078 (2011).
[1] ETH Zürich
[2] Queens University, Belfast, UK
[3] Lehigh University, Bethlehem PA, USA
[4] Cardiff University, Cardiff, UK

T. Sasaki, V. Godbole, Y. Takeuchi[1], Y. Ukyo[1], P. Novák
Morphological and structural changes of Mg-substituted $Li(Ni,Co,Al)O_2$ during overcharge reaction
doi:10.1149/2.025111jes, J. Electrochem. Soc. **158**, A1214-A1219 (2011).
[1] Toyota Central R&D Labs., Nagakute, Japan

J.-J. Sauvain[1], Ari Setyan[1], P. Wild[1], P. Tacchini[2], G. Lagger[2], F. Storti[1], S. Deslarzes[1], M. Guillemin[1], M.J. Rossi, M. Riediker[1]
Biomarkers of oxidative stress and its association with the urinary reducing capacity in bus maintenance workers
doi:10.1186/1745-6673-6-18, Journal of Occupational Medicine and Toxicology **6**,18 (2011).
[1] University of Lausanne
[2] EDEL Therapeutics S.A., Lausanne
[3] University of California, Davis, USA

A. Savouchkina, A. Foelske-Schmitz, G.G. Scherer, A. Wokaun, R. Kötz
Study of platinum deposition on untreated and thermally modified glassy carbon
doi: 10.1149/1.3589915, J. Electrochem. Soc. **158**, D420-D425 (2011).

A. Savouchkina, A. Foelske-Schmitz, V.A. Guzenko, D. Weingarth, G.G. Scherer, A. Wokaun, R. Kötz
In situ STM study of Pt-nanodot arrays on HOPG prepared by electron-beam lithography
doi: 10.1016/j.elecom.2011.02.027, Electrochem. Commun. **13**, 484-487 (2011).

S. Schmid[1], R. Burkard[1], K.F.A. Frumau[2], C. Tobon[2], L.A. Bruijnzeel[2], R. Siegwolf, W. Eugster[3]
Using eddy covariance and stable isotope mass balance techniques to estimate fog water contributions to a Costa Rican cloud forest during the dry season
doi:10.1002/hyp.7739, Hydrol. Processes **25**, 429-437 (2011).
[1] University of Bern
[2] VU University, Amsterdam, The Netherlands
[3] ETH Zürich

H. Schneider, P. Maire, P. Novák
Electrochemical and spectroscopic characterization of lithium titanate spinel $Li_4Ti_5O_{12}$
doi:10.1016/j.electacta.2011.08.008, Electrochim. Acta **56**, 9324-9328 (2011).

I.A. Schneider, S. von Dahlen
Start-stop phenomena in channel and land areas of a polymer electrolyte fuel cell
doi: 10.1149/1.3518520, Electrochem. Solid State Lett. **14**, B30-B33 (2011).

I.A. Schneider, M.H. Bayer, S. von Dahlen
Locally resolved electrochemical impedance spectroscopy in channel and land areas of a differential polymer electrolyte fuel cell
doi: 10.1149/1.3536498, J. Electrochem. Soc. **158**, B343-B348 (2011).

H. Schulenburg, B. Schwanitz, J. Krbanjevic[1], N. Linse, G.G. Scherer, A. Wokaun
Quantification of platinum deposition in polymer electrolyte fuel cell membranes
doi: Electrochem. Commun. **13**, 921–923 (2011).
[1] EPF Lausanne

H. Schulenburg, B. Schwanitz, N. Linse, G.G. Scherer, A. Wokaun, J. Krbanjevic[1], R. Grothausmann[2], I. Manke[2]
3D imaging of catalyst support corrosion in polymer electrolyte fuel cells
doi.org/10.1021/jp203016u, J. Phys. Chem. C **115**, 14236–14243 (2011).
[1] EPF Lausanne
[2] Helmholtz Zentrum für Materialien und Energie, Berlin, Germany

J.A. Schuler[1], C. Gehrig[1], Z. Wuillemin[1], A.J. Schuler, J. Wochele, C. Ludwig, A. Hessler-Wyser[1], J. Vanherle[1]
Air side contamination in solid oxide fuel cell stack testing
J. Power Sources **196**, 7225-7231 (2011).
[1] EPF Lausanne

J.A. Schuler[1], Z. Wuillemin[1], A. Hessler-Wyser[1], C. Ludwig, J. Vanherle[1]
Multi-scale assessment of Cr contamination levels in SOFC cathode environment
doi:10.1149/1.3570190 ECST **35**, 2001-2008 (2011).
[1] EPF Lausanne

B. Schwanitz, H. Schulenburg, M. Horisberger, A. Wokaun, G.G. Scherer
Stability of ultra low Pt anodes for polymer electrolyte fuel cells - prepared by magnetron sputtering
doi: 10.1007/s12678-010-0032-z, Electrocatal. **2**, 35-40 (2011).

L. Sharifian[1], Y.M. Wright[1], K. Boulouchos[1], M. Elsener, O. Kröcher
Transient simulation of NO_x reduction over a Fe-Zeolite catalyst in an NH_3-SCR system and study of the performance under different operating conditions
doi: 10.4271/2011-01-1084, SAE Technical Paper Series **2011-01-2084** / JSAE 20119195 (2011).
[1] ETH Zürich

J. Shaw Stewart, T. Lippert, M. Nagel[1], F. Nüesch[1], A. Wokaun
Laser-induced forward transfer of polymer light-emitting diode pixels with increased charge injection
Appl. Mater. Interfaces **3**, 309-316 (2011).
[1] Empa Dübendorf

J. Shaw Stewart[1], B. Chu[1], Th. Lippert, Y. Maniglio[1], M. Nagel[1], F. Nüesch[1], A. Wokaun
Improved laser-induced forward transfer of organic semiconductor thin films by reducing the environmental pressure and controlling the substrate-substrate gap width
Appl. Phys. A **105**, 713-722 (2011).
[1] Empa, Dübendorf

F. Simmen, A. Foelske-Schmitz, P. Verma, M. Horisberger, Th. Lippert, P. Novák, C.W. Schneider, A. Wokaun
Surface layer formation on $Li_{1+x}Mn_2O_{4-\delta}$ thin film electrodes during electrochemical cycling
doi:10.1016/j.electacta.2011.07.046, Electrochim. Acta **56**, 8539- 8544 (2011).

F. Simmen, M. Horisberger, B. Seyfang, T. Lippert, P. Novák, M. Döbeli[1], M. Mallepell, C.W. Schneider, A. Wokaun
Glassy carbon – a promising substrate material for pulsed laser deposition of thin $Li_{1+x}Mn_2O_{4-\delta}$ electrodes
doi:10.1016/j.apsusc.2010.11.176, Appl. Surf. Sci. **257**, 5347-5353 (2011).
[1] ETH Zürich

S.J. Sjostedt[1], J.G. Slowik, J.R. Brook[1], R.Y.W. Chang[2], C. Mihele[1], C.A. Stroud[1], A. Vlasenko[1], J.P.D. Abbatt[2]
Diurnally resolved particulate and VOC measurements at a rural site: Indication of significant biogenic secondary organic aerosol formation
doi:10.5194/acp-11-5745-2011, Atmos. Chem. Phys. **11**, 5745-5760 (2011).
[1] Environment Canada, Toronto, Canada
[2] University of Toronto, Canada

R.B. Skeie[1], T.K. Berntsen[1], G. Myhre[1], K. Tanaka[1], M.M. Kvalevåg[1], C.R. Hoyle
Anthropogenic radiative forcing time series from pre-industrial times until 2010
Atmos. Chem. Phys. **11**, 11827-11857 (2011).
[1] CICERO, Norway
[2] University of Oslo, Norway
[3] ETH Zürich

J. Skrzypski[1], I. Bezverkhyy[1], O. Safonova, J.P. Bellat[1]
2.8NiO-$H_{1.8}Ni_{0.6}(OH)MoO_4$-Novel nanocomposite material for the reactive adsorption of sulfur-containing molecules at moderate temperature
Appl. Catal. B **106,** 460-468 (2011).
[1] CNRS – Université de Bourgogne, Dijon Cedex, France

J.G. Slowik, J. Brook[1], R.Y.W. Chang[2], G.J. Evans[2], K. Hayden[1], C.H. Jeong[2], S.M. Li[1], J. Liggio[1], P.S.K. Liu[1], M. McGuire[2], C. Mihele[1], S. Sjostedt[2], A. Vlasenko[2], J.P.D. Abbatt[2]
Photochemical processing of organic aerosol at nearby continental sites: Contrast between urban plumes and regional aerosol
doi:10.5194/acp-11-2991-2011, Atmos. Chem. Phys. **11**, 2991-3006 (2011).
[1] Environment Canada, Toronto, Canada
[2] University of Toronto, Canada

J.G. Slowik, D.J. Cziczo[1], J.P.D. Abbatt[2]
Analysis of cloud condensation nuclei composition and growth kinetics using a pumped counterflow virtual impactor and aerosol mass spectrometer
doi:10.5194/amt-4-1677-2011, Atmos. Meas. Tech. **4**, 1677-1688 (2011).
[1] PNNL, Richland, USA
[2] University of Toronto, Canada

X. Song[1], M.M. Barbour[2], M. Saurer, B.R. Helliker[1]
Examining the large-scale convergence of photosynthesis-weighted tree leaf temperatures through stable oxygen isotope analysis of multiple data sets
doi: 10.1111/j.1469-8137.2011.03851.x, New Phytologist **192**, 912-924 (2011).
[1] University of Pennsylvania, Philadelphia, USA
[2] University of Sydney, Australia

O.A. Sovde[1], C.R. Hoyle, G. Myhre[1], I.S.A. Isaksen[1]
The HNO_3 forming branch of the HO_2 + NO reaction: Pre-industrial-to-present trends in atmospheric species and radiative forcings
doi:10.5194/acp-11-8929-2011, Atmos. Chem. Phys. **11**, 8929-8943 (2011).
[1] CICERO, Norway
[2] University of Oslo, Norway

M. Steinbauer[1], P. Hemberger, I. Fischer[1], A. Bodi
Photoionization of C_7H_6 and C_7H_5: Observation of the fulvenallenyl radical
Chem. Phys. Chem. **12**, 1795-1797 (2011).
[1] University of Würzburg, Germany

B. Steubing[1], I. Ballmer, O. Thees, L. Gerber, F. Maréchal[2], R. Zah[1], C. Ludwig
An environmental optimization model for bioenergy plant sizes and locations for the case of wood-derived SNG in Switzerland
doi.org/10.3384/ecp11057279, World Renewable Energy Congress, Linköping University Electronic Press, Sweden **1**, 279-286 (2011).
[1] Empa Dübendorf
[2] EPF Lausanne

B. Steubing[1], R. Zah[1], C. Ludwig
Life cycle assessment of SNG from wood for heating, electricity, and transportation
Biomass Bioenergy **35**, 2950-2960 (2011).
[1] Empa Dübendorf

C.A. Stroud[1], P.A. Makar[1], M.D. Moran[1], W. Gong[1], S. Gong[1], J. Zhang[1], K. Hayden[1], C. Mihele[1], J.R. Brook[1], J.P.D. Abbatt[2], J.G. Slowik
Impact of model grid spacing on regional- and urban- scale air quality predictions of organic aerosol
doi:10.5194/acp-11-3107-2011, Atmos. Chem. Phys. **11**, 3107-3118 (2011).
[1] University of Toronto, Canada
[2] Environment Canada, Toronto, Canada

C. Suter[1], P. Tomes[2], A. Weidenkaff[2], A. Steinfeld
A solar cavity-receiver packed with an array of thermoelectric converter modules
Sol. Energy **85**, 1511-1518 (2011).
[1] ETH Zürich
[2] Empa Dübendorf

L. Tabet[1], C. Bussy[1], A. Setyan[1], A. Simon-Deckers[1], M.J. Rossi, J. Boczkowski[1], S. Lanone[1]
Coating carbon nanotubes with a polystyrene-based polymer protects against pulmonary toxicity
doi:10.1186/1743-8977-8-3, Particle and Fibre Toxicology **8** (2011).
[1] Nanotube collaboration

T. Todorova, D. Peitz, O. Kröcher, A. Wokaun, B. Delley
Guanidinium formate decomposition on the (101) TiO_2-anatase surface: combined minimum energy reaction pathway calculations and temperature-programmed decomposition experiments
doi:10.1021/jp106523b, J. Phys. Chem. C **115**, 1195-1203 (2011).

P. Tomes[1], C. Suter[2], M. Trottmann[1], A. Steinfeld, A. Weidenkaff[1]
Thermoelectric oxide modules (TOMs) tested in a solar cavity-receiver
J. Mater. Res. **26**, 1975-1982 (2011).
[1] Empa Dübendorf
[2] ETH Zürich

T. Trickl[1], N. Bärtsch-Ritter, H. Eisele[1], M. Furger, R. Mücke[1], M. Sprenger[2], A. Stohl[3]
High-ozone layers in the middle and upper troposphere above Central Europe: Potential import from the stratosphere along the subtropical jet stream
doi:10.5194/acp-11-9343-2011, Atmos. Chem. Phys. **11**, 9343-9366 (2011).
[1] Karlsruher Institut für Technologie, IMK-IFU, Garmisch-Partenkirchen, Germany
[2] ETH Zürich
[3] NILU, Kjeller, Norway

T. Tritscher, J. Dommen, P.F. DeCarlo, M. Gysel, P.B. Barmet, A.P. Praplan, E. Weingartner, A.S.H. Prévôt, I. Riipinen[1], N.M. Donahue[2], U. Baltensperger
Volatility and hygroscopicity of aging secondary organic aerosol in a smog chamber
Atmos. Chem. Phys. **11**, 11477-11496 (2011).
[1] University of Helsinki, Finland
[2] Carnegie Mellon University, Pittsburgh, PA, USA

T. Tritscher, Z. Jurányi, M. Martin[1], R. Chirico, M. Gysel, M.F. Heringa, P.F. DeCarlo, B. Sierau[1], A.S.H. Prévôt, E. Weingartner, U. Baltensperger
Changes of hygroscopicity and morphology during ageing of diesel soot
doi:10.1088/1748-9326/6/3/034026, Environ. Res. Lett. **6**, 034026, (2011).
[1] ETH Zürich

P. Verma, P. Maire, P. Novák
Concatenation of electrochemical grafting with chemical or electrochemical modification for preparing electrodes with specific surface functionality
doi:10.1016/j.electacta.2010.11.055, Electrochim. Acta **56**, 3555-3561 (2011).

O. Waser[1], R. Büchel[1], A. Hintennach, P. Novák, S.E. Pratsinis[1]
Continuous flame aerosol synthesis of carbon-coated nano-$LiFePO_4$ for Li-Ion batteries
doi:10.1016/j.jaerosci.2011.06.003, J. Aerosol Sci. **42**, 657-667 (2011).
[1] ETH Zürich

D. Weingarth, A. Foelske-Schmitz, A. Wokaun, R. Kötz
In situ electrochemical XPS study of the Pt / [EMIM][BF_4] system
doi: 10.1016/j.elecom.2011.03.027, Electrochem. Commun. **13,** 619-622 (2011).

M. Wellinger, S.M.A. Biollaz, J. Wochele, Ch. Ludwig
Sampling and online analysis of alkalis in thermal process gases with a novel surface ionization detector
Energy Fuels **25**, 4163-4171 (2011).

R.A. Werner[1], N. Buchmann[1], R.T.W. Siegwolf, B.E. Kornexl[1], A. Gessler[2]
Metabolic fluxes, carbon isotope fractionation and respiration - lessons to be learned from plant biochemistry
New Phytologist **191**, 10-15 (2011).
[1] ETH Zürich
[2] Leibniz-Centre for Agricultural Landscape Research, Müncheberg, Germany

R.A. Witik[1], J. Payet[1], V. Michaud[1], C. Ludwig, J.-A.E. Månson[1]
Assessing the life cycle costs and environmental performance of lightweight materials in automobile applications
Composites: Part A **41**, 1694-1709 (2011).
[1] EPF Lausanne

J.P.S. Wong[1], A.K.Y. Lee[1], J.G. Slowik, D.J. Cziczo[1], W.R. Leaitch[1], A. Macdonald[1], J.P.D. Abbatt[1]
Oxidation of ambient biogenic secondary organic aerosol by hydroxyl radicals: Effects on cloud condensation nuclei activity
doi:10.1029/2011GL049351, Geophys. Res. Lett. **38**, L22805 (2011).
[1] Whistler Aerosol and Cloud Study collaborators

J. Wurzbacher[1], C. Gebald[1], A. Steinfeld
Separation of CO_2 from air by temperature-vacuum swing adsorption using diamine-functionalized silica gel
Energy Environ. Sci. **4**, 3584-3592 (2011).
[1] ETH Zürich

H. Yoon[1], T. Cooper[1], A. Steinfeld
Non-catalytic autothermal gasification of woody biomass
Int. J. Hydrogen Energy **36**, 7852-7860 (2011).
[1] ETH Zürich

M. Zaglio, G. Schuler, A. Wokaun, J. Mantzaras, F.N. Büchi
Parameter extraction from experimental PEFC data using an evolutionary optimization algorithm
doi:10.1051/epjap/2011100190, Eur. Phys. J. Appl. Phys. **54**, 23409 (2011).

M. Zaglio, A. Wokaun, J. Mantzaras, F.N. Büchi
1d-modeling and experimental study of the PEFC dynamic behavior at load increase
doi: 10.1002/fuce.201000127, Fuel Cells **11**, 526-536 (2011).

V. Zelenay, R. Mooser[1], T. Tritscher, A. Křepelová, M.F. Heringa, R. Chirico, A.S.H. Prévôt, E. Weingartner, U. Baltensperger, J. Dommen, B. Watts, J. Raabe, T. Huthwelker, M. Ammann
Aging induced changes on NEXAFS fingerprints in individual combustion particles
doi:10.5194/acp-11-11777-2011, Atmos. Chem. Phys. **11**, 11777-11791 (2011).
[1] Empa Dübendorf

E. Zermatten[1], S. Haussener[1], M. Schneebeli[1], A. Steinfeld
Tomography-based determination of permeability and Dupuit-Forchheimer coefficient of characteristic snow samples
J. Glaciology **57**, 811-816 (2011).
[1] ETH Zürich

X. Zhang[1], Y.-H. Lin[2], J.D. Surratt[2], P. Zotter, A.S.H. Prévôt, R.J. Weber[1]
Light-absorbing soluble organic aerosol in Los Angeles and Atlanta: A contrast in secondary organic aerosol
doi:10.1029/2011GL049385, Geophys. Res. Lett. **38**, L21810, (2011).
[1] Georgia Tech, Atlanta, USA
[2] University of North Carolina, Chapel Hill, USA

P. Zieger, E. Weingartner, J. Henzing[1], M. Moerman[1], G. de Leeuw[1], J. Mikkilä[1], M. Ehn[1], T. Petäjä[1], K. Clemer[1], M. van Roozendael[1], S. Yilmaz[1], U. Friess[1], H. Irie[1], T. Wagner[1], R. Shaiganfar[1], S. Beirle[1], A. Apituley[1], K. Wilson[1], U. Baltensperger
Comparison of ambient aerosol extinction coefficients obtained from in-situ, MAX-DOAS and LIDAR measurements at Cabauw
Atmos. Chem. Phys. **11**, 2603-2624 (2011).
[1] external member of the CINDI consortium

Conference Proceedings / Other Papers

S. Aksoyoglu, J. Keller, D. Oderbolz, I. Barmpadimos, A.S.H. Prévôt, U. Baltensperger
Sensitivity of ozone and aerosols to precursor emissions in Europe
Proc. 14th International Conference on harmonization within atmospheric dispersion modelling for regulatory purposes
HARMO, Kos, University of West Macedonia, Greece, 321-325, October 2-6 (2011).

I. Alxneit, G. Dibowski[1]
Spectral characterization of solar simulators
17th SolarPACES Conference, Granada, Spain, September 20-23 (2011).
[1] DLR Köln, Germany

J. Bernard, M. Hofer, U. Hannesen[1], A. Toth[2], A. Tsukada, F.N. Büchi, P. Dietrich
Direct electrical coupling of fuel cell and battery for electric powertrains
Proc. International Advanced Mobility Forum (IAMF), Geneva, March 8-9 (2011).
[1] Belenos Clean Power Holding, Biel
[2] Swatch Group, Biel

J. Bernard, M. Hofer, U. Hannesen[1], F.N. Büchi
H_2/O_2 fuel cell system for automotive application
Proc. of European Fuel Cell Forum 2011, contribution # A0402, Lucerne, June 28 – July 1 (2011).
[1] Belenos Clean Power Holding, Biel

P. Boillat, P. Oberholzer, R. Perego, R. Siegrist, A. Kaestner, E.H. Lehmann, G.G. Scherer, A. Wokaun
Application of neutron imaging in PEFC research
doi: 10.1149/1.3635541, ECS Trans. **41**, 27 (2011).

B. Boksberger, S. Ulli-Beer
Lokale Policy Roadmap 2020: Potentiale und Handlungsoptionen nachhaltiger Mobilität
Bericht im Rahmen des Novatlantis-Projekts "Erlebnisraum Mobilität", PSI Villigen, March 7 (2011).

B. Boksberger, S. Ulli-Beer
10 Jahre Umwelttaxis in der Schweiz: Forschung zu Innovation, Adaption und Diffusion alternativer Fahrzeuge und Treibstoffe
Eine Studie im Rahmen des Novatlantis-Projekts "Erlebnisraum Mobilität", PSI Villigen, March 15 (2011).

B. Boksberger, S. Ulli-Beer
Schweizer Flottenmanagerumfrage 2011. Chancen alternativer Treibstoffe & Antriebstechnologien
Eine Studie im Rahmen des Novatlantis-Projekts "Erlebnisraum Mobilität", PSI Villigen, March 20 (2011).

N. Bukowiecki
Vulkanasche über der Schweiz
Geosciences actuel, **3/2011**, 34-46, October 1 (2011).

S. Daniele, Y.-C. Lin, M. Matuszewski, P. Jansohn, K. Boulouchos[1]
NO_x emissions for combustion systems relevant to zero emission power concepts
Proc. 5th European Combustion Meeting, Cardiff, Wales, June 28 - July 1 (2011).
[1] ETH Zürich

J. Eller, J. Roth, F. Marone, M. Stampanoni[1], A. Wokaun, F.N. Büchi
Towards ultra-fast x-ray tomographic microscopy of liquid water in PEFC
doi: 10.1149/1.3635572, ECS Trans. **41**, 387-394 (2011).
[1] Institute for Biomedical Engineering, University and ETH Zürich

L. Gubler, S.M. Dockheer[1], W.H. Koppenol[1]
Radicals in fuel cell membranes: mechanisms of formation and ionomer attack
doi: 10.1149/1.3635674, ECS Trans. **41**, 1, 1431-1439 (2011).
[1] ETH Zürich

L. Gubler, H. Ben youcef, S. Lüscher, J. Thut, L. Bonorand, G.G. Scherer
Development of high performance and durable fuel cell membranes based on radiation grafting
Proc. European Fuel Cell Forum 2011, contribution #A1008, Luzern, June 28 - July 1 (2011).

M. Havenith[1], W. Märkle
THz-Spektroskopie und Solvatationsdynamik
GDCh Nachrichten aus der Chemie **03**, 291-296 (2011).
[1] Ruhr-Universität, Bochum, Germany

C. Hutter, W. Villasmil, M. Chambon, A. Meier
Operational experience with a 100 kW solar pilot plant for thermal dissociation of zinc oxide
17th SolarPACES Conference, Granada, Spain, September 20-23 (2011).

P. Jansohn
Forschungsprogramm "Kraftwerk 2020"
Jahresberichte der Programmleiter, Bundesamt für Energie (BFE) (2011).

M.D. Kaufman-Rechulski, S. Geiger, J. Schneebeli, T.J. Schildhauer, S.M.A. Biollaz
Characterizing gas streams in biomass gasification plants using a liquid-quench based diagnostic tool: Influence of the sampling system
Proc. European Biomass Conference and Exhibition Berlin, Germany, June 6-10 (2011).

M.D. Kaufman-Rechulski, T.J. Schildhauer, S.M.A. Biollaz
Organic sulfur compounds in the producer gas from wood and grass gasification
Proc. European Biomass Conference and Exhibition Berlin, Germany, June 6-10 (2011).

B. Kopainsky, K. Tröger, S. Derwisch, S. Ulli-Beer
Combining system dynamics and conjoint analysis for the design of sustainable policies to increase food security in Sub-Saharan African countries
European System Dynamics Workshop: Developing Sustainable Strategies with System Dynamics. Frankfurt School of Finance & Management, Frankfurt (Main), Germany (2011).

R. Kötz, D. Cericola, A. Foelske, M. Hantel, D. Weingarth
How to increase specific energy of electrochemical capacitors
Proc. 2nd European Advanced Automotive Battery Conference, ECCAP Symposium - Large EC Capacitor Technology and Application, 103-107, Mainz, Germany, June 6-10 (2011).

P. Kyrtatos[1], P. Obrecht[1], K. Boulouchos[1], K. Hoyer, P. Dietrich
In-cylinder measurement analysis of diesel engine combustion with miller valve timing
13. Tagung "Der Arbeitsprozess des Verbrennungmotors" Graz, Austria, September 22-23 (2011).
[1] ETH Zürich

E.H. Lehmann, A. Tremsin, C. Grünzweig, I. Johnson, P. Boillat, L. Josic
Neutron imaging - detector options in progress
doi:10.1088/1748-0221/6/01/C01050, J. Instr. **6**, C01050 (2011).

Y. Lin, M. Matuszewski, S. Daniele, P. Jansohn, K. Boulouchos[1]
NO_x emission for combustion systems relevant to zero emissions power concepts
European Combustion Meeting 2011, Cardiff, UK, June 28 - July 1 (2011).
[1] ETH Zürich

P.G. Loutzenhiser[1], A. Stamatiou[1], W. Villasmil, A. Steinfeld
Concentrated solar energy for thermochemically producing liquid fuels from CO_2 and H_2O
TMS Symposium Carbon Dioxide and Other Greenhouse Gas Reduction Metallurgy, San Diego, USA, February 27 - March 3 (2011).
[1] ETH Zürich

P.G. Loutzenhiser[1], A. Steinfeld
Solar syngas production from CO_2 and H_2O in a two-step thermochemical cycle via Zn/ZnO redox reactions: Thermodynamic cycle analysis
Proc. International Conference on Hydrogen Production, Thessaloniki, Greece, June 19-22 (2011).
[1] ETH Zürich

C. Ludwig
The role of thermal processes in sustainable waste management – A swiss perspective
Proc. Sustainable Solid Waste Management in Eastern Europe: Prospects for the Future, Kiev, Ukraine May 19-20 (2011).

C. Ludwig, F. Vogel, M. Brandenberger, M. Bagnoud, A. Testino, R.P.W.J. Struis, L. Hermann
Integrated minerals receycling in biofuel production - The SunCHem Process
Proc. Fray International Symposium, Cancun, Mexico, November 27 - December 1 (2011).

M. Matuszewski, P. Jansohn
Combustion in gas turbines with flue gas recirculation
VDI-Tagung "25. Deutscher Flammentag 2011 – Verbrennung und Feuerung", September 14-15 (2011).
VDI-Berichte **2119**, 271 - 276

A. Meier
Task II: Solar Chemistry Research
International Energy Agency – SolarPACES Annual Report 2010, edited by C. Richter, Chapter 4 (2011).

P. Oberholzer, P. Boillat, R.I Siegrist, R. Perego, A. Kaestner, E.H. Lehmann, G.G. Scherer, A. Wokaun
Neutron imaging of isothermal sub-zero degree celsius cold-starts of a polymer electrolyte fuel cell (PEFC)
doi: 10.1149/1.3635569, ECS Trans. **41**, 363 (2011).

D. Peitz, M. Elsener, O. Kröcher
Guanidinium formate as a novel ammonia precursor for NO_x abatement using selective catalytic reduction in mobile applications
Prepr. Pap. - Am. Chem. Soc., Div. Fuel Chem. **56**, 19741 (2011).

D. Peitz, O. Kröcher, M. Elsener, P. Toshev[1], T. Sattelmayer[1], A. Heubuch[1], G. Wachtmeister[1], B. Schulz[1], C. Gerhart[1], H.-P. Krimmer[1], E. Jacob[1]
Catalytic decomposition of guanidinium formate for onboard ammonia gas production, independent of engine operation
Proc. Konferenzband 9. FAD-Konferenz „Herausforderung Abgasnachbehandlung für Dieselmotoren", Dresden, Germany, November 3-4 (2011).
[1] External member of the NORA research project

B. Perucco[1], J.O. Schumacher[1], J. Roth, F.N. Büchi
Two-phase modelling of the membrane electrode assembly of proton exchange membrane fuel cells
Proc. EFC 2011, European Fuel Cell - Piero Lunghi Conference, contribution EFC11126, Rome, Italy, December 14-16 (2011).
[1] Zurich University of Applied Sciences, Winterthur

M. Pravettoni[1], M. Cadruvi[2], T. Cooper[2], S. Dittmann[1], G. Ambrosetti[3], A. Steinfeld
INPHOCUS - a novel design for concentration photovoltaics: characterization of the receiver and light uniformity analysis
Proc. 26th EU PVSEC European Photovoltaic Solar Energy Conference, Hamburg, Germany, September 5-8 (2011).
[1] SUPSI-ISAAC, Canobbio
[2] ETH Zürich
[3] Airlight Energy, Biasca

T. Priem[1], I. Noirot[1], P. Mukish[1], A. Martin[2], L. Jörissen[2], F.N. Büchi, S. Kreitmeier, F. Finsterwalder[3]
Could a generic european fuel cell stack be competitive during early market introduction phase and medium term horizon?
Proc. EFC 2011, European Fuel Cell - Piero Lunghi Conference, contribution EFC11024, Rome, Italy, December 14-16 (2011).
[1] CEA/LITEN, Grenoble, France
[2] Zentrum für Solarenergie- und Wasserstoff Forschung (ZSW), Ulm, Germany
[3] Daimler AG, Stuttgart, Germany

M. Roesle[1], V. Coskun[1], A. Steinfeld
Numerical analysis of heat loss from a parabolic trough absorber tube with active vacuum system
ASME 5th International Conference on Energy Sustainability & 9th Fuel Cell Science, Washington DC, USA, August 7-10 (2011).
[1] ETH Zürich

E. Rojas[1], R. Bayón[1], R. Adinberg[2], F. Fabrizi[3], C. Hutter, D. Laing[4], X. Py[5]
Towards standardization of testing storage prototypes
Proc. 17th SolarPACES Conference, Granada, Spain, September 20-23 (2011).
[1] CIEMAT-PSA, Madrid, Spain
[2] WIS, Rehovot, Israel
[3] ENEA-UTRINN-STD, Rome, Italy
[4] DLR Stuttgart, Germany
[5] PROMES-CNRS, Perpignan, France

J. Roth, J. Eller, F.N. Büchi
Effects of synchrotron radiation on polymer electrolyte fuel cell materials
doi: 10.1149/1.3635572, ECS Trans. **41**, 371-387 (2011).

U. Rhyner, J.W. Regler, S.M.A. Biollaz, R. Mai, H. Leibold
1150h hot gas filter experiment for B-IGFC process
European Biomass Conference and Exhibition Berlin, Germany, June 6-10 (2011).

B. Steubing, I. Ballmer, L. Gerber, F. Maréchal, R. Zah, C. Ludwig
An environmental optimization model for bioenergy plant sizes and locations for the case of wood-derived SNG in Switzerland
Proc. World Renewable Energy Congress 2011, Bioenergy Technology (BE),
Linköping, Sweden, May 8-11 (2011).

C. Suter[1], Z. Jovanovic[1], A. Steinfeld
A 1 kW_{el} thermoelectric stack for geothermal power generation — Modeling and geometrical optimization
Proc. 9th European Conference on Thermoelectrics, Thessaloniki, Greece, September 28-30 (2011).
[1] ETH Zürich

S. Ulli-Beer, S.N. Grösser, A. Wokaun
How does the Multi-Level Perspective help to enhance a System Dynamics analysis of a specific transition challenge?
Proc. 29th International System Dynamics Conference, Washington DC, USA, July 24-28 (2011).

C. Wik[1], K. Hoyer, T. Matt[2], P. Kyrtatos[3]
2-stage turbo charging on medium speed engines - results from the LERF-test facility
16th Supercharging Conference, Dresden, Germany, September 29-30 (2011).
[1] Wärtsilä Finland Oy
[2] ABB Turbo Systems AG, Birr
[3] ETH Zürich

C. Wieckert, N. Piatkowski[1], A. Steinfeld, A. Obrist[2], P. von Zedtwitz[2]
Solar reactor prototype testing for solar steam-gasification of carbonaceous feedstocks to syngas
Proc. World Engineers Convention, Geneva, September 4-9 (2011).
[1] ETH Zürich
[2] Holcim, Holderbank

A. Wokaun
Treibstoff aus Sonnenlicht?
horizonte **89**, June 8-9 (2011).

G. Zanganeh[1], A. Pedretti[2], A. Steinfeld
A packed bed of rocks for high-temperature thermal storage of concentrating solar energy
Proc. World Engineers Convention, Geneva, September 4-9 (2011).
[1] ETH Zürich
[2] Airlight Energy, Biasca

DISSERTATIONS

I. Barmpadimos
Trends and variability of airborne particulate matter in Switzerland and in Europe
Ph.D. Thesis, No. 20075, ETH Zürich, November 2011.

M.H. Bayer
Ein mehrdimensionales Impedanzmodell für Polymerelektrolyt-Brennstoffzellen
Ph.D. Thesis, No. 19746, ETH Zürich, May 2011.

P. Bernardo
Influence des propriétés du graphite sur le premier cycle d'intercalation du lithium
Ph.D. Thesis, No. 16620, Universität Mülhausen, July 2011.

D. Cericola
Towards the reliable hybridization of electrochemical capacitors and rechargeable batteries
Ph.D.Thesis, No. 19744, ETH Zürich, May 2011.

S. Daniele
Lean premixed syngas combustion for gas turbine applications
Ph.D. Thesis, No. 19657, ETH Zürich, April 2011.

M. Esposito
Thin Metal Oxide Films by PLD: „Tracing" the Oxygen and Understanding its Role
Ph.D. Thesis, No. 19867, ETH Zürich, July 2011.

V. Godbole
Elucidating the reaction mechanism of electrode materials for Li-ion batteries using in situ structural characterization
Ph.D. Thesis, No. 20007, ETH Zürich, October 2011.

M. Heringa
Primary emission and secondary formation of organic aerosol from domestic wood burning
Ph.D. Thesis, No. 20087, ETH Zürich, November 2011.

N. Linse
Start/stop phenomena in polymer electrolyte fuel cells
Ph.D. Thesis, No. 20132, ETH Zürich, December 2011.

M. Mehring
Composition and reactivity analysis of diesel soot with advanced FTIR spectroscopy and a new TG-FTIR system, at the example of the oxidation with O_2, NO_2 and H_2SO_4 and the SCR reaction with NO_x and NH_3
Ph.D. Thesis, No. 19993, ETH Zürich, September 2011.

C. Mohr
Source apportionment of ambient submicron aerosol using stationary and mobile aerosol mass spectrometer data
Ph.D. Thesis, No. 20053, ETH Zürich, October 2011.

A. Peitz-Savouchkina
Degradation mechanisms of electro-catalysts used in polymer electrolyte fuel cells
Ph.D. Thesis, No. 20133, ETH Zürich, December 2011.

A.C.J. Richard
Determination of trace elements in ambient aerosols with synchrotron induced X-ray fluorescence spectrometry and subsequent source apportionment
Ph.D. Thesis, No. 19667, ETH Zürich, May 2011.

B. Schwanitz
Reduzierung der Platinbeladung und Imaging von Alterungsphänomenen in der Polymerelektrolyt-Brennstoffzelle
Ph.D. Thesis, No. 20142, ETH Zürich, December 2011.

T. Tritscher
Hygroscopicity and volatility of fresh and processed aerosols from different sources
Ph.D. Thesis, No. 19799, ETH Zürich, June 2011.

P. Verma
Electrochemical and chemical surface modifications of carbons for Li-ion batteries
Ph.D. Thesis, No. 20006, ETH Zürich, October 2011.

S. von Dahlen
Ortsaufgelöste in situ Charakterisierung von Polymerelektrolyt-Brennstoffzellen in Kanal- und Stegregionen
Ph.D. Thesis, No. 20131, ETH Zürich, December 2011.

E. Wilhelm
Multi-criteria analysis of heuristically designed vehicles
Ph.D. Thesis, No. 19692, ETH Zürich, May 2011.

M. Zaglio
Model based transient analysis of polymer electrolyte fuel cells
Ph.D. Thesis, No. 19992, ETH Zürich, September 2011.

P. Zieger
Effects of relative humidity on aerosol light scattering
Ph.D. Thesis, No. 19659, ETH Zürich, April 2011.

THESES

Diploma / Master Theses

M. Citerne
Developpement d'un humidificateur pour une micro pile à combustible
PSI Villigen and Università di Corsica, France, September 2011.

S. Fritz[1]
Entwicklung eines Hydrolysekatalysators für die Zersetzung von Guanidiniumformiat
PSI Villigen and Fachhochschule Frankfurt am Main, Germany, August 2011.
[1] Fachhochschule Frankfurt am Main, Germany

B. Gamarra
Acclimation of net photosynthesis and growth under rapid temperature changes in Populous tremula sp.
Department of Environmental Sciences (UWIS), ETH Zürich, September 2011.

E. Hammer
Calculation and interpretation of cloud peak supersaturations at the Jungfraujoch
Faculty of Science, University of Bern, März 2011.

C. Ketterer
Investigation of the planetary boundary layer at the Kleine Scheidegg and at the Jungfraujoch using remote sensing and in-situ measurements
Faculty of Science, University of Bern, December 2011.

T. Rosén
Determination of water saturation dependent gas transport properties of PEFC gas diffusion layers via the Lattice Boltzmann method
Kungliga Tekniska Högskolan (KTH), Stockholm, Sweden, May 2011.

O. Rueda
Filter performance control by dynamic pressure measurements for the process chain of a biomass-integrated gasification fuel cell system
PSI Villigen and ETH Zürich, December 2011.

F. Visconti
Detailed combustion fields of methane and air mixtures by a model reduction technique
PSI Villigen and Polytecnico di Torino, Italy, April 2011.

Bachelor Theses

M. Leoni
Determination of thermo-physical properties of CO_2 *capture sorbent*
PSI Villigen and ETH Zürich, July 2011.

F. Müller
Thermally-driven metal oxide cycles for inert gas recycling
PSI Villigen and ETH Zürich, July 2011.

D.-A. Tian
Vacuum distillation of silicon via carbothermal reduction of SiO_2 *with concentrated solar energy*
PSI Villigen and ETH Zürich, July 2011.

A. Siegrist
Validierung eines Codierungssystems zum Erfüllungsgrad von Funktionen im Technischen Innovationssystem von Elektrozweirädern
University of Bern, December 2011.

M. Weirich
Syngas production via a solar thermochemical cycle based on FeO/Fe_3O_4 *redox reactions –*
Thermogravimeter analysis of the 2^{nd} *step*
PSI Villigen and ETH Zürich, March 2011.

Semester Theses

Z. Künsch
PIV data processing of a turbulent premixed flame
PSI Villigen and ETH Zürich, December 2011.

G. Putzi
Analysis of chemical kinetics of the Mn_3O_4/MnO *reduction reaction in high temperature / high-solar-radiation flux conditions*
PSI Villigen and ETH Zürich, December 2011.

D. Weibel
Experimental investigation of a volumetric air receiver for concentrated solar power
PSI Villigen and ETH Zürich, December 2011.

M. Welte
Dopant effects on the reduction of cerium oxide for two-step thermochemical cycles for solar fuel production
PSI Villigen and ETH Zürich, June 2011.

TALKS / MEDIA

Invited Talks

I. Alxneit
Temperature measurement in solar furnaces and solar simulators
2nd SFERA Winter School (Solar Fuels & Materials), ETH Zürich, March 24-25, 2011.

U. Baltensperger
Is there a link between galactic cosmic rays and clouds? The CLOUD experiment at CERN
LTP Thursday colloquium, PSI Villigen, December 8, 2011.

U. Baltensperger
Why do we measure aerosols at the Jungfraujoch?
GAW-CH Conference, ETH Zürich, January 18-19, 2011.

U. Baltensperger
Die Auswirkungen von Partikeln und gasförmigen Schadstoffen aus Verbrennungsmotoren
DIESELvision 2011, Rapperswil, October 7, 2011.

U. Baltensperger
Chemical analysis of atmospheric aerosols
ANAKON 2011, Zürich, March 22-25, 2011.

U. Baltensperger
Research on new particle formation at PSI and at CERN
Windtunnel Opening Ceremony Empa Dübendorf, November 7, 2011.

U. Baltensperger
Scavenging of atmospheric constituents by snow
ISSI Extreme, Bern, August 20 - September 2, 2011.

U. Baltensperger
The influence of cosmic rays on new particle formation and clouds
ISSI Workshop, Study of Cosmic Ray Influende Upon Atmospheric Processes, Bern, September 19, 2011.

U. Baltensperger
Integration of surface, in-situ observations and satellite observations
ISS Workshop, Observing and Modelling Earth's Energy Flows, Bern, January 10-14, 2011.

U. Baltensperger
Is there a link between galactic cosmic rays and clouds? What we know and what we don't know yet after the first experiments at CERN
Università degli Studi di Milano & National Institute of Nuclear Physics, Milano, Italy, October 25, 2011.

U. Baltensperger
New particle formation in the atmosphere: Insights from the CLOUD experiment at CERN
University of Bern, October 17, 2011.

U. Baltensperger, Z. Jurányi, E. Hammer, M. Gysel, N. Bukowiecki, E. Weingartner
Cloud condensation nuclei concentrations and actual supersaturations in real clouds
Goldschmidt Conference, Prague, Hungary, August 14-19, 2011.

S.M.A. Biollaz
Biomethane development in Switzerland
SGC International Seminar on Biomass Gasification, Malmö, Sweden, October 6-7, 2011.

P. Boillat
Application of neutron imaging in PEFC research
220th ECS Meeting, Boston, USA, October 9-14, 2011.

F.N. Büchi
Brennstoffzellen - Prinzip, Eigenschaften und Anwendungen
Naturwissenschaften und Unterricht, Zürcher Hochschulinstitut für Lehrerbildung, ETH Zürich, March 26, 2011.

N. Bukowiecki
Feinstaubimmissionen von Holzfeuerungen: Untersuchungen zum Verhalten der Schadstoffe in der Atmosphäre
BAFU, Ittigen, November 9, 2011.

N. Bukowiecki
Wie und warum man Feinstaub untersucht
Kantonsschule Rychenberg, Winterthur, December 5, 2011.

M. Casapu
Acidic zirconia mixed oxides as a promising alternative for urea-SCR catalysis
3rd International Conference „Vehicle Emission Reduction Technologies", Detroit, USA, April 19, 2011.

M. Casapu
Acidic zirconia mixed oxides as a promising alternative for urea-SCR catalysis
7th Internation CTI Conference SCR Systems, Stuttgart, Germany, July 5-6, 2011.

M. Casapu
Automotive catalysis studied by XAS
SLS Symposium X-ray spectroscopies of energy materials, PSI Villigen, March 2, 2011.

M. Chambon
Solar thermochemical cycles based on the ZnO/Zn or SnO_2/SnO redox couples
2nd SFERA Winter School (Solar Fuels & Materials), ETH Zürich, March 24-25, 2011.

I. Czekaj
Modelling of catalytic systems used in energy and environmental technologies
Schering Fellows Meeting, Berlin, Germany, May 12-14, 2011.

I. Czekaj
Understanding mechanism of surface catalytic reactions: combination of theory and experiments
Institute Seminar „Science with Photons", Institute for Methods and Instrumentation in Synchrotron Radiation Research, Helmholtz-Zentrum Berlin für Materialien und Energie BESSY II, Berlin, Germany, May 12, 2011.

P. Dietrich
Wird Wasserstoff ein Rolle als Energieträger in der individuellen Mobilität spielen?
Carbagas, Thun, May 13, 2011.

P. Dietrich
Hydrogen as energy carrier for mobility (workshop W1-3)
11. Challenge Bibendum, Berlin, May 18-22, 2011.

P. Dietrich
Innovative Technologien in der Energiewirtschaft
Euroforum Zürich, May 25, 2011.

P. Dietrich
Biomassenumwandlung am Paul Scherrer Institut PSI
Generalversammlung Schweizerische Studiengesellschaft für Motorschmierstoffe ssm,
PSI Villigen, May 27, 2011.

P. Dietrich
Welchen Anteil erlangen die Erneuerbaren im zukünftigen Energiesystem? – Potenziale der neuen erneuerbaren Energieträger
Rohstoffe & Energiemärkte, CreditSuisse, Zürich, August 26, 2011.

P. Dietrich, F. Vogel, O. Kröcher, C. Ludwig
SunCHem – from liquid biomass to SNG or from inventions to a renewable energy carrier
12th International Sustainability Leadership Symposium 2011, Rüschlikon, September 19, 2011.

P. Dietrich
Potenzial des Elektroantriebes im Strassenverkehr der Zukunft
Schweizerischer Energierat, Zürich, October 20, 2011.

P. Dietrich
Wasserstoffantriebe im Strassenverkehr der Zukunft
Schweizerischer Technischer Verein STV Sektion Aargau, Brugg, November 17, 2011.

H.P. Fehr, P. Dietrich, A. Huber
Wahl der besten Transportkette
Zukunft urbane Mobilität, Forum 3, Zürich, July 6, 2011.

A. Foelske-Schmitz
XPS studies of ionic liquids for electrochemical energy storage - closing the pressure gap in electrochemistry research
Mitarbeiterseminar, Lehrstuhl E19, Technische Physik, TU München, Munich, Germany, July 1, 2011.

T. Gerber
Synchrotron based spectroscopy for combustion research
International energy agency 33rd task leaders meeting on energy conservation and emissions reduction in combustion, Lund, Sweden, August 7-11, 2011.

L. Gubler
Polymerelektrolyt Brennstoffzellen: Entwicklungsstand und materialwissenschaftliche Herausforderungen
9. Riesaer Brennstoffzellen – Workshop, Riesa, Germany, June 22, 2011.

M. Gysel
Cloud interactions and past records of atmospheric black carbon
Oberpfaffenhofen, Germany, December 12, 2011.

M. Gysel
A powerful tool for characterization of black carbon in atmospheric aerosols and ice cores
Grenoble, France, March 17, 2011.

C.R. Hoyle
Climate consequences of a regional nuclear conflict
PMOD/WRC Davos, September 9, 2011.

C.R. Hoyle
Ice nucleation properties of volcanic ash
WSL-Institut für Schnee- und Lawinenforschung SLF, Davos, November 23, 2011.

C. Hutter
Treibstoffe aus konzentrierter Sonnenenergie
– Runder Tisch in Zürich – Vortrag und Diskussion, ASPO Schweiz, April 27, 2011.
– Volkshochschule Bad Zurzach, December 1, 2011.

C. Hutter
Benzin aus Wasser, CO_2 und Sonnenlicht
F. Hoffmann-La Roche AG Engineering Platform, December 1, 2011.

P. Jansohn
Stromerzeugung mit Gaskraftwerken – zu welchem Preis?
Gaskraftwerke mit ihren Pros and Cons aus wissenschaftlicher Sicht
Treffen der Parlamentarischen Gruppe „Klimaänderung“, Bern, September 29, 2011.

P. Jansohn
Gas Turbine: construction and technology
Gastvorlesung, Poznan University of Technology, Poland, October 18-19, 2011.

R. Kötz
How to increase specific energy of electrochemical capacitors
2nd European Advanced Automotive Battery Conference, Mainz, Germany, June 6-10, 2011.

R. Kötz
Carbon nanomaterials for electrochemical capacitors
EICOON Summer School, Nanomaterial Issues in Electrochemical Energy Conversion: Fuel Cells, Batteries, Supercapacitors, Technology Centre Innopoli 1, Espoo, Finland, June 15-17, 2011.

R. Kötz
Roads to high energy electrochemical capacitors
62nd ISE Annual Meeting of the ISE, Niigata, Japan, September 11-16, 2011.

R. Kötz
Potential and limits of electrochemical double layer capacitors
GDCh Wissenschaftsforum, Bremen, Germany, September 4-7, 2011.

R. Kötz
Batterietechnologie – Bewertung im Licht von drei Fragen: Reichweite, Kosten, Umweltverträglichkeit
2nd Novatlantis Mobilitätsforum, Elektromobilität - Vom Konzept in die Praxis, Basel, November 16, 2011.

O. Kröcher
Selective catalytic reduction of NO_x with NH_3 over soot
FVV-Workshop, Frankfurt, Germany, September 16, 2011.

O. Kröcher
A niobia-ceria based multi-purpose catalyst for selective catalytic reduction of NO_x, urea hydrolysis and soot oxidation in diesel exhaust
1st Swiss Heterogeneous Catalysis Meeting, Grindelwald, June 16-17, 2011.

O. Kröcher
Vanadium-based SCR catalysts
3rd International Conference Selective Catalytic Reduction, Wiesbaden, Germany, September 26-28, 2011.

Y. Lin
Combustion properties of hydrogen-rich fuel gases at gas turbine relevant conditions
Verbrennungsforschung in der Schweiz, ETH Zürich, October 28, 2011.

T. Lippert
Laser ablation studied by energy resolved mass spectrometry and time/space resolved emission spectroscopy
European Winter Conference on Plasma Spectrochemistry, Zaragoza, Spain, January 2011.

T. Lippert
Thin oxide films applied as model systems for energy applications
MRS Spring meeting, San Francisco, USA, April 2011.

T. Lippert
UV laser ablation of polymers: from fundamentals to applications
Opening of the Laser Center at Empa Thun, April 2011.

T. Lippert
Design of polymers for laser structuring
Laboratory LP3, University of Marseille, France, April 2011.

T. Lippert
Laser Interaction with Materials: From Structuring to Thin Film Deposition
Photonics Ireland 2011, Dublin, Ireland, September 2011.

T. Lippert
Thin oxide films applied as models systems for energy applications
Conference on Materials and Renewable Energies (EMCMRE-1), Marrakesch, Marocco, November 2011.

J. Mantzaras
Laser diagnostics near reacting interfaces: recent accomplishments, challenges and future trends
Gordon Research Conference Laser Diagnostics in Combustion, Waterville Valley NH, USA, August 14-19, 2011.

A. Meier
The Zn-based thermochemical cycle for splitting H_2O and CO_2
2nd SFERA Winter School (Solar Fuels & Materials), ETH Zürich, March 24-25, 2011.

A. Meier
Trends in solar chemistry
17th SolarPACES Conference, Granada, Spain, September 23, 2011.

M. Nachtegaal
From modulation to oscillation: Identifying structural changes in catalysts with sub-second XAS
– Brookhaven National Laboratory, Shirley, USA, April 11, 2011.
– Joint IOP-PSI workshop, Beijing, China, October 20-21, 2011.

M. Nachtegaal
SuperXAS beamline
– Directorate National Synchrotron Light Source II, Shirley, USA, April 11, 2011.
– Shanghai Synchrotron Radiation Facility, Shanghai, China, October 24, 2011.

P. Novák
Oxygen, nano & Co.: Future or buzzwords of lithium batteries?
Seminar at Toyota Central R&D Labs., Inc., Nagoya, Japan, September 19, 2011.

P. Novák
Re-visiting the SEI: Everything is much more complex than believed in the past
62nd ISE Annual Meeting, Niigata, Japan, September 12, 2011.

P. Novák
Was kommt nach der Lithiumionen-Batterie?
Universität Münster, Münster, Germany, September 6, 2011.

P. Novák
State-of-the-Art der Lithium-Ion Technologie
5. DFG Statusmeeting, Münster, Germany, September 5, 2011.

P. Novák
Nanomaterials for battery electrodes: The characterization challenge
International Conference on Materials for Advanced Technologies ICMAT 2011, Singapore, June 30, 2011.

P. Novák
Li-S and Li-Air systems: The characterization challenge
Symposium “Beyond Lithium IV”, Pacific Northwest National Laboratory, Richland, USA, June 9, 2011.

P. Novák
Battery research: A wedding of surface electrochemistry with solid state electrochemistry
SAOG 2011 - 27th Annual Meeting of the Swiss Working Group on Surface and Interface Science, University of Fribourg, Fribourg, January 28, 2011.

T. Peter[1], C.R. Hoyle, A. Stenke[1], E. Rozanov[2]
Climate consequences of a regional nuclear conflict
Glion, September 26, 2011.
[1] ETH Zürich
[2] PMOD/WRC Davos

N. I. Prasianakis
Development of advanced lattice Boltzmann algorithms for the modeling of processes in power generation systems
Institute of Mechanics, Materials and Civil Engineering (iMMC), Universite Catholique Louvain (UC-Louvain), Belgium, May 13, 2011.

A.S.H. Prévôt
Quellen von Feinstaub. Bedeutung von Holzfeuerungen
Jahresversammlung Holzenergie Schweiz, 27. Mai, 2011.

A.S.H. Prévôt
Latest findings of PSI on secondary organic aerosols
Carnegie Mellon University seminar, Pittsburgh, USA, October 10, 2011.

P.P. Radi
Shedding light on dark states
Université de Strasbourg, France, December 8, 2011.

G.G. Scherer
Degradation of solid polymer electrolytes in electrochemical cells - some considerations
First International LoLiPEM Workshop. Long life membranes based on PFSA & SAPs: Preparation and characterization, Grottaferrata, Italia, March 17-18, 2011.

G.G. Scherer
Some aspects of aging, degradation, and failure modes in polymer electrolyte fuel cells
PEM fuel cell catalyst and MEA preparation and characterization, HySA Catalysis, Hydrogen South Africa, Capetown, South Africa, March 28-29, 2011.

G.G. Scherer
General introduction to fuel cells
Joint ICTP-IAEA Advanced School on the Role of Nuclear Technology in Hydrogen-Based Energy Systems, Trieste, Italy, June 17, 2011.

G.G. Scherer
Neutron imaging of liquid water in polymer electrolyte fuel cells
Joint ICTP-IAEA Advanced School on the Role of Nuclear Technology in Hydrogen-Based Energy Systems, Trieste, Italy, June 17, 2011.

G.G. Scherer
Proton-conducting membranes as solid electrolytes prepared by radiation grafting
Joint ICTP-IAEA Advanced School on the Role of Nuclear Technology in Hydrogen-Based Energy Systems, Trieste, Italy, June 17, 2011.

G.G. Scherer
Part 1: Introduction to fuel cells
Part 2: Types of fuel cells
Part 3: PEFC applications
Tutorials on the occasion of the European Fuel Cell Forum 2011, Lucerne, June 28, 2011.

G.G. Scherer
Protonen-leitende polymere Festelektrolyte für Brennstoffzellen
Leibnitz-Institut für Oberflächenmodifizierung e.V., Leipzig, Germany, July 7, 2011.

G.G. Scherer
The Electrochemistry Laboratory of Paul Scherrer Institut
Yamanashi University, Kofu, Japan, September 8, 2011.

G.G. Scherer
Water management of polymer electrolyte fuel cells studied by neutron imaging
Electrochemical Society of Japan, Niigata, Japan, September 9-10, 2011.

G.G. Scherer
Polymer electrolyte fuel cells materials research aspects studied at Paul Scherrer Institut
62nd ISE Annual Meeting, Niigata, Japan, September 11-15, 2011.

G.G. Scherer
Aspects of electromobility – today and tomorrow
Nissan Research Center, Nissan Motor Co. Ltd., Kanagawa, Japan, September 17, 2011.

G.G. Scherer
Fuel cell technology for automotive applications
Chemistry Department, University of Fribourg, October 11, 2011.

G.G. Scherer
Individual electromobility based on electrochemical devices – an overview
Centre for Bioprocess Engineering Research, University of Cape Town, South Africa, November 18, 2011.

G.G. Scherer
Fundamentals and some practical aspects of electrocatalysis for energy conversion and storage processes
CATSA 2011, Gauteng, South Africa, November 13-16, 2011.

G.G. Scherer
Nanostructures in polymer electrolyte fuel cells
Winterschool "Nanomaterials for Energy Applications", University Duisburg, Germany, December 9, 2011.

T.J. Schmidt
Durability and diagnostics of membrane electrode assemblies: Can lifetime be predicted?
ETH Zürich, Februar 22, 2011.

T.J. Schmidt
Electrocatalysis for electrochemical energy conversion
1st CEA-ETH Zürich Workshop, June 8, 2011.

T.J. Schmidt
Catalyst research for polymer electrolyte fuel cells
Institute of Electrochemistry, University of Ulm, Germany, July 14, 2011.

T.J. Schmidt
Electrocatalysts for polymer electrolyte fuel cells: From fundamentals to applications
Departement of Chemistry and Biochemistry, University of Bern, November 10, 2011.

C.W. Schneider, T. Lippert, P. Delaporte
Laser Induced Forward Transfer of Functional Materials: the European eLIFT Project
12th International Symposium on Laser Precision Microfabrication, Takamatsu, Japan, June 2011.

G. Siddiqi[1], P. Jansohn
The Swiss Federal Office of Energy – contributing to solutions for a lower greenhouse gas future
Innovation Days, Sulzer Chemtech Ltd. Schlieren, January 20, 2011.
[1] BFE Bern

O.V. Sidorova, R. Siegwolf, M. Saurer, V.S. Myglan[1], T. Boettger[2], A.V. Kirdyanov[3], M.V. Brukhanova[3], M.M. Naurzbaev[3], E.A. Vaganov[1], M.K. Hughes[4]
Response of trees from high-latitude and high-altitude regions to extreme events during the last 1500 years
XVIII INQUA Congress, Bern, July 21-27, 2011.
[1] Siberian Federal University, Russia
[2] UFZ Leipzig/Halle, Germany
[3] V.N.Sukachev Institute of Forest, Russia
[4] University of Arizona, Tucson, USA

R. Siegwolf
Stabile isotopes in tree rings – beyond climate reconstruction: An ecophysiological point of view
Bayreuther Zentrum für Ökologie und Umweltforschung, Universität Bayreuth, Germany, May 12, 2011.

R. Siegwolf
Tree rings as a multi-proxy archive for environmental changes
University of Helsinki, Finland, March 31, 2011.

R. Siegwolf
Multi-isotope approaches to study ecological and plant–atmosphere interactions
Central European Meeting for Isotope Users, Thermo Scientific, Bremen, Germany, June 27-28, 2011.

R. Siegwolf
Tree rings, an archive for environmental changes beyond climate reconstruction
Max Plank Institut für Biogeochemistry, Jena, Germany, March 16-18, 2011.

A. Steinfeld
Liquid fuels from water, CO_2, and solar energy
– IMDEA Energy, Madrid, Spain, April 4, 2011.
– The University of New South Wales, Sydney, Australia, July 20, 2011.

A. Steinfeld
Concentrated solar energy for high-temperature applications
Keynote, Arica, Chile, June 24, 2011.

A. Steinfeld
Fuels from sunlight, water, and CO_2 via thermochemical processes
Keynote, APCSEET 2011 - 8th Asia Pacific Conference on Sustainable Energy & Environmental Technologies, Adelaide, Australia, July 12, 2011.

A. Steinfeld
Solar thermochemical processes for the extractive metallurgical industry
Swinburne University of Technology, Melbourne, Australia, July 18, 2011.

A. Steinfeld
Flüssige Treibstoffe aus Wasser, CO_2, und Sonnenlicht
Schweizer Technion-Gesellschaft, Zürich, October 26, 2011.

J. Szlachetko
Application of wavelength-dispersive spectroscopy for micro-fluorescence analysis
Breaking Frontiers: Submicron Structures in Physics and Biology
XLIV Zakopane School of Physics, Zakopane, Poland, May 16-21, 2011.

S. Ulli-Beer, B. Boksberger
Einsatzpotenzial effizienter Firmen-Autos: Ergebnisse der Schweizer Flottenmanagerumfrage 2011
Auto Basel, September 16, 2011.

S. Ulli-Beer, B. Boksberger
Schweizer Flottenmanagerumfrage 2011
BAFU Workshop Flottenmanager, Ittigen, August 22, 2011.

S. Ulli-Beer
Understanding Induced (Energy) Technology Change From A Feedback Perspective: How Does Integrative Innovation System Modeling Inform the Multi Level Perspective MLP?
Swiss Chapter of the System Dynamics Society, Zürich, May 2, 2011.

E. Weingartner
Measurements of aerosols and clouds at the High Alpine site Jungfraujoch (3580 m asl, Switzerland)
Institute for Meteorology and Climate Research, KIT, Karlsruhe, Germany, May 10, 2011.

E. Weingartner, Z. Jurányi, E. Hammer, M. Laborde, J. Cozic[1], N. Bukowiecki, M. Gysel, B. Verheggen[2], U. Baltensperger
Aerosol-cloud interactions
GAW-CH Conference ETH Zürich, January 18-19, 2011.
[1] Laboratoire de Glaciologie et Géophysique de l'Environnement, St Martin d'Hères Cedex, France
[2] Energy research Centre of the Netherlands, Petten, The Netherlands

C. Wieckert
Konzentrierte Sonnenenergie – Optionen für die zukünftige Energieversorgung
Rotary Club Baden, January 11, 2011.

C. Wieckert
Solar carbothermic production of zinc
2nd SFERA Winter School (Solar Fuels & Materials), ETH Zürich, March 24-25, 2011.

A. Wokaun
Nano Applications in the Field of Future Energy
Swiss NanoConvention 2011, Baden, May 19, 2011.

A. Wokaun
Die Vision nachhaltiger Energieversorgungssysteme im globalen Kontext: Was dürfen wir vom technischen Fortschritt 2030 erwarten?
Paulus Akademie, Zunfthaus zur Waag, Zürich, October 27, 2011.

A. Wokaun
Energiespeicherung aus Sonnenenergie
Kader Forum der Herzog Kull Group, Widenmoos, October 28, 2011.

A. Wokaun
Die Zukunft der Fahrzeugtechnologie – Antriebssysteme, erneuerbare Treibstoffe und die Position von Elektroautos
2. Novatlantis Mobilitätsforum 'Elektromobilität – vom Konzept in die Praxis', Basel, November 16, 2011.

P. Zieger
Effects of relative humidity on aerosol light scattering
9th Swiss Geoscience Meeting, Zürich, November 12, 2011.

Other Talks

E.M. Alayon, M. Nachtegaal, E. Kleymenov, J.A. van Bokhoven
Methane to methanol conversion on Cu-MOR
1st Swiss Heterogeneous Catalysis Meeting, Grindelwald, June 16-17, 2011.

E.M. Alayon, M. Nachtegaal, E. Kleymenov, J.A. van Bokhoven
Probing the active site during methane conversion over Cu-MOR with X-ray absorption spectroscopy
5st International FEZA Conference, Valencia, Spain, July 3-7, 2011.

E.M. Alayon, M. Nachtegaal, E. Kleymenov, J.A. van Bokhoven
Probing the active site during methane conversion over Cu-MOR with X-ray absorption spectroscopy
Joint Users' Meeting at PSI, PSI Villigen, September 15-16, 2011.

S. Aksoyoglu
Sensitivity of ozone and aerosols to precursor emissions in Europe
The 14th International Conference on Harmonization Within Atmospheric Dispersion Modelling for Regulatory Purposes, HARMO, Kos, Greece, October 3, 2011.

S. Aksoyoglu, J. Keller, H. Christoph, D. Oderbolz, A.S.H. Prévôt, U. Baltensperger
Air quality modeling and source apportionment studies for aerosols in Switzerland
ACCENT/GLOREAM Workshop on Tropospheric Chemical Transport Modelling, Copenhagen, Denmark, January 26-28, 2011.

I. Alxneit, G. Dibowski[1]
Spectral characterization of solar simulators
Proc. 17th SolarPACES Conference, Granada, Spain, September 20-23, 2011.
[1] DLR, Köln, Germany

U. Baltensperger, M.F. Heringa, P. Barmet, R. Chirico, C. Mohr, S.M. Platt, L. Pfaffenberger, J.G. Slowik, P.F. DeCarlo, J. Dommen, A.S.H. Prévôt
Discrimination of secondary organic aerosol from different sources
EAC, Manchester, UK, September 4-9, 2011.

M. Bator, Y. Hu, M. Kenzelmann, H. Luetkens, C. Niedermayer, C.W. Schneider, J. Stahn, T. Lippert, J. White, A. Wokaun
Preparation, and structural and magnetic characterization of multiferroic o-$TbMnO_3$ and o-$LuMnO_3$ thin films
MaNEP, Swiss Workshop on Materials with Novel Electronic Properties, Les Diablerets, July 2011.

J. Bernard, M. Hofer, U. Hannesen[1], A. Toth[2], A. Tsukada, F.N. Büchi, P. Dietrich
Direct electrical coupling of fuel cell and battery for electric powertrains
International Advanced Mobility Forum (IAMF), Geneva, March 8-9, 2011.
[1] Belenos Clean Power Holding, Biel
[2] Swatch Group, Biel

S.M.A. Biollaz
Future needs on biomass gasification and gas cleaning for SNG production for optimizing the whole value Chain from biomass to SNG sulfur
tcbiomass2011, Chicago, USA, September 28–30, 2011.

P. Bleith, V. Godbole, C. Viellevieille, P. Novák
$M_{0.5}TiOPO_4$ as high specific charge battery material
LAC Christmas Symposium, ETH Zürich, December 21, 2011.

P. Boillat, P. Oberholzer, R. Siegrist, A. Kästner, E. H. Lehmann, G. G. Scherer, A. Wokaun
Assessing the effect of liquid water on PEFC performance by the combined use of transient helox operation and neutron imaging
8th Symposium on Fuel Cell Modeling and Experimental Validation (MODVAL8), Bonn, Germany, March 8-9, 2011.

C.N. Borca, A. Uldry, A. Idhil, N. Zema[1], S. Turchini1, D. Catone[1], A. Foelske, D. Grolimund, M. Samaras[2]
The influence of Cr-composition on the local magnetic structure of FeCr alloys
E-MRS ICAM IUMRS 2011 Spring Meeting, Nice, France, May 9-13, 2011.
[1] CNR, Roma, Italy
[2] University of Applied Science, Rapperswil

F.N. Büchi, J. Eller, J. Roth, F. Marone, M. Stampanoni[1], A. Wokaun
Progress in in-situ x-ray tomography of in PEFC
8th Symposium on Fuel Cell Modelling and Experimental Validation (MODVAL 8), Bonn, Germany, March 8-9, 2011.
[1] Institute for Biomedical Engineering, University and ETH Zürich

F.N. Büchi, J. Bernard, M. Hofer, U. Hannesen[1]
H_2/O_2 fuel cell system for automotive application
European Fuel Cell Forum 2011, Lucerne, June 28 –July 1, 2011.
[1] Belenos Clean Power Holding, Biel

F.N. Büchi, J. Eller, J. Roth, F. Marone, M. Stampanoni[1], A. Wokaun
Towards ultra-fast x-ray tomographic microscopy of liquid water in PEFC
220th ECS Meeting, Boston, MA, USA, October 9-14, 2011.
[1] Institute for Biomedical Engineering, University and ETH Zürich

N. Bukowiecki, E. Andrews[1]
Climatology of Aerosol Radiative Properties in the Free Troposphere
International Symposium Climate Change in High Mountain Regions, Zentralanstalt für Meteorologie und Geodynamik, Salzburg, Austria, August 28 - September 1, 2011.
[1] external member of the AeroRadProp team

N. Bukowiecki, M. Gysel, Z. Jurányi, G. Wehrle, P. Zieger, M. Laborde, E. Hammer, E. Weingartner, U. Baltensperger
Long-term aerosol measurements at the high altitude research station Jungfraujoch (Switzerland)
International Symposium Climate Change in High Mountain Regions, Zentralanstalt für Meteorologie und Geodynamik, Salzburg, Austria, August 28 - September 1, 2011.

N. Bukowiecki, P. Zieger, E. Weingartner, Z. Jurányi, M. Gysel, B. Neininger[1], B. Schneider[1], C. Hueglin[1], A. Ulrich[1], A. Wichser[1], S. Henne[1], D. Brunner[1], R. Kaegi[1], M. Schwikowski, L. Tobler, F.G. Wienhold[1], I. Engel[1], B. Buchmann[1], T. Peter[1], U. Baltensperger
Ground-based and airborne in-situ measurements of the Eyjafjallajökull volcanic aerosol plume in Switzerland in April and May 2010
EGU General Assembly 2011, Vienna, Austria, Geophysical Research Abstracts **13**, EGU2011-2420, 2011.
[1] external member of the Swiss Eyja in-situ team

N. Bukowiecki, P. Zieger, E. Hammer, Z. Jurányi, M. Gysel, E. Weingartner, J. Spiegel[1], W. Eugster[1], U. Baltensperger
On the activation and ambient peak supersaturation of CCNs at Jungfraujoch, Switzerland (3580 m asl): Results from the CLACE 2010 campaign
EAC, Manchester, UK, September 4-9, 2011.
[1] ETH Zürich

F. Canonaco, J. Slowik, A.S.H. Prévôt, U. Baltensperger
Long-term on-line measurement of non-refractory submicron aerosol in the city of Zurich
EAC, Manchester, UK, September 4-9, 2011.

M. Collaud, E. Weingartner, C. Ketterer, O. Maier, S. Frey, P. Zieger, N. Bukowiecki, U. Baltensperger
Planetary boundary layer influence at the Jungfraujoch: In-situ and remote sensing measurements
EAC, Manchester, UK, September 4-9, 2011.

M. Crippa, C. Mohr, M. Heringa, A.S.H. Prévôt, U. Baltensperger
Contributions from woodburning: Mobile and stationary measurements of PM1 chemical composition at various sites across Europe
IMBALANCE meeting, ETH Zürich, February 2, 2011.

M. Crippa, J. Slowik, A.S.H. Prévôt, U. Baltensperger
Wintertime organic source apportionment in the Paris region
– Final Symposium of the EU FP7 project MEGAPOLI, Paris, France, September 26, 2011.
– AAAR, Orlando, USA, October 3-7, 2011.

I. Czekaj, J. Wambach, O. Kröcher
DFT modeling of catalysts for energy supply and environment protection
HITY 2011, Krakow, Poland, May 18-20, 2011.

I. Czekaj, J. Wambach, R.P.W.J. Struis, S.M.A. Biollaz
Density functional theory study of Ni-Al_2O_3 catalyst poisoning
14th International Density Functional Theory Conference: Applications in Physics, Chemistry, Biology, Pharmacy, Athens, Greece, August 29 – September 2, 2011.

B. D'Anna[1], N. Marchand[2], I. El Haddad, A. Boréave[2], O. Favez[2], C. George[2], C. Piot[3], J.-L. Jaffrezo[3], J.-L. Besombes[4], H. Wortham[2]
Source apportionment of fine aerosol in Marseille (France)
EAC, Manchester, UK, September 4-9, 2011.
[1] CNRS-Université Lyon, Villeurbanne, France
[2] CNRS-Université d'Aix-Marseille, Marseille, France
[3] CNRS-Université Grenoble, France
[4] Université Savoie-Polytech'Savoie, Chambéry, France

J. Dommen, T. Tritscher, P.F. DeCarlo, P.B. Barmet, A.P. Praplan, E. Weingartner, M. Gysel, A.S.H. Prévôt, N.M. Donahue, U. Baltensperger
Aging of secondary organic aerosol in a smog chamber
EAC, Manchester, UK, September 4-9, 2011.

J. Eller, J. Roth, M. Stampanoni[1], A. Wokaun, F.N. Büchi
XTM visualization of water condensation and evaporation in porous gas diffusion layers of polymer electrolyte fuel cell
MUSIS Workshop, Bad Lauterbad, Germany, February 2-4, 2011.
[1] Institute for Biomedical Engineering, University and ETH Zürich

J. Eller, J. Roth, F. Marone, M. Stampanoni[1], A. Wokaun, F.N. Büchi
In-situ x-ray tomographic microscopy of polymer electrolyte fuel cells: Analysis of 3D water distribution
3rd Interpore Conference, Bordeaux, France, March 29-31, 2011.
[1] Institute for Biomedical Engineering, University and ETH Zürich

I. Engel[1], B. Luo[1], C.R. Hoyle, F.G. Wienhold[1], M.C. Pitts[1], L.R. Poole[1], J.-U. Grooß[1], T. Peter[1]
PSC observations in the Arctic winter 2009/2010 suggest heterogeneous nucleation of NAT and ice
2011 IYC Symposium on Stratospheric Ozone and Climate Change, Washington DC, USA, November 10, 2011.
[1] external member of RECONCILE project

A. Foelske-Schmitz, D. Weingarth, A. Wokaun, R. Kötz
XPS analysis of electrochemical processes at the ionic liquid/electrode and the ionic liquid/ultra high vacuum interface
220th ECS Meeting, Boston, USA, October 9-14, 2011.

A. Foelske-Schmitz, D. Weingarth, A. Wokaun, R. Kötz
Quasi in situ XPS study of electrochemical oxidation/reduction of HOPG in the ionic liquid [EMIM][BF$_4$]
SAOG, Fribourg, January 28, 2011.

M. Frosch[1], M. Bilde[1], A. Nenes[2], A.P. Praplan, Z. Juranyi, J. Dommen, M. Gysel, E. Weingartner, U. Baltensperger
CCN activity and volatility of β-caryophyllene secondary organic aerosol
NOSA & FAAR Aerosol Symposium 2011, Tampere, Finland, November 9-11, 2011.
[1] University of Copenhagen, Denmark
[2] Georgia Institute of Technology, Atlanta, Georgia, USA

M. Furger, M. Crippa, F. Freutel[1], L. Poulain[2], S. Visser, S. Szidat[3], P. Zotter, A.S.H. Prévôt, U. Baltensperger
Regional vs. local aerosol sources during the MEGAPOLI Paris campaigns
IUGG General Assembly, Melbourne, Australia, June 28 - July 7, 2011.
[1] Max Planck Institute for Chemistry, Mainz, Germany
[2] Leibniz Institute for Tropospheric Research, Leipzig, Germany
[3] University of Bern

T. Gerber
Dissociative photoionization of urea: On the enthalpy of formation of isocyanic acid
COST Action CM0901 Second Annual meeting, Zaragoza, Spain, September 7-9, 2011.

V. Godbole, C. Villevieille, H.-H. Sommer, S. Indris[1], P. Novák
Structural and electrochemical studies of $M_{0.5}TiOPO_4$ (M=Ni, Cu, Mg) synthesized using modified solution route
Lithium Batteries Discussion 2011, Arcachon, France, June 12-17, 2011.
[1] Karlsruhe Institute of Technology, Karlsruhe, Germany

L. Gubler, S.M. Dockheer[1], G.G. Scherer, W.H. Koppenol[1]
Radicals in fuel cell membranes: concentration, reaction kinetics and lifetime
Fundamentals and Developments of Fuel Cell Conference 2011, Grenoble, France, January 19-21, 2011.
[1] ETH Zürich

M. Gysel, M. Laborde, N. Bukowiecki, Z. Jurányi, E. Hammer, P. Zieger, U. Baltensperger, E. Weingartner
In situ measurement of cloud droplet activation behaviour of black carbon particles
EAC, Manchester, UK, September 4-9, 2011.

M. Gysel, M. Laborde, N. Bukowiecki, Z. Jurányi, E. Hammer, P. Zieger, U. Baltensperger, E. Weingartner
Influence of mixing state of atmospheric black carbon particles on their cloud droplet activation behaviour in real clouds
10th International Conference on Carbonaceous Particles in the Atmosphere, Vienna, Austria, June 27, 2011.

E. Hammer
Aerosol-Cloud interaction: Peak supersaturations in real clouds
NCAS Summer School 2011, University of Cambridge, September 21-23, 2011.

M.M. Hantel, T. Kaspar[1], R. Nesper[1], A. Wokaun, R. Kötz
Partially reduced graphite oxide: A graphene like material for supercapacitor electrodes
ISEE'Cap, Poznan, Poland, June 12-16, 2011.
[1] ETH Zürich

M.M. Hantel, T. Kaspar[1], R. Nesper[1], A. Wokaun, R. Kötz
A comprehensive study on partially reduced graphite oxide for supercapacitor electrodes
CESEP, Vichy, France, September 25-29, 2011.
[1] ETH Zürich

M.F. Heringa, P. Barmet, R. Chirico, C. Mohr, S.M. Platt, L.Pfaffenberger, J.G. Slowik, P.F. DeCarlo, J. Dommen, A.S.H. Prévôt, U. Baltensperger
Discrimination of secondary organic aerosol from different sources
Goldschmidt Conference, Prague, Czech Republic, August 14-19, 2011.

M. Hess, W. Märkle, P. Novák
Intercalation kinetics of lithium in graphite
The 16th International Symposium on Intercalation Compounds ISIC-16, Seč-Ústupky, Czech Republic, May 22-27, 2011.

C. Hutter, W. Villasmil, M. Chambon, A. Meier
Operational experience with a 100 kW solar pilot plant for thermal dissociation of zinc oxide
Proc. 17th SolarPACES Conference, Granada, Spain, September 20-23, 2011.

P. Jansohn
Gas turbine combustion for zero emission power plants
International Energy Agency (IEA), Implementing Agreement on Energy Conservation and Emission Reduction in Combustion
33rd Task Leaders Meeting, Lund, Sweden, August 7-11, 2011.

J. Kang, N. I. Prasianakis, J. Mantzaras
Thermal multi-component flow simulation on standard lattices with application to energy conversion systems
20th International Conference on Discrete Simulation of Fluid Dynamics (DSFD2011), North Dakota, USA, August 8-12, 2011.

M.D. Kaufman-Rechulski, T.J. Schildhauer, S.M.A. Biollaz
Organic sulfur compounds in the producer gas from wood and grass gasification
European Biomass Conference and Exhibition Berlin, Germany, June 6-10, 2011.

J. Keller, S. Aksoyoglu Sloan, D. Oderbolz, A.S.H. Prévôt
From MM5 to WRF-AWR: Performance of Meteorological Modeling for Air Quality Simulations with CAMx in Central Europe with a particular Focus on Switzerland
ACCENT/GLOREAM Workshop on Tropospheric Chemical Transport Modelling, Copenhagen, Denmark, January 26-28, 2011.

G. Knopp
Time-frequency resolved fs-FWM studies of alkyl-benzenes
European Conference on Nonlinear Optics and Spectroscopy ECONOS, Enschede, The Netherlands, May 23-24, 2011.

C.F.J. König, J.A. van Bokhoven, T.J. Schildhauer, M. Nachtegaal
Quantitative analysis of modulated-excitation X-ray absorption spectra
1st Swiss Heterogeneous Catalysis Meeting, Grindelwald, June 16-17, 2011.

S. Kreitmeier, A. Wokaun, F.N. Büchi
Characterization of the gas separation in PEFC membranes
8th Symposium on Fuel Cell Modeling and Experimental Validation (MODVAL8), Bonn, Germany, March 8-9, 2011.

S. Kreitmeier, A. Wokaun, F.N. Büchi
Local degradation of the gas separation in PFSA membranes
2nd International Workshop on Degradation Issues of Fuel Cells, Thessaloniki, Greece, September 21-23, 2011.

L. Künzi, S. Schneider, P. Mertes, J. Dommen, U. Baltensperger, A.S.H. Prévôt, M. Kalberer, M. Geiser
Responses of lung cell cultures after realistic exposure to primary and secondary carbonaceous aerosols
EAC, Manchester, UK, September 4-9, 2011.

M. Laborde, M. Gysel, M. Schnaiter[1], C. Linke[1], H. Saathoff[1], K.-H. Naumann[1], O. Möhler[1], J. Taylor[1], M. Flynn[1], J. Allan[1], H. Coe[1], K. Heimerl[1], F. Dahlkötter[1], B. Weinzierl[1], A. Wollny[1], L. Polo[1], J. Cozic[1], P. Laj[1], J.M. Flores[1], Y. Rudich[1], S. Berlenz[1] and U. Wagner[1]
Single Particle Soot Photometer (SP2) intercomparison: Results from 6 instruments
EAC, Manchester, UK, September 4-9, 2011.
[1] external member of the SOOT11 consortium

M. Laborde, M. Gysel, M. Schnaiter[1], C. Linke[1], H. Saathoff[1], K.-H. Naumann[1], M. Flores[1] Y.Rudich[1]
Soot particles restructuration due to coating: Result from the AIDA chamber using a Single Particle Soot Photometer (SP2)
10th International Conference on Carbonaceous Particles in the Atmosphere, ICCPA, Vienna, Austria, June 28, 2011.
[1] external member of the SOOT11 consortium

T. Lippert, T. Mattle, U. Lehmann, A. Hintennach, A. Grisel
Semiconducting sensing Layers deposited with a Laser-induced Forward Transfer Process (LIFT) Process for the Manufacturing of Integrated Gas Sensors
4th International Symposium on Flexible Organic Electronics, Thessaloniki, Greece, July 2011.

Y. Liu, F. Siekmann[1], G. Salque[2], P. Renard[1], I. El Haddad, B. Temime-Roussel[1], D. Voisin[2], R. Thissen[3], A. Monod[1]
Oligomer and SOA formation through atmospheric aqueous phase processing of methacrolein and methyl vinyl ketone
10th International Conference on Carbonaceous Particles in the Atmosphere (ICCPA), Vienna, Austria, June 26-29, 2011.
[1] Aix-Marseille University, Marseille, France
[2] Université Joseph Fourier – Grenoble, France
[3] Institut de Planétologie et d'Astrophysique de Grenoble, France

P. Loutzenhiser[1], A. Stamatiou[1], D. Gstoehl, A. Meier, A. Steinfeld
Concentrated solar power for producing liquid fuels from CO_2 and H_2O
TMS Symposium Carbon Dioxide and Other Greenhouse Gas Reduction Metallurgy, San Diego, USA, February 27 - March 3, 2011.
[1] ETH Zürich

M. Mehring
Detailed diesel soot analysis by TG-FTIR
Anakon 2011, Zürich, March 22-25, 2011.

C. Mohr, A.S.H. Prévôt, I. El Haddad, C. Mohr, M. Crippa, S. Platt, L. Poulain[1], J. Slowik, U. Baltensperger
Contribution of cooking to organic aerosol in urban areas
AGU, San Francisco, USA, December 5-9, 2011.
[1] Leibniz Forschungsinstitut, Leipzig, Germany

A. Monod[1], F. Siekmann[1], P. Renard[1], Y. Liu, I. El Haddad, B. Temime-Roussel[1], E. Quivet[1], N. Marchand[1], H. Wortham[1]
Atmospheric aqueous phase processes
Workshop on Atmospheric Composition and Processes in Contrasting Environments, Cork, Ireland, September 20, 2011.
[1] Aix-Marseille University, Marseille, France

P. Novák
Fährt das Auto der Zukunft mit Batterien?
- PSI Villigen, August 5, 2011 and October 16, 2011.
- Schloss Böttstein, Böttstein, March 31, 2011.

P. Oberholzer, P. Boillat, R. Siegrist, A. Kästner, E.H. Lehmann, G.G. Scherer, A. Wokaun
Sub-zero isothermal start-up of PEFC visualized with neutron imaging
8th Symposium on Fuel Cell Modeling and Experimental Validation (MODVAL8), Bonn, Germany, March 8-9, 2011.

P. Oberholzer, P. Boillat, R. Siegrist, A. Kaestner, E.H. Lehmann, G.G. Scherer, A. Wokaun
Neutron imaging of isothermal sub-zero degree celsius cold-starts of a polymer electrolyte fuel cell (PEFC)
220th ECS Meeting, Boston, USA, October 9-14, 2011.

D.C. Oderbolz, S.A. Sloan, J. Keller, I. Barmpadimos, C. Häni, A.S.H. Prévôt
3D-modelling of biogenic secondary aerosol in Switzerland and Europe using different bVOC models
International Workshop on Biogenic Volatile Organic Compound Emissions, Models and Their Applications, Lancaster Environment Centre, Lancaster University, UK, May 17-18, 2011.

D. Peitz
Guanidinium formate as a novel ammonia precursor for NO_x abatement using selective catalytic reduction in mobile applications
ACS National Meeting, Denver, Colorado, USA, August 28 – September 1, 2011.

D. Peitz
Catalytic decomposition of guanidinium formate for onboard ammonia gas production, independent of engine operation
9. FAD-Konferenz „Herausforderung Abgasnachbehandlung für Dieselmotoren“, Dresden, Germany, November 3-4, 2011.

R.J. Peláez[1], C.N. Afonso[1], J. Chen, M. Esposito, T. Lippert
Do negative ions matter in pulsed laser deposition?
11th International Conference on Laser Ablation (COLA), Cancun, Mexico, November 2011.
[1] Instituto de Optica, Serrano, Madrid, Spain

L. Pfaffenberger, P. Barmet, J. Slowik, A.P. Praplan, S. Platt, J. Dommen, A.S.H. Prévôt, U. Baltensperger
How to produce low-volatility oxygenated organic aerosol
AAAR, Orlando, USA, October 3-7, 2011.

N. I. Prasianakis, J. Kang, J. Mantzaras
Lattice Boltzmann approaches for thermal multi-component flows in complex geometries
8th International Conference for Mesoscopic Methods in Engineering and Science (ICMMES 2011), Lyon, France, July 4-8, 2011.

N. I. Prasianakis, J. Kang, F.N. Büchi, J. Mantzaras
Modeling of heat transfer and mixing processes for complex geometries with applications to energy conversion systems
64th Annual Meeting, Division of Fluid Dynamics (DFD2011), Maryland, USA, November 20-22, 2011.

A.S.H. Prévôt
Primary and secondary organic aerosol emissions from 2-stroke mopeds
AAAR, Orlando, USA, October 3-7, 2011.

A.S.H. Prévôt
The weekly cycle of ambient concentrations and traffic emissions of coarse (PM10-PM2.5) atmospheric particles
EAC, Manchester, UK, September 4-9, 2011.

A.S.H. Prévôt
Organic aerosols and their sources in Paris during the MEGAPOLI winter campaign
European Geophysical Union, Vienna, Austria, April 4-8, 2011.

A.S.H. Prévôt
Diurnal cycle of fossil and non-fossil total carbon using ^{14}C analyses during CalNex
AAAR, Orlando, USA, October 3-7, 2011.

A.S.H. Prévôt
Sources of particulate matter in Paris
Final Megapoli Meeting, September 26-28, 2011.

U. Rhyner, J.W. Regler, S.M.A. Biollaz, R. Mai, H. Leibold
1150h hot gas filter experiment for B-IGFC process
European Biomass Conference and Exhibition Berlin, Germany, June 6-10, 2011.

U. Rhyner, S.M.A. Biollaz, T. J. Schildhauer
Catalytic conversion of tars in a monolith in the presence of H2S at 750°C
European Biomass Conference and Exhibition Berlin, Germany, June 6-10, 2011.

F. Riccobono, E. Weingartner, U. Baltensperger and the CLOUD Collaboration
CLOUD results
CHIPP Meeting, Leysin, September 1-2, 2011.

F. Riccobono, E. Weingartner, U. Baltensperger
First results from the CLOUD experiment at CERN
AAAR, Orlando, USA, October 3-7, 2011.

F. Riccobono, E. Weingartner, U. Baltensperger
Early stage particle growth rates during the CLOUD experiment
EAC, Manchester, UK, September 4-9, 2011.

K.T. Rinne, N.J. Loader[1], V.R. Switsur[2], J.S. Waterhouse[2]
400-year May-August precipitation reconstruction for Southern England using stable oxygen isotope ratios ($\delta^{18}O$) of tree rings
XVIII INQUA Congress, Bern, July 21-27, 2011.
[1] Swansea University, UK
[2] Anglia Ruskin University, Cambridge, UK

B. Rosati
Investigation of hygroscopicity and aging of aerosols using the WHOPS
NCAS Summer School, Scotland, UK, September 11-23, 2011.

J. Roth, J. Eller, F.N. Büchi
Effects of synchrotron radiation on polymer electrolyte fuel cell materials
220th ECS Meeting, Boston, USA, October 9–14, 2011.

T. Sasaki, V. Godbole, C. Villevieille, Y. Ukyo[1], P. Novák
Direct detection of inhomogeneous reactions perpendicular to current collector by using in situ XRD
Lithium Batteries Discussion 2011, Arcachon, France, June 12-17, 2011.
[1] Toyota Central R&D Labs.

T. Sasaki, V. Godbole, C. Villevieille, Y. Ukyo[1], P. Novák
In situ investigation of inhomogeneous reactions perpendicular to current collector by using two-layer electrodes
62nd ISE Annual Meeting, Niigata, Japan, September 11-16, 2011.
[1] Toyota Central R&D Labs.

M. Saurer, A. Kress, O. Sidorova, R. Siegwolf
On the reconstruction of precipitation in temperature-limited environments by the use of stable isotopes in tree-rings
XVIII INQUA Congress, Bern, July 21-27, 2011.

M. Saurer, R. Siegwolf
Stable isotopes as long-term indicators of hydrological changes
GASIR Conference, PSI Villigen, October 10-12, 2011.

A. Savouchkina, A. Foelske-Schmitz, V.A. Guzenko, D. Weingarth, R. Kötz, G.G. Scherer, A. Wokaun
In situ STM study of Pt-nanodot arrays on HOPG prepared by electron beam lithography
ECASIA, Cardiff, UK, September 4-9, 2011

T.J. Schmidt, H.A. Gasteiger[1]
Polymer electrolyte fuel cells
Short Course at the ECS Meeting, Boston, USA, October 9, 2011.
[1] TU Munich, Germany

L. Schnaiter[1], K. -H Naumann[1], H. Saathoff[1], Möhler[1], M. Flores[1], Y. Rudich[1], A. Wollny[1], M. Flynn[1], J. Taylor[1], M. Laborde, M. Gysel, S. Berlenz[1], U. Wagner[1]
Laboratory study on the UV-VIS-NIR light absorption properties of combustion aerosols by means of four different photoacoustic instruments
10th International Conference on Carbonaceous Particles in the Atmosphere, Vienna, June 21-27, 2011.
[1] External member of the SOOT11 consortium

C.W. Schneider, M. Esposito, I. Marozau, Y. Hu, T. Lippert, K. Conder, M. Doebeli[1], M. Mallepell[1], C. Richter[2], J. Mannhart[2], A. Wokaun
Oxygen diffusion properties of $SrTiO_3$ and $LaAlO_3$ thin films
Workshop on Synthesis and Design of Multi-Functional Materials and Heterostructures (MAMA), Napoli, Italy, October 2011.
[1] ETH Zürich
[2] University of Augsburg, Germany

J. Shaw Stewart, T. Lippert, M. Nagel[1], F. Nüesch[1], A. Wokaun
A tri-colour PLED pixel by laser-induced forward transfer
11th International Conference on Laser Ablation (COLA), Cancun, Mexico, November 2011.
[1] Empa Dübendorf

O.V. Sidorova, M. Saurer, R. Siegwolf
Extremely warm periods in the eastern Taimyr inferred from tree-ring and stable isotope chronologies
GASIR Conference, PSI Villigen, October 10-12, 2011.

O.V. Sidorova, R. Siegwolf, V.S. Myglan[1], N.J. Loader[2], A. Kress, G. Helle[3], K. Treydte[4], M. Saurer
Climatic changes in the high altitude regions inferred from tree-rings and stable isotopes
EURODENDRO, Engelberg, September 19-23, 2011.
[1] Siberian Federal University, Russia
[2] Swansea University, UK
[3] German Centre for GeoSciences-GFZ, Potsdam, Germany
[4] WSL Birmensdorf

J.G. Slowik, R.Y.-W. Chang[1], S.J. Sjostedt[1], A. Vlasenko[1], J.P.D. Abbatt[1]
Factor analysis of coupled aerosol and VOC mass spectra in regions of biogenic influence
AAAR, Orlando, USA, October 3-7, 2011.
[1] University of Toronto, Canada

J.G. Slowik, J.P.S. Wong[1], J.P.D. Abbatt[1]
Real-time, controlled OH-initiated oxidation of biogenic secondary organic aerosol
EAC, Manchester, UK, September 4-9, 2011.
[1] University of Toronto, Canada

J. Slowik, R. Wolf, I. El Haddad, L. Williams[1], L. Gonzalez[2], J. Jayne[1], D. Worsnop[1], K. Smith[2], A.S.H. Prévôt, U. Baltensperger
A New PM2.5 Aerodynamic lens for aerosol mass spectrometry: intercomparison and first field deployment
AAAR, Orlando, USA, October 3-7, 2011.
[1] Aerodyne Research, Billerica, USA
[2] Massachusetts Institute of Technology, Cambridge, USA

M.E. Spahr[1], T. Hucke[1], F. Mornaghini[1], W. Märkle, P. Novák
The influence of carbon additives on the engineering and performance of lithium-ion battery electrodes
International Battery Association 2011 Meeting, Cape Town, South Africa, April 11-15, 2011.
[1] TIMCAL SA, Bodio

D. Stender, S. Cook[1], T. Lippert, J.A. Kilner[1], A. Wokaun
SIMS characterization of thin films grown on isotopically labeled substrates
International Conference on Solid State Ionics 18, Warsaw, Poland, July 2011.
[1] Imperial College of Science, Technology and Medicine, London, UK

K. Streit, K. Rinne, N. Buchmann[1], R. Siegwolf
Tracing the C allocation in Larix after 9 years of CO_2 exposure and 3 years of soil warming
GASIR, Annual Meeting of German Association for Stable Isotope Research, PSI Villigen, October 10-12, 2011.
[1] ETH Zürich

Y. Sych
Intersystem crossing in radicals by two-color four-wave mixing
ECONOS 2011, University of Twente, Enschede, The Netherlands, May 23-25, 2011.

J.W. Taylor[1], J. Allan[1], D. Liu[1], M. Gysel, M. Schnaiter[1], H. Coe[1]
Changes in black carbon composition and optical properties due to coatings of secondary organics
AAAR, Orlando, USA, October 3-7, 2011.
[1] external members of the SOOT11 team

T. Tritscher, M. Crippa, Z. Jurányi, M. Laborde, E. Weingartner, U. Baltensperger
Volatility and hygroscopicity of ambient aerosols during MEGAPOLI Paris campaign
AAAR, Orlando, USA, October 3-7, 2011.

S. Ulli-Beer
How does the Multi-Level Perspective help to enhance a System Dynamics analysis of a specific transition challenge?
2nd International Conference on Sustainability Transitions IST, Lund, Sweden, June 13-14, 2011.

S. Ulli-Beer, B. Boksberger, A. Wokaun
How to calibrate and validate the global Industrial Transformation Model (ITM) for the automaker industry together with practitioners?
Workshop der GOR-Arbeitsgruppe „Simulation und Optimierung komplexer Systeme", Wuppertal, Germany, February 24-25, 2011.

P. Verma, P. Novák
Grafting as novel approach to obtain surface modified carbons for tuning Li^+ intercalation kinetics and SEI morphology
Lithium Batteries Discussion 2011, Arcachon, France, June 12-17, 2011.

C. Villevieille, H. Sommer, H. Schneider, S. Pérez-Villar, P. Novák
Structural investigations of $Li_2MnO_3 \cdot Li(Mn_xNi_yCo_z)O_2$ - neutron diffraction, in situ X-ray diffraction, and in situ Raman spectroscopy
220th ECS Meeting, Boston, USA, October 9-14, 2011.

S. Visser, M. Furger, A.S.H. Prévôt
High time-resolution elemental composition of particulate matter in Pasadena
CalNex Data Analysis Workshop, Sacramento, California, USA, May 16-19, 2011.

S. Visser, M. Furger, A.S.H. Prévôt
PM10, PM2.5 and PM1.0 elemental analysis with 2-hour time resolution
ClearfLo IOP Planning Meeting, Birmingham, UK, October 6, 2011.

S. Visser, M. Furger, A. Richard, A.S.H. Prévôt, U. Baltensperger
Trace elements in aerosols - RDI & SR-XRF
MEGAPOLI Meeting, PSI Villigen, April 26-27, 2011.

D. Weingarth, A. Foelske-Schmitz, A. Wokaun, R. Kötz
Electrochemistry combined with XPS: In situ study of the Pt / [EMIM][BF4] system
ECASIA, Cardiff, UK, September 4-9, 2011.

E. Weingartner, J. Cozic, B. Verheggen, S. Mertes, N. Bukowiecki, Z. Jurányi, M. Gysel, M. Laborde, E. Hammer, U. Baltensperger
Measurements of aerosol activation behavior in mixed phase clouds at the high alpine site Jungfraujoch (3580 m asl, Switzerland)
The XXV IUGG General Assembly, Melbourne, Australia, June 28 - July 7, 2011.

A. Wokaun
Szenarien der künftigen Energieversorgung der Schweiz
Überparteiliche Informationsveranstaltung 'Ersatz des Kernkraftwerks Mühleberg – Fakten statt Emotionen' in Thun und Neuenegg, January 11 and 20, 2011.

A. Wokaun
Fernwärme für das Klima
Fernwärme-Forum, Kongresshaus Biel, January 20, 2011.
Teilnehmer der Podiumsdiskussion

A. Wokaun
Mögliche Technologien zur Eigenproduktion: pro und cons
Novartis, Basel, May 12, 2011.

A. Wokaun
Member in Panel Session *'Energy security – the price we have to pay'*
41st St. Gallen Symposium, University of St. Gallen, May 13, 2011.

A. Wokaun
Keynote in session '*Renewable Energy and Storage*'
World Engineers' Convention, Geneva, September 4-9, 2011.

R. Wolf, J. Slowik, I. El Haddad, L.R. Williams[1], J.T. Jayne[1], D.R. Worsnop[1], A.S.H. Prévôt, U. Baltensperger
Ambient measurements of large particles with an aerosol mass spectrometer
EAC 2011, Manchester, UK, September 4-9, 2011.
[1] Aerodyne Research Inc., Billerica, Massachusetts, USA

R. Wolf, J. Slowik, A.S.H. Prévôt, U. Baltensperger
AMS measurements during BIO06 campaign
KIT Karlsruhe, Germany, November 24-25, 2011.

P. Zieger, N. Bukowiecki, U. Baltensperger, C. Ketterer[1], M. Collaud Coen[1], O. Maier[1], E. Kienast[1], F. Wienhold[1], T. Peter[1], J. Von Bismarck[1], M. Starace[1], T. Ruhtz[1], K. Clemer[1], M. Van Roozendael[1], S. Frey[1], H. Wille[1], E. Weingartner
Closure study of aerosol optical properties using in-situ and remote sensing techniques
EAC 2011, Manchester, UK, September 4-9, 2011.
[1] external member of the CLACE2010 optical closure study team

P. Zieger, R. Fierz-Schmidhauser, M. Gysel, J. Ström[1], S. Henne[2], K.E. Yttri[3], U. Baltensperger, E. Weingartner
Effects of relative humidity on aerosol light scattering in the Arctic
10th Ny-Alesund seminar, Kjeller, Norway, October 25-26, 2011.
[1] Norwegian Polar Res Inst, Tromso, Norway
[2] Empa Dübendorf
[3] Norwegian Inst Air Res, Kjeller, Norway

P. Zieger, R. Fierz-Schmidhauser, E. Weingartner, U. Baltensperger
Effects of relative humidity on aerosol light scattering: Results from different European sites
EAC 2011, Manchester, UK, September 4-9, 2011.

P. Zieger, E. Weingartner, J. Henzing[1], M. Moerman[1], G. de Leeuw[1], J. Mikkilä[1], M. Ehn[1], T. Petäjä[1], K. Clemer[1], M. van Roozendael[1], S. Yilmaz[1], U. Friess[1], H. Irie[1], T. Wagner[1], R. Shaiganfar[1], S. Beirle[1], A. Apituley[1], K. Wilson[1], U. Baltensperger
Comparison of ambient aerosol extinction coefficients obtained from in-situ, MAX-DOAS and LIDAR measurements at Cabauw
EAC 2011, Manchester, UK, September 4-9, 2011.
[1] external member of the CINDI consortium

P. Zotter, A.S.H. Prévôt, Y.L. Zhang[1], S. Szidat[1], X. Zhang[2], Y.-H. Lin[3], P. Hayes[4], J. Schnelle-Kreis[5], G. Seibert[5], R. Zimmermann[5], J.D. Surratt[3], J.L. Jimenez[4], R. Weber[2], U. Baltensperger
Diurnal cycle of fossil and non-fossil total carbon using ^{14}C analyses during CalNex
CalNex Data Analysis Workshop, Sacramento, California, USA, May 16-19, 2011.
[1] University of Bern
[2] Georgia Institute of Technology, Atlanta, USA
[3] University of North Carolina, Chapel Hill, USA
[4] University of Colorado, Boulder, USA
[5] Helmholtz Zentrum München, Germany

Contributions to Media

U. Baltensperger
Cern-Experiment stellt Wissen über Wolken infrage
Zeitungsbericht: Tages Anzeiger, August 25, 2011.

U. Baltensperger
Ozon- und Pollenbelastung treffen das Land härter
– Zeitungsbericht: Der Bund, April 27, 2011.
– Zeitungsbericht: Tages Anzeiger und Tagesanzeiger online, April 27, 2011.
– Online: Baslerzeitung Online, April 27, 2011.

U. Baltensperger
So hilft der Teilchenbeschleuniger bei der Erforschung von Wolken
Online: Basler Zeitung Online, August 26, 2011.

U. Baltensperger
Cern study gives insight into cloud formation
Online: swissinfo.ch swissinfo englisch, August 26, 2011.

U. Baltensperger
Einfluss von Schwefelsäure- und Ammoniakdämpfen überschätzt
Zeitungsbericht: Die Botschaft, August 27, 2011.

U. Baltensperger
Klimaexperiment mit Teilchenbeschleuniger trägt Früchte
– Zeitungsbericht: Neue Züricher Zeitung, August 31, 2011.
– Online: NZZ Online, August 31, 2011.

U. Baltensperger
Excellent wood burning wood improve air quality
environmentalresearchweb, April 8, 2011.

N. Bukowiecki
Saubere Strassen und intakte Beläge sorgen für bessere Luft
Journal: Gesundheitsschutz und Umwelttechnik, April 26, 2011.

P. Dietrich
Preisauszeichnung für innovative Arbeiten im Bereich Energiesparen
Radio Central, January 6, 2011.

P. Dietrich
Zweimal 'Watt d'Or' für den Aargau
SR DRS 1, Regionaljournal Aargau/Solothurn, January 5, 2011.

P. Dietrich
Saubere Mobilität
Automobil Revue, January 12, 2011.

P. Dietrich
Prestigepreis «Watt d'Or 2011»für innovative Energietechnologien
SEV-VSE Bulletin, January 21, 2011.

P. Dietrich
Potenzial einer kostengünstigen Brennstoffzelle für Autos aufgezeigt
neue Produkte, February 15, 2011.

P. Dietrich
Technikkongress in Genf
Automobil Revue, March 15, 2011.

P. Dietrich
Kostengünstige Brennstoffzelle für Autos
Aktuell Technik, September 16, 2011.

P. Dietrich
Tankstelle zu Hause. Auto verbrennt Wasserstoff mit reinem Sauerstoff
Fernsehbericht: nano, 3sat, October 6, 2011.

P. Dietrich
Anlass Schweizerischer Energierat
Interview Tagesschau November 3, 2011.

M. Gysel
Russ lässt Gletscher schmelzen
Journal: Gesundheitsschutz und Umwelttechnik, April 26, 2011.

P. Jansohn
Mehr Klimaschutz dank Gasstrom?
Zeitungsartikel: Tagesanzeiger, May 6, 2011.

P. Jansohn
centrali a gas: una tecnologia su cui contare per l'uscita dal nucleare?
RSI Rete Uno, Radiogiornale, December 15, 2011 (edizione delle 18:30).

A. Meier, C. Hutter
Schweizer Forscher speichern Sonnenenergie in Zink
Fernsehbericht: „Einstein“ im Schweizer Fernsehen SF1, October 6, 2011.

A. Wokaun
Medienkonferenz des ETH Rates zum Thema Energie
Bern, April 27, 2011.
Teilnehmer als Experte

A. Wokaun
Anhörung in der UREK Ständerat zu Fragen 'Erneuerbare Energien'
Parlamentsdienste, Bern, August 29, 2011.

POSTERS

E.M. Alayon, M. Nachtegaal, E. Kleymenov, M. Ranocchiari, J.A. van Bokhoven
Methane to methanol conversion on Cu-MOR
Swiss Chemical Society Fall Meeting, Lausanne, September 9, 2011.

E.M. Alayon, M. Nachtegaal, E. Kleymenov, M. Ranocchiari, J.A. van Bokhoven
Methane to methanol conversion on Cu-MOR
5th IDECAT/ERIC J-CAT Conference on Catalysis, Bertinoro, Italy, September 21-25, 2011.

P. Barmet, J. Dommen, P. DeCarlo, F. Bianchi, L. Pfaffenberger, M. Saurer, R. Siegwolf, A. Prévôt, U. Baltensperger
Do oxidation products of methane contribute to SOA formation?
AAAR, Orlando, USA, October 3-7, 2011.

M. Bator, M. Esposito, C.W. Schneider, T. Lippert, A. Wokaun
Investigation of excited species evolution in a laser-induced $TbMnO_3$ and $La_{1-x}Ca_xMnO_3$ plasma by optical emission spectroscopy
EMRS Spring meeting, Nice, France, May 2011.

M. Bator, Y. Hu, H. Luetkens, M. Kenzelmann, T. Lippert, C. Niedermayer, C.W. Schneider, A. Wokaun
Preparation and characterization of $TbMnO_3$ thin films
12th International Conference on Muon Spin Rotation, Relaxation and Resonance (µSR2011), Cancun, Mexico, July 2011.

A.M. Bernhard, M. Elsener, O. Kröcher
Behavior of urea decomposition byproducts on TiO_2-anatase
1st Swiss Heterogeneous Catalysis Meeting, Grindelwald, June 16-17, 2011.

A.M. Bernhard, M. Elsener, D. Peitz, O. Kröcher
Behavior of urea decomposition byproducts on TiO_2-anatase
EuropaCat X, Glasgow, Scotland, August 28 – September 2, 2011.

P. Bleith, V. Godbole, C. Villevieille, P. Novák
$Fe_{0.5}TiOPO_4$ as battery material with high specific charge
Empa-Doktoranden-Symposium, St. Gallen, October 18, 2011.

A. Bodi, A. Kvaran[1], H. Wang[1] B. Sztáray[2]
Thermochemistry of halons based on iPEPICO and computations
Gaseous Ions: Structures, Energetics & Reactions, Galveston, TX, USA, February 27 - March 4, 2011.
[1] University of Iceland, Reykjavik, Iceland
[2] University of the Pacific, Stockton, CA, USA

A. Bodi, A. G. Császár[1], B. Sztáray[2]
Unimolecular dissociation of energy selected light water ions and its isotopologues $^1H_2O^+$, $^2H_2O^+$, $^1H_2HO^+$ and $^1H_2{}^{18}O^+$
Gaseous Ions: Structures, Energetics & Reactions, Galveston, TX, USA, February 27 - March 4, 2011.
[1] Eötvös University, Budapest, Hungary
[2] University of the Pacific, Stockton, CA, USA

P. Bornhauser, Y. Sych, G. Knopp, T. Gerber, P.P.P. Radi
Deperturbation studies of radicals by applying two-color resonant four-wave mixing
31st International Symposium on Free Radicals, Port Douglas, Australia, July 24-29, 2011.

A. Brambilla, Y. Ghermay, C. Frouzakis[1], J. Mantzaras, R. Bombach
Experimental and numerical investigation of combustion dynamics in lean premixed CO/H_2/air mixtures
Schweizer Verbrennungstagung 2011, Zürich, October 28, 2011.
[1] ETH Zürich

Y. Buchmüller, G.G. Scherer, A Wokaun, L. Gubler
Introduction of functionalizable groups via radiation grafting into polymer electrolyte membranes for fuel cells
12th Tihany Symposium on Radiation Chemistry, Zalakaros, Hungary, August 27 - September 1, 2011.

N. Bukowiecki, P. Zieger, E. Hammer, Z. Jurányi, M. Gysel, M. Laborde, E. Weingartner, U. Baltensperger, M. Collaud Coen1, C. Ketterer[1], O. Maier[1], D. Ruffieux[1], J. Spiegel[1], W. Eugster[1], C. Chou[1], J. Henneberger[1], U. Lohmann[1], E. Kienast[1], F.G. Wienhold[1], T. Peter[1], J. von Bismarck[1], M. Starace[1], T. Ruhtz[1], K. Clemer[1], M. van Roozendael[1]
In-situ investigation of cloud microphysics and aerosol optical properties during the CLACE 2010 campaign at Jungfraujoch, Switzerland (3580 m asl): An Overview
EAC, Manchester, UK, September 4-9, 2011.
[1] external member of the CLACE2010 team

M. Crippa, G. Lonati
Weekly and daily patterns of the particle number concentration in Milan, Italy
AAAR, Orlando, USA, October 3-7, 2011.

I. Czekaj, J. Wambach, F. Loviat
Nickel-palladium small clusters behaviour at the γ-Al_2O_3 support: theoretical and experimental studies
HITY 2011, Krakow, Poland, May 18-20, 2011.

I. Czekaj, J. Wambach, R.P.W.J. Struis, T.J. Schildhauer, S.M.A. Biollaz
Ni-Al_2O_3 poisoning: theoretical and experimental studies
1st Swiss Heterogeneous Catalysis Meeting, Grindelwald, June 16-17, 2011.

I. Czekaj
DFT calculations and vibrational spectroscopy studies on the hydrolysis of HNCO: catalyst screening
MUST Meeting, Lenk, January 10-14, 2011.

I. Czekaj, O. Kröcher, R.P.W.J. Struis
Theoretical study of NCO and COS hydrolysis over Al_2O_3 catalyst
Fall Meeting of the Swiss Chemical Society 2011, EPF Lausanne, September 9, 2011.

I. Czekaj, J. Wambach, K. Kacprzak, F. Loviat
Nickel-palladium small clusters behaviour at the γ-Al_2O_3 support: theoretical and experimental studies
Symposium on Size Selected Clusters, Davos, March 20-25, 2011.

I. Czekaj, J. Wambach, R.P.W.J. Struis, S.M.A. Biollaz
Sulphur poisoning of Ni catalysts: DFT cluster studies
Symposium on Size Selected Clusters, Davos, March 20-25, 2011.

I. Czekaj, J. Wambach, R.P.W.J. Struis, T.J. Schildhauer, S.M.A. Biollaz
Mechanism of Ni-Al_2O_3 poisoning: theoretical and experimental studies
Frontiers in Interface Science – Theory and Experiment, Berlin, Germany, June 29-July 1, 2011.

I. Czekaj, J. Wambach
NixPdy nanoparticles stability at the γ-Al2O3 support: DFT studies
Fall meeting of the Swiss Chemical Society 2011, EPF Lausanne, September 9, 2011.

S. Daniele, Y.-C. Lin, M. Matuszewski, P. Jansohn, K. Boulouchos[1]
NO_x emissions for combustion systems relevant to zero emission power concepts
Proc. 5th European Combustion Meeting, Cardiff, Wales, UK, June 28 - July 1 2011.
[1] ETH Zürich

J. Eller, J. Roth, F. Marone, M. Stampanoni, A. Wokaun, F.N. Büchi
Insight into the 3D water distribution in PEFC gas diffusion layer by in-situ x-ray tomographic microscopy
JUM@P '11 Joint Users' Meeting at PSI, PSI Villigen, September 15-16, 2011.

M. Esposito, M. Bator, M. Döbeli[1], T. Lippert, C.W. Schneider, A. Wokaun
Negative ions: the overlooked species in thin film growth by pulsed laser deposition
11th International Conference on Laser Ablation (COLA), Cancun, Mexico, November 2011.
[1] ETH Zürich

M. Flores[1], M.Schnaiter[1], M. Laborde, J.Taylor[1], C. Linke[1], H. Saathoff[1], M. Gysel, S.Borrmann[1], A. Abo Riziq[1], Y.Rudich[1]
Optical evolution of pure black carbon and internally mixed with secondary organic aerosol
10th International Conference on Carbonaceous Particles in the Atmosphere, ICCPA, Vienna, June 26-29, 2011.
[1] external member of the SOOT11 consortium

A. Foelske-Schmitz, A. Savouchkina, V.A. Guzenko, D. Weingarth, A. Wokaun, G.G. Scherer, R. Kötz
In situ STM study of Pt-nanodot arrays on HOPG prepared by electron beam lithography
220th ECS Meeting, Boston, USA, October 9-14, 2011.

A. Foelske-Schmitz, D. Weingarth, R. Kötz, A. Wokaun
XPS study of electrochemical processes at the ionic liquid/electrode and ionic liquid/ultra high vacuum interface
Ionic Liquids: Faraday Discussion 154, Belfast, UK, August 22-24, 2011.

T. Gerber, G. Knopp, P.P.P. Radi, A. Bodi, P. Hemberger, Y. Liu, P. Maksyutenko, Y. Sych
Combustion research with synchrotron radiation
Verbrennungsforschung in der Schweiz, ETH Zürich, November 28, 2011.

L. Gubler, W.H. Koppenol[1]
Mechanism of the chemical stabilization in fuel cell membranes using the Ce^{3+}/Ce^{4+} redox couple
220th ECS Meeting, Boston, USA, Abstract #908, October 9-14, 2011.
[1] ETH Zürich

M. Gysel, M. Laborde, M. Schnaiter[1], C. Linke[1], H. Saathoff[1], K.-H. Naumann[1], O. Möhler[1], J. Taylor[1], M.J. Flynn[1], J.D. Allan[1], H. Coe[1], K. Heimerl[1], F. Dahlkötter[1], B. Weinzierl[1], A.G. Wollny[1], L. Polo[1], J. Cozic[1], J.M. Flores[1], Y. Rudich[1], S. Berlenz[1], U. Wagner[1]
Intercomparison study of 6 Single Particle Soot Photometers
10th International Conference on Carbonaceous Particles in the Atmosphere, Vienna, Austria, June 26-28, 2011.
[1] external member of the SOOT11 team

E. Hammer, Z. Jurányi, N. Bukowiecki, E. Weingartner, M. Gysel, J. Spiegel[1], W. Eugster[1], U. Baltensperger
Calculation and interpretation of cloud peak supersaturations at the high alpine site Jungfraujoch
15th ETH-Conference on Combustion Generated Nanoparticles, June 26-29, 2011.
[1] ETH Zürich

J. Harvey[1], R. Tuckett[1], A. Bodi
Exploring the fast and slow dissociations of fluorinated ethenes: The good, the bad and the timebombs faraday discussions 150
Frontiers in Spectroscopy, Basel, April 6-8, 2011.
[1] University of Birmingham, UK

Y. Hu, M. Bator, M. Döbeli[1], C.W. Schneider, C. Niedermayer, T. Lippert, M. Kenzelmann, A. Wokaun
Systematic characterization of orthorhombic rare earth manganate thin films grown by pulsed laser deposition
EMRS Spring meeting, Nice, France, May 2011.
[1] ETH Zürich

Y. Hu, C. Borca, C.W. Schneider, M. Bator, M. Kenzelmann, T. Lippert, A. Wokaun
Analysis of Mn K edge XANES spectra of rare earth manganite thin films
SPS Meeting, Lausanne, June 2011.

K. Jetsrisuparb, F. Lindner, H. Ben youcef, G.G. Scherer, A. Wokaun, L. Gubler
Modification of proton exchange membranes for fuel cells by radiation induced grafting
PolyColl 2011, Geneva, April 29, 2011.

K. Jetsrisuparb, Z. Zhang, H. Ben youcef, G.G. Scherer, A. Wokaun, L. Gubler
Influence of functional groups on membrane durability
2nd International Workshop on Degradation Issues of Fuel Cells, Thessaloniki, Greece, September 21-23, 2011.

S. Kaspari[1], M. Schwikowski, M. Gysel, T.H. Painter[2]
Spatial and seasonal variations in black carbon concentrations in snow and ice in the Solu-Khumbu, Nepal
AGU Fall Meeting 2011, San Francisco, USA, December 5-9, 2011.
[1] Central Washington University, Ellensburg, USA
[2] Jet Propulsion Laboratory, Pasadena, USA

G. Knopp, P.P.P. Radi, Y. Sych, P. Matsyutenko, T. Gerber
Investigations of low frequency vibrations by time-frequency analysis of dispersed fs-FWM
15th Conference on Timeresolved Vibrational Spectroscopy, Ascona, June 19-24, 2011.

G. Knopp, P.P.P. Radi, Y. Sych, P. Matsyutenko, T. Gerber
A time frequency analysis of of dispersed fs-FWM with regard to low frequency vibrations
10th Conference on Femtochemistry, Madrid, Spain, July 10-15, 2011.

L. Künzi, S. Schneider, P. Mertes, M. Kalberer, J. Dommen, U. Baltensperger, M. Geiser
Responses of lung cell cultures after realistic exposure to primary and secondary organic aerosol
ISAM, Rotterdam, The Netherlands, June 18-22, 2011.

Y. Lin, M. Matuszewski, S. Daniele, P. Jansohn, K. Boulouchos
NOx emission for combustion systems relevant to zero emissions power concepts
European Combustion Meeting 2011, Cardiff, UK, June 28 - July 1, 2011.

T. Lippert, M. Esposito, I. Marozau, K. Conder, M. Döbeli[1], M. Mallepell[1], Y. Hu, C.W. Schneider, A. Wokaun
The Origin of Oxygen in Oxide Thin Films - Role of the Substrate
MRS Spring meeting, San Francisco, USA, April 2011.
[1] ETH Zürich

F. Lucci[1], C. Frouzakis[1], J. Mantzaras
Direct numerical simulation of turbulent catalytic combustion
CSCS User Day, Luzern, September 23, 2011.
[1] ETH Zürich

T. Mattle, J. Shaw Stewart, C.W. Schneider, T. Lippert, A. Wokaun
Laser Induced Forward Transfer of SnO_2 and Al-Layers and Process Investigation by Time Resolved Imaging
EMRS Spring meeting, Nice, France, May 2011.

P. Mertes, J. Dommen, U. Baltensperger
Quantification of peroxides in secondary organic aerosol by long pathlength absorbance spectroscopy
ANAKON 2011, Gesellschaft Deutscher Chemiker e.V., ETH Zürich, March 22-25, 2011.

C. Mohr, R. Richter, P.F. DeCarlo, R. Chirico, M.F. Heringa, M. Crippa, A.S.H. Prévôt, J.L. Jimenez, X. Querol, U. Baltensperger
Sources of ambient submicron aerosol in the Barcelona metropolitan area: Applying PMF on HR-ToF-AMS data
EGU, Vienna, Austria, April 3-8, 2011.

M. Nagel[1], Y. Maniglio[1], F. Nüesch[1], J. Shaw Stewart, T. Mattle, T. Lippert
Development of Dynamic Release Layer Photopolymers Compatible with Solution-based Layer-by-Layer Deposition Techniques
EMRS Spring meeting, Nice, France, May 2011.
[1] Empa Dübendorf

A. Palla-Papavlu[1], V. Dinca[1], M. Dinescu[1], F. Di Pietrantonio[2], D. Cannata[2], M. Benetti[2], E. Verona[2], T. Mattle, T. Lippert
Detection of sarin gas by chemoselective polymers transferred by laser induced forward transfer
11th International Conference on Laser Ablation (COLA), Cancun, Mexico, November 2011.
[1] NILPRP, National Institute for Lasers, Plasma and Radiation Physics, Bucharest, Romania
[2] "O.M.Corbino" Institute of Acoustics, CNR, Rome, Italy

D. Peitz, M. Elsener, O. Kröcher
NH_3 generation by decomposition of guanidnium formate on noble metal-doped TiO_2-catalysts
1st Swiss Heterogeneous Catalysis Meeting, Grindelwald, June 16-17, 2011.

T. Peter[1], I. Engel[1], B. Luo[1], C.R. Hoyle, M.C. Pitts[1], L.R. Poole[1], J.-U. Grooss[1]
Investigation of heterogeneous NAT nucleation mechanisms using polar stratospheric cloud backscatter measurements onboard the CALIPSO satellite
WCRP OSC, Denver, USA, October, 2011.
[1] RECONCILE project member

T. Peter[1], A. Gallice[1], F. Wienhold[1], C. Hoyle, F. Immler[2]
Modeling the ascent of sounding balloons: Derivation of the vertical air motion
WCRP open science conference, Denver, USA, October 24-28, 2011.
[1] ETH Zürich
[2] German Weather Service, Lindenberg, Germany

A.P. Praplan, F. Bianchi, F. Riccobono, J. Dommen, E. Weingartner, U. Baltensperger
Ternary Nucleation of Sulfuric Acid, Water and Dimethylamine in the CLOUD Experiment
AGU Fall Meeting 2011, San Francisco, California, USA, December 4-9, 2011.

F. Riccobono, E. Weingartner, U. Baltensperger
Nano-particles growth rates measured at the CLOUD experiment at CERN
AAAR, Orlando, USA, October 3-7, 2011.

K.T. Rinne, M. Saurer, K. Streit, R. Siegwolf
Development of HPLC-IRMS methodology for $\delta^{13}C$ analysis of needle sugars
GASIR conference, PSI Villigen, October 10-12, 2011.

T. Rosén, N. Prasianakis, J. Kang, J. Eller, J. Mantzaras, F.N. Büchi
In-situ measurements of gas transport properties in gas diffusion layers of PEFCs
Tagung Verbrennungsforschung in der Schweiz, ETH Zürich, October 28, 2011.

O.V. Safonova, C. Paun, A. Cervellino, P. Abdala, E. Kleymenov, M. Nachtegaal, J.A. van Bokhoven
Structural changes in nano-ceria during redox cycling: correlation of in situ XAS, XRD and raman spectroscopy.
Swiss Chemical Society Fall Meeting, Lausanne, September 9, 2011.

A. Savouchkina, A. Foelske-Schmitz, R. Kötz, G. G. Scherer, A. Wokaun
Oxidation of Pt/glassy carbon model electrodes: effect of heat-treatment of glassy carbon
SAOG, Fribourg, January 28, 2011.

A. Savouchkina, V.A. Guzenko, A. Foelske-Schmitz, D. Weingarth, R. Kötz, A. Wokaun, G.G. Scherer
Model electrodes prepared by electron beam lithography: Pt (im)mobility on HOPG
27th One-Day-Symposium of the Electrochemistry Laboratory, PSI Villigen, May 11, 2011.

C.W. Schneider, M. Esposito, I. Marozau, Y. Hu, T. Lippert, K. Conder, M. Doebeli[1], M. Mallepell[1], C. Richter[2], J. Mannhart[2], A. Wokaun
Substrate oxygen diffusion into as-grown $SrTiO_3$ and $LaAlO_3$ thin films
11th International Conference on Laser Ablation (COLA), Cancun, Mexico, November 2011.
1 ETH Zürich
2 University of Augsburg, Germany

J. Shaw Stewart, T. Lippert, M. Nagel[1], F. Nüesch[1], A.Wokaun
A tri-colour OLED pixel by laser-induced forward transfer
EMRS Spring meeting, Nice, France, May 2011.
1 Empa Dübendorf

O.V. Sidorova, M. Saurer, V. Myglan[1], A. Kirdyanov[2], M. Bryukhanova[2], R. Siegwolf, K. Streit
Climatic changes in the Russian Altai inferred from tree-ring parameters and stable isotopes
ISOTOPES 2011, Greoux-les-Bains, France, June 20-24, 2011.
1 Siberian Federal University, Russia
2 V.N. Sukachev Institute of Forest, Russia

R. Siegwolf, O. Sidorova, M. Saurer
Stable isotopes, the link between tree physiology and tree ring width data as climate proxies
EGU General Assembly, Session: IG4, Stable isotopes as tool in paleo-climate studies
Vienna, Austria, April 3-8, 2011.

S. Simard[1], P. Fonti[1], A. Giovanelli[2], A. Gessler[3], M. Saurer, R. Siegwolf, B. Ulrich[1], K. Treydte[1]
From carbohydrate assimilation to tree ring formation – a carbon isotope based study in the Loetschental/Swiss Alps
EURODENDRO, Engelberg, September 19, 2011.
1 WSL Birmensdorf
2 Leibniz-Centre for Agricultural Landscape Research, Müncheberg, Germany
3 Trees and Timber Institute, Florence, Italy

D. Stender, P. Reinhard[1], T.M. Ryll[1], J.L.M. Rupp[1], L.J. Gauckler[1], T. Lippert, A. Wokaun
Electrical measurements of 3 mol% yttria stabilized zirconia grown by pulsed laser deposition
International Conference on Solid State Ionics 18, Warsaw, Poland, July 2011.
1 ETH Zürich

K. Streit, K. Rinne, R. Siegwolf
Modification of C allocation in Larix after 9 years of CO_2 exposure at 550 ppm and 3 years of soil warming
ISOTOPES 2011, Château Laval, Gréoux-les-Bains, Provence-Alpes-Côte d'Azur, France, June 20-24, 2011.

P. Verma, P. Novák
Surface modified carbons for Li-ion batteries
27th One-Day-Symposium of the Electrochemistry Laboratory, PSI Villigen, May 11, 2011.

S. Visser, M. Furger, A. Richard, U. Flechsig, K. Appel[1], A.S.H. Prévôt, U. Baltensperger
Trace elements in PM10, PM2.5 and PM1.0 aerosols in Megacities determined with SR-XRF
JVM, PSI Villigen, September 5-16, 2011.
1 DESY/HASYLAB, Hamburg, Germany

S. Visser, M. Furger, A. Richard, U. Flechsig, K. Appel[1], A.S.H. Prévôt, U. Baltensperger
Elemental composition of PM10, PM2.5 and PM1.0 aerosols during MEGAPOLI 2010, Paris
EAC, Manchester, UK, September 4-9, 2011.
1 DESY/HASYLAB, Hamburg, Germany

S. Visser, M. Furger, A. Richard, U. Flechsig, K. Appel[1], A.S.H. Prévôt, U. Baltensperger
Elemental composition of PM10, PM2.5 and PM1.0 aerosols during MEGAPOLI 2010, Paris
Proc. International Conference on Chemistry and the Environment, Zürich, September 11-15, 2011.
1 DESY/HASYLAB, Hamburg, Germany

E. Weingartner, Z. Jurányi, M. Gysel, N. Bukowiecki, U. Baltensperger
Climatology of the CCN number concentration at the high alpine site Jungfraujoch (3580 m asl, Switzerland)
XXV IUGG General Assembly, Melbourne, Australia, June 28 - July 7, 2011.

E. Weingartner, P. Zieger, B. Henzing, G.D. Leeuw, J. Mikkila, U. Friess, H. Irie, T. Wagner, A. Apituley, U. Baltensperger
Comparison of ambient aerosol extinction coefficients obtained from in-situ, MAX-DOAS and LIDAR measurements in Cabauw (Netherlands)
XXV IUGG General Assembly, Melbourne, Australia, June 28 - July 7, 2011.

A. Wollny[1], B. Weinzierl[1], M. Gysel, M. Schnaiter[1], O. Möhler[1], M.O. Andreae[1], U. Pöschl[1]
Single-Particle-Soot-Photometer (SP2) investigations of soot aerosol and cloud interactions
EGU General Assembly 2011, European Geophysical Union, Vienna, Austria, April 3-8, 2011.
[1] external members of the SP2 team

M. Zaglio, J. Roth, J. Mantzaras, F.N. Büchi
Transient Bi-domain 1D PEFC model
8th Symposium on Fuel Cell Modelling and Experimental Validation (MODVAL 8), Bonn, Germany, March 8-9, 2011.

Z. Zhang, K. Jetsrisuparb, L. Gubler, G.G. Scherer, A. Wokaun
Proton conductivity studies on radiation-grafted membranes
Fall Meeting of the Swiss Chemical Society 2011, Lausanne, September 9, 2011.

Z. Zhang, K. Jetsrisuparb, G.G. Scherer, A. Wokaun, L. Gubler
A study on the effects of methacrylonitrile as co-monomer in radiation grafted membranes
2nd International Workshop on Degradation Issues of Fuel Cells, Thessaloniki, Greece, September 21-23, 2011.

P. Zotter, A.S.H. Prévôt, Y.L. Zhang[1], S. Szidat[1], X. Zhang[2], Y.-H. Lin[3], P. Hayes[4], J.D. Surratt[3], J.L. Jimenez[4], R. Weber[2], U. Baltensperger
Diurnal cycle of fossil and non-fossil total carbon using ^{14}C analyses during CalNex
EAC, Manchester, UK, September 4-9, 2011.
[1] University of Bern
[2] Georgia Institute of Technology, Atlanta, GA, USA
[3] University of North Carolina, Chapel Hill, NC, USA
[4] University of Colorado, Boulder, CO, USA
[5] Helmholtz Zentrum München, Neuherberg, Germany

P. Zotter, A.S.H. Prévôt, Y.L. Zhang[1], S. Szidat[1], X. Zhang[2], Y.-H. Lin[3], P. Hayes[4], J.D. Surratt[3], J.L. Jimenez[4], R. Weber[2], U. Baltensperger
Diurnal cycle of fossil and non-fossil total carbon using ^{14}C analyses during CalNex
International Workshop on Small Scale Radiocarbon Analysis, ETH Zürich, September 13-16, 2011.
[1] University of Bern
[2] Georgia Institute of Technology, Atlanta, GA, USA
[3] University of North Carolina, Chapel Hill, NC, USA
[4] University of Colorado, Boulder, CO, USA
[5] Helmholtz Zentrum München, Neuherberg, Germany

PATENT APPLICATIONS

J. Bernard, F.N. Büchi, P. Dietrich
Method of operating a fuel cell/battery passive hybrid power supply
Patent Application No. EP 2 320 504 A1, 2011.

M. Elsener, O. Kröcher, D. Peitz, A. Bernhard
Ammonia generator converting liquid ammonia precursor solutions to gaseous ammonia for DeNOx-applications using selective catalytic reduction of nitrogen oxides
Patent Application No. EP11153417.8, 2011.

T.J. Schildhauer
A process and a system for the gasification and/or combustion of biomass and/or coal with an at least partial carbon dioxide separation
Patent Application No. 2010P23686EP, 2011.

A. Tsukada, P. Dietrich, M. Hofer, F.N. Büchi, U. Hannesen
Method of shut-down and starting of a fuel cell
Patent Application No. EP 2 338 198 A0, 2011.

CONFERENCES, WORKSHOPS & EXHIBITIONS

U. Baltensperger
Kickoff Meeting ACTRIS
Zurzach, May 25-27, 2011.
Organizer

A. Brambilla, Y. Ghermay, C. Frouzakis[1], J. Mantzaras, R. Bombach
Numerical simulation of combustion dynamics in lean premixed CO/H_2/air mixtures
13th International Conference on Numerical Combustion, Corfu, Greece, April 27-29, 2011.
[1] ETH Zürich

A. Brambilla, Y. Ghermay, C. Frouzakis[1], J. Mantzaras, R. Bombach
Experimental and numerical investigation of combustion dynamics in lean premixed CO/H_2/air mixtures
European Combustion Meeting 2011, Cardiff, Wales, UK, June 28 - July 1, 2011.
[1] ETH Zürich

F. Di Rienzo[1], P. Asinari[1], E. Chiavazzo[1], N. I. Prasianakis, J. Mantzaras
A lattice Boltzmann model for reactive flows simulation
13th International Conference on Numerical Combustion, Corfu, Greece, April 27-29, 2011.
[1] Polytechnico Torino, Italy

F. Di Rienzo[1], P. Asinari[1], E. Chiavazzo[1], N. I. Prasianakis, J. Mantzaras
Coupling lattice Boltzmann model with reduced chemical kinetics for combustion smulations
8th International Conference for Mesoscopic Methods in Engineering and Science (ICMMES 2011), Lyon, France, July 4-8, 2011.
[1] Polytechnico Torino, Italy

P. Dietrich
4th International Advanced Mobility Forum IAMF
Geneva, March 8-9, 2011.
Chair of the Organization Committee

M. Furger, R. Philipona[1]
Swiss Geoscience Meeting - Session 10: Meteorology and Climatology
Zürich, SCNAT Swiss Academy of Sciences, November 12, 2011.
[1] MeteoSwiss, Payerne

S. Hermle[2], St. Renz[3], K. Boulouchos[1], P. Jansohn
Verbrennungsforschung in der Schweiz
Semper Aula, ETH Zürich, October 28, 2011.
Co-organizer
[1] ETH Zürich
[2] BFE Bern
[3] Beratung Renz Consulting, Basel, c/o BFE, Bern

M. Hofer, M. Frei-Hardt
Swiss Innovation Forum - Presentation of S-Chain Project
Basel, November 3, 2011.
Presenters

M. Kauert[1], G. Siddiqi[2], P. Jansohn
Carbon Capture and Storage: Current status and future perspectives with focus to power generation
Bundesamt für Energie BFE, Bern, August 31, 2011.
Co-organizer
[1] Swisselectric Research
[2] BFE Bern

R. Kötz
2nd European Advanced Automotive Battery Conference, ECCAP Symposium - Large EC Capacitor Technology and Application
Mainz, Germany, June 6-10, 2011.
Chair of Session 1

R. Kötz
The 2nd International Symposium on Enhanced Electrochemical Capacitors ISEE'Cap 2011
Poznan, Poland, June 12-16, 2011.
Member of International Advisory Board

A. Meier
17th SolarPACES Conference
Granada, Spain, September 20-23, 2011.
Member of Scientific Committee

M. Nachtegaal, O. Safonova
JUM@P: SLS, SINQ user meeting
PSI Villigen, September 15-16, 2011.
Co-organizer

P. Novák
62nd Annual Meeting of the International Society of Electrochemistry
Niigata, Japan, September 11-16, 2011.
Organizing Committee

T. Lippert
E-MRS spring meeting 2011
Symposium: Laser Materials Processing for Micro and Nano Applications, Nice, France, May 2011.
Co-chair of the symposium

T. Lippert
International Symposium on Laser Precision Microfabrication (LPM 2011)
Kagawa, Japan, June 2011.
Member of Program Committee

T. Lippert
1st Central and Eastern European Conference on Thermal Analysis and Calorimetry (CEEC-TAC1)
Craiova, Romania, September 2011.
Member of Scientific Committee

T. Lippert
11th International Conference on Laser Ablation (COLA'11)
Cancun, Mexico, November 2011.
Member of Steering Committee

T.J. Schmidt
Polymer Electrolyte Fuel Cells 11
220th ECS Meeting, Boston, USA, October 9-14, 2011.
Co-organizer

G.G. Scherer, R. Kötz, P. Novák
Electromobility
27th One-Day-Symposium of the Electrochemistry Laboratory, PSI Villigen, May 11, 2011.
Organizer

M. Schultze, J. Mantzaras, R. Bombach, R. Kaufmann
Combustion of hydrogen/air mixtures at fuel-rich equivalence ratios
Schweizer Verbrennungstagung 2011, Zürich, October 28, 2011.

R. Siegwolf
Annual Meeting of the German Association for Stable Isotope Research (GASIR)
PSI Villigen, October 10-12, 2011.
Organizer

R. Siegwolf
Session IG4, Stable isotopes as tool in (paleo-) climate studies
EGU General Assembly, Vienna, Austria, April 3-8, 2011.
Session Convenor

A. Steinfeld
7th SOLLAB Doctoral Colloquium on Solar Concentrating Technologies
Grindelwald, March 21-23, 2011.
Chairman

A. Steinfeld
2nd EU-SFERA Winter School on "Solar Fuels & Materials"
ETH Zürich, March 24-25, 2011.
Chairman

A. Steinfeld
ICH2P-11 - International Conference on Hydrogen Production
Thessaloniki, Greece, June 19-22, 2011.
Member of Scientific Advisory Board

A. Steinfeld
HYPOTHESIS IX, Hydrogen Power Theoretical and Engineering Solutions Int. Symposium
San José, Costa Rica, December 12-15, 2011.
Member of Scientific Advisory Board

C. Wieckert
17th SolarPACES Conference
Granada, Spain, September 20-23, 2011.
Member of Scientific Committee

A. Wokaun
Energiebranche im Umbruch: Strategische Herausforderung für Energieversorger
Energy&Utility Com, Gottlieb Duttweiler Institut, Rüschlikon, November 22, 2011.
Tagungsleiter

MEMBERSHIPS IN EXTERNAL COMMITTEES

U. Baltensperger
National Research Council, Swiss National Science Foundation
Member

U. Baltensperger
Umweltforschung der Forschungszentrum Jülich GmbH
Wissenschaftlicher Beirat, Vorsitzender
Wissenschaftlich-Technisches Ausschuss Mitglied

U. Baltensperger
sc nat Commission, Atmospheric Chemistry and Physics
Member

U. Baltensperger
Scientific Advisory Group for Aerosol within Global Atmosphere Watch
Member

U. Baltensperger
Canadian Network for the Detection of Atmospheric Change (CANDAC)
Board of Directors

U. Baltensperger
Programme Advisory Board of APPRAISE (Aerosol Properties, Processes And InfluenceS on the Earth 's climate)
Chairman

F.N. Büchi
Prüfungskommission Physiklaboranten, Kanton Zürich
Experte

P. Dietrich
International Energy Agency Implementing Agreement on Hybrid and Electric Vehicles (IA-HEV), Annex 13
Member

T. Gerber
Detailed chemical kinetic models for cleaner combustion, COST Action CM0901 (European Cooperation in Science and Technology)
Member of Management Committee

L. Gubler
Prüfungskommission Physiklaboranten, Kanton Zürich
Experte

P. Jansohn
International Energy Agency (IEA)
Implementing agreement on energy conservation and emission reduction in combustion
Collaborative Task Leader "Gas Turbine Combustion"

P. Jansohn
International Energy Agency (IEA), GHG R&D Programme
Representative (Alternate) for Switzerland

P. Jansohn
ProcessNet Fachgemeinschaft „Sustainable production, energy and resources"
Fachausschuss „Hochtemperaturtechnik"
Berufenes Mitglied

P. Jansohn
European Turbine Network (ETN)
Member

P. Jansohn
European Technology Platform – Zero Emission Fossil Fuel Power Plants (ETP-ZEP),
Taskforce Technology and Government Group
Member / Representative (Alternate) for Switzerland

G. Knopp
International Journal of Spectroscopy / Hindawi Publishing
Lead Guest Editor

G. Knopp
Chemical Imaging by Coherent Raman Microscopy / COST- European Cooperation in Science and Technology
Member of Management Committee

R. Kötz
Electrochimica Acta
Associate Editor

T. Lippert
E-MRS
Member of Executive Committee and Vice President

T. Lippert
Journal of Laser Micro/Nanoengineering (JLMN)
Co-Editor

T. Lippert
Laser Chemistry
Associate Editor

T. Lippert
Materials
Member of the Editorial Board

J. Mantzaras
Combustion and Flame Journal
Editorial Board

A. Meier
International Energy Agency (IEA) – SolarPACES Implementing Agreement
Operating Agent

A. Meier
SOLLAB – Alliance of European Laboratories on Solar Thermal Concentrating Systems
Steering Committee

P. Novák
Materials
Editorial Board

P. Novák
The Northeastern Center for Chemical Energy Storage (*NECCES)*
Scientific Advisory Board

P. Radi
Journal of Raman Spectroscopy
Editorial Board

G.G. Scherer
Advisory Board European Fuel Cell Forum
Member

G.G. Scherer
Asian Polymer Association, New Delhi, India
Honorary Member

G.G. Scherer
Kantonsschule Wohlen
Maturitätsprüfungsexperte Biologie/Chemie

G.G. Scherer
Advisory Board Electrocatalysis, Springer
Member

T.J. Schmidt
HySA/Catalysis Competence Centre, University of Cape Town, South Africa
Technical Steering Committee

A. Steinfeld
SOLLAB – Alliance of European Laboratories on Solar Thermal Concentrating Systems
Steering Committee

A. Steinfeld
IMDEA-Energía, *Spain*
Scientific Council

A. Steinfeld
TMS (Minerals, Metals & Materials Society)
Member – Energy Committee

A. Steinfeld
SANDIA Laboratories' "Sunshine to Petrol" program
Member of Advisory Board

A. Steinfeld
European Federation of Chemical Engineering
Member - Process Engineering for Alternative Energy Resources Committee

A. Steinfeld
ASME Kreith Energy Award
Member of Selection Committee

A. Steinfeld
ASME Ralph Coates Roe Medal
Member of Selection Committee

A. Steinfeld
Swiss Academy of Engineering Sciences
Member

A. Steinfeld
Advances in Solar Energy
Associate Editor

A. Steinfeld
Energies
Associate Editor

A. Steinfeld
P*rogress in Energy and Combustion Science*
Associate Editor

A. Wokaun
Schweizerische Akademie der Technischen Wissenschaften (SATW)
Member

A. Wokaun
European Climate Forum
Member of Council

A. Wokaun
novatlantis –Nachhaltigkeit im ETH-Bereich
Member of Steering Committee

A. Wokaun
Studiengruppe Energieperspektiven
President

A. Wokaun
CORE
Member

A. Wokaun
Advisory Group on Energy (AGE), European Union
Member

A. Wokaun
European Energy Research Alliance (EERA)
Member of Executive Committee

A. Wokaun
Beirat Energiestrategie 2050 des UVEK
Member

AWARDS

J. Bernard, M. Hofer, U. Hannesen[1], N. Hayek[1], P. Dietrich, F.N. Büchi
Schweizer Brennstoffzelle für Personenwagen
Watt d'Or 2011, Bundesamt für Energie, Bern, January 6, 2011.
[1] Belenos Clean Power Holding, Biel

P. Boillat
Wasserverteilung in einer Brennstoffzellenmembran
PSI Impuls Preis, PSI Villigen, September 30, 2011.

Y. Ghermay, J. Mantzaras, R. Bombach
Experimental and numerical investigation of hetero-/homogeneous combustion of $CO/H_2/O_2/N_2$ mixtures over platinum at pressures up to 5 bar
Distinguished Paper Award, 33rd International Symposium on Combustion
Proc. Combust. Inst. **33**, 1827-1835 (2011).

M. Hantel
Partially reduced graphite oxide: A graphene like material for supercapacitor electrodes
ISE Young Researcher Award for the Best Oral Presentation, presented at the ISEE'Cap, Poznan, Poland, June 12-16, 2011.

A. Steinfeld
Golden Idea Award of IDEE-SUISSE, March 31, 2011.

P. Zieger
Atmospheric Chemistry and Physics ACP Award 2011, Zürich, 2011.

LIST OF PUBLICATIONS 2011

Large Research Facilities and SwissFEL Project

UNIVERSITY LEVEL AND OTHER TEACHING

A. Adelmann, P. Arbenz
Parallel Numerical Methods
ETH- Zurich, Switzerland
Spring Semester 2011

A. Adelmann
Statistics and Probability
University of Applied Science, Zurich, Switzerland
Spring Semester 2011

H.H. Braun
Beam Diagnostics with RF methods
Course at Cockroft Institute, Daresbury, UK
7 March 2011

H.H. Braun
Short Pulse X-Ray Free Electron Lasers, Illustrated with SwissFEL
Course at DESY, Hamburg, Germany
30 March 2011

M. Dittmar, U. Langenegger, K. Müller, O. Steinkamp, U.D. Straumann, A. Streun
Experimental Methods and Instruments of Particle Physics
University of Zurich and ETH Zurich, Switzerland
Winter Semester 2011/12

D. Kiselev
Aktuelle Experimente am Beschleuniger zur Kern- und Nukleonenstruktur
University of Basel, Switzerland
Spring Semester 2011

D. Kiselev
Activation and Radiation Damage in the Environment of Hadron Accelerators
CERN Accelerator School Advanced Level, Bilbao, Spain
1 June 2011

B. Patterson, T. Greber
Physik der kondensierte Materie
University of Zurich, Switzerland
Fall Semester 2011

B. Patterson, S. Reiche, T. Schietinger, H. Weyer
SwissFEL Science and Technology
Studentenpraktikum, University of Zurich, Switzerland
24–26 November 2011

S. Reiche
Free-Electron Lasers
Cern Accelerator School, Chios, Greece
18 – 30 September 2011

L. Rivkin
Introduction to Particle Accelerator Physics
EPFL Lausanne, Switzerland
Fall Semester 2011

T. Schietinger
The SwissFEL Project at PSI
Joint Universities Accelerator School 2011 (JUAS), PSI Villigen, Switzerland
25 February 2011

T. Schietinger
Das Zukunftsprojekt SwissFEL am Paul Scherrer Institut
Hochrhein-Seminar für Mathematik und Naturwissenschaften, Waldshut, Germany
21 October 2011

J.M. Schippers
Basic Physics for Proton Therapy
PSI Winterschool, Bad Zurzach, Switzerland
16 January 2011

J.M. Schippers
Accelerators for Proton Therapy
PSI Winterschool, Bad Zurzach, Switzerland
16 January 2011

J.M. Schippers
The SC-Cyclotron at PSI and other Accelerators for Proton Therapy
Joint university Accelerator school (JUAS), PSI, Villigen, Switzerland
24 February 2011

J.M. Schippers
Basic physics, Ion Sources, Accelerators, Beam Transport and Future Developments in Accelerators for Hadron Therapy
Postgraduate school “Master on-line”, University Heidelberg, Germany
May-August 2011

J.M. Schippers
Particle Generation, Accelerator Technology
ESTRO Teaching Course on Radiotherapy with Protons and Ions, Institut Curie, Paris, France
11-15 September 2011

J.M. Schippers
New Technologies in Particle Therapy for Hospital based Centers
ESTRO Teaching Course on Radiotherapy with Protons and Ions, Institut Curie, Paris, France
11-15 September 2011

J.M. Schippers
Radiobiology in Radiotherapy
Medical Physics Coarse, ETH Zürich, Switzerland
9 December 2011

V. Schlott
Diagnostics for Light Sources
3rd DITANET School on Beam Diagnostics, Stockholm, Sweden
7 – 11 March 2011

M. Seidel
Cyclotrons
CERN Accelerator School on High Power Hadron Machines. Bilbao, Spain
26 May 2011

V. Schlott
Synchrotron Light Source Diagnostics
DITANET Advanced School on Beam Diagnostics, Stockholm, Sweden
9 März 2011

E. Zimoch
Accelerator Controls
Joint Universities Accelerator School (JUAS), Archamps, France
28 February 2011

PEER REVIEWED PAPERS

D. Kiselev in A.N. Antonov et al.
The Electron-Ion Scattering Experiment ELISe at the International Facility for Antiproton and Ion Research (FAIR): A Conceptual Design Study
Nucl. Instr. Meth., **A 637,** 60 (2011)

C. Baumgarten
Cyclotron closed Orbits on a Radial Grid
Nucl. Instr. Meth., A **647**, 31 (2011)

C. Baumgarten
Use of Real Dirac Matrices in 2-Dimensional Coupled Linear Optics
Phys. Rev. ST – Accel. Beams, **14**,114002 (2011)

C. Baumgarten
Transverse-Longitudinal Coupling by Space Charge in Cyclotrons
Phys. Rev. ST – Accel. Beams, **14**, 114201 (2011)

C. Baumgarten, A. Barchetti, H. Einenkel, D. Goetz, P. A. Schmelzbach
A compact Electron Cyclotron Resonance Proton Source for the Paul Scherrer Institute's Proton Accelerator Facility
Rev. Sci. Instrum., **82**, 053304, 82 (2011)

P. Beaud, S.L. Johnson, E. Vorobeva, C. Milne, A. Caviezel, S.O. Mariager, R.A. De Souza, U. Staub, G. Ingold
Ultrafast structural dynamics in condensed matter
CHIMIA **65**, 308 (2011)

Y.J. Bi, A. Adelmann, R. Dölling, M. Humbel, W. Joho, M. Seidel, T.J. Zhang
Towards Quantitative Simulations of High Power Proton Cyclotrons
Phys. Rev. ST Accel. Beams **14**, 054402 (2011)

R. Calaga, W. Fischer, G. Robert-Demolaize, N. Milas
Long-Range Beam-Beam Experiments in the Relativistic Heavy Ion Collider
Phys. Rev. ST Accel. Beams, **14**, 091001 (2011)

L. Carroll, P. Friedli, P. Lerch, J. Schneider, D.M. Treyer, S. Hunziker, S. Stutz, H. Sigg
Ultra-Broadband infrared Pump-Probe Spectroscopy using Synchrotron Radiation and a Tuneable Pump
Rev. Sci. Instr., **82**, 063101 (2011)

A. Fallahi, B. Oswald
On the Computation of Electromagnetic Dyadic Green's Function in Spherically Multilayered Media
IEEE Trans. Microwave Theory Tech., **59**, 1433, doi: 10.1109 (2011)

A. Froideval, A. Badillo, J. Bertsch, S. Churakov, R. Dähn, C. Degueldre, T. Lind, D. Paladino, B.D. Patterson
Towards Possible Opportunities in Nuclear Materials Science and Technology at an X-ray Free Electron Laser Research Facility
J. Nuc. Mat. **416**, 242 (2011)

M. Gaspar, M. Pedrozzi, L.F.R. Ferreira, T. Garvey
A Compact 500MHz 4kW Solid State Power Amplifier for Accelerator Applications
Nucl. Instr. Meth., A **637**, 18 (2011)

M. Harb, A. Jurgilaitis, H. Enquist, R. Nuske, C.V. Schmising, J. Gaudin, S.L. Johnson, C.J. Milne, P. Beaud, E. Vorobeva, A. Caviezel, S.O. Mariager, G. Ingold, J. Larsson
Picosecond dynamics of laser-induced strain in graphite
Phys. Ver. **84**, 045435 (2011)

C.P. Hauri, C. Vicario, C. Ruchert, F. Ardana
Strong-Field Single-Cycle THz Pulses Generated in an Organic Crystal
Appl. Phys. Lett., **99**, 161116 (2011)

S.C. Leemann, A. Streun
Perspectives for Future Light Source Lattices Incorporating yet Uncommon Magnets
Phys. Rev. ST Accel. Beams, **14**, 030701 (2011)

F.A. Lima, C.J. Milne, D.C.V. Amarasinghe, M.H. Rittmann-Frank, R.M. van der Veen, M. Reinhard, V.T. Pham, S. Karlsson, S.L. Johnson, D. Grolimund, C. Borca, T. Huthwelker, M. Janousch, F. van Mourik, R. Abela, M. Chergui
A High-Repetition Rate Scheme for Synchrotron-Based Picosecond Laser Pump/X-Ray Probe Experiments on Chemical and Biological Systems in Solution
Review of Scientific Instruments, **82**, 063111 (2011)

F. Le Pimpec, C. Gough, V. Chouhan, S. Kato
Field Emission from Carbon Nanotubes in DC and Pulsed Mode
Nucl. Instr. Meth., A **660**, 7 (2011)

M. Medarde, R. Moormann, R. Frison, R.J. Puzniak, E. Pomjakushina, K. Conder, E. Platacis, Y. Dai, D. Kiselev, L. Zanini, S. Török, P. Zagyvai, S. Heinitz, J. Neuhausen, D. Schumann, K. Thomsen
Lead-Gold Eutectic: An Alternative Liquid Target Material Candidate for High Power Spallation Neutron Sources
J. Nucl. Mat. **411**, 72 (2011)

C.J. Milne, R.M. van der Veen, V.T. Pham, F.A. Lima, H. Rittmann-Frank, M. Reinhard, F, van Mourik, S. Karlsson, T.J. Penfold, M. Chergui
Ultrafast X-ray Absorption Studies of the Structural Dynamics of Molecular and Biological Systems in Solution
CHIMIA **65**, 303 (2011)

H. Moeini, S. Ilieva, F. Aksouhb, K. Boretzky, A. Chatillon, A. Corsi, P. Egelhof, H. Emling, G. Ickert, J. Jourdan, N. K. Nayestanaki, D. Kiselev, O. Kiselev, C. Kozhuharov, T. Le Bleis, X.C. Le, A. Yu, Litvinov, K. Mahata, J.P. Meier, F. Nolden, S. Paschalis, U. Popp, H. Simon, M. Steck, T. Stöhlker, H. Weick, D. Werthmüller, A. Zalite
First Feasibility Experiment for the EXL Project with Prototype Detectors at the ESR Storage Ring
Nucl. Instr. Meth., A **634**, 77 (2011)

E. Möhr-Vorobeva, S.L. Johnson, P. Beaud, U. Staub, R. De Souza, C. Milne, G. Ingold , J. Demsar, H. Schaefer, A. Titov
Nonthermal Melting of a Charge Density Wave in TiSe2
Phys. Rev. Letters **107**, 036403 (2011)

B. Oswald, A. Fomins, A. Fallahi, P. Leidenberger, P. Bastian
3-Dimensional Time-Domain Full-Wave Analysis of Optical Array Antennas
Journal of Computational and Theoretical Nanoscience, **8** (8), 1852, doi: 10.1166 (2011)

M. Paraliev, C. Gough, S. Ivkovic, L. Stingelin
Eddy Current Focusing Solenoid
Nucl. Instr. Meth., A **637**, 12 (2011)

B.D. Patterson
A Simplified Approach to Synchrotron Radiation
Am. J. Phys. **79**, 1046 (2011)

B.D. Patterson, J. Sa, A. Ichsanow, C.P. Hauri, C. Vicario, C. Ruchert, I. Czekaj, R. Gehrig, H.C. Sigg, J. A. van Bokhoven, B. Pedrini, R. Abela
Can Energetic Terahertz Pulses Initiate Surface Catalytic Reactions on the Picosecond Time Scale?
Chimia **65**, 323 (2011)

V.T. Pham, T.J. Penfold, R.M. van der Veen, F. Lima, A. El Nahhas, S.L. Johnson, P. Beaud, R. Abela, C. Bressler, I. Tavernelli, C.J. Milne, M. Chergui
Probing the Transition from Hydrophilic to Hydrophobic Solvation with Atomic Scale Resolution
Journal of the American Chemical Society, **133** (32), 12740 (2011)

M. Reinhard, F.A. Lima, A. El Nahhas, C. Milne, V.T. Pham, R. van der Veen, D.C.V. Amarasinghe, S.L. Johnson, P. Beaud, D. Grolimund, C.N. Borca, R. Abela, G. Ingold, C. Bressler, M. Chergui
Solvation Dynamics using Ultrafast X-Ray Absorption Spectroscopy
Biophotonics: Spectrospcopy, Imaging, Sensing and Manipulation, 381 (2011)

C. Ruchert, F. Ardana, A. Trisorio, C. Vicario, C.P. Hauri
Towards High-Power Single-Cycle THz Laser for Initiating High-field-sensitive Phenomena
Chimia **65**, 320 (2011)

K. Samec, R. Ž. Milenković, L. Blumenfeld, S. Dementjevs, C. Kharoua, Y. Kadi
Measurement and Analysis of Turbulent Liquid Metal Flow in a High-Power Spallation Neutron Source-EURISOL
Nucl. Instr. Meth., A **638**, 1 (2011)

S. Sanfilippo, J.M. Schippers, M. Negrazus, A. Gabard, M. Calvi, V. Vrankovic
Design Study of a 3.5 T Superconducting Sector Magnet in a 450 MeV/Nucl Booster Cyclotron for Carbon Ion Therapy
IEEE Transactions on Applied Superconductivity, **21** (3), 1838 (2011)

J.M. Schippers, A. Lomax
Emerging Technologies in Protontherapy
Acta Oncologica, **50**, 838 (2011)

M. Smadella, Z. Salman, W.A. MacFarlane, B.D. Patterson, P.R. Willmott, K.H. Chow, M.D. Hossain, H. Saadaoui, W. Wang, R.F. Kiefl
Depth Dependence of the Structural Phase Transition of SrTiO3 Studied with β-NMR and Grazing Incidence X-ray Diffraction
Phys. Rev. B **83**, 224112 (2011)

T.J. Stocki, A. Jason, H. Miyadera, E.-I. Esch, N.J. Hoteling, A. Adelmann, R.H. Heffner, A. Green, J Olsthoorn
Using Exotic Atoms to keep Borders Safe
J. Phys.: Conf. Ser. **312**, 062009 (2011)

P. van Luijk, H. Faber, J.A. Langendijk, S. Brandenburg, J.M. Schippers,
Volume Dependent Expression of in and Out-of-field Effects in the Proton Irradiated Rat Lung
Int. J. Radiat. Oncol. Biol. Phys., **81**, 262 (2011)

A. Trisorio, C. Ruchert, C.P. Hauri
Direct Shaping of Broadband High Energy Ultraviolet Pulses
Appl. Physics, B **98**, 323 (2011)

A. Trisorio, P.M. Paul, F. Ple, C. Vicario, C.P. Hauri
Ultrabroadband TW-class Ti:Sapphire Laser System with Adjustable Central Wavelength, Bandwidth and Multi-Color Operation
Optics Express **19**, 20128 (2011)

S. Tsujino, M. Paraliev, E. Kirk, T. Vogel, F. Le Pimpec, C. Gough, S. Ivkovic, H.-H. Braun
Nanosecond Pulsed Field Emission from Single-Gate Metallic Field Emitter Arrays Fabricated by Molding
J. Vac. Sci. Technol. B **29**, 02B117 (2011)

J. Yang, T. Zhang, Y. Lin, A. Adelmann, F. Wang, S. An
High Performance Computation on Beam Dynamics Problems in High Intensity Compact Cyclotrons
Science China, Physics, Mechanics & Astronomy Science China Press and Springer-Verlag Berlin, **54,** Suppl. 2: 1, doi: 10.1007/s11433-011-4544-1 (2011)

L. Zanini, S. Dementjev, F. Gröschel, W. Leung, R. Milenković, K. Thomsen, W. Wagner, M. Wohlmuther, X. Cheng, A. Class, A. Konobeyev, P. Agostini, P. Meloni, J.-C. David, A. Letourneau, S. Leray, S. Panebianco, L. Cachon, C. Latgé, P. Roubin, A. Guertin, N. Thiolliere, M. Dierckx
Experience from the Post-Test Analysis of MEGAPIE
Journal of Nuclear Materials, **415**, 367 (2011)

T. Zhang, J. Yang, M. Li, L. Xia, S. An, Z. Yin, J. Zhong, F. Yang, W. Joho, A. Adelmann, P. Sigg
Conceptual Design of an 800MeV High Power Proton Driver
Nucl. Instr. Meth., B **269**, 2964 (2011)

OTHER PAPERS

C. Antoine, F. Peauger, F. Le Pimpec
Electromigration occurrences and its effects on metallic surfaces submitted to high electromagnetic field : A novel approach to breakdown in accelerators
e-Print: arXiv:1110.0397 [physics.acc-ph] (2011)

W.M. Fawley, J. Frisch, Z. Huang, Y. Jiao, H.-D. Nuhn, C. Pellegrini, S. Reiche, J. Wu
Toward TW-level, Hard X-Ray Pulses at LCLS
SLAC-PUB-14616

N. Milas, A. Streun, A. Andersson, Y. Papaphilippou, F. Antoniou
Report on Existing Hardware and Needed Upgrades of the Storage Ring of the Swiss Light Source
TIARA-REP-WP6-2011-004

H. Okuno, A. Adelmann
Round-beam Formation from High-Power Uranium Beam at Low-Energy Cyclotron in RIBF
RIKEN Accelerator Progress Report, **44**, 109 (2011)

CONFERENCE, WORKSHOP AND SEMINAR CONTRIBUTIONS

A. Adelmann, P. Arbenz, Y. Ineichen
Improvements of a Fast Parallel Poisson Solver on Irregular Domains Applied Parallel and Scientific Computing
Proc. PARA 2010, Reykjavík, Iceland, Part II, LNCS, **7133**, Springer, Heidelberg, 2012

A. Adelmann, L. Calabretta, A. Calanna, W. Kleeven, T. Koeth, T. Zhang, D. Campo, M. Abs, L. Piazza, L. Stingelin, S. Gammino, P. McIntyre, H. Okuno, R. Barlow, J. Conrad, M. Shaevitz, J. Alonso, W. Barletta, M. Seidel, J. Yeck
High Power Cyclotrons for the DAEδALUS CP-violation Experiment
Ettore Majorana Centre for Scientific Culture, Erice, Italy (2011)

M. Aiba, M. Böge, J. Chrin, N. Milas, T. Schilcher, A. Streun
Comparison of Linear Optics Correction Means at the SLS
Proc. IPAC 2011, San Sebastian, Spain, 3032 (2011)

M. Aiba, M. Böge, J. Chrin, N. Milas, T. Schilcher, A. Streun
SLS Experience
Optics Measurements, Corrections and Modeling for High-Performance Storage Ring Workshop, Geneva, Switzerland (2011)

M. Aiba, M. Calvi
Status of SwissFEL
4th XFEL 3-site Meeting, Sayo, Japan (2011)

V. Arsov, S. Hunziker, M. Kaiser, V. Schlott, F. Loehl
Optical Synchronization of the SwissFEL 250 MeV Test Injector Gun Laser with the Optical Master Oscillator
Proc. FEL 2011, Shanghai, China (2011)

A. Bertrand, R. Krempaska, H. Lutz
Another Alarm Handler Concept
EPICS Collaboration Meeting, PSI, Villigen, Switzerland (2011)

A. Bertrand, R. Krempaska, H. Lutz, M. Provenzano
The PSI Hardware Inventory Database
EPICS Collaboration Meeting, PSI, Villigen, Switzerland (2011)

B. Beutner, E. Prat
Considerations about Optics-Based Phase-Space Measurements at Linac-Based FEL Facilities
Proc. FEL 2011, Shanghai, China (2011)

B. Beutner, S. Reiche
Operation Modes and Longitudinal Layout for the SwissFEL Hard X-Ray Facility
Proc. FEL 2011, Shanghai, China (2011)

S. Bettoni, M. Pedrozzi, S. Reiche, T. Schietinger
Beam Dynamics Simulations for the SwissFEL Injector Test Facility
Proc. IPAC 2011, San Sebastian, Spain 3107 (2011)

B. Blarer, P.A. Duperrex, G. Dzieglewski, F. Heinrich, A. Mezger, D. Reggiani, U. Rohrer,
K. Thomsen, M. Wohlmuther
The Beam Safety System of the PSI UCN Source
Proc. DIPAC11, Hamburg, Germany, 35 (2011)

M. Böge
Status of SLS Instrumentation and Achievements in Coupling Control
TIARA-SVET Kick-off Meeting, CERN, Switzerland, 23 February 2011

M. Böge, M. Aiba, N. Milas, A. Streun, S. M. Liuzzo
SLS Vertical Emittance Tuning
Proc. IPAC 2011, San Sebastian, Spain, 3035 (2011)

P. Chevtsov, F. Mueller, P. Peier, V. Schlott, D.M. Treyer, B. Steffen
Electro Optical Beam Diagnostics System and its Control at PSI
Proc. ICALEPCS 2011, Grenoble, France, 195 (2011)

J. Chrin, R. Krempaska, H. Lutz, G. Prekas, T. Pelaia
XML Constructs for Developing Dynamic Applications or Towards a Universal Representation of article Accelerators in XML
Proc. IPAC 2011, San Sebastián, Spain, 2295 (2011)

J. Chrin, M.C. Sloan
CAFE, A Modern C++ Interface to the Epics Channel Access Library
Proc. ICALEPCS 2011, Grenoble, France, 840 (2011)

J. Chrin
Hard Rock CAFE
EPICS Collaboration Team Meeting, PSI, Villigen, Switzerland (2011)

A. Citterio, M. Aiba, R. Zennaro
Long Range Wakefields in the SwissFEL C-band Linac
Proc. IPAC 2011, San Sebastian, Spain, 781 (2011)

M. Dach, D. Anicic, D.A. Armstrong, K. Bitterli, H. Brands, P. Chevtsov, F. Haemmerli,
M. Heiniger, C.E. Higgs, W. Hugentobler, G. Janser, B. Kalantari, R. Kapeller, T. Korhonen,
M.P. Laznovsky, T. Pal, D. Vermeulen, G. Jud, R.A. Krempaska, W. Portmann, E. Zimoch
Control System in SwissFEL Injector Test Facility
Proc. ICALEPCS 2011, Grenoble, France, 593 (2011)

M. Dehler
FEL X Band Issues
CLIC Seminar, CERN, Geneva, Switzerland (2011)

M. Dehler, A. Candel, L. Lee
Numerical Validation of the CLIC/SwissFEL/FERMI Multi Purpose X Band Structure
Proc. LINAC 2010, Tsukuba, Japan, 223 (2011)

M. Dehler, S. Atieh, D. Gudkov, S. Lebet, G. Riddone, J. Shi, A. Citterio, R. Zennaro, G.D. 'Auria, C. Serpico
Fabrication of the CERN/PSI/ST X-band Accelerating Structures
Proc. IPAC 2011, San Sebastian, Spain, 86 (2011)

M. Dehler , S. Verdú-Andrés , W. Wuensch , A. Faus-Golfe , B. Gimeno Martinez, J. Kovermann, V. Boria , D. Raboso
Comparative Study of Experimental Signals from Multipactor and Breakdown
Proc. MULCOPIM11, Valencia, Spain (2011)

P.A. Duperrex
Compact Reconfigurable Beam Current Safety System for UCN
Proc. DIPAC 2011, Hamburg, Germany, 218 (2011)

A. Falone, A. Adelmann, J.-Y. Raguin, L. Stingelin
RF Gun Studies for the SwissFEL Injector
Proc. IPAC 2011, San Sebastian, Spain, 3179 (2011)

A. Gabard, D. George, M. Negrazus, L. Rivkin, V. Vrankovic, Y. Kolokolnikov, P. Vobly
A 2.9 Tesla Room Temperature Superbend Magnet for the Swiss Light Source at PSI
Proc. IPAC 2011, San Sebastian, Spain, 3038 (2011)

C. Gerth, B. Schmidt, S. Wesch, R. Ischebeck, G.L. Orlandi, P. Peier, V. Schlott
THz Radiation Diagnostics for Monitoring the Bunch Compression at the SwissFEL Injector Test Facility
Proc. DIPAC 2011, Hamburg, Germany, 374 (2011)

C. Gough, M. Paraliev, S. Ivkovic
Recent Results from a Combined Diode-RF Gun
Proc. IPAC 2011, Kyoto, Japan, 3182 (2011)

C.P. Hauri, A. Trisorio, C. Ruchert, C. Vicario
Latest Developments for Photoinjector, Seeding and High-Power THz Laser Systems
Proc. FEL 2011, Shanghai, China (2011)

M. Herzog, W. Leitenberger, R. Shayduk, R.M. van der Veen, C.J. Milne, S.L. Johnson, I. Vrejoiu, M. Alexe, D. Hesse, M. Bargheer
Transient X-ray Reflectivity of Epitaxial Oxide Superlattices Investigated by Femtosecond X-ray Diffraction
ULTRAFAST PHENOMENA XVII, Oxford University Press, 290-292 (2011)

N. Hiller, E. Huttel, A.-S. Müller, A. Plech, F. Müller, P. Peier, V. Schlott
A Setup for Single Shot Electro Optical Bunch Length Measurements at the ANKA Storage Ring
Proc. IPAC 2011, San Sebastian, Spain, 1206 (2011)

R. Ischebeck, G.L. Orlandi, P. Peier, V. Schlott, B. Smit, C. Vicario, C. Zimmerli, C. Gerth
Diffraction Radiation Monitor for Multiple Spectral Bands
Proc. FEL 2011, Shanghai, China (2011)

G. Jud
The PSI Web Interface to the EPICS Channel Archiver
EPICS Collaboration Team Meeting, PSI, Villigen, Switzerland (2011)

G. Jud, A. Lüdeke, W. Portmann
The PSI Web Interface to the EPICS Channel Archiver
Proc. ICALEPCS 2011, Grenoble, France, 141 (2011)

B. Kalantari, T. Korhonen
Beam Synchronous Data Acquisition for SwissFEL test Injector
Proc. ICALEPCS 2011, Grenoble, France 180 (2011)

R. Kapeller
Virtual Servers for Controls Applications
EPICS Collaboration Team Meeting, PSI, Villigen, Switzerland (2011)

R. Krempaska, A. Bertrand, C. Higgs, R. Kapeller, H. Lutz, M. Provenzano
How to Maintain Hundreds of Computers Offering Different Functionalities with Only Two System Administrators
Proc. ICALEPCS 2011, Grenoble, France, 56 (2011)

R. Krempaska, A. Bertrand, F. Lendzian, H. Lutz
High Intensity Proton Accelerator Controls Network Upgrade
Proc. ICALEPCS 2011, Grenoble, France, 361 (2011)

G. Lambert, J. Gautier, Ph. Zeitoun, C. Valentin, T. Marchenko, F. Tissandier, J.Ph. Goddet, M. Ribiere, A. Sardinha, G. Rey, S. Sebban, C.P. Hauri, M. Fajardo
High Harmonics from Gas, a suitable Source for Seeding FEL from the Extreme-ultraviolet to Soft X-Ray Region
Proc. FEL 2011, Shanghai, China (2011)

F. Lima, C. Milne, M.H. Rittmann-Frank, R. van der Veen, M. Reinhard, M. Benfatto, M. Chergui
Time-resolved pump-probe XAS on ligated Myoglobin in physiological media
SLS Symposium on Measurements in Solution, Paul Scherrer Institut, Switzerland (2011)

U. Locans, N. Jekabsons, R. Milenković, S. Dementjevs
Large-eddy Simulations using Various Sub-Grid Scale Models compared with Experimental Measurements
Proc. MMA 2011, Sigulda, Latvia, 81, ISBN 978-9984-45-351-4 (2011)

A. Lüdeke
Cognitive Ergonomics of Operational Tools
Proc. ICALEPCS 2011, Grenoble, France, 1196 (2011)

A. Lüdeke
Do you believe in Operation Statistics?
Accelerator Reliability Workshop 2011, Cape Town, South Africa (2011)

A. Lüdeke
Operational Experience with the High Intensity Proton Accelerator Facility of PSI
Accelerator Reliability Workshop 2011, Cape Town, South Africa (2011)

A. Lüdeke
The Electronic Logbook Revisited
Accelerator Reliability Workshop 2011, Cape Town, South Africa (2011)

H. Lutz, D. Anicic
Database Driven Control System Configuration for the PSI Proton Accelerator Facilities
Proc. ICALEPCS 2011, Grenoble, France, 289 (2011)

R. Milenković, S. Dementjevs
Turbulence Properties and Disitribution of local Heat Transfer Coefficients around Horizontal Tubes in the SINQ Rod Bundle Target for non-uniform Inlet Conditions
Proc. ICONE19, Chiba, Japan, Technical Session 9-9, ISBN 978-4-88898-204-7 (2011)

R. Milenković, S. Dementjevs
Thermalhydraulic Investigations of a Horizontal Rod Bundle Target at High-Powers During Operation
Proc. NURETH-14, Toronto, Canada, Technical Session, B3-4, ISBN 978-1-926773-05-6 (2011)

R. Milenković, S. Dementjevs
COOLBUNT-Unified Coolability Studies for SINQ and ESS
High Power Targetry Workshop 4, Malmö, Sweden (2011)

R. Milenković, S. Dementjevs, E. Manfrin
On diagnostics of target systems
Proc. Int. PAMIR Conference on Fundamental and Applied MHD, Borgo, Corsica, France, **1**, 495 (2011)

R. Milenković, K. Samec, S. Dementjevs, A. Kalt, C. Kharoua, E. Platacis, A. Zik, A. Flerov, L. Blumenfeld, F. Barbagallo, K. Thomsen, E. Manfrin, Y. Kadi
EURISOL- Compact Liquid Metal Converter Target: Representative Prototype Design and Tests, Technology and Components of Accelerator-driven Systems
Proc. OECD-NEA TCADS Int. Workshop, Karlsruhe Institute of Technology, Germany, 283, ISBN 978-92-64-11727-3 (2010)

R. Miyamoto, R. Calaga, M. Aiba, R. Tomás, G. Vanbavinckhove
Measurement of Coupling Resonance Driving Terms in the LHC with AC Dipoles
Proc. IPAC 2011, San Sebastian, Spain, 2061 (2011)

A. Murokh, S. Reiche
High Power THz FEL Source based on FFAG Betatron
Proc. PAC 2011, New York, NY, USA, 2142 (2011)

P. Oberta, U. Flechsig, R. Abela
The SwisFEL Facility and its Preliminary Optics Beamline Layout
Proc. SPIE Conference – The Int. Society for Optical Engineering, Prag, Czech Republic, **8078**, doi:10.1117/12.887162 (2011)

M. Paraliev, S. Tsujino, C. Gough, E. Kirk, S. Ivkovic
Sub-nanosecond Electron Emission from Electrically Gated Field Emitting Arrays
Proc. Pulsed Power Conference, Chicago, USA (2011)

M. Pedrozzi, T. Schietinger, M. Aiba, S. Bettoni, B. Beutner, A. Falone, R. Ganter, R. Ischebeck, F. Le Pimpec, N. Milas, G.L. Orlandi, E. Prat, S. Reiche, C. Vicario
SwissFEL Injector Test Facility – Test and Plans
Proc. FEL 2011, Shanghai, China (2011)

E. Prat, S. Reiche
EEHG Seeding Design for SwissFEL
Proc. FEL 2011, Shanghai, China (2011)

M. Pedrozzi
SwissFEL Project – a National Hard X-Ray Free Electron Laser Facility at PSI
CRPP Seminar, EPFL Lausanne, Switzerland (2011)

M. Reinhard, F.A. Lima, A. El Nahhas, C. Milne, V.T. Pham, R. van der Veen, D.C.V. Amarasinghe, S.L. Johnson, P. Beaud, D. Grolimund, C.N. Borca, R. Abela, G. Ingold, C. Bressler, M. Chergui
Solvation Dynamics using Ultrafast X-Ray Absorption Spectroscopy
Biophotonics: Spectroscopy, Imaging, Sensing and Manipulation, 381 (2011)

D. Reggiani, B. Blarer, P.-A. Duperrex, G. Dzieglewski, F. Heinrich, A.C. Mezger, U. Rohrer, K. Thomsen, M. Wohlmuther
The Beam Safety System of the PSI UCN Source
Proc. DIPAC 2011, Hamburg, Germany, 35 (2011)

C. Gabor, A.P. Letchford, D. Reggiani, M. Seidel
Comparative Studies of Reconstruction Methods to Achieve Multi-Dimensional Phase Space Information
Proc. DIPAC2011, Hamburg, Germany, 521 (2011)

S. Sanfilippo
Magnetic Measurement Activities at the Paul Scherrer Institute. Status for the X-Ray Free Electron Laser SwissFEL
17th Int. Magnetic Measurements Workshop, La Mola, Terrassa-Barcelona, Spain (2011)

T. Schietinger, M. Aiba, S. Bettoni, B. Beutner, A. Falone, R. Ganter, R. Ischebeck, F. Le Pimpec, N. Milas, G.L. Orlandi, M. Pedrozzi, E. Prat, S. Reiche, C. Vicario
Commissioning Status of the SwissFEL Injector Test Facility
Proc. IPAC 2011, San Sebastian, Spain, 3110 (2011)

D. Schulte, A. Andersson, S. Bettoni, R. Corsini, A. Dubrowskiy, A. Gerbershagen, J.-B. Jeanneret, G. Morpurgo, G. Sterbini, F. Stulle, R. Tomas, F. Marcellini, P. N. Burrows, C. Perry, A. Aksoy, V. Arsov, M. Dehler
Status of the CLIC Phase and Amplitude Stabilisation Concept
Proc. LINAC 2010, Tsukuba, Japan, Switzerland, 103 (2011)

B.T. Schwartz, D.L. Bruhwiler, I. Pogorelov, V.N. Litvinenko, G. Wang, Y. Hao, S. Reiche
Simulations of a Single-Pass through a Coherent Electron Cooler for 40 GeV/n Au^{+79}
Proc. PAC 2011, New York, NY, USA (2011)

L.G. Sukhikh, G. Kube, A. Potylisyn, V. Schlott
Coherent Resonant Diffraction Radiation from Inclined Grating as a Tool for Bunch Length Diagnostics
Proc. DIPAC 2011, Hamburg, Germany, 377 (2011)

G. Vanbavinckhove, M. Aiba, R. Calaga, R. Miyamoto, R. Tomás
Record Low β-Beat of 10% in the LHC
Proc. IPAC 2011, San Sebastian, Spain, 2061 (2011)

G. Vanbavinckhove, M. Aiba, R. Bartolini, R. Calaga, R. Miyamoto, M. Giovannozzi, F. Schmidt, R. Tomás, E.H. Maclean
First Measurements of Higher Order Optics Parameters in the LHC
Proc. IPAC 2011, San Sebastian, Spain, 2061 (2011)

G. Vankó, P. Glatzel, V.T. Pham, R. Abela, D. Grolimund, C.N. Borca, S.L. Johnson, C.J. Milne, W. Gawelda, A. Galler, C. Bressler
Time Resolved X-ray Emission Spectroscopy
ULTRAFAST PHENOMENA XVII, Oxford University Press, 766 (2011)

E. Vorobeva, S.L. Johnson, P. Beaud, U. Staub, R. De Souza, C. Milne, J. Demsar, H. Schäfer, A. Titov, G. Ingold
Femtosecond laser-induced CDW melting in TiSe2
ULTRAFAST PHENOMENA XVII, Oxford University Press, 164 (2011)

W. Wagner, H. Heyck, D. Kiselev, K. Thomsen, M. Wohlmuther, L. Zanini
PSI Experience with High-Power Target Design and Operation
Int. Workshop on Technology and Components of Accelerator Driven Systems
Nuclear Science, 275, ISBN 978-92-64-11727-3, OECD (2011)

C. Wouters, V. Vranković, S. Sidorov, R. Deckardt, P. Chevtsov, R. Widmer, M. Calvi, A. Gabard, S. Sanfilippo
Experiences with the Single Stretched Vibrating Wire Test-Stand at PSI
17^{th} Int. Magnetic Measurements Workshop, La Mola, Terrassa-Barcelona, Spain (2011)

E. Zimoch
EPICS for Beginners
EPICS Collaboration Meeting Fall 2011, PSI, Villigen, Switzerland (2011)

E. Zimoch, A. Luedeke
Purpose and Benefit of Control System Training for Operators
Proc. ICALEPCS 2011, Grenoble, France, 1186 (2011)

INVITED TALKS

A. Adelmann
Precise Beam Dynamics Simulations of Large and Complicated
Accelerator Structures, Triumf, Vancouver Canada
23 Februar 2011

A. Adelmann
Precise Beam Dynamics Simulations: from High Power Cyclotron to (X)FEL Modeling
CBP LBL Berkley USA
9 March2011

A. Adelmann
Precise Beam Dynamics Simulations: from High Power Cyclotron to XFEL Modeling
CIAE, Beijing China
22 May 2011

A. Adelmann
Precise Beam Dynamics Simulations: from High Power Cyclotron to XFEL Modeling
Tsinghua, Beijing China
25 May 2011

A. Adelmann
OPAL a versatile Parallel Tool for Precise 3D Beam Dynamics Studies including Collective Effects
RAL, United Kingdom
12 July 2011

A. Adelmann
Angewandte Mathematik im Spannungsfeld der Teilchenbeschleuniger-Physik & dem Hochleistungsrechnen, Alte Kantonsschule Aarau, Switzerland
4 August 2011

A. Adelmann
OPAL - A Next Generation Accelerator Modeling Tool
ERL 2011, Tsukuba, Japan
20 October 2011

A. Adelmann
H2+ and SRC versus H for the DAEδALUS Project
Eloisatron Workshop, Erice Italy
30 November 2011

A. Adelmann
Space Charge Studies of a H2+ SRC for the DAEδALUS Project
Eloisatron Workshop, Erice Italy
30 November 2011

A. Adelmann
Space Charge Studies of a Proton Ring Cyclotron for the DAEδALUS Project
Eloisatron Workshop, Erice Italy
30 November 2011

M. Böge
Top-Up Operation at the SLS
Top-Up Workshop, POSTECH, Pohang, Korea
10 November 2011

H.H. Braun
SwissFEL, the Hard X-Ray Free Electron Laser at PSI
24^{th} International Vacuum Nanoelectronics Conference
University of Wuppertal, Germany
19 July 2011

R. Dölling
Aktuelle Anforderungen an Vielteilchen-Strahlsimulationen aus Sicht des Betriebs des PSI-Hochstrom-Protonenbeschleunigers
Institut für Allgemeine Elektrotechnik, Universität Rostock, Germany
29 September 2011

R. Ganter
High Brightness Gun Development for SwissFEL
Ultra-Bright Electron Source Workshop, Cockroft Institute, Daresbury Science and Innovation Campus, UK
29 June 2011

C.P. Hauri
Latest Developments for Photoinjector, Seeding and High-Power THz Laser Systems
Int. Free Electron Laser Conference, Shanghai, China
21-26 August 2011

D. Kiselev
Charakterisierung von Beschleunigerabfällen, Entsorgung und Freigabe
16. Strahlenschutzseminar, Dresden, Germany
24 March 2011

A. Lüdeke
Cognitive Ergonomics of Operational Tools
ICALEPCS 2011, Grenoble, France
14 October 2011

C.J. Milne
Ultrafast time-resolved x-ray absorption spectroscopy: Watching atoms dance
Physical Chemistry Seminar, University of Basel, Basel, Switzerland
19 January 2011

C.J. Milne
High repetition rate ultrafast time-resolved x-ray absorption spectroscopy
XFEL seminar, European XFEL, Hamburg, Germany
1 July 2011

C.J. Milne
High repetition rate ultrafast time-resolved x-ray absorption spectroscopy
International Conference on Chemical Kinetics, Boston, MA, USA
10-14 July 2011

C.J. Milne
High repetition rate ultrafast time-resolved x-ray absorption spectroscopy
Advanced Photon Source, Argonne National Laboratory, IL, USA
15 July 2011

B. Oswald
The 3-Dimensional Frequency Domain Discontinuous Galerkin Method - With an Emphasis on Nano-Optics
7th Workshop on Numerical Methods for Optical Nano Structures, Swiss Federal Institute of Technology, Zurich, Switzerland
4 - 5 July 2011

M. Paraliev
Tesla Transformer based 500 kV Pulser for Low Emittance Teststand at Paul Scherrer Institut
Pulsed Power Symposium 2011, Loughborough, UK
20 September 2011

S. Reiche
Numerical Methods in FEL Simulations
FEL Prize Winner talk
FEL Conference 2011, Shanghai,China
22 August 2011

S. Reiche
Expected Performances of Seeded FELs
Workshop: New Science Opportunities at FLASH
DESY, Hamburg, Germany
12 October 2011

S. Reiche
SwissFEL - Design Strategies for a Compact X-ray FEL Facility
TAC-SR Workshop, Istanbul, Turkey
4 July 2011

T. Schilcher
First Results of the SwissFEL Injector Test Facility LLRF System
LLRF11, Hamburg, Germany
19 October 2011

J.M. Schippers
Emerging technologies in particle therapy
ACTA/NACP Symposium on particle therapy, Uppsala, Sweden
13-15 April 2011

J.M. Schippers
Compact Electromagnetic Accelerators and Beam Deliveries for Proton and Ion Therapy
ESTRO Anniversary Conference, London, United Kingdom
8-12 May 2011

J.M. Schippers
High Precision Radiotherapy with Protons; Techniques and Dosimetry
Dosimetry Symposium at the Netherlands Metrology Lab VSL, Delft, the Netherlands
8 December 2011

M. Seidel
The PSI High Intensity Proton Accelerator
Institute for Atomic Energy, Beijing, China
26 September 2011

A. Streun
Laser Beam Slicing
CELLS-ALBA, Cerdanyola del Vallès, Barcelona, Spain
29 June 2011

WORKSHOPS (organized by GFA or SwissFEL)

B. Keil
Organizer
European XFEL BPM & Beam Stability Collaboration Workshop
PSI, Villigen, Switzerland, 29-30 March 2011

B. Patterson, M. van Daalen, B. Pedrini, S. Steinbrückner, R. Abela
Organizers
SwissFEL Workshop on Spectroscopic Experiments
University of Berne, Switzerland, 12 September 2011

B. Patterson, M. van Daalen, B. Pedrini, S. Steinbrückner, R. Abela
Organizers
SwissFEL Workshop on Scattering and Diffraction Experiments
University of Berne, Switzerland, 21 November 2011

D. Zimoch, B. Ajmo
Organizers
EPICS Collaboration Meeting Fall 2011
PSI, Villigen, Switzerland, 3-7 October 2011

MASTER THESES

X. Buffat
Betatron Squeeze Optimisation at the Large Hadron Collider based on First Year of Operation Data
Master Thesis, EPFL Lausanne, Switzerland, January 2011
Thesis Advisors: Prof. Dr. L. Rivkin (EPFL, PSI)
Dr. S. Redaelli (CERN)

D. Egger
Diagnostics at MAX-Lab with Incoherent Synchrotron Radiation
Master Thesis, EPFL Lausanne, Switzerland, January 2011
Thesis Advisors: Prof. Dr. L. Rivkin (EPFL, PSI)
Dr. Å. Andersson (MAX-Lab)

A. Slavinskiss
Optimization of SINQ (Swiss Spallation Neutron Source) Target Cooling; Development of Measurement System for Thermohydraulic and Structural-Mechanical Experiments
Master Thesis; Ventspils University Ventspils, Latvia, June 2011
Thesis advisors: Prof. Dr. N. Jekabsons (Ventspils University)
Dr. R. Milenković (PSI)
Dr. S. Dementjevs (PSI)

M. Toggweiler
An adaptive Time Integration Method for more Efficient Simulation of Particle Accelerators
Master Thesis, ETH Zurich, Switzerland, October 2011
Thesis Advisors: Prof. Dr. P. Arbenz (ETHZ)
Dr. A. Adelmann (PSI)

DISSERTATIONS

A. Garonna
Cyclotron Designs for Ion Beam Therapy with Cyclinacs
EPFL 2011 / Thesis No. 5156
Thesis advisors: Prof. Dr. L. Rivkin (EPFL, PSI)
Prof. Dr. U. Amaldi (TERA Foundation)

F. A. Lima
Investigation of Physiological Solutions of Metalloproteins in a High-Repetition Rate Picosecond X-ray Absorption Experiment
EPFL 2011 / Thesis No. 5249
Thesis advisors: Prof. Dr. M. Chergui (EPFL)
Dr. R. Abela (PSI)

O. Mete
Study and Experimental Characterization of a Novel Photo Injector for the CLIC Drive Beam
EPFL 2011 / Thesis No. 5020
Thesis advisors: Prof. Dr. L. Rivkin (EPFL, PSI)
Dr. S. Döbert (CERN)

F.L. Müller
Elecro-Optical Bunch Length Measurements at the Swiss Light Source
University of Berne, Institute of Applied Physics, Thesis No. 3600
Thesis Advisors: Prof. Dr. T. Feurer (IAP, University of Berne)
Dr. V. Schlott (PSI)

Memberships in external Committees

R. Abela
- European XFEL, Science Advisory Committee
- Canadian Light Source, Science Advisory Committee
- ESRF, Science Advisory Committee, chairman
- EuroFEL, Member of Director's Board
- Linac Coherent Light Source, Science Advisory Committee
- MAX IV, Science Advisory Committee

A. Adelmann
- Speedup Society (treasury)
- CSCS "Rosa (Horizon) Project" Steering Committee
- Program Committee ICFA High Brightness Beam Dynamics Workshop
- International Super Computing Conference (ISC), Program Committee

M. Boege
- Machine Advisory Committee Taiwan Photon Source (TPS), NSRRC, Taiwan
- Design Review Committee Pohang Light Source (PLS-II), POSTECH, Pohang, Korea

H.H. Braun
- DESY, Germany, Machine Advisory Committee
- European XFEL, Germany, Machine Advisory Committee
- ELETTRA, Italy, Machine Advisory Committee
- CERN, CLIC CDR Value estimate review committee
- Int. FEL conf. SPC (2011&2012)
- IPAC OC & SPC
- Board of the European Physical Society Accelerator Group, elected member

P. Chevtsov
- Member of the International Program Committee of the PCaPAC (Personal Computers and Particle Accelerator Controls) International Workshop

R. Dölling
- LIPAc HEBT Line and Beam Dump Detailed Design Review, Committee Member

T. Garvey
- European Committee for Future Accelerators (plenary)
- Scientific and Technical Committee for the Accelerator, Cryogenic and Magnet Department of CEA-Saclay
- European X-FEL Accelerator Consortium Board
- CLIC/CTF3 Collaboration Board
- EuCARD Governing Board
- Program and organizing committees of the International Linear Accelerator Conference
- ECFA Review Panel for Future Accelerator Based Neutrino Facilities

C. Hauri
- CHIPP board member

L. Rivkin
- CERN Scientific Policy Committee
- MAXIV Machine Advisory Committee (Chairman)
- CERN Accelerator School, Advisory Committee
- CERN, CLIC CTF3 Collaboration Board
- Joint Universities Accelerator School, Program Committee
- TIARA Governing Board, Chairman

S. Sanfilippo
- International Magnetic Measurement Workshop, International Advisory Committee

M. Seidel
- Int. Particle Accelerator Conference (IPAC) Advisory Committee, Member of the Board of the European Physical Society Accelerator Group
- Int. Conferences on Cyclotrons and their Applications: Int. Organizing Committee and Program Committee
- Accelerator Technology Advisory Committee for the Chinese Neutron Spallation Source (CSNS)
- ICFA Workshops on High Brightness, High Intensity Hadron Beams, Scientific Advisory Committee
- European Cyclotron Progress Meetings, Scientific Advisory Committee
- Swiss Vacuum Society, Member of Managing Board
- LHC Collimation Review, June 14-15 2011, chair of review committee

J.M. Schippers

- TRIUMF Accelerator Advisory Committee, Vancouver BC, Canada.
- Board Member of the Groningen proton therapy Center, Univ. Medical Center, Groningen, Netherlands
- Chairman of subcommittee “particle dosimetry” of the Netherlands Commission on Radiation Dosimetry

V. Schlott

- ALBA Spanish Light Source, Machine Advisory Committee, Bellaterra, Spain
- ANKA Machine Advisory Committee, KIT, Karlsruhe, Germany
- DIPAC Scientific Program Committee
- In Kind Review Committee for the European XFEL (Vice-Chairman)

Logistics 2011

LIST OF PUBLICATIONS

Jaeggi, M., Roellin, S., J. Alvarado-Cortez and Eikenberg, J.
Determination of ^{241}Pu in nuclear waste slurries: a comparative study using LSC and ICP-MS.
Appl. Radiation Isotopes (in press). On-line available: doi:10.10.16/j.apradiso.2011.10.005, 2011

Thiollière, N., Zanini, L., David, J.-Ch., Eikenberg, J., Guertin, A., Konobeyev, Yu, Lemaire, S. and Panebianco, S.
Gas production in the MEGAPIE spallation target.
Nucl. Science & Engineering 169, 178-187, 2011

Caresana, M., Ferrarini, M., Fuerstner, M. Mayer, S.
Determination of LET in PADC detectors through the measurement of track parameters. Nuclear Inst. and Methods in Physics Research A, 2011.

Fiechtner-Scharrer, A., Mayer, S., Boschung, M. and Whitelaw, A.
Influence of variation of etching conditions on the sensitivity of PADC detectors with a new evaluation method.
Radiat Prot. Dosimetry, Vol. 144 (1-4):150-154, 2011.

Goetti, R., Leschka, S., Boschung, M., Mayer, S., Wyss, C., Stolzmann, P., Frauenfelder, T.,
Radiation doses from phantom measurements at high-pitch dual-source computed tomography coronary angiography.
Eur. J. Radiol. 2011 Feb 8. [Epub ahead of print].

Hälg, R., Besserer, J., Boschung, M., Mayer, S., Clasie, B., Kry, S., Scheider, U.
Field calibration of PADC track etch detectors for local neutron dosimetry in man using different radiation qualities.
Submitted to Nuclear Inst. and Methods in Physics Research A, 2011.

Hoedlmoser, H., Schuler, Ch., Butterweck, G., Mayer, S.
Characteristics of the Neutron Irradiation Facilities of the PSI Calibration Laboratory. AIP Conf. Proc. 1412, 385-392; doi:10.1063/1.3665339, 2011.

Hohmann, E., Safai, S., Bula, Ch., Lüscher, R., Harm, C., Mayer, S., Morath, O., Pedroni, E., Zenklusen, S.
Investigation of the neutron stray field produced by irradiating a water phantom with 200 MeV protons.
Nuclear Technology, Vol. 175 (1), 77-80, 2011.

Zhang, G., Becker, F., Urban, M., Xuan, Y., Fürstner, M., Mayer, S.
Simulating the angular response of makrofol as a detector for neutron induced recoils.
Radiation Measurements, Vol. 46(4), 405-408, 2011.

Butterweck, G., Schuler, Ch., Mayer, S.
Die Vergleichsmessung 2010 für Radongasmessmittel am PSI.
PSI-Bericht Nr. 11-01, ISSN 1019-0643, Januar 2011.

Bucher, B., Butterweck, G., Rybach, L., Schwarz G., Mayer, S.
Aeroradiometrische Messungen im Rahmen der Übung ARM10.
PSI-Bericht Nr. 11-02, ISSN 1019-0643, Juni 2011.

Aste A., Gysin A.[1], Rast S.[2], Thanassis S.[3], Wehrle C.[1], Meyer E.[1]
"Magnetic properties of nanomagnetic and biomagnetic systems analyzed using cantilever magnetometry"
Nanotechnology 22 (2010) 285715 (doi:10.1088/0957-4484/22/28/285715)
[1]University of BASEL, CH
[1]University of BASEL, CH
[1]University of BASEL, CH
[2]Steinrebenstrasse 43, CH-4153 Reinach
[3]Institute of Materials Science, NCSR Demokritos, Athens, GR

UNIVERSITY LEVEL TEACHING

Aste A.
"Symmetrien und Felder", Vorlesung an der Universität Basel: 26989-01,
Frühjahrssemester FS 2011

Aste A.
"Übung: Symmetrien und Felder"
Vorlesung an der Universität Basel: 26988-01, Frühjahrssemester FS 2011

Aste A.
"Relativistische Quantenfeldtheorie"
Vorlesung an der Universität Basel: 19573-01, Herbstsemester HS 2011

Aste A.
"Übung: Relativistische Quantenfeldtheorie",
Vorlesung an der Universität Basel: 19572-01, Herbstsemester HS 2011

Mayer, S., Scheidegger, R., Prasser, H.
Radiation Biology and Radiation Protection (ETH-Zürich, LV-ID-Nr.: 151-2035-00),
Blockveranstaltung 17.Okt – 28.Okt. 2011

CONFERENCE, WORKSHOP AND SEMINAR CONTRIBUTIONS

Jäckle, H., Paul Scherrer Institut
Ke, X., Jenni, F., University of Applied Sciences Northwestern Switzerland, Windisch
Practical Experience with Self-Optimizing, High Dynamic Control of Accelerator Magnet Power Supplies
IPAC 2011, San Sebastian, Spain

Ke, X., Jenni, F., University of Applied Sciences Northwestern Switzerland, Windisch
Jäckle, H., Paul Scherrer Institut
Self-Optimizing, High Dynamic Control of Magnet Power Supplies for Particle Accelerators
EPE 2011, Birmingham, UK

Ke, X., Jenni, F., University of Applied Sciences Northwestern Switzerland, Windisch
Jäckle, H., Paul Scherrer Institut
SELF-OPTIMIZING HIGH DYNAMIC POWER SUPPLY CONTROL
PAC 2011, New York, USA

Ke, X., Jenni, F., University of Applied Sciences Northwestern Switzerland, Windisch
Jäckle, H., Paul Scherrer Institut
Observer and In Situ Identification Based High Dynamic Converter Control
PCIM 2011, Nürnberg, Germany

Mayer, S.
Personal neutron dosimetry at PSI. Advanced WE-Heraeus Physics School on Ionising Radiation and Protection of Man and the Environment
Bad Honnef, Deutschland, 25. Mai 2011

Mayer, S.
Präsentation der Sektion Messwesen, Arbeitskreis Umweltüberwachung des Fachverbandes für Strahlenschutz.
PSI, 7./8. April 2011

Mayer, S.
Stand der Personendosimetrie in der Schweiz. Arbeitskreis Dosimetrie des Fachverbandes für Strahlenschutz
HelmholtzZentrum, München, Deutschland, 7./8. November 2011

Wernli, C., Hoedlmoser, H., Boschung, M., Hohmann, E., Mayer, S.
Neutron dosimetry around accelerators in Switzerland.
International Conference on Accelerator Radiation Safety (ICARS2011), Mumbai, India, 16-18 November 2011

Boschung, M., Mayer, S., Wernli, C.
Personal neutron dosimetry in Switzerland.
7th International Workshop on Ionizing Radiation Monitoring, Mito, Japan, 3-4 Dezember 2011

A. Wällisch
Trials to solidify a Zn-containing low level radioactive sludge with calcium sulfoaluminate cement
at NUWCEM 2011, 1st International Symposium on Cement-based Materials for Nuclear Wastes
Avignon, 10th October - 14th October 2011


STECKVERTEILER B

◀ **PhD students Vadim Davydov und Steven Van Petegem at the neutron instrument POLDI at SINQ. This instrument allows the non-destructive determination of residual stresses in machine components.**
(Photo: Scanderbeg Sauer Photography)

PAUL SCHERRER INSTITUT

Paul Scherrer Institut, 5232 Villigen PSI, Switzerland
Tel. +41 56 310 21 11, Fax +41 56 310 21 99
www.psi.ch