

# Andreas Menzel

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## Experience

- since 2011 **group leader “Coherent X-ray Scattering” (CXS)**  
the group comprises four permanent positions, *i.e.*, three staff scientists and one technician, and four postdoctoral appointees and one PhD student (status Jul 20, 2014)
- since 2007 **staff scientist at the Paul Scherrer Institut** (tenured since 2010)  
My research focuses on extending the applicability of X-ray scattering and imaging techniques toward high resolution and specificity when characterizing statistically relevant ensembles, increasing dose efficiency, *i.e.*, reducing sample consumption, and accessing transient states *in operando*. Starting from a fundamental understanding of the processes of X-ray scattering, propagation, and detection, experiments characteristically use and—if necessary—trigger the development of state-of-the-art instrumentation. Of particular interest is data and image analysis that is firmly underpinned by detection and estimation theory.
- **X-ray ptychography:**  
Characteristic for ptychography is its combination of high sensitivity and specificity with high spatial resolution and dose efficiency. The research goal encompasses development of the technique and pushing the envelope of what imaging capabilities are possible as well as turning ptychography into a technique that is useful for and usable by non-specialists.
  - **high-brilliance applications of small-angle X-ray scattering:**  
Small-angle X-ray scattering at a highly brilliant source with modern detectors enables measurements from small volumes, *e.g.*, spatially resolved for imaging applications, with high time resolution for dynamics characterization, or with a combination of these properties and demands.
  - **management of the cSAXS beamline:**  
Operation and development of the cSAXS beamline has the goal to provide a state-of-the-art facility for the Swiss and international user communities. We conduct instrumental, methodological, and analytical developments in order to maintain the beamline’s position as one of the premier facilities worldwide for coherent diffractive imaging and high-brilliance applications of small-angle X-ray scattering.
- 2005-2006 **Marie-Curie postdoctoral fellow** at BESSY — primary investigator: Stefan Eisebitt
- analysis of the switching behavior of magnetic multilayer systems and patterned media,
  - singular X-ray optics.
- 2002-2005 **postdoctoral appointee** at Argonne National Laboratory — primary investigator: Hoydoo You
- structural analysis of electrode adsorbates and their interaction with the electrode surfaces
- summer 2001 **visiting scientist** at Ames Laboratory — supervisor: Michael C. Tringides
- investigating quantum size effects of epitaxially grown Pb islands on Si(111).
- 1998-2002 **graduate research/teaching assistant** at Georgia Institute of Technology — advisor: Edward H. Conrad
- research on surface diffusion using low-energy electron diffraction intensity fluctuations,
  - supporting classes, such as Classical Mechanics and Statistical Mechanics, and teaching lab courses, including Introductory Physics I and II (primarily for non physics majors) and Electronics.
  - private tutoring
- 1996-1997 **teaching assistant**, physics department, University Stuttgart
- 1996 **assistant** in the Institute of Theoretical and Applied Physics, University Stuttgart

## Education

- 1997-2002 **School of Physics, Georgia Institute of Technology, Atlanta, USA: Graduate studies**
- **Doctor of Philosophy**, December 2002  
*Step Dynamics Measurements with Time-Resolved Low-Energy Electron Diffraction*
  - **Master of Science in Physics**, May 2002
- 1999-2002 **School of Electrical and Computer Engineering, Georgia Institute of Technology, Atlanta, USA: Graduate studies** in Digital Signal Processing and Communication
- **Master of Science**, May 2002
- 1994-1997 **Studies in Physics** at the **University Stuttgart**, including Higher Mathematics and Chemistry