

Facilities and Instruments

The Paul Scherrer Institute runs Switzerland's Large-Scale research facilities for users from the national and international scientific community, in particular for condensed matter, materials science and biology research. PSI is one of only two locations in the world providing the three complementary probes of synchrotron X-rays, neutrons and muons at one site.

Synchrotron X-rays are available at the *Swiss Light Source (SLS)* – a third-generation synchrotron light source based on a 2.4 GeV electron ring and providing photon beams of high brightness at 14 beamlines. Neutrons are produced at the continuous *spallation source SINQ* – the only one of its kind worldwide. SINQ is a state-of-the-art user facility for neutron scattering and imaging with a suite of 13 instruments. The *Swiss Muon Source (S μ S)* is the world's most intense continuous muon source, with 6 beamlines available for experiments using muons as sensitive local magnetic probes. High-precision particle physics experiments use these unique beams to complement the LHC highenergy frontier experiments at CERN in investigating the limits of the Standard Model of particle physics.

Both SINQ and S μ S are powered by a 590 MeV cyclotron that delivers a 1.3 MW proton beam (the world's most powerful proton accelerator). In 2010, the suite of User Facilities will be extended by the Ultra-Cold Neutron Source (UCN), and a few years later by the X-Ray Free- Electron Laser (XFEL), a new large-scale facility that will provide ultrashort, intense X-ray pulses for the investigation of fast processes and the determination of molecular structures.

In addition to the User Facilities at the accelerators, other PSI laboratories are also open to external users, for example the *Hot Laboratory* operated by the Nuclear Energy and Safety Department that allows experiments to be performed on highly radioactive samples.



Jochen Stahn, instrument scientist, and PhD student Justin Hoppler preparing a neutron scattering experiment.