



No. IV/09 - 23 December 2009

PSI photon, neutron and muon user facilities newsletter

Editorial



Kurt Clausen

Dear Colleagues,

With this last PSI Facility Newsletter in 2009 we would like to thank all our users for their huge contributions to an exciting and successful 2009 with a correspondingly remarkable list of publications based on experiments at our three facilities - SLS, SINQ and S μ S. With impressive numbers of received proposals for each of these facilities - we can look forward to a very busy 2010. In the last quarter of this year we have met a couple of important milestones: on November 12th the new nanoXAS beam line at SLS was inaugurated, on December 15th we had the first neutrons from our second spallation neutron target station - the Ultra Cold Neutron (UCN) source. During this autumn we also approved and started building a new High Field (10T) μ SR spectrometer. All three projects are unique and will provide the best research capabilities in their respective fields world wide. On the 18th of December the integrated proton current on SINQ for the first time surpassed 6 Ah for one year - with the new optimised solid target this means approximately 50% more neutrons were produced in 2009 than in any previous year.

Merry Christmas and a happy and successful New Year.

Kurt Clausen on behalf of PSI

New calls for proposals

SLS: PX-beamlines

call on January 8 with deadline on February 15, 2010

non-PX beamlines

call on February 8 with deadline on March 15, 2010

More information

<<http://sls.web.psi.ch/view.php/users/experiments/proposals/opencalls/index.html>>

SINQ: all instruments

deadline on May 15, 2010.

More information

<http://sinq.web.psi.ch/sinq/sinq_call.html>

S μ S: instruments GPS, LTF, GPD and DOLLY

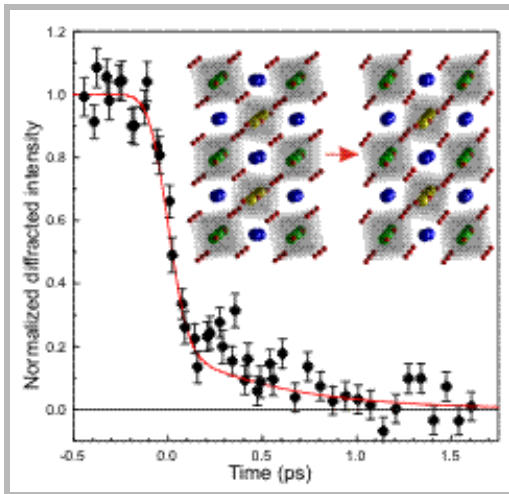
deadline in June 2010

More information

<http://lmu.web.psi.ch/facilities/next_call.html>

Upcoming events

Research highlights



SLS: Watching atoms move: an ultrafast phase transition P. Beaud et al: PRL 103, 155702 (2009) One approach to advance our understanding of the complex interactions between different

degrees of freedom in strongly correlated systems is to use time-resolved methods to study the response of a material after it has been driven out of equilibrium. Ultrafast optical techniques have demonstrated considerable potential to unravel the correlations that drive the interesting physics in such materials. Phonon dynamics in these studies are only indirectly observed via the electronic response, and are not generally able to unambiguously disentangle the dynamics of the lattice from those of the electronic subsystem. By using femtosecond x-ray diffraction to probe directly the structural response of photoexcited manganite, we have found evidence of an ultrafast laser-induced structural phase transition driven directly by electronic excitation and occurring on a sub-picosecond time scale. **Read the full story here!**

SINQ: Spin Amplitude Modulation Driven Magneto-electric Coupling in the New Multiferroic FeTe₂O₅Br. Pregelj et al: PRL 103, 147202

February 14-17, 2010:

POLFEL workshop, Ryn, Poland Information and registration

March 1-5, 2010: Annual

meeting of EuroFEL (European FEL consortium), Berlin, Germany Information and registration

March 8-12: ICANS XIX 19th

Meeting of the International Collaboration on Advanced Neutron Sources, Grindelwald, Switzerland Information and registration

May 24-30: Diffraction at

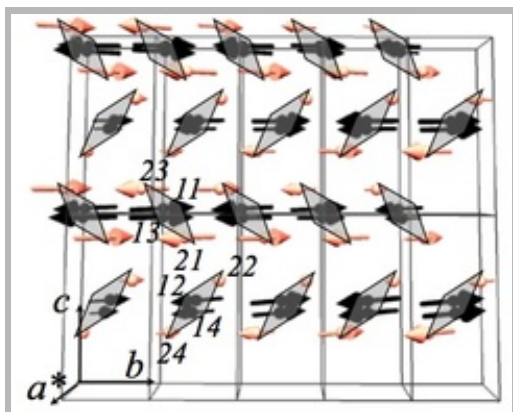
the Nanoscale - Nanocrystals, Defective & Amorphous Materials A hands-on workshop on X-rays, synchrotron radiation and neutron diffraction techniques including experimental and computational aspects. Information and registration

August 7-13: 9th PSI Summer

School on condensed matter research, Zuoz, Switzerland. Information and registration

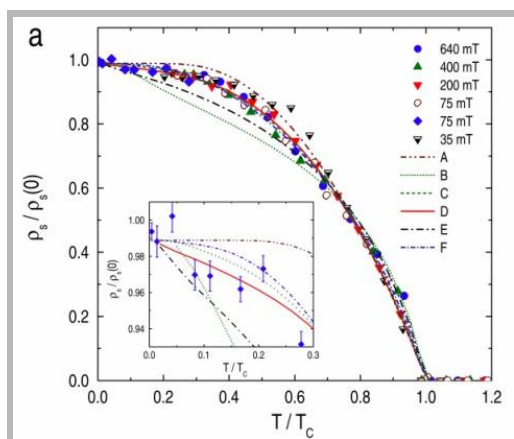
Facility news

SLS: Inauguration of the new

**(2009)**

The magnetic and ferroelectric properties of the layered geometrically frustrated cluster compound $\text{FeTe}_2\text{O}_5\text{Br}$ were investigated with single-crystal neutron diffraction and dielectric measurements.

An incommensurate transverse amplitude modulated magnetic order with the wave vector $q=(1/2,0.463,0)$ develops below $T_N=10.6(2)$ K. Simultaneously, a ferroelectric order due to exchange striction involving polarizable Te^{4+} lone-pair electrons develops perpendicular to q and to Fe^{3+} magnetic moments. The observed magnetoelectric coupling is proposed to originate from the temperature dependent phase difference between neighboring amplitude modulation waves. Read the full story here



μSR : Superfluid Density and Energy Gap Function of Superconducting $\text{PrPt}_4\text{Ge}_{12}$
A. Maisuradze et al: PRL103, 147002 (2009)

The filled skutterudite superconductor

$\text{PrPt}_4\text{Ge}_{12}$ was studied in muon-spin rotation (μSR), specific heat, and electrical resistivity experiments. The continuous increase of the superfluid density with decreasing temperature and the dependence of the magnetic penetration depth ' λ ' on the magnetic field obtained by means of μSR , as well as the observation of a T^3 dependence of the electronic specific heat indicate the presence of pointlike nodes in the superconducting energy gap. The gap and the specific heat are found to be

NanoXAS beamline (12. November 2009). The novel instrument aiming at combining the benefits of scanning force microscopy with those of x-ray spectroscopy was developed and installed as a dedicated beamline at the SLS. For this purpose we built an instrument combining a scanning transmission x-ray microscope with a beam-deflection atomic force microscope in a coaxial geometry. This allows one to combine x-ray absorption spectroscopy and high resolution topography in-situ. When replacing the conventional scanning probe tip by a coaxially shielded tip the instrument will allow detection of the photoelectrons produced by resonant x-ray absorption. This could yield spectroscopic information with a spatial resolution approaching the values achievable with atomic force microscopy.

The two new beamlines, Phoenix and X-Treme have seen first light this autumn. They will be operational in the second half of 2010. Both beamlines are for X-ray absorption spectroscopy, with Phoenix focusing on environmental and materials research, and X-Treme providing measurements

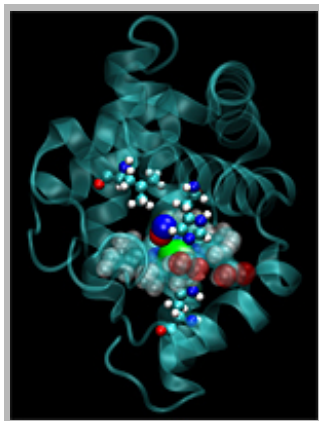
well described by two models with point nodes, similar to results obtained for the unconventional heavy fermion skutterudite superconductor PrOs₄Sb₁₂. Read the full story here

News from the SLS Users Association JUSAP

From SUSA to JUSAP: since the PSI Users Association represents the users of all three major user facilities, the former SLS-related name SUSA was changed at the PSI Users' Meeting by majority vote to Joint Users' Association of PSI (JUSAP).

New feedback questionnaire: one of the first actions taken by **JUSAP** was to initiate a relaunch of the user feedbacks for their experiments. The new formsheet is now available online as a part of DUO and each participant is reminded automatically a couple of weeks after the experiment to fill in the feedback form. JUSAP and PSI already now thank the users for their feedbacks.

News from SwissFEL



first SwissFEL-beam

SwissFEL Science case Based on the SwissFEL Science Workshop Series, the SwissFEL Science Case has now been finished. Input from all PSI Departments and review committees has been integrated. The documents official designation is „PSI Bericht Nr. 09-10«, and 1200 copies will be printed and distributed to government agencies and uni-

under high magnetic field and low temperature.

SINQ: A new record was achieved in the delivery of neutrons in 2009. The previous maximum of the total charge of 5200 mAh (2005) was significantly exceeded with more than 6000 mAh in 2009. In addition on December 15, 2009 the very first neutrons of the new ultracold neutron facility (UCN) were produced. Routine operation is planned for 2010.

SmuS: The high field μ SR project has been officially launched by the PSI directorate. User facility operation is planned for 2012. More information In 2009 totally 178 new proposals were submitted for SmuS, which is a new record and an increase of 14% compared to the previous year.

SwissFEL: The SwissFEL project is progressing well. The SwissFEL conceptual design report is in preparation and will be completed in April 2010. The Science Case is completed, and the presentation to the ETH board will be made in Spring 2010. The SwissFEL motion should

versity departments.

The document is available as a PDF file from the SwissFEL web page.

The chairman of the editorial board, Bruce Patterson, would like to thank the many colleagues who contributed to this effort. »

be included in the «BFI Botschaft», to be discussed by the Swiss parliament in 2011. The project will be realized in 2 phases. Phase 1: a hard X-ray beamline («Aramis») will be completed by the end of 2016. Phase 2: a soft X-ray beamline («Athos»), will be completed by the end of 2018.

Announcements

Facility publications

The 2009 annual scientific report of PSI is available: **downloaded here**

Obtain a comprehensive list of publications sorted by different criteria:

- **SLS publications** <http://sls.web.psi.ch/view.php/science/lsy/publications/lsy_publications.html>
- **SINQ & SμS publications** <http://num.web.psi.ch/publ_all.htm>

Future Building Site SwissFEL

The future SwissFEL building site has been extensively discussed and preference was given to the Würenlinger side of the Aare. The status of the project has been presented in two interviews given to two local newspapers, the Botschaft and the Aargauer Zeitung.

Proprietary research

A certain fraction of the beamtime at PSI research facilities is reserved for proprietary use. This is handled by **Technology Transfer PSI** <<http://www.psi.ch/industry/technology-transfer>> .

The following **directory** <<http://www.psi.ch/industry/randd-services>> lists services on offer by these facilities.

Imprint

PSI Facility News addresses the users of the PSI large facilities and appears quarterly in English. Any feedback is highly welcome! **More information.** <<http://www.psi.ch/imprint>>

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