

Synchrotron Light News

SOLARIS operational from 2017

In a few months the National Synchrotron Radiation Centre SOLARIS will be opened to the first users. This synchrotron light source was constructed in Krakow, Poland and the commissioning of the storage ring has started in May 2015. Currently both the efforts to improve the machine performance and steep progress towards the commissioning of the two experimental beamlines are realized.

Inauguration of MAX IV

On 21 June 2016 the first of the fourth generation of synchrotron light sources, namely MAX IV, will be opened in Lund. The biggest ever Swedish investment in research infrastructure is plan to host more than 2000 scientists from all over the world each year offering new opportunities for groundbreaking experiments in materials and life sciences.

SESAME – synchrotron light of unity in Middle East

In the heart of the Middle East, surrounded by political tensions and humanitarian disaster, scientists outdistance diplomats in efforts for stabilization and peace with SESAME – Synchrotron-Light for Experimental Science and Applications in the Middle East. In the project are involved countries such as: Bahrain, Cyprus, Egypt, Iran, Jordan, Pakistan, the Palestinian Authority, Turkey and Israel as well. Most member countries pay annual membership fees of some \$500,000 each. This project also brings together European scientists, and it seeks to foster advanced research in the region and allow researchers to collaborate across the whole Middle East. The EU has by now contributed over €10 million for the construction of the facility. SESAME will be located in Jordan and is due to be commissioned in the middle of 2017 year.

Gregori Aminoff Prize 2016

The Royal Swedish Academy of Sciences has awarded the Gregori Aminoff Prize in crystallography 2016 to Professor Poul Nissen, Aarhus University, Denmark, and Professor Chikashi Toyoshima, University of Tokyo, Japan, “for their fundamental contributions to understanding the structural basis for ATP-driven translocation of ions across membranes”. The prize amount to in total 100.000SEK.

Innovation Award on Synchrotron Radiation 2015

The 2015 Innovation Award on Synchrotron Radiation has been given on December 10, 2015 in Berlin-Adlershof to Dr. Claudio Masciovecchio from the Elettra-Sincrotrone in Trieste. His work on "First transient grating experiment in the soft X-ray range at the FERMI free-electron laser by exploitation of the coherent and multi-wave nature of the four-wave mixing process" has impressively demonstrated the prospects of the worldwide first seeded free electron laser for soft X-rays

FERMI. The Innovation Award on Synchrotron Radiation is sponsored by SPECS GmbH and BESTEC GmbH.

Kai Siegbahn Prize 2015

Giacomo Ghiringhelli from the Politecnico di Milano, Milan, Italy has been selected by an international committee of top researchers in the field of synchrotron radiation. Giacomo Ghiringhelli is being awarded the prize for his outstanding, innovative work in the experimental development and scientific exploitation of Resonant Inelastic X-ray Scattering in the soft X-ray regime as a new and key tool to understand magnetic and electronic excitations in highly correlated transition metal compounds. The award recognizes this incredible achievement with a cash prize, honoring Dr. Ghiringhelli with an award ceremony at Uppsala University.

Ernst Eckhard Koch Prize 2015

The Association of Friends of Helmholtz-Zentrum Berlin awarded during the Seventh Joint BER II and BESSY II User Meeting on 10 December 2015 the 25th Ernst Eckhard Koch Prize for outstanding doctoral theses in the field of research with synchrotron radiation. Dr. Robert Streubel was honored for his doctoral dissertation “Imaging Spin Textures on Curved Magnetic Surfaces” at Technische Universität Chemnitz that dealt with the investigation of three-dimensional magnetic structures by a new combination of X-ray absorption tomography and photoemission microscopy.

Spanish Synchrotron User Association Prize 2015

Prize to the best PhD thesis in Synchrotron Radiation awarded to Ignacio Martín-Fabiani. The board of directors of the AUSE (Spanish Synchrotron User Association) has awarded Dr. Ignacio Martín-Fabiani with the prize to the best PhD thesis 2015 for his dissertation on "Nanostructuring of Polymer Materials with controlled Morphology".

Helmholtz Prize 2015

For their high-precision measurements carried out at DESY's free-electron laser FLASH, five research scientists from the Goethe University in Frankfurt am Main are to receive the Helmholtz Prize in Metrology. The team surrounding Reinhard Dörner used a special apparatus to study extremely weakly bound helium molecules. This excellent work is an outstanding example of high-precision metrology and demonstrates the enormous potential of free-electron laser. The Helmholtz Prize is endowed with 20,000 euros.

Infineum-Diamond Prize 2015

The Infineum-Diamond prize for innovative automotive research using synchrotron light has been awarded to Oxford University post-doctoral researcher, David Collins. Working in collaboration with BMW-MINI, David's research looks at the ductility of sheet metal used in manufacturing. This research has the potential to create stronger, more streamlined and more geometrically complex steel structures.

IXAS Awards 2015

IXAS Awards were presented at XAFS16 conference in Karlsruhe. IXAS Young Scientist Awards, Dale Sayers Prize and Farrel Lytle Prize, have been granted to Narciso Souze-Neto (Brazilian Synchrotron Light Laboratory) and Amelie Juhin (French National Centre for Scientific Research, Paris), respectively. IXAS Outstanding Achievement Award, Ed Stern Prize, was presented to Majed Chergui (Ecole Polytechnique Federale de Lausanne) and Andrea Di Cicco (Università di Camerino).

ESRF Young Scientist of the Year 2016

The Young Scientist Award was presented to Andrew Cairns for his ground breaking studies of negative linear compressibility. The "Young Scientist of the Year" award is given every year by the Users Organisation for outstanding work done at the ESRF by a scientist 35 years of age or younger.

Carousel – synchrotron free time reading

24 hours at the X-ray factory

R. Van Noorden,

Nature **531**(7596) (2016) 564.

Reportage from visiting the ESRF synchrotron. *Nature* spent a day and a night at the European Synchrotron Radiation Facility to reveal the science that never sleeps.

Beamtime

P. Gambardella,

ETH MatBlatt **2015/1**, 4.

'So what is beamtime?' An attempt to answer this fundamental question has been published in the *Professoren Ecke* of the *Bulletin of Materials Division* of ETH Zurich. Must read par for anyone who wants to do synchrotron experiments.

Revealing letters in rolled Herculaneum papyri by X-ray phase-contrast imaging

V. Mocella, E. Brun, C. Ferrero, D. Delattre,

Nature communications **6** (2015) 5895.

The paper presents the opportunity to read the of Herculaneum papyrus rolls carbonized due to the eruption of Mount Vesuvius in 79 AD and belonging to the only library passed on from Antiquity. Due to carbonization, enrolling the rolls is impossible. The experimental readout method consists in X-ray phase-contrast imaging.

Mitigation strategies for radiation damage in the analysis of ancient materials

L. Bertrand, S. Schöeder, D. Anglos, M. B. Breese, K. Janssens, M. Moini, A. Simon,
TrAC Trends in Analytical Chemistry **66** (2015) 128-145.

A review of methodologies aiming for reducing the radiation damage when studying the Cultural heritage materials using the intense radiation sources.

Discovery and Structure Determination of an Unusual Sulfide Telluride through an Effective Combination of TEM and Synchrotron Microdiffraction

F. Fahrnbauer, T. Rosenthal, T. Schmutzler, G. Wagner, G. Vaughan, J. P. Wright, O. Oeckler,
Angewandte Chemie International Edition **54**(34) (2015) 10020-10023.

The authors report on the use of combined transmission electron microscopy and microfocused synchrotron in a study of a new sulfide telluride Pb₈Sb₈S₁₅Te₅ compound. The structure consists of chains of heterocubane-like units.

Handbook on Synchrotron Radiation: Vacuum Ultraviolet and Soft X-ray Processes

Marr, G. V. (Ed.) (Elsevier, 2013)

This valuable book focuses on the use of synchrotron radiation extending from about 10 eV to 3 keV photon energy.

X-Ray Absorption and X-Ray Emission Spectroscopy: Theory and Applications

J.A. van Bokhoven, C. Lamberti (Eds.) (Wiley, 2016)

Two-volume book features articles that explain the phenomena and describe examples of X-ray absorption and emission applications in chemistry, biochemistry, catalysis, amorphous and liquid systems, and surface science.

Hard X-ray Photoelectron Spectroscopy (HAXPES)

J.C. Woicik (Ed.) (Springer, 2016)

The first complete summary of the state of the art in HAXPES. Historical works, modern instrumentation, theory and applications, from physics to chemistry and materials science and engineering.

Combining In Situ Synchrotron X-Ray Diffraction and Absorption Techniques with Transmission Electron Microscopy to Study the Origin of Thermal Instability in Overcharged Cathode Materials for Lithium-Ion Batteries

K. W. Nam, S. M. Bak, E. Hu, X. Yu, Y. Zhou, X. Wang, L. Wu, Y. Zhu K-Y. Chung, X. Q. Yang,
Advanced Functional Materials, **23**(8) (2013) 1047-1063.

Thermal Instability in Overcharged Cathode Materials for Lithium- Ion Batteries is studied using combined experimental methods involving the synchrotron radiation.

Serial crystallography on in vivo grown microcrystals using synchrotron radiation

C. Gati, G. Bourenkov, M. Klinge, D. Rehders, F. Stellato, D. Oberthür,... & C. Betzel,
IUCrJ **1**(2) (2014) 87-94.

A strategy applicable in protein microcrystallography is presented. The strategy is found to be helpful in studies of micrometre size protein crystals.