

current events

This section carries events of interest to the synchrotron radiation community. Works intended for this section should be sent direct to the Current-Events Editor (s.hasnain@dl.ac.uk).

Europe holds its first XFEL users meeting in Hamburg

260 scientists from 22 countries gathered on 24–25 January at DESY, Hamburg, Germany, for the First European XFEL (X-ray free-electron laser) Users Meeting. The first users meeting marks the beginning of a series of regular workshops and meetings between the scientists interested in the research opportunities at the XFEL and the planners of the facility. Its goal was not only to inform about the status of the project and its scientific perspectives: ‘We wanted to include the future users in the planning already in this early stage’, said Dr Thomas Tschentscher, DESY physicist and member of the European XFEL Project Team.

Professor John Wood, Chairman of the European Strategy Forum on Research Infrastructures (ESFRI; <http://cordis.europa.eu/esfri/>), pointed out the important role played by the XFEL on the European research scene, ‘In September 2006, ESFRI published the first European roadmap for new large-scale research infrastructures which are of central importance for the European research position for the next ten to 20 years and whose impact will reach far beyond European borders. The XFEL is a vanguard among the 35 selected projects. The experimental opportunities at the facility will revolutionize the nature of X-ray science.’ Today, Europe holds a leading position in this kind of research thanks to the DESY facility FLASH, which until 2009 will be the only facility in the world for first experiments with soft X-ray laser radiation. ‘As a pilot facility for the XFEL, FLASH is an invaluable asset, and the remarkable first results already demonstrate the enormous potential of the European X-ray laser XFEL.’

There were a number of scientific talks from experts from around the world. For example, Henry Chapman talked about the outstanding achievements of successfully imaging single particles using the FLASH facility (soft X-ray free-electron laser). Apart from obvious issues like radiation damage, he stressed the many big challenges to single-particle imaging. Thus the development of



Scientists at the First XFEL Users Meeting in Hamburg.

techniques stretching from sample injection to reconstructing three-dimensional structures from many two-dimensional diffraction patterns will drive the technologies required for single-particle imaging. He went on to summarize the first experimental demonstration of the recording of an ultrafast coherent diffraction pattern of a nano-structured non-periodic object and its image reconstruction. This was recently published in *Nature Physics* (December 2006 issue). From experiments carried out at FLASH during 2006, he also presented the reconstruction of a three-dimensional X-ray image from a non-crystalline object (50 nm gold spheres arranged in a pyramid) at 10 nm resolution. Moreover, he demonstrated for the first time single-particle diffraction of 200 nm-sized particles taken ‘on the fly’ when injected in the FEL beam by the electrospray approach.

The 3.4 km-long XFEL facility will be located in the federal states of Hamburg and Schleswig-Holstein and comprise three sites. The facility will begin on the DESY site in Hamburg-Bahrenfeld and run in a north-western direction to the town of Schenefeld (Pinneberg district, Schleswig-Holstein), which borders on Hamburg. Here, the research campus with an underground experimental hall comprising ten measuring stations is expected to be realized by 2013.

The construction costs for the XFEL facility amount to 986 million Euros (1.3 billion USD). As the host country, Germany will cover some 60% of these costs with 40% expected to come from European partner countries. Until now, 11 European countries and the People’s Republic of China have declared their intention to participate in the XFEL. Concrete bilateral negotiations are currently taking place on the governmental level between Germany and the various interested countries to determine the nature and scale of each country’s participation. The goal is to establish the pre-requisites for an independent European XFEL research organization by mid-2007, and start the construction work in autumn 2007.

Midwest Center for Structural Genomics deposits 500th structure into Protein Data Bank

The Midwest Centre for Structural Genomics (MCSG), based at the Advanced Photon Source in Chicago, USA, deposited its 500th structure in the Protein Data Bank (PDB) in early January this year. The MCSG (<http://www.mcsg.anl.gov/>) is one of four large-scale research centres of the Protein Structure Initiative, funded by the National Institutes of Health (<http://www.nih.gov/>). The second production phase of the NIH’s Protein Structure Initiative, which is currently underway, has a primary goal of large-scale structure determination to maximize the coverage of protein sequence space by structural information. A majority of the 500 structures (582 at the time of going to press) solved by the MCSG have been derived from human pathogens and have unique sequences. Determining these structures helps scientists better understand the function and biology of these organisms and in some cases helps create uniquely designed targeted drugs and vaccines.

‘Forty years ago it took researchers worldwide 16 years to deposit the first 25 structures into the PDB’, said MCSG Director Andrzej Joachimiak. ‘By November 2003, the MCSG had deposited its first

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100 structures, and in the past three years we have deposited an additional 400 structures.'

DIAMOND races to get users operation started

The year has started at DIAMOND with efforts to get as many of the Phase 1 beamlines ready for 'expert users' operation. The storage ring is now operating with some 120 mA and 12 h lifetime. Some of the beamlines have obtained beams on the samples and are expected to have new scientific results in the coming weeks. The first macromolecular crystallography beamline on I03, which is equipped with an ADSC 315 CCD detector, was also ready to take data from a test crystal. As we go to press, we wish the team success.



Diamond Life Sciences Director Louise Johnson (right) with I03 beamline scientist Katherine McAuley.

EMBL Hamburg receives funds for structural biology at PETRA-III

The German Federal Ministry for Education and Research has awarded 8.8 million Euros (approximately 11.4 million USD) to the Hamburg Outstation of the European Molecular Biology Laboratory (EMBL) for the construction of an Integrated Research Facility for Structural Biology at the new PETRA-III storage ring of the German Synchrotron Research Centre, named EMBL@PETRA-III. The new facility will comprise a complete and automated pipeline for structural investigations of proteins and other biological molecules using the high-energy X-rays of PETRA-III, soon to be one of the world's most powerful radiation sources. The new addition to EMBL Hamburg's existing structural biology facilities will start operations in 2010.

'PETRA-III will be one of the world's strongest synchrotron rings with leading optical parameters', said Matthias Wilmanns, Head of EMBL Hamburg. 'Now we will bring together the cutting-edge technology provided by DESY and our expertise in the life sciences in the new Integrated Facilities for Structural Biology at PETRA-III to make them available to the scientific community.'

Protein science meeting in Karachi

The Ninth International Symposium on Protein Structure Function Relationship was held in Karachi during 11–14 January 2007. The opening session was presided by Pakistan's Federal Minister, Professor Atta-ur-Rehman FRS, and hosted by the Vice-Chancellor Pirzada Qasim. The inaugural lecture was given by Roger Fourme,

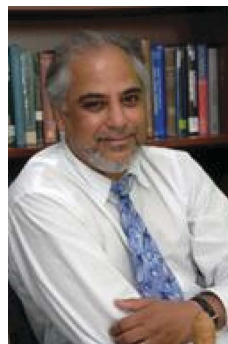


Right to left: Roger Fourme, Pirzada Qasim, Atta-ur-Rehman (Minister), Samar Hasnain, Roger Bauer and Atiya Abbasi (meeting organiser) at the protein science meeting in Karachi.

the Director of Life Sciences of SOLEIL, the new 2.75 GeV third-generation synchrotron radiation source about to begin its users operation. The delegates heard a number of presentations on structural biology research undertaken on a number of synchrotron sources including Daresbury, EMBL-Hamburg and ESRF. The strong appetite for synchrotron-radiation-based science was visible among the delegates. Pakistan, being a founding member of SESAME, is actively engaged in the construction phase of SESAME and is investigating the possibility of building a low-energy synchrotron radiation source for its national use as part of the step-change agenda of scientific research.

Swapan Chattopadhyay appointed the UK's first Chair of Accelerator Physics and to be the Inaugural Director of The Cockcroft Institute

The Universities of Liverpool, Manchester and Lancaster have appointed Swapan Chattopadhyay the Sir John Cockcroft Chair of Physics. The three universities have together created this new Chair, the first such joint-Chair in Accelerator Physics in the UK. Chattopadhyay's appointment is to be held concurrently with the position of Inaugural Director of The Cockcroft Institute from 19 March 2007. The Cockcroft Institute is located at the Daresbury Science and Innovation Campus and is a joint venture of the three universities with the UK Research Councils PPARC and CCLRC, and with the North West Development Agency (NWDA). Professor Chattopadhyay will also serve as a principal member of the steering committees for the flagship 'Fourth-Generation' Light Source, 4GLS.



Swapan Chattopadhyay.

Swapn Chattopadhyay is currently Associate Director at the Thomas Jefferson National Accelerator Facility, USA. He is internationally recognized for pioneering work in the physics and technology of particle beams and photon science. His achievements have included major contributions to phase-space cooling, to innovative particle colliders, to novel synchrotron radiation production, and to the generation of ultra-short femtosecond X-ray sources. He received his PhD in Physics from the University of California at Berkeley in

1982, after which he spent a couple of years at CERN. He returned to Berkeley Laboratory in 1984, where he worked on the accelerator physics of the Advanced Light Source and the Superconducting Super Collider. He was a Senior Scientist, a Guest Professor and the Founder/Director of the Center for Beam Physics at Berkeley, until his move to Jefferson Laboratory in 2001 after 25 years at the University of California and Lawrence Berkeley National Laboratory.