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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.s.hasnain@liverpool.ac.uk).

Brian Stephenson appointed Argonne Associate Laboratory Director of Photon Sciences and Director of the APS

Brian Stephenson has been appointed Associate Laboratory Director (ALD) for Photon Sciences at the Argonne National Laboratory. The directorate comprises three research and support divisions centred on Argonne's Advanced Photon Source (APS). Brian has been Interim ALD for Photon Sciences since October 2010, proving his abilities to lead both the directorate and the APS upgrade project effort. Brian is well known to the synchrotron radiation community and is a well recognized world leader in X-ray science with vast knowledge and expertise in synchrotrons, beamlines and instrumentation. He received an R&D 100 award for his work on the hard X-ray nanoprobe, served on the APS User Steering Committee, and was a critical team member in the development of the initial proposal to upgrade the APS.

Brian joined Argonne in 1995, serving most recently as Senior Physicist and Group Leader of the Synchrotron Radiation Studies Group in the Materials Science Division, and Director of the Nanoscale Materials Collaborative Access Team at the APS. Previously, he worked at IBM's T. J Watson Research Center, first as a research staff member, then as manager of the Statistical Physics Group. From 1987 to 1995 he was spokesperson for the IBM–MIT Participating Research Group at the National Synchrotron Light Source. From 1990 to 1994 he led the IBM–MIT–McGill Collaborative Access Team at the APS. He said 'It is a significant professional challenge to move from user and beamline developer to this new position. In the past year, while I served as Interim ALD, I came to see the APS from a new perspective. We have had some big successes.' He added 'So, it is a great honour for me to take on the responsibility of Argonne Associate Laboratory Director of Photon Sciences and Director of the APS at a time when the Advanced Photon Source upgrade project will bring even more muscle to this great scientific adventure.'

Brian Stephenson.

This announcement has been followed by more good news for the APS community when William Brinkman, Director of the US Department of Energy (DOE) Office of Science gave his approval for Critical Decision 1 (CD-1) for the APS upgrade project. CD-1 means that the DOE has formally approved the alternative selection and cost range for the APS upgrade project, establishing the preliminary technical scope of the project and authorizing the detailed preliminary design, and initial research and development activities.

Synchrotron radiation community remembers Hirotsugu Tsuruta

Hirotsugu Tsuruta, Senior Scientist at the Stanford Synchrotron Radiation Lightsource (SSRL), SLAC National Accelerator Laboratory, and the Department of Chemistry, Stanford University, died of cancer on 25 August 2011 at the age of 49. The news of his untimely death came at the IUCr Congress and General Assembly in Madrid. Since then there have been a number of tributes, some of which are reproduced below.

Hiro was born in Sasebo, in Nagasaki Prefecture, Japan, on 18 August 1962. He received his BSc in solid state physics and MSc in materials science (focused on kinetics studies of calcium-induced conformal changes of calmodulin, under the guidance of Professor T. Sano) at the Department of Materials Science, Faculty of Science, Hiroshima University, in 1985 and 1987, respectively. His DSc in biophysics was awarded by the Department of Materials Science, Faculty of Science, Hiroshima University in 1990. He spent a postdoctoral year at Hiroshima University, supported by the Japan Society for the Promotion of Science, mainly at the Jichi Medical School, after which he moved to SSRL and the Department of Chemistry in 1991 as a Science Research Associate. While a graduate student, Hiro worked on time-resolved small-angle X-ray scattering studies using synchrotron radiation and studying the allosteric transition of aspartate transcarbamylase, having Professors H. Kihara, T. Sano and T. Ohta as advisors, being an exchange graduate student at the Department of Physics, Jichi Medical School. He performed experiments at the Photon Factory during this time, and was involved

Hiro Tsuruta and Christine Trame. (Photograph courtesy of Yoshiyuki Amemiya.)

in several collaborative research projects using synchrotron radiation small-angle X-ray scattering. He developed a stopped-flow rapid mixer specifically designed for time-resolved solution scattering experiments at sub-zero temperatures. As a postdoctoral fellow, he continued to perform time-resolved small-angle X-ray scattering studies on biological macromolecules and also interacted extensively with Professors Y. Amemiya (Photon Factory; now at University of Tokyo) and K. Wakabayashi (Osaka University).

Hiro became responsible for structural biology research and instrumental developments in synchrotron radiation small-angle X-ray scattering (SAXS) at SSRL, in the Structural Molecular Biology program. For almost 20 years he led the effort to develop and implement the structural biology SAXS beamline BL4-2 facility, which today is one of the most highly performing and productive experimental facilities in the world, and which has become a beamline of choice for weakly scattering and challenging systems. Hiro was driven by his keen scientific interests and intellectual curiosity. His primary research field was biophysics, where he pursued his strong interest in structure–function relationships in biological macromolecular assemblies at the molecular structure level. He studied macromolecular assemblies such as virus particles, molecular chaperon proteins, kinases, heatshock proteins and transcription regulators. In particular, he evolved his interest in studying dynamical structural changes of these systems using time-resolved techniques.

Hiro served the scientific community in many respects, including co-authoring Volume F of *International Tables for Crystallography*, serving as chair of the American Crystallographic Association Small Angle Scattering Special Interest Group, serving most recently on the Scientific Advisory Committee for Petra-III and the NIH NCRR/GM Advisory Committee for structural biology beamlines at NSLS-II. Most of all he dedicated much of his time to the teaching and support of numerous SSRL SAXS users at BL4-2, providing everything from unyielding intellectual advice and support to mundane help such as troubleshooting a malfunctioning detector, a clogged dispenser or a forgotten computer password, around the clock and including weekends. He leaves an international legacy in the growing area of bioSAXS science, for which he pursued new developments and science applications until the end.

Professor Yoshiyuki Amemiya of the University of Tokyo and one of the founding co-editor's of the *Journal of Synchrotron Radiation*, said 'I had known Dr Hiro Tsuruta for about 30 years since he was a graduate student of Hiroshima University when he frequently conducted SAXS experiments at beamline 15A, for which I was responsible at the Photon Factory. I remember him as a highly motivated fast-learning graduate student. The last time I met Hiro was January 2011 at an annual meeting of the Japanese Society for Synchrotron Radiation Research. What impressed me very much then was his strong will and cheerful attitude in talking about his research to be pursued further and his warm and enthusiastic heart to help our science community develop by doing whatever he can, though his body was obviously very weak due to cancer. It is very sad that I will not be able to see him again physically, but it is sure that he continues to be alive in my mind and in the hearts of our colleagues.'

Dr Dmitri Svergun, Group Leader at EMBL Hamburg and a leading SAXS expert, said 'It is very difficult to find words adequately expressing the sorrow. Hiro was one of the brightest and simultaneously modest scientists I ever met. Both professionally and personally it was always a pleasure communicating with him, and the memories of him will be kept alive.' Dr Guenter Grossmann, another SAXS expert, said 'The SAXS community lost a very talented and forward-looking synchrotron radiation beamline scientist with a very keen interest in research and development who made significant contributions to the field of structural biology. He was devoted to the support of users and improvement of 'his' beamline. Together with my colleagues at the University of Liverpool I was very excited to perform the world's first remote synchrotron SAXS data collection between Europe (University of Liverpool) and America (SSRL) in 2009. Without Hiro's commitment this milestone would not have been achieved so quickly. Despite his serious illness he continued to assist in a cheerful and positive manner. He will be remembered not only for his scientific accomplishments but also for setting a high standard against which other beamline scientists will be measured. I will miss any future get-togethers with Hiro and would like to express my heartfelt sympathy for Christine.' Dr Katsuaki Inoue, SAXS beamline scientist at the Diamond Light Source, said 'I was very shocked to hear about Hiro's passing away and I am still deep in a profound sadness. But I never forget his smile as well as all his great contributions to the SAXS field.' Hiro will be missed by all he interacted with both professionally and personally.

Latest achievements and developments at LCLS

Two years after the first Linac Coherent Light Source (LCLS) experiment, X-rays entered the latest instrument designed for X-ray correlation spectroscopy (XCS). Commissioning is now under way and the first XCS users will arrive in November. XCS is the fifth LCLS instrument to come online, allowing researchers to investigate the dynamics of atoms and molecules within a sample on extremely fast time scales. One way that XCS will do this is to take each incoming LCLS pulse and split it in half, sending one half down one pathway and the other down a second that is just slightly longer than the first. When the two halves rejoin further downstream, the second lags behind. By comparing the sample's responses to the first and second pulses, researchers can see how the material's intricate structure evolves on unprecedented ultrafast time scales.

Experiments have also been reported [*Phys. Rev. Lett.* (2011), **107**, 144801] to show that LCLS is producing the most coherent (laser-like) X-rays ever measured. The world's first X-ray laser is not only a true laser but it is an extremely good one, according to measurements reported on 30 September in *Physical Review Letters*. For a light source to be declared a laser, the majority of its photons must be coherent, oscillating in sync. When LCLS at SLAC National Accelerator Laboratory in Palo Alto, California, USA, began operating in 2009, the evidence for laser light was the presence of bright monochromatic focused X-ray pulses. However, until now, estimates of the coherence of the light were based on simulations. To demonstrate that the LCLS is indeed coherent, a research team led by Ivan Vartanyants, of DESY synchrotron in Hamburg and the National Research Nuclear University in Moscow, used a form of the classic double-slit experiment. They shined the LCLS's 780 eV X-ray photon energy pulses through a silicon sheet containing hundreds of 'single-use' pinhole pairs with different spacings and focused the beam onto a new pair after each beam pulse. They determined a coherence length of 17 μm in the vertical direction and estimated the temporal coherence time of 0.55 fs concluding that 78% of the total power is contained in the dominant mode compared with less than 1% in a typical X-ray synchrotron source. 'It was a surprise that our measured values were so close to theoretical estimates made for LCLS', said Vartanyants, since the machine is so complex.

New Advanced Protein Crystallization Facility at APS

Last month a groundbreaking ceremony took place for the new Advanced Protein Crystallization Facility (APCF) at the Advanced Photon Source (APS). Planned to open in 2014, the USD 34.5M APCF will be a state-of-the-art laboratory unparalleled in the USA. The facility will be focused on the production, purification and characterization of proteins and protein crystals. Funding for the design and construction of a 50000 square-foot structural genomics facility is being provided by the State of Illinois. The APCF will complement the Structural Biology Center, a DOE scientific user facility also located at the APS. The APCF will also serve the growing needs of the Midwest Center for Structural Genomics (one of four Protein Structure Initiative Centers funded by the National Institutes of General Medical Science), currently located within Argonne's Biosciences Building.

The groundbreaking ceremony for the new Advanced Protein Crystallization Facility.