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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.hasnain@dl.ac.uk).

Third Nobel Prize for synchrotron work: Stanford celebrates

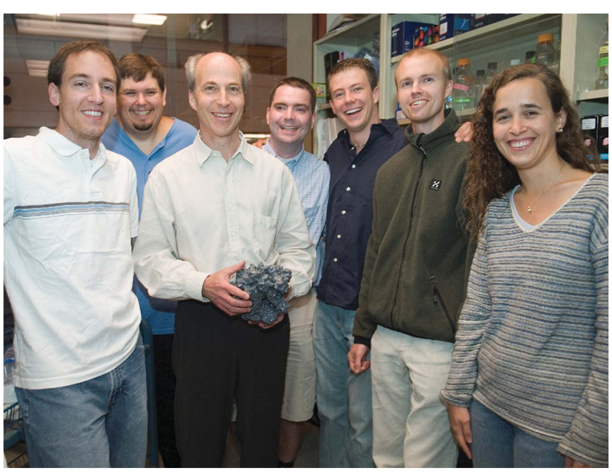
The Nobel Prize in Chemistry for 2006 was awarded to Roger Kornberg of Stanford University Medical School's Department of Structural Biology. This is the third Nobel Prize awarded for synchrotron-radiation-based work: all of the prizes have been in the area of structural biology, the previous being awarded to Rod MacKinnon (2003) and John Walker (1997). The structural work of MacKinnon was carried out primarily at the Cornell High Energy Synchrotron Source (CHESS) and the National Synchrotron Light Source (NSLS) at Brookhaven [*J. Synchrotron Rad.* (2004), **11**, 125–126]. The Nobel Prize to Sir John Walker in 1997 was the first Nobel Prize for synchrotron radiation work, where the structural work on F1-ATPase was carried out at the Daresbury SRS [*J. Synchrotron Rad.* (1999), **6**, 809–944]. Fifty-nine year old Roger Kornberg was the sole recipient of the prize and, with father Arthur, became the sixth father and son to win Nobel Prizes. Arthur Kornberg, Professor Emeritus at the Stanford School of Medicine, shared the 1959 Nobel Prize in Medicine with Severo Ochoa for studies on how genetic information is transferred from one DNA molecule to another.

The Nobel Prize in Chemistry for 2006 was awarded to Roger Kornberg for his fundamental studies of the molecular basis of eukaryotic transcription. Transcription is the process in a cell in which the genetic information stored in DNA is activated by the synthesis of complementary mRNA by enzymes called RNA polymerases.

Kornberg has made breakthrough progress in the molecular understanding of transcription and its regulation in eukaryotic cells. His combination of advanced biochemical techniques with structural determinations has enabled the atomic-level reconstruction of RNA polymerase from yeast in isolation as well as in a number of functionally relevant complexes with template DNA, product mRNA, substrate nucleotides and regulatory proteins. Roger Kornberg entered the field of transcription when he worked on the structure of chromatin as a post-doctoral student at the MRC in Cambridge, UK, with Francis Crick and Aaron Klug. After his return to Stanford, the main objective of Kornberg's research continued to be the understanding of transcriptional regulation in eukaryotes. Kornberg realised early on that RNA polymerase might be the platform around which the whole eukaryotic transcription machinery is built. However, the large size of yeast RNA polymerase II (12 subunits, 0.5×10^6 Da) and the scarcity and the instability of the purified complex made structural studies very difficult. The breakthrough came in 2000. In a number of papers[1] the structure of a ten-subunit yeast RNA polymerase at 2.8 Å resolution was described as well as an elongating complex consisting of RNA polymerase, template DNA and product RNA.

The SSRL Director at the time, Keith Hodgson, when this work was carried out by Kornberg, said on the occasion, "We are very pleased that the magnificent structural work of Roger Kornberg and his colleagues was significantly enabled by synchrotron X-rays at SSRL. These studies offer our most detailed glimpse into the inner workings of one of nature's most remarkable molecular machines".

We join in congratulating Roger Kornberg, his team at Stanford Medical School, the SSRL facility and its staff.



Roger Kornberg with his team after receiving the news. From left to right, Craig Kaplan, David Bushnell, Roger Kornberg, Karl-Magnus Larsson, Andy Ehrensberger, Henrik Spahr and Maia Azube. (Photograph credit: Linda A. Cicero.)

Advanced Light Source gets a new Director

Roger Falcone, 54, a physicist whose specialty is the use of ultrafast pulses of X-ray and laser light to study phenomena in condensed matter, molecular and atomic physics, has been named the new Director of the Advanced Light Source (ALS) at Lawrence Berkeley National Laboratory (Berkeley Lab).

"Roger Falcone has been a leader in the fields of ultrafast science and X-ray studies of advanced materials," said Berkeley Lab director Steven Chu in announcing the appointment. "He has a broad understanding of the fields of interest to the ALS user community and is extremely well poised to lead the ALS into the future of soft X-ray science and technology. As former Chair of the Physics Department at UC Berkeley, Roger has proven leadership experience. We look forward to a wonderful and exciting new era at the ALS under his direction."

Falcone succeeds Janos Kirz, a former Co-editor of the *Journal of Synchrotron Radiation*, who has been directing the ALS in an interim capacity since June 2004, when he took up the reins of leadership on behalf of Daniel Chemla owing to his illness.

Falcone himself is a veteran user of the ALS. Among other achievements he was the co-author, along with Robert Schoenlein, of a proposal that brought in beamlines 6.0.1 and 6.0.2, dubbed the Ultrafast X-ray Facility, which are optimized for the generation of femtosecond X-ray pulses. "I have been involved with the ALS as a user for ten years and with the Berkeley campus and lab community for over 20 years", Falcone said. "I greatly enjoy working with the

[1] Cramer, P., Bushnell, D. A., Fu, J., Gnatt, A. L., Maier-Davis, B., Thompson, N. E., Burgess, R. R., Edwards, A. M., David, P. R. & Kornberg, R. D. (2000). *Science*, **288**, 640–649; Bushnell, D. A., Cramer, P. & Kornberg, R. D. (2001). *Structure*, **9**, R11–R14; Cramer, P., Bushnell, D. A. & Kornberg, R. D. (2001). *Science*, **292**, 1863–1876.

Roger Falcone.

people here, from the staff to visiting scientists. We have an exceptionally committed and talented group at the ALS, and a world-class facility that our supporters in Washington recognize as a national treasure."

Falcone's undergraduate degree in physics was earned at Princeton University in 1974. He earned an MS and PhD in electrical engineering from Stanford University in 1976 and 1979, respectively. Following a three-year fellowship with the Applied Physics Department at Stanford, he joined the faculty of UC Berkeley's Physics Department in 1983. He rose quickly through the academic ranks, becoming a full professor in 1991. He chairs the Science Advisory Committee for the Linac Coherent Light Source (LCLS), now being built at Stanford and due to come on-line in 2009.

Australian Synchrotron makes progress

At 03:15 on 14 July 2006, only two years and ten months after earthmoving machines started to grade the 'green-field' site, beam was captured, then accumulated and stored in the 3 GeV storage ring of the Australian Synchrotron. The beam current was 1 mA and the beam lifetime was 10 min; the beam was immediately visible on the X-ray pinhole diagnostic beamline. This met a major milestone date that had been promised to the Victorian State Government, the funding agency for this part of the project, almost four years previously. Two months later, 50 mA is routinely stored (limited only by the available RF power), the injection efficiency has reached 67%, the beam lifetime is 4 h at 50 mA and is improving daily, and about 3 A h of beam scrubbing has been accumulated. The storage ring has been completely characterized using beam-based alignment of the beam-position monitors, measurement of the orbit response matrix, and the *LOCO* code. Using these tools the orbit has been corrected to less than 50 μm RMS horizontally and 80 μm RMS vertically, and dispersion, beta functions and beam emittance are remarkably close to the predicted values. In addition, the optical diagnostic beamline has been commissioned and initial streak camera data show no longitudinal or transverse instability in the beam.

The Accelerator Physics team celebrating the first stored beam, and (inset bottom left) the cross section of the beam as seen on the X-ray pinhole array camera; the holes in the array are 1 mm apart.

This work is the culmination of an accelerator installation effort that started after the synchrotron building was handed over in April 2005. The Australian project adopted the approach where technical contracts were typically design, build, install and commission contracts, thereby freeing up the small synchrotron staff to concentrate on design, design verification, contract supervision, assistance with installation, and close collaboration in the commissioning. This approach allowed the number of synchrotron staff assigned to the technical aspects associated with procurement, and construction, installation and commissioning the accelerators and the technical support infrastructure (power, water cooling *etc.*) to be kept to a maximum of 45 people.

While the accelerator physics team now concentrates on bringing the accelerator systems up to full specifications, the procurement activities have shifted to the beamlines. Ten front-ends are already fully installed and commissioned, terminating in vacuum valves outside the accelerator shielding, so the beamlines can be bolted into position without interfering with accelerator commissioning. Currently the beamline hutches are being installed for the first five beamlines. Installation of the first five beamlines will commence in December 2006, with the expectation that they will start delivering beam to users in the second quarter of 2007. Designs of the next four beamlines (three of which will take light from in-vacuum undulators) are well advanced, and are expected to come on-line in the second quarter of 2008.