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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).

Brookhaven's next big machine, NSLS-II, makes progress

The 3 GeV NSLS-II storage ring, with a circumference of 791.5 m and expected average spectral brightness exceeding 10^{21} photons mm^{-2} mrad^{-2} s^{-1} (0.1% bandwidth)$^{-1}$ [*J. Synchrotron Rad.* (2009), **16**, 314], has begun to make significant progress on the ground. The first parts of the NSLS-II ring began to take shape after the concrete-pouring process began on 20 July 2009. Once complete, the 400000 square-foot building will house the accelerator ring, the largest component of the machine, as well as the beamlines. In total, the ring-building will require a little more than one million cubic feet of concrete, which will take about 18 months to pour. Much of this extraordinary amount of concrete is needed to form the building's massive concrete tunnel and experimental floor, and to meet requirements for a stable floor base in order to provide the extreme beam stability to reach the high brilliance required for experiments. Steel beams will begin to arrive on site as early as September, with the bulk of the steel erection starting in December. The installation of underground utilities is also underway and will increase in the next few months.

Important tests were also conducted on the engineering design in the development of the magnet girder assembly. The aim was to determine how closely the magnets would stay aligned when they are moved from their assembly point to the NSLS-II tunnel. Results confirmed that the magnets' high-precision alignment would survive the process of transporting, installing and fixing the girders to the ground in the tunnel. During the tests, the magnetic centres of the magnets were aligned inside the environmental room to within a few micrometres. The team then extracted the magnets from the room, put them onto a truck that travelled around the site, and then returned the magnets to the assembly room. The team then re-assembled the magnets in position and measured how far they moved out of alignment.

Construction of the NSLS-II building.

Magnets on a girder being loaded onto a truck.

More energy for the FLASH free-electron laser

The newest accelerator module for the FLASH free-electron laser has successfully passed the test. Now it is possible to increase the FLASH energy to 1.2 GeV. This means that even shorter wavelengths, down to 4.5 nm, will be available for experiments starting next year. The module is a prototype for the European XFEL and was partly manufactured in China. It was built in China on behalf of the IHEP Institute in Beijing, and consists of an outer vacuum tank and an inner support structure for the cavity string called the 'cold mass'. Later on, China will supply part of the modules needed for the European XFEL as a contribution in kind.

For this extension of FLASH an additional module with eight accelerating structures is needed. The desired accelerating gradient of the module was specified to be 25 MV m^{-1} so that, after the installation of the module at the end of the current FLASH accelerator, the electron beam energy will safely reach 1.2 GeV. In parallel, the manufacturing of this additional module allows the final small technical changes required for the European XFEL to be cross-checked.

The prototype PXFEL1 was assembled at DESY from April to June 2009, with the participation of the CEA Saclay where series production is to take place. Then it was directly installed into DESY's cryomodule test bench and cooled down to 2 K. In mid-July, after successful tests of the RF couplers, a gradient average of up to 30 MV m^{-1} was reached. At PXFEL1, all cavities reached the gradients that were expected on the basis of previous results from individual cavity test bench tests. Currently, the modules are tested for heat loss, and the integrated superconducting magnets for their performance according to plan. First results confirm expectations. This is especially true for the mechanical behaviour when cooling down from room temperature to 2 K: the observed shrinkage and movements of the whole structure are all within the permitted tolerances.

First X-ray beam at the PETRA III light source

Scientists from the Helmholtz research centre DESY have generated the first X-ray light for research at the new synchrotron radiation source PETRA III. This means that the most brilliant storage-ring X-ray source in the world is now available for experimental operation. The 2.3 km electron storage ring went through a two-year Euro 225M upgrade, converting it into a brilliant X-ray light source. Following the upcoming test runs of the individual measuring devices, PETRA III will start regular user operation in 2010. After the first storing of particles at PETRA III in April this year, the undulators have been installed and X-ray beams have been obtained.

The PETRA accelerator was originally built for particle physics. More recently, PETRA was used as a pre-accelerator for DESY's successful particle accelerator HERA. The remodelling of PETRA into the most modern storage-ring X-ray source in the world was largely funded by the Federal Ministry of Education and Research, the City of Hamburg and the Helmholtz Association. A 300 m-long experimental hall has been built over the PETRA storage ring, housing 14 synchrotron beamlines and up to 30 experimental stations. To ensure that the synchrotron beam is not compromised in its stability on the sample by vibration during 'exposure', the experiments will be installed on the largest monolithic concrete slab in the world.

CLS celebrates 2000th researcher visit

The Canadian Light Source (CLS) recently reached an important milestone in its operational life when it received its 2000th research visitor, Brian Bewer, a University of Saskatchewan graduate student. Bewer, who is working on a PhD in physics with Dean Chapman, crossed the 2000 mark while conducting experiments imaging prostate cancer on the BioMedical Imaging and Therapy beamline. 'This is an important milestone for the Canadian Light Source and our user community of academic and industrial scientists', said CLS Executive Director Josef Hormes. 'It shows, in a very concrete way, that the CLS is a resource that is in demand and being used by researchers from Saskatchewan and around the world. I am not surprised that our 2000th user visit was made by a graduate student as they are the people that push science forward and make the most of the opportunity to use a facility like the CLS.'

The CLS staff discovered that Bewer was the 2000th visitor recently when reviewing the 2009 visitor statistics. The first experiment conducted by a researcher visiting the CLS occurred in May 2005. The CLS anticipates that the number of visits by researchers to the CLS will grow to 2000 annually once seven beamlines that are currently under construction and in the early stages of testing join the seven beamlines that are currently operational.

SESAME signs three MOUs at its Council meeting

The SESAME project continues to attract institutions from across the world to partner in its effort to build its scientific and technical capacity to help construct and utilise the world competitive 2.5 GeV synchrotron radiation source in Allan, near Amman.

SESAME, at its Council meeting on 20 July 2009, signed a Memorandum of Understanding (MOU) with the Abdus Salam International Centre for Theoretical Physics (ICTP), Italy, Instituto Tecnologico e Nuclear (ITN), Portugal, and Paul Scherrer Institute (PSI), Switzerland. These MOUs are aimed at strengthening scientific and training links between these institutions and SESAME by increasing staff and expertise exchanges as well as fellowships and joint workshops/symposia. The Council also welcomed Japan as the latest observer country to formally join the project.

Sir Christopher Llewellyn-Smith, President of the SESAME Council (second from right), is flanked by Julio M. Montalvao e Silva, President of ITN (left), and Claudio Tuniz, Assistant Director ICTP (right), with Albin Wrulich (PSI) on the extreme left. The directorate of SESAME (standing in the back row, from left to right, Hafeez Hoorani, Khaled Toukan, Amor Nadji and Yasser Khalil) witness the important partnership.