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).

Canadian Light Source starts

Commissioning of the Canadian Light Source (CLS) has achieved several milestones on its way to experimental operation, expected to commence in the second quarter of 2004. After two months of pre-commissioning, a 2.9 GeV electron beam has been stored in the CLS storage ring. On 18 November 2003 it was first stored for 1 s (and then lost during the next injection cycle). The following day the beam was 'stacked' to a current of 4 mA and stored for 20 min. By the end of December, 10 mA beams were being run with lifetimes of about 1 h.

The CLS storage ring features a compact design (171 m circumference) with magnets operating at the limit of conventional technology. It is the first dedicated synchrotron radiation source that is utilizing a superconducting RF source.

Higher currents will be attempted once the orbit has been corrected. Vertical orbit correction is very near the design goal of ± 1.5 mm, and horizontal orbit correction has begun.

On 9 December the first light was extracted from the storage ring into the optical synchrotron radiation beamline. Also in December, extensive radiation surveys were performed. Design of the final configuration of the radiation shielding is now underway.

The procurement of the first seven beamlines and insertion devices has been completed. Installation of the first beamline components has started, along with the installation of the first radiation enclosures and front ends. The expectation is that four of the beamlines will be under commissioning in the first quarter of 2004, with the remaining three starting commissioning in the second and third quarters. The first operational beamlines will be the far-IR, mid-IR and three soft X-ray beamlines (SGM, VLS-PGM and spectromicroscopy), followed by two hard X-ray beamlines (protein crystallography and XAFS/microprobe).

Canadian synchrotron radiation users, who have been active on many synchrotrons, can now look forward to their own national source. Like in so many other cases, this is expected to catalyse a significant growth of the Canadian synchrotron radiation scientific community.

SPEAR3, a 3 GeV third-generation synchrotron radiation source at Stanford

Stanford Synchrotron Radiation Laboratory (SSRL) was one of the pioneering synchrotron radiation laboratories that started life with the parasitic use of a high-energy accelerator [others from this vintage have been DESY, Frascati and NINA-SRF at Daresbury; see *J. Synchrotron Rad.* (1997), **4**, 315–405]. SPEAR had undergone several upgrades but this time a completely new machine has been the goal, with a low emittance of 12–18 nm rad and a design maximum current capability of 500 mA. The machine is capable of incorporating a large number of insertion devices in its straight sections, including narrow-gap undulators.

Only eight months after the last electrons circulated in the original SPEAR storage ring (which began operation in the early 1970s for high-energy physics with parasitic operation for synchrotron radiation), the first electrons circulated in the completely new SPEAR3 ring. Commissioning of the new 3 GeV SPEAR3 light source began on 10 December 2003, with first beam being accumulated five days later. A little over a month later, currents of 70 mA with reasonable lifetimes are already being reached and at-energy injection is very effective. The rapid installation and success of very rapid commissioning is a real testimony to the whole SPEAR3 project staff and collaborators who have built an excellent machine and equipped it with powerful and accessible machine modelling and control programs. The first user run on SPEAR3 is scheduled to begin in March of this year, less than a year after the shutdown to begin the installation of SPEAR3 in April 2003.

The SPEAR3 upgrade at a cost of USD 58 million was made possible by the joint support and funding of the US Department of Energy and the National Institutes of Health. Construction and installation work was performed jointly by contractors and staff from SSRL, along with numerous other divisions at SLAC.

The 3 GeV 500 mA ring boasts a copper vacuum chamber, mode-damped RF cavities and state-of-the-art power supply, and state-of-the-art instrumentation and control systems. The original SSRL beamlines are being upgraded with liquid-nitrogen-cooled monochromators, high-performance mirrors and other optical components in preparation for future 500 mA operation expected to commence towards the end of 2004. While the permanent-magnet insertion devices from SPEAR2 have been retained, two electromagnet wigglers have been replaced with permanent-magnet devices. To take full advantage of the new low-emittance lattice, two new undulator beamlines are already under construction, a soft X-ray undulator serving microscopy and another for materials applications. A hard X-ray in-vacuum undulator for macromolecular crystallography is also being pursued.

SESAME holds its second user's meeting

The Second SESAME User's Meeting was held at Isfahan University of Technology in the beautiful and historical surroundings of the city of Isfahan in Iran, during the period from 29 November to 1 December 2003. Some 70 participants came from a number of member and observer countries including Brazil, Federal Republic of Germany, Iran, Japan, Jordan, Pakistan, Palestinian Authority, Turkey, United Arab Emirates, United Kingdom, United States and Yemen.

The meeting was opened with a talk by Herwig Schopper, President of the SESAME Council, who briefed the audience on the history and current status of SESAME. Dieter Einfeld gave a detailed account of the 2.5 GeV lattice design and showed the performance of a number of possible insertion devices. A very high proportion of the machine circumference is now devoted to insertion devices. Herman Winick talked about the growth of synchrotron radiation sources in the world. Samar Hasnain presented the plan for the first phase of SESAME beamlines. Details of six phase 1 beamlines were given so that working groups could provide feedback. The plan includes building beamlines which meet the requirements of a wide range of scientific activities from archaeometry to biology and chemistry. Reza Mansouri, Chairman of the SESAME Training Committee, described a 'roadmap' for SESAME capacity building in the region for the 2004–2007 period. There were additional talks

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covering a range of applications, including Soichi Wakatsuki (Japan) and Joel Sussmann (Israel) on structural biology, Manolis Pantos (UK) on archaeology and cultural heritage, Nasser Hamdan (UAE) on surfaces and interfaces, Shoaib Ahmad (Pakistan) on photoemission and photoabsorption spectroscopy, Aldo Craievich (Brazil) on SAXS of nanostructured materials, and Pierre Rizkallah (UK) on the use of synchrotron radiation by the pharmaceutical industry.

On the last day of the meeting and on the basis of the discussions and lectures presented during the previous days, four different working groups were formed to discuss the detailed plan for the six phase 1 beamlines dedicated to (i) small-angle-resolved X-ray scattering (SAXS)/wide-angle-resolved X-ray scattering (WAXS); (ii) MAD protein crystallography; (iii) photoelectron and photoabsorption spectroscopy; (iv) X-ray absorption fine structure (XAFS)/X-ray fluorescence spectroscopy (XRF); (v) powder diffraction also with X-ray fluorescence capabilities; and (vi) infrared spectromicroscopy.

SPring-8 tests its superconducting wiggler

A three-pole 10 T wavelength shifter (wiggler) has recently been installed and tested on the 8 GeV SPring-8 with the aim of investigating the scope of SPring-8 as a γ-ray source in the 1–5 MeV range. A beam of 1 mA (limited to this value to avoid excessive heat load) has been stored at wiggler magnetic fields of up to 9.7 T. The superconducting wiggler spectum showed very high intensity in this range in accordance with the calculated spectrum. A significant effect on the stored beam, namely an increase in horizontal emittance by a factor of two, was observed. It is likely that if this device is to become an experimental facility then it would be used in its own dedicated time with small beam currents in the storage ring.

CLS gets its executive director

Bill Thomlinson, well known in the synchrotron radiation community, recently joined the Canadian Light Source as its Executive Director. He began his career in synchrotron radiation when he joined the newly established synchrotron department at Brookhaven in 1979. There he became Associate Chairman, responsible for the general welfare of the users community. He also established one of most significant medical activities on a synchrotron which eventually took him to the European Synchrotron Radiation Facility in Grenoble in January 1999 as Head of the Medical Research Group. The challenge of establishing the Canadian Light Source as a major synchrotron radiation centre brought him back to the American continent. Bill started his scientific career as a physicist, having obtained his doctorate from Yale in 1970. His first post-doctoral assignment was at Cornell, and later at Julich.

Bill Thomlinson.