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current events

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

ALBA team builds up

The Spanish synchrotron facility, ALBA, is beginning to make rapid progress. Its staff strength has increased to 75 (http://www.cells.es/). During 2005 the ALBA storage ring has seen the completion of its design and the start of the ordering for the main components. The lattice has been frozen and the details of the closed-orbit correction scheme, as well as the effect of the insertion devices on the beam dynamics, are currently being examined. ALBA is a 3 GeV storage ring with a 3 GeV booster synchrotron and a 100 MeV electron linear accelerator (linac). ALBA will use the so-called top-up injection mode, providing greater stability to the beamline optics and experimental operation. The linac, with the option for top-up, was ordered as a turn-key system in October 2005. The storage ring will have 32 bending magnets, 112 quadrupoles and 120 sextupoles. The contracts for the quadrupole and sextupole magnets have also been awarded and currently the tendering for the bending magnets is in progress. ALBA will have a normal conducting HOM-free RF cavity. The design of the vacuum system for the storage ring is completed and now the Accelerator Division of ALBA is turning its attention to the design of the booster synchrotron and front ends of the beamlines. There will be six phase-one beamlines including XAFS, protein crystallography, powder diffraction, XMCD and SAXS/WAXS.

Artists impression of ALBA.

The ALBA team as of March 2006.

DIAMOND and SPring-8 sign up to future collaboration

Diamond Light Source Ltd, the UK's next-generation synchrotron facility, the Japan Synchrotron Radiation Research Institute (JASRI), and the RIKEN Harima Institute recently signed a Memorandum of Understanding (MoU) to strengthen collaborative research between Japan and the UK. The signing was undertaken by Professor Gerhard Materlik, Chief Executive of Diamond Light Source Ltd, Dr Akira Kira, Director General of JASRI, and Dr Hiroyoshi Suematsu, Director of RIKEN Harima Institute.

Professor Materlik said, 'Synchrotron science has developed rapidly in the last 20 years thanks to a very open collaborative spirit among the community. As Diamond approaches its launch in early 2007, it is a very positive move for us to be able to sign this MoU with JASRI and RIKEN. It will enable us to combine expertise to accomplish significant scientific goals, develop common specialized knowledge and effective use of facilities and increase cooperation and mutual support between the three organizations. The aim for all three institutes is to give the best integrated service to users in our own countries and the international community of scientists.'

Dr Kira said, "SPring-8 is the world's largest synchrotron light facility and has been operating since 1997. We are delighted to be able to share our knowledge with Diamond, one of the newest synchrotrons in the world. By strengthening the international collaboration with the highly skilled team that Professor Materlik is gathering together at Diamond in the UK, we aim to build on the achievements of the past 20 years, which the UK has seen at the forefront of synchrotron radiation developments and genome science."

DESY's VUV free-electron laser celebrates the conclusion of first experimental session

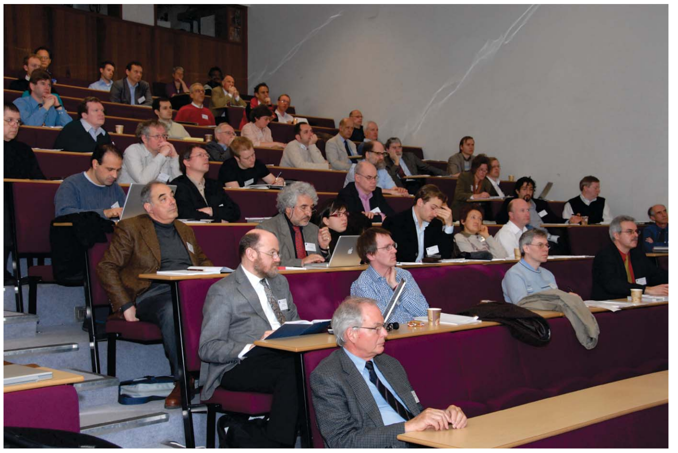
The first measuring period for external users at the new X-ray radiation source VUV-FEL at DESY in Hamburg has been successfully concluded. Since its official start in August 2005, a total of 14 research teams from ten countries have carried out first experiments using the facility's intense VUV laser beam. 'Both the external researchers and the DESY team gained most valuable experience with the new machine', DESY Research Director Professor Jochen Schneider said. 'As a worldwide unique pioneering facility for free-electron lasers for the generation of X-ray radiation, the VUV-FEL for example offers completely new possibilities to trace various processes on extremely short time scales.'

The free-electron laser VUV-FEL is the first such facility and until 2009 it will remain the only source of intense laser radiation in the ultraviolet and the soft X-ray range. The 300 m-long facility at DESY generated laser flashes with a wavelength of 32 nm (320 Å, $\sim$39 eV) for the first time in January 2005, the shortest wavelength ever achieved with a free-electron laser. Four experimental stations are currently available, at which different instruments can be operated alternately.

'The VUV-FEL is an absolute novelty: for the first time experiments with intense pulsed laser radiation can now be carried out at these short wavelengths', explained DESY physicist Josef Feldhaus, who is in charge of the coordination of the experiments at the VUV-FEL. 'The researchers are thus venturing into completely uncharted terrain, of which nobody has any experience yet.' The experiments carried out during this first measuring period ranged from the generation and measurement of plasmas to studies of gases and clusters and to the first investigations of experimental methods for complex biomolecules, which will later be used at the European X-ray laser XFEL. As expected, the light flashes of the VUV-FEL are shorter than 50 fs. This has allowed several groups to trace various processes on extremely short time scales by taking time-resolved 'snapshots' of the reaction process. The investigation of such time-resolved processes with radiation of short wavelengths is one of the most important new applications that will be possible in the future with this kind of X-ray laser.

The next user period will start in May 2006. Current machine studies are focused on improving the stability of the facility and shortening the wavelength of the radiation to around 15 nm (150 Å, ~80 eV). The shortest wavelength of 6 nm (60 Å, ~206 eV) planned for the VUV-FEL will be reached after the installation of an additional accelerator module in 2007.

The free-electron laser VUV-FEL generates short-wavelength intense laser light flashes according to the SASE principle of 'self-amplified spontaneous emission'. In a first step, electrons are brought to high energies by a superconducting linear accelerator. They then race through a periodic arrangement of magnets, the so-called undulator, which forces them to follow a slalom course and thereby radiate flashes of light. Sophisticated beamlines then lead these laser flashes into the experimental hall, where they are distributed among the various measuring stations.



The 2006 FALS meeting at Daresbury.

Delegates at the 1973 meeting.

Experts gather at Daresbury to discuss future advanced light sources (FALS)

Leading experts in laser, plasma and accelerator-based light sources gathered at Daresbury for a two-day workshop during 30–31 March 2006. The workshop was sponsored by the European Science Foundation. Reports and plans from many centres, including BESSY (Berlin), DESY (Hamburg), MAX-IV (Lund), Jefferson Laboratory (USA), Elettra (Trieste), ERLP and 4GLS (Daresbury) were presented. Many of the experimental possibilities and challenges were discussed. The excitement generated from the first experimental session of DESY's VUV-FEL (the highest-energy FEL to date) could be felt throughout the meeting. Dr Gwyn Williams, during his overview talk, summed up the feeling by drawing an analogy to the 1973 meeting of synchrotron radiation experts in the same lecture hall. The figures above show delegates during the two pioneering meetings.