

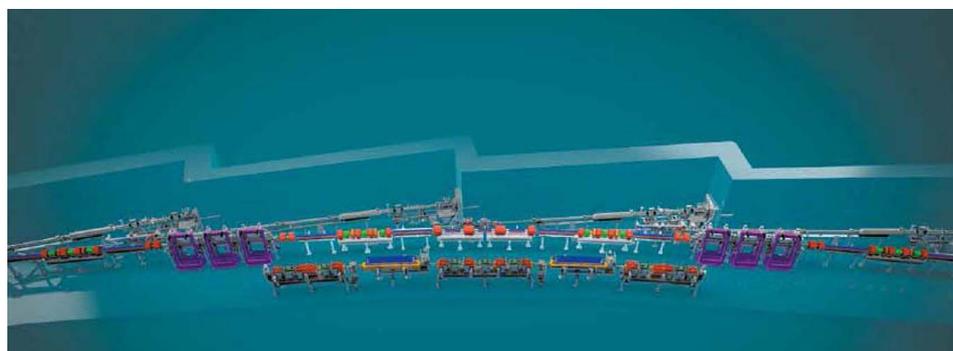
## Current events

### 1. Phase II Upgrade of ESRF launched

The ESRF officially launched Phase II of its Upgrade Programme on 28 May 2015. The major technological challenge of this second step is the replacement of the existing storage ring with a so-called multi-bend achromat (MBA) lattice; see also the Special Issue on *Diffraction-Limited Storage Rings and New Science Opportunities* [*J. Synchrotron Rad.* (2014), **21**, 837–1089]. MAX-IV (Lund, Sweden) and Sirius (Campinas, Brazil) will be the first such rings in operation. At several other synchrotrons, MBA lattices are in the planning stage. MBA lattices deliver much brighter X-ray beams than present storage-ring lattices.

Initiated in 2009, the ESRF Upgrade Programme will extend until 2022 and is implemented in two phases. Phase I, which will be completed by the end of 2015, enabled the construction or refurbishment of 19 experimental stations. A new ultra-stable experimental hall of 8000 m<sup>2</sup> was required as well as the enhancement of the scientific equipment and accelerator infrastructure. In Phase II (2015–2022), the technological challenge will be to shut down and dismantle the existing accelerator and install the MBA in its place, while causing minimal disruption to the ongoing user programme. Phase II also includes the construction of new state-of-the-art beamlines, an ambitious instrumentation programme focused on high-performance detectors and an intensified ‘big data’ strategy, designed to exploit the enhanced brilliance, coherence flux and performances of the new X-ray synchrotron source. The user programme will be put on hold from the end of 2018 to June 2020 while the accelerator is dismantled and the new source installed and commissioned.

At the launching ceremony, ESRF Director General Francesco Sette said: ‘The construction of this new light source, deeply rooted in the existing infrastructure, will allow Europe to strengthen its strategic position in this area of science with an exceptional return on investment and minimal disruption of the ongoing programme: this is possible and conceivable only thanks to the 20 years of experience and unique concentration of skills and expertise of the ESRF staff. I am confident that, with the support of its scientific community and the motivation of its staff, this is a new era for the ESRF, for the history of synchrotrons and for the science that is now being written.’



A new design for the ESRF storage ring with a MBA lattice. The new lattice elements (magnets, vacuum chambers and position monitors) within each of the 32 lattice cells will all be put within the existing tunnel.

### 2. DESY doubles research capacity of X-ray laser FLASH

On 20 May 2015 an official ceremony was held to inaugurate the second laser line of the X-ray laser FLASH.

FLASH delivers extremely short and intense X-rays flashes, which can be used to observe the ultra-fast processes taking place in the world of molecules and atoms. The





Inauguration of the two FLASH experimental halls, named after Albert Einstein and Kai Siegbahn. From left to right: Beatrix Vierkorn-Rudolph of the Federal Ministry of Research, the Swedish secretary of state Anders Lönn, DESY director Helmut Dosch, Hamburg's mayor Olaf Scholz, and Hans Siegbahn, son of Kai Siegbahn. Credit: Lars Berg/DESY.

facility is used by some 200 scientists from all over the world annually. In the past three years, DESY has extended the facility at a cost of EUR 33 million, adding a second laser line and a second experimental hall. Not only has the number of experimental stations increased, but also the quality of the X-ray flashes has been improved thanks to new technological developments. In contrast to the original laser line, the wavelength of the X-rays on the new laser line can be altered during operation.

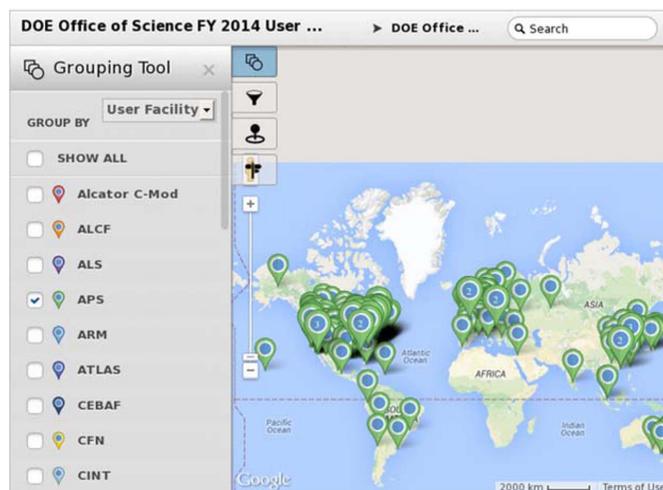
At the inauguration ceremony, Olaf Scholz, First Mayor of Hamburg, and Anders Lönn, State Secretary to Sweden's Minister for Higher Education and Research, named the two FLASH experimental halls after the physicists Albert Einstein and Kai Siegbahn. "The further technical refinement of our successful X-ray laser FLASH will now give researchers from all over the world even more precise insights into the nanocosm," said the Chairman of DESY's Board of Directors, Helmut Dosch.

### 3. DOE's Office of Science User Facilities demonstrates wide impact across the globe

The US Department of Energy's Office of Science is the single largest supporter of basic research in the physical sciences in

the USA and is actively sponsoring research to address some of the most challenging technical and scientific issues today. A unique collection of research centres are operated by the Office of Science as User Facilities, which hosted more than 30000 national and international researchers in the last 12 months alone. The Office of Science User Facility light sources include LCLS, SSRL, ALS, NSLS-II and APS. Scientists from universities, industry and other research centres across the globe use the resources at these facilities, which are available through a competitive peer-reviewed process. No fee is charged if the results are made available to the public; if the research is proprietary, the government charges for the cost of using the facility.

To demonstrate the wide impact of these User Facilities, a new online mapping tool is now available at <http://science.energy.gov/user-facilities/user-statistics/> to reveal the connections, and widespread benefits, from use of these User Facilities. For example, by selecting the Advanced Photon Source, it is easy to see where the users of the APS are located on the world map, and the number of users from each institution. Maps such as these serve to demonstrate to stakeholders and the public the wide impact and use of these facilities, and help to articulate the importance for supporting investments in these research centers. The map is part of the Office of Science's ongoing efforts to provide expanded information resources for its stakeholders.



Mapping research infrastructures and users of the US DOE Office of Science User Facilities.