

The Year 2006 at DESY

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During the past year DESY has achieved a number of major goals:

- FLASH, the former VUV-FEL, was operated very successfully for users as well as for accelerator and FEL process studies. Saturation of the FEL radiation was reached at wavelengths of 13 nm, thereby achieving new world records. Of crucial importance for the user community was the ability to reach new energy domains and the very reliable operation, allowing for reliable planning of experimental activities. Details can be found in the contributions to this volume.
- DORIS has delivered to experiments the largest number of beam-hours ever, with an unprecedented large mean time between failures.
- The planning and preparatory work for the transformation of PETRA into a very high brilliance and very low emittance synchrotron light source for hard x-rays continues to progress on schedule.
- In the field of elementary particle physics HERA has delivered a new record luminosity. Concerning future projects DESY is evolving into a German hub for research at the Large Hadron Collider (LHC) at CERN and continues its central role in the preparatory work towards the International Linear Collider (ILC).

A crucial basis for the successes of DESY is the competence to construct, build, and operate large accelerator facilities. This competence was illustrated in 2006 by numerous prizes to DESY scientists or scientists working in close connection with DESY. The substantial increase in contributions to Linac conferences regarding superconducting accelerator technology indicates that the leadership role of DESY in this field has triggered a major development world wide. The synergies between the XFEL and ILC projects are prime examples how very different research areas benefit from the same accelerator technology. DESY is heavily engaged in the industry forum EIFast (European Industry Forum for Accelerators with Superconducting RF Technology) in order to strengthen the position of the European Industry in the world-wide competition for construction of accelerator facilities.

FLASH, PETRA III and the European XFEL will provide unique possibilities for research with photons at DESY. This has led to a large interest of other organizations in continuing, extending or starting activities at the DESY site. Among these are the University of Hamburg, the Max-Planck Society, and the European Molecular Biology Laboratory. In collaboration with these institutes a Centre for FEL Science (CFEL) at DESY and a joint centre for structural biology together with Helmholtz centres active in health research are in preparation.

The European XFEL facility

The European Project Team, headed by M. Altarelli, has completed the Technical Design Report and the major documents on organizational issues. In parallel to these activities the discussion of administrative and funding aspects were pursued in the International Steering Committee (ISC) and its working group on Administrative and Financial Issues (AFI). Thirteen nations, which have signed the Memorandum of Understanding for the preparatory phase of the European XFEL project, are represented in the ISC.

The preparatory phase has essentially been finished in summer 2006 by reaching three major milestones:

- The European Project Team finalized the Technical Design Report for the construction and operation of the European XFEL facility. This report, which includes a full costing of the project, is available at http://xfel.desy.de/tdr/index_eng.html. The TDR was officially handed over to the International Steering Committee on 25 July 2006 (see photo).
- The basic legal documents necessary for a foundation of the international XFEL GmbH (in charge to construct and operate the XFEL facility) were completed. They are now being checked by the international partners.
- Also in July 2006 DESY received the formal approval for its plan to construct and operate the XFEL. This approval marked the end of the complex plan approval procedure started in April 2005. No major objections were raised so that the XFEL can be built essentially as requested. Some law suits, mainly regarding private property, are pending and should be resolved within the next few months.



M. Altarelli, leader of the European Project Team, officially hands over the Technical Design Report to H. Schunck, chair of the International Steering Committee, on 25 July 2006. Further persons are (from left to right): J. Schneider (DESY director for research with photons), A. Wagner (Chair of the DESY Directorate) and K. Witte, A. Schwarz, R. Brinkmann and T. Delissen (members of the European Project Team).

These milestones provide a sound basis to found the XFEL GmbH and start construction. In view of the international competition the timely realization of the European XFEL project is of crucial importance. The time lines are now determined by the progress of the international negotiations concerning contributions to the XFEL facility.

The Project Team at DESY continues its work, concentrating on the industrialization of major components. R&D activities for detectors required at the XFEL have started; first expressions of interest for possible in-kind contributions of the international partners were received. At present a start of construction of the XFEL facility is foreseen for the 2nd half of 2007.

The great interest of the communities is documented also by the *First European XFEL Users' Meeting* in January 2007.

Particle Physics at DESY

HERA has finished successfully its experimental programme with electron-proton collisions in June 2006. Now HERA is operated with positron-proton collisions. The last months before the shutdown on 30 June 2007, will be devoted to an operation at a reduced centre-of-mass energy to realize a unique capability of measuring specific aspects of the proton structure.

DESY has very successfully started its contribution to the LHC experiments ATLAS and CMS. In spite of limited personnel resources available for these activities DESY has already taken responsibilities for detector installation, computing and physics coordination. At DESY a so called TIER-2 analysis centre is being set up in Grid technology. Even though at present focused on the analysis of LHC data it will also provide the necessary computing power required for the research with photons at DESY.

Research and development towards the International Linear Collider has continued as scheduled. A Reference Design Report (RDR) including costing will become available in February 2007.

In 2006 the CERN Council has agreed on a strategy for future particle physics activities in Europe. DESY's priorities – exploit HERA, contribute to the LHC, prepare the ILC – fit very well into this strategy.

Personnel and other matters

A major highlight in 2006 was the visit of the German Federal President H. Köhler who visited the FLASH facility in August.

The term of D. Trines as director of the accelerator division will end in June 2007. R. Brinkmann, at present leader of the DESY XFEL project group and accelerator responsible within the European Project Team, was appointed as successor of D. Trines.