DESY inFORM

11/2007

ARGUS Symposium

20 years ago the ARGUS experiment at DESY proved that B-mesons mix with their antiparticles. The anniversary of this spectacular discovery will be celebrated with a Symposium on 9 October in the auditorium. http://argus-fest.desy.de

Anniversary

Ten years of hands-on courses at the DESY school laboratory will be celebrated with an event featuring physics comedian Vince Ebert: “Thinking allowed” (in German). All DESY staff are welcome. Auditorium, 22 November, 7 p.m.

Staff Meeting

On 6 November at 9:30 a.m. there will be a staff meeting at DESY: in the auditorium in Hamburg and in seminar room 3 in Zeuthen. Both locations will be connected by video conference.

Women’s Research

“Women in Science and Technology” is the name of an exhibition conceived by the Lübeck University of Applied Sciences. From 7 to 14 November, life and work of 19 women scientists are presented in the foyer of the auditorium.

Director’s Corner

In the past weeks we were able to report on some outstanding progress in the area of our Free Electron Laser programme. At the international FEL Conference in Novosibirsk in September the PITZ-Group gave a report on results from the photo-injector test stand in Zeuthen. For the first time the beam quality (emittance) required for the European XFEL facility was demonstrated—a very pleasing success of the PITZ-Team and the technical groups involved.
FLASH achieved new performance records within a few weeks of re-commissioning after the long shutdown: in September the design beam energy of one gigaelectronvolt was reached, thanks to the high accelerating fields in the newly installed module 6 and the refurbished module 3. The pre-processing of the modules on the Cryomodule Test Bench (CMTB) is now a well established process. The test stand was built as part of XFEL preparation and was commissioned in autumn 2006. In contrast to previous experience with new modules in FLASH, this time no lengthy RF power

(continued overleaf)

Giving New Momentum to an Old Friendship

Helmholtz Association promotes partnership with Russia

During the Russian-German Intergovernmental Consultations in mid-October, Minister of Education and Research Dr. Annette Schavan and her Russian colleague Professor Andrej Fursenko agreed on a closer collaboration in the field of research and innovation between the two countries. At DESY, the long partnership between Russia and Germany is strengthened by new collaboration at XFEL and PETRA III, and continues its tradition in particle physics. Ten German and ten Russian young particle physicists will form a research network, a platform to exchange ideas and results in physics analysis and detector development in the future. The new research team, officially one of eight Helmholtz-Russian Joint Research Groups, will get financial support starting in November. In September, the initiators Kerstin Borras and her Russian colleague

A research programme concept with team spirit: Roman Mizuk (ITEP) and Kerstin Borras (DESY)

Roman Mizuk got the approval for the concept of the three-year programme for activities at HERA, the LHC and the ILC. The group consists of young physicists from ZEUS, H1 and FLC, and on the Russian side from the three participating institutes ITEP (Institute for Theoretical and Experimental Physics), MSU (Moscow State University) and MEPhI (Moscow Engineering Physics Institute). “The new project will strengthen the development of our symbiotic collaboration,” said Roman Mizuk.
This good partnership has a long tradition. One of the “mentors” of the young scientists group, Professor Michael Danilov, has received several awards for his research in collaboration with DESY. These days this collaboration is on new technologies which are developed at MEPhI and currently used for an ILC calorimeter prototype. *(she)*

Speak Your Mind

Survey for DESY inForm readers starts in November

DESY inForm has been around for more than a year and we would like to find out what our readers think about it. In order to do that we have created a survey on DESY inForm format and contents and questions on how these could be improved. Within the coming weeks, an email will be sent to with a link to the online survey. It will only take a few minutes to complete. You can be absolutely sure that the evaluation is anonymous and that all information will be handled confidentially. The result will be published early next year. We thank you in advance and are looking forward to receiving many replies! *(she)*

Director's Corner

processing of the modules in the linac was required. On 4 October the production of laser radiation at 6.5 nanometre wavelength was achieved in the FLASH undulators with the electron beam energy near one gigaelectronvolt. DESY thus underlines its present leading role in the field of FEL facilities in an impressive way. The keys to these remarkable successes are the competence and the experience of the many colleagues involved—and last but not least the enthusiasm for and fun at work. I hope that we will continue in this spirit.

Sincerely yours,
Reinhard Brinkmann

XFEL ISC—What's Behind It?

Preparations for European XFEL GmbH well under way

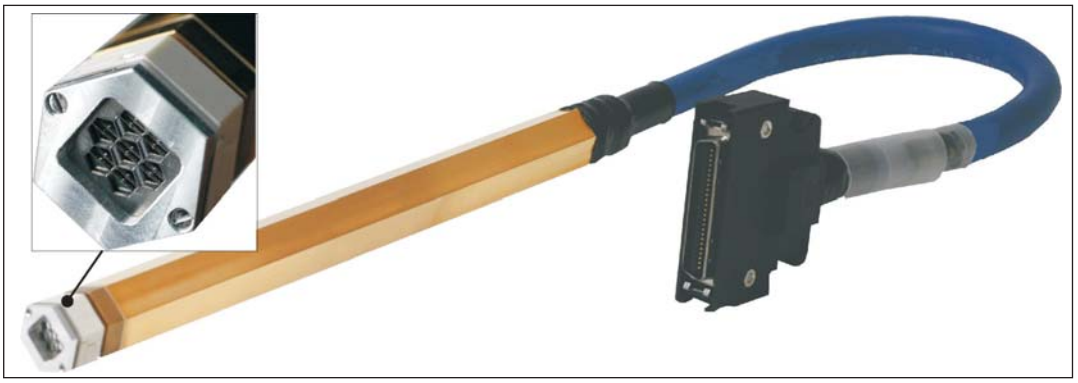
The XFEL International Steering Committee (ISC) is almost on the home stretch. One focal point of their meetings—the most recent one was held in Darmstadt on 17 October—was to make a multi-governmental convention to be signed at the beginning of 2008 more concrete. This convention is a prerequisite for the foundation of the European XFEL GmbH. Central issue of the XFEL ISC, founded in February 2004, is the regulation of the international contributions and the preparation of an independent European XFEL research organisation, the European XFEL GmbH. This now also concerns decisions on human resources. The members are high-level governmental representatives from currently 13 countries, soon to be 15, which have declared their willingness to participate in the construction and operation of the XFEL facility. *(pf)*

The International Steering Committee (ISC) at the September meeting at DESY. First row, 7th from left: John Wood, Chairman of the ISC.

Small, Fast and Precise

New silicon drift detector for HASYLAB

Synchrotron radiation researchers at HASYLAB demand a lot from their detectors. The detectors are supposed to be low in noise, flexible and compact, the should work at room temperature and be able to recognise single photons at a high rate. Karsten Hansen's group FEC—micro electronic development—has created a new detector that fulfils all these requirements.



The seven sensors of the detector module collect photons from HASYLAB experiments.

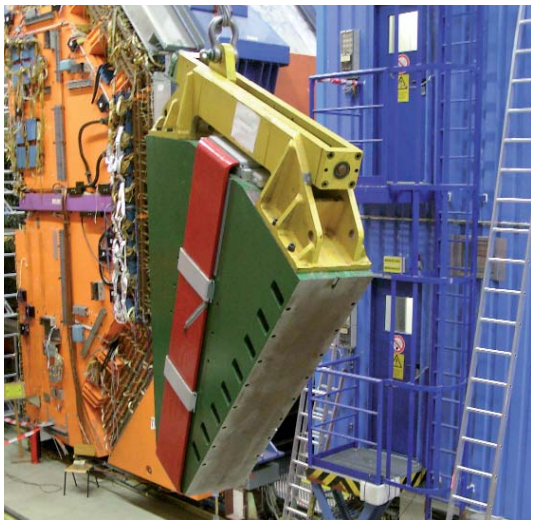
This new silicon drift detector is made up of seven hectagonal cells tat absorb photons. These particles of light come from a probe —for example a liquid—that is excited to emit photons with X-ray light. From the light spectra the researchers can draw conclusions about the nature of the probe and what went on inside it. Seven channels in a specially designed chip compute the information entering the cells in record times. One channel can register a million photons per second, so the whole chip can gather information on seven million photons per second. The sensors and the chip are both part of a module that is 16 millimetres slim—a technology that is about to get patented.

Developing the chip has taken the group three years. During this process prototypes were tested under real conditions and improved continuously. The result is a mini-series of ten modules that are already being used at HASYLAB. *(baw)*

Like a Backwards Jigsaw Puzzle

The HERA detectors are disassembled again into their single components

The HERA shutdown happened not that long ago. Ever since the collaborations have been busy dismantling the experiments. Suddenly physicists hold detector components in their hands that they haven't seen in 15 years.
In the beginning H1 proceeded like it would in a normal shutdown and started with removing the sensitive parts in the very centre of the detector. "The difference was that we didn't stop at the tracking detectors. Right now we have opened the liquid argon calorimeter and are preparing the disassembly of the rings," said Günter Eckerlin, technical coordinator of H1. For the first time since the beginning of HERA operation the 350-ton calorimeter was brought to room temperature from minus 186 degrees celsius within 30 days. When the calorimeter rings and the cryostats will be dismantled, probably in May 2008, most of the work will be completed. The enormous solenoid and the iron yoke equipped with muon chambers will remain in the hall. Dismantling of HERMES has advanced the most. The spin experiment was built in a less complicated and intertwined way than its 'colleagues'. The dismantling team headed by Volker Prahl has already disassembled almost all subdetectors and packed them in wooden cases for transport. Even now scientists are learning something new. Volker Prahl: "In fact, the transport cases have to be free of pesticides, a EU regulation. Moreover, you just can't believe how many of the detector components have to be submitted to customs supervision and the exportation has to be documented for every item."
For the calorimeter, which weighs in at a light 45 tons, the team is still working on the best dismantling scenario; the HERMES spectrometer magnet will remain in the hall for the time being. At ZEUS, the interior of the detector is approached from the front. The enormous muon chambers, standing in proton beam direction at the detector, were removed with cranes, as were the 200-ton toroid magnets, which once forced muons to follow a curved path. Next will be the forward and backward calorimeters, which will be dismantled module by module. The inner components of the detector can be reached after that.
"The limiting factor is the hall crane," said Uwe Schneekloth, coordinator of the ZEUS work. "We mostly have to handle heavy and bulky pieces, which all have to be transported by crane." It will still take about a year before the iron yoke, the last part of the hall, will finally be removed. The steel panels of the ZEUS iron yoke, with a thickness of more than seven centimetres, have to be dissected into transportable pieces. For this purpose, a flame cutter has to make cuts of a length of 3.7 kilometres altogether. *(tz)*



Removal of a 13-ton magnet segment at ZEUS

The Standard is High

High-quality vocational training in Zeuthen

In the morning, when the drawing of the assembly parts to be produced is lying on the workbench, the countdown begins for Tobias Gräber. During an internal test examination nobody will turn a blind eye. The future industrial mechanic in equipment technology and precision mechanics have to demonstrate their skills in turning and milling techniques, even under stress. After all, instructor Jürgen Grote wants to guarantee best possible preparation of his trainees for the final exam at the beginning of 2008.
Almost yearly, the Zeuthen trainees of the mechanics workshop, headed by Ingo Kundoch, are among the best of the year. This year, at the end of October, Daniel Burchert received this award. The precision mechanic has now started his military service where he plans to learn more about aeroplane maintenance.
Zeuthen's leading role in vocational training is also well known outside the region. The weekly paper "ZEIT" picked up the topic "training" and published a profile of Tobias Gräber. *(she)*

Fourth year trainee Tobias Gräber

Shutdown of Cyclotron

HAIZY has nothing to do with HASYLAB; it is the acronym for the (German version of) Hamburg Isochron Cyclotron. Until recently, it rendered its services to the nuclear medicine department of the UKE university hospital. After 39 years the cyclotron on the DESY site was shut down on 1 October. Run by the first Institute for Experimental Physics of the University of Hamburg, it used to accelerat protons, helium and hydrogen isotopes, for example for neutron experiments. From 1994 on it was used for medical purposes. Isotopes like fluor-18 were used for medical examinations to identify tumours. The people who ran the cyclotron will now move to the UKE hospital, where a new cyclotron will be built. (she)

DESY INFORM

Good Collaboration

Good partnership with ESRF bears fruit

The European Synchrotron Radiation Facility (ESRF) in Grenoble and DESY share more than just joint interest in the field of research with photons. Within the framework of the cooperation agreement existing since October 2005, both partner institutes are driven by the development of new instruments for synchrotron light sources. Recently DESY started using the ID6 beamline, where a prototype of the double crystal monochromator for PETRA III is being tested at the moment. This important optical component will ensures beam quality and stability for the experiments.

The team at the ID6 beamline of ESRF next to the double crystal monochromator (f.l.): Werner Schmid, Pierre Wattecamps, Dirk Ahrendt (DESY), Hans-Christian Wille (DESY), Jan Horbach (DESY), Thomas Roth, Carsten Detlefs

In its interior, eight motors precisely control the angular adjustment of the two silicon crystals which filter those wavelengths from the undulator beam that the experiment requires. Hans-Christian Wille, sent by DESY, and his colleagues at ESRF not only test the precision of rough and fine adjustment of the different axes, but also check the cooling of the crystal with liquid nitrogen. Without cooling, the crystals would melt in the heat of the undulator beam within a short time.

The double crystal monochromator already undergoes operational tests during the reconstruction phase of PETRA. This means that the testing phase during commissioning will be shorter later. Another big advantage is “professional training” in Grenoble. Because of the lively exchange of information with their colleagues at ESRF, members of the PETRA III team can gather practical experience at the ID6 beamline, which they will need for the operation of the new lightsource. *(she)*

Sunshine in Every Room

The kindergarten inaugurates its new building

After a short construction period the kindergarten building is now back under the reign of the little ones. On 22 October they took their first exploration tour through the rooms painted in yellow, orange and lavender. The spacious gym room is perfect for exercise and games, the playing castle includes a large bull’s eye in the wall to crawl through, meals are served in the children’s restaurant and there are relaxation rooms for naptime. The official inauguration is scheduled for 6 December, St. Nicholas’ Day. Administrative Council Chair Bärbel Brumme-Bothe and invited guests will attend the ceremony. *(she)*

More room for the kindergarten kids

PETRA III

Construction Milestone Ceremony

The PETRA III construction site changes every day. At the moment the huge concrete roof bearings are being installed. The construction milestone ceremony for the new experimental hall will take place on 26 November. DESY has invited Federal Research Minister Annette Schavan and Mayor Ole von Beust to this event. All DESY staff members are cordially invited at 2 p.m. to celebrate the completion of the PETRA III structural work. (tz)

Installation of dipole magnets

The first accelerator components were moved back into the PETRA III tunnel earlier than expected. On 8 October four dipole magnets were already at their exact and final position. A few weeks ago 200 of these magnets, weighing about eight tons each, had been removed in a logistically challenging manoeuvre for a technical overhaul and equipped with new coils. The full tunnel stretch between halls east and southeast have already been fully installed since the the beginning of reinstallation. (she)

Vacuum technology

Sarah Müller, Hans-Bernd Peters (both ZM1) and Ulrich Hahn (FS-BT) have developed a fast closing shutter to protect the vacuum in the PETRA III storage ring. The shutter, which has just been patented, is inserted at the junction between storage ring and beamline. If pressure decreases in the experimental area, the shutter will close in one hundredth of a second. This stops air from entering into beamline and accelerator and makes sure that service interruptions can be kept as short as possible. (she)

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