

Go-ahead for XFEL

Federal minister of Education and Research Dr. Annette Schavan (BMBF) has announced that an official ceremony marking the start of the European XFEL project will take place on June 5, the first day of the conference of ECRI2007.

Worldwide Synchrony

Databases for LHC data analysis must always be up to date, even when distributed globally. A status report for the implementation of an adequate system will be presented by Dirk Duellmann (CERN) at DESY, seminar room 3, on May 21 at 4 p.m.

Halftime

In an intermediate assessment, from 21 to 23 May, the Extended Scientific Council will make a survey of DESY's research program with a subsequent auditors' recommendation. Open session: Hamburg, May 21/22, auditorium

High-Performance Lasers

Professor Roland Sauerbrey, scientific director of Rossendorf Research Center, will hold a lecture on "Laser plasma acceleration of electrons", giving an insight in high performance lasers. Hamburg, May 15, 5 p.m., auditorium

Director's Corner



Safety First!
Our goal: no accidents!

The remodeling of FLASH is underway and starting July 2 the HERA experiments will be disassembled. PETRA rebuilding starts at the same time. Shortly after this, XFEL construction work will begin. Heavy components will be moved, ground will be removed, and cranes will continuously be in operation. There will be a lot of activities like welding, drilling, cabling and pipe laying, concrete casting and pole ramming. Old equipment will be dismantled; new components will be delivered, installed, connected and tested. Given these circumstances, the directorate would like to appeal to all DESY staff to consider safety and avoid accidents at all times. This means that already in the phase of planning, a risk analysis with the adequate provisions is necessary. Please also make sure that you wear protective equipment when required. In 2006, accidents have increased at DESY, most of them during handling tools and operating machines (31 percent).

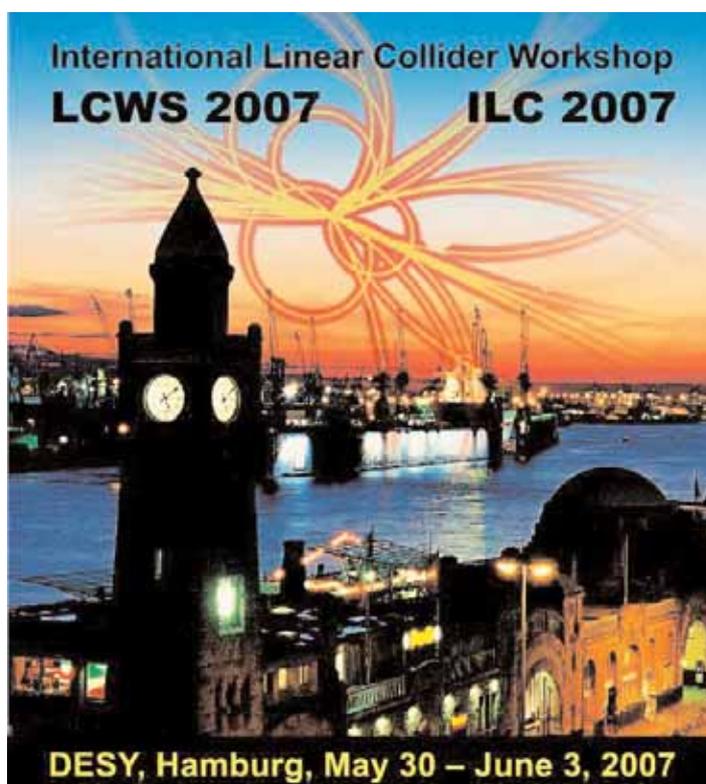
(continued overleaf)

ILC Community Meets in Hamburg

Plenary sessions in a tent mean roads are blocked on campus

Large projects have large collaborations. Some 500 or more detector and machine experts from around the world will come to DESY for two parallel workshops, ILC2007 and LCWS07 to discuss progress on detector prototypes of the International Linear Collider (ILC) and tackle the next big steps on the way to building the machine.

ILC2007, the follow-up to the Snowmass workshop in 2005 that kicked off the ILC's core team Global Design Effort (GDE), will last from May 30 to June 2. During this meeting participants will review the current status of the machine, identify engineering milestones for the next two years and plan the publication of the ILC's Engineering Design Report. LCWS07, lasting from May 30 to June 3, brings together the detector and physics community for a review and an outlook, including a detailed planning timeline and the future of the currently four ILC detector concepts. Common plenary sessions of both meetings are planned for May 30 and June 2 and 3. "We want a lot of cross-feeding of people between the sessions," says Ties Behnke (FLC), one of the main organisers. "Unlike the GDE meetings, this is a really open workshop where everyone's invited," adds Nick Walker (MPY), while



director of Research Rolf-Dieter Heuer stresses the important timing between the publication of the Reference and Engineering Design Report: "We are very happy to host this meeting at such a crucial point for the ILC project. We hope that the international community will continue to make major progress on planning the future of particle physics."

"I hope for all DESY colleagues' understanding during the week," says Ties Behnke.



Five hundred extra people on the DESY campus will not go unnoticed. A massive tent will sit on the parking lot in front of building 1 for the plenary sessions. This means that the road between building 1 and the canteen will be blocked for roughly three weeks—the tent will be used for the Science Night on June 9 as well. During the time of the workshop, the canteen might be rather crowded, even though the extension will be reserved for workshop participants. "I hope for all DESY colleagues' understanding during the week," says Ties Behnke. (baw)
Info: <http://lcws07.desy.de>

Director's Corner

These accidents must be avoided by higher qualification, experience and caution.

Please don't hesitate to warn your colleagues when they put themselves at risk, and also include the members of contracting companies when considering safety measures. Employees from external companies had been affected by many serious accidents that happened at other research centers in the past years.

In case you have questions or suggestions for improvements concerning safety, please contact the safety department D5.

The goal that we should all strive for is an exciting construction phase without accidents in your own interest. I wish you success!

*Sincerely,
Albrecht Wagner*

Living the Standard Model and Beyond DESY Theorist Peter Zerwas retires



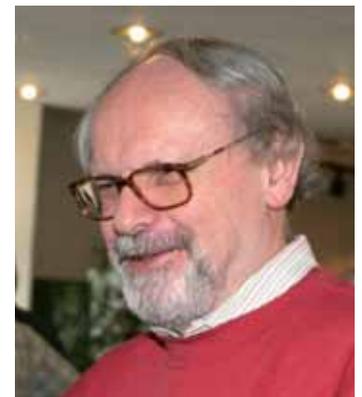
Peter Zerwas in 1980

When a theoretical physicist is about to retire after many years of working on theories in particle physics at labs and universities, what does he look forward to doing in his retirement? Physics, of course. Peter Zerwas is leaving DESY after 16 years connecting theory with experiment in particle physics, but a new office and desk are already waiting for him at Aachen university. "I don't want to miss the results coming from the LHC next year," says Zerwas, "these are exciting times!"

By moving back to Aachen Zerwas closes a circle that began at the university there in 1961. During his undergraduate years, he was actually quite technical, doing research on the physics of nuclear reactors. When he got to know the theories needed for understanding Fermi's theory of reactors, he switched fields and became a theorist. He witnessed ground-breaking developments in physics, including the discovery of neutral currents at CERN, the unveiling of the quark structure of the proton at SLAC and the observation of gluon jets at the PETRA accelerator at DESY, which provided a basis for the theory of quantum chromodynamics or QCD. QCD was Zerwas' main area of research for many years, starting from the analysis of gluon jets at PETRA, the structure function of the photon, and extending up to signals of the triple-gluon coupling that were later observed at LEP. He then

switched to Higgs physics and supersymmetry studies both at the LHC and at linear colliders. In recent years he focussed on methods for reconstructing the physical scenario near the Planck scale hoping to find the ultimate unification of forces. His colleagues from around the world (and beyond) will gather at DESY on May 29 for a colloquium in his honour. (baw)

Zerwas colloquium, May 29, 4.30 p.m. auditorium



Peter Zerwas today

An Idea takes Shape

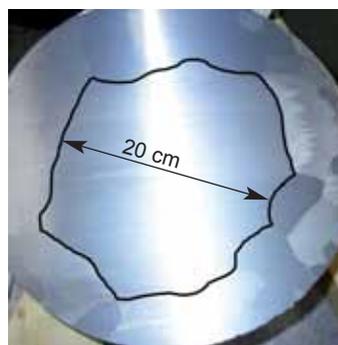
New production technique in view for niobium cavities

In the development of superconducting cavities for the ILC, the machine planning group (MPL) lands another success. New prototypes manufactured from a so-called niobium single crystal plate yield excellent results. The advantage of single-crystal cavities compared with standard ones made of polycrystalline niobium lies in the atomic structure of the crystal lattice.

Polycrystalline metal has a lattice that is not always arrayed regularly, leading to sharp edges and unequal orientations in the crystal grid. These ruptures, called grain boundaries, basically

reduce the performance of a cavity.

A single crystal does not have grain boundaries. All niobium atoms rest in a homogeneous, regularly arrayed layer of the crystal lattice. In collaboration with the manufacturer ACCEL, DESY scientists succeeded in building a single-cell 1.3-gigahertz cavity from a single niobium crystal. In test runs it reached acceleration gradients of about 38 megavolts per meter. The MPL group is now confidently planning a first nine-cell cavity. Since it is currently impossible to produce the sufficient amount of large



Single crystal with a diameter of 20 centimeters—scientists are only satisfied with a diameter of 26,5 centimeters.

niobium single crystals, smaller but thicker single crystal plates have to be rolled out and moulded to a half cell; subsequently, two of them are welded together. The trick is to avoid grain boundaries even at the welding seam by taking care that the identical orientation of the niobium atoms is maintained—thus the entire cavity cell consists of one single crystal. Only recently, the joint DESY/ACCEL invention has obtained the decision to grant a patent for this production technique. (she)

Navigation System in the Beak

Scientists trace the bird's magnetic sense in an experiment at HASYLAB



Homing pigeons always find their way back home. They get the directions from the position of the sun, and they even use motorways and crossroads as optical aids. But this is not sufficient for precise navigation. Birds use a very special magnetic sense, and scientists from Frankfurt have recently discovered how this is done at HASYLAB. Iron-crystals in the beak are used to analyze the direction and amplitude of the Earth's magnetic field, which helps the pigeons to find their way without fault. Gerta Fleissner and her team of researchers from the Goethe University in Frankfurt obtained the first hints for this compass

from microscopic examinations of the histological microsections of the beak. The result: a complex grid of nerves, sensory dendrites, was found in the skin lining the upper beak. At six different points, the scientists discovered ferrites, areas with magnetic properties.

At HASYLAB, at the microfocus beamline L for micro X-ray fluorescence analysis and micro X-ray absorption spectroscopy, research continued with the collaboration of Gerald Falkenberg from HASYLAB and Branko Stahl from TU Darmstadt, determining the distribution and exact quantity of the ferrites and also decoding their chemical composition.

The analysis showed that the dendrites in the skin of the beaks contained a domino like array of small metal platelets of magnetite. From time to time small clusters containing magnetite shift between the bands. Together they form an operational unit.

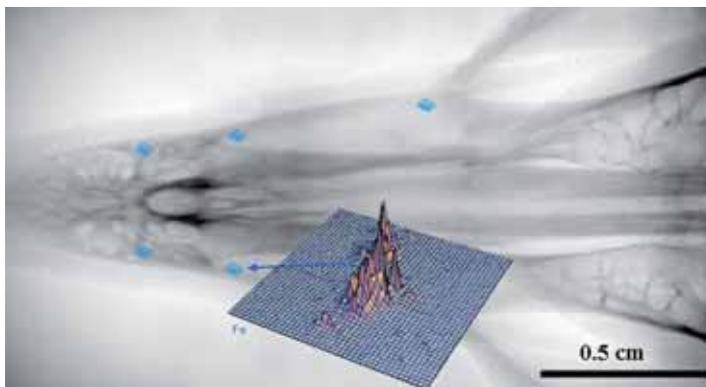
Scientists found the same effect in the beaks of robins, garden warblers and even chickens. It even might turn out to be a

universal receptor system of all birds.

With the small magnetic helpers, homing pigeons may sense minimum direction and amplitude alterations of the Earth's magnetic field. Scientists think that a possible signal chain might work like this: when a pigeon loses the right track, this might lead to an alteration of the local, inhomogeneous field detected and amplified by the magnetite platelets, thus exerting traction or pressure

force on the magnetite clusters. This produces a signal at the mechanical neural receptors that are connected with the brain. Hence, the pigeon would sense the change of direction and be able to correct it.

In the next measuring period at HASYLAB, Gerta Fleissner and her team will continue to examine the function mode of the magnetic field and the exact sensing and interaction of the iron-containing cell compartments of the dendrites. (she)



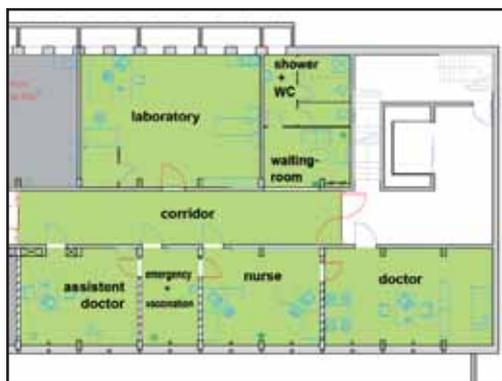
X-ray image of the beak with an inset of a X-Ray Fluorescence Analysis (μ XRF) diagram. With a resolution of a 15thousandth of a millimeter, the X-ray beam screens the histological microsection and reveals the distribution and quantity of iron in the beak's skin lining.

The Doctor Will See You Now

New medical center at DESY

In the basement of building 1, the DESY medical practice is getting a new look and layout better suited to meet new requirements. At the same time, the existing premises are totally renovated. Before returning to the new medical center, Jan Thomas Bandelow and his team have to camp in a provisional practice in a container on the parking area behind building 9. According to the construction department, the moving date is scheduled for the end of May.

Patients will find the new layout much more comfortable. The uninviting hallway will be substituted with a closed area with waiting



The green shaded areas are the new rooms of the medical team.

room, extra toilet and a larger surgery. The expansion is necessary because accident prevention regulations require medical examinations with additional

equipment. The medical team is not only willing to help in case of small accidents but are also happy to give support to stop smoking or dietary advice. In general, much emphasis is put on disease prevention. The diabetes examinations last year proved to be a great success.

In the future, several campaigns will be offered every year to DESY employees. (she)

PETRA III

Early Start

DESY staff working in building 25b and 25f will have to give up their parking lots earlier than expected. As of April 25, the construction company ZÜBLIN needs this space for the construction managers and personnel containers. DESY staff can park in the so-called "green" parking area. In order to shorten the way to the buildings, there will be an entrance gate at the fence. The former stairway crossing the PETRA wall has already been removed. Now a natural stone stairway is in place beneath the FLASH hall. A guard will be in charge of gate surveillance daily till 7 p.m. After that, the gate will only open the induction lines on the ground. (she)

XFEL tunnel model nears completion

First installation training will soon begin

A 51-meter-long model of the XFEL main tunnel, called "XTL Mock-up" by the experts, is currently being built near HERA West. During the week after Easter, 68 concrete half shells were delivered and assembled on the cast floor slab. To protect it against the weather, the tunnel will be covered by a beige sheet steel construction that will provide more free space at the ends of the tunnel.

The 2100-meter-long XFEL main tunnel will be packed with accelerator components and various technical devices. To prepare for this challenge, the installation groups can now use the tunnel model to try out and train the multitude of tasks that will later often have to be performed as



The XFEL tunnel model is assembled from concrete elements in the finest April weather. Only the 64-m-long sheet metal building is now missing.

quickly as possible. "The XTL Mock-up is a very important pilot activity which already proves to be very valuable," explains project leader Thomas Hott from MPY. "Everybody involved learned a lot already in the planning and construction phase, and the teams are already coordinating their

activities in preparation for the special specifications at the XFEL." The spectrum of the installation training ranges from power and water supply,

smoke detectors, emergency lights and escape route signaling, to models of the 12-meter-long accelerator modules. In addition, the end of the tunnel provides space for a ten-meter-long undulator section. Here, the challenge is to keep the temperature extremely stable, with variations smaller than 0.1°C. (pf)

FLASH

Heavy work during the shutdown

"On the first meters, we had to work the Egyptian way, with the help of many strong hands," says Burghard Sparr from MEA1. Under his direction, the 12-meter-long, 8.5-ton accelerator module 5 standing at the narrowest point of the FLASH tunnel was moved outside in mid-April. It will be repaired during the shutdown and reinstalled together with module 6. Besides some smaller work, the installation list also comprises the exchange of module 3* for the new module 7, which successfully passed all the tests in the test stand, reaching an average accelerating gradient of 28 megavolts per meter. In August, FLASH will then be ready for operation at 1 gigaelectronvolt. (pf)

Among Friends

The Association of the Friends and Sponsors of DESY presents PhD Prize

They work silently, the Friends and Sponsors of DESY. You don't see them often, but mails are promptly answered. For a long time the association has permanently fostered research and culture on the DESY campus. They are known for the yearly PhD Prize presentation, which this year will be awarded by Professor Albrecht Wagner at the meeting of the Physics Research Committee on May 10.

The contributions of about 75 members do not only

fund the PhD Prize of 3000 Euros per year, but also two or three public concerts that are performed in the DESY auditorium.

They also participate in the expenses for the Jentschke Lectures, help foreign guest scientists and their families in case of need, support integration programs of the International Office (e.g. language courses and Coffee Morning) or buy microscopes for the DESY kindergarten. In 2006, the association has spent roughly 12 000

Euros for different projects. Two people primarily pull the strings: auditor Walter Pfaffenberger, member since 1964, and Chairman Friedrich Büßer. In fact, both could just enjoy their retirement, but they are dedicated too much.

For new membership information and PhD Prize application, please visit the website below. (she)

<http://vffd.desy.de>

Grid Computing

Great Performance!

The magic number has been surpassed: at the end of February, the ZEUS collaboration achieved a record of one billion simulated electron-proton collisions on the global computer grid. More than 40 international centers with around 8000 CPU's (Central Processing Units) are participating in the simulation of such collisions. This performance clearly demonstrates DESY's competence as a GRID center and it shows that DESY is fit for the coming data flood from the LHC experiments. (she)

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