

Open the Way for New Research

Interdisciplinary work at the future CFEL

The Centre for Free Electron Laser Science (CFEL) will be the new node in research with free-electron lasers. "It has an interdisciplinary approach and will work like an independent research centre," says Henry Chapman (DESY and University of Hamburg), one of the centre's two directors. The goal is to open up new research fields.

Various scientific perspectives and experimental techniques that researchers today can only imagine will be developed at CFEL for various disciplines. For this purpose, Chapman brings together biologists, chemists and physicists. Since the beginning of this year, he and his colleague, the second director Andrea Cavalleri (Max Planck Society and University of Hamburg), push the development of CFEL, supported by the University of Hamburg and the Max Planck Society and DESY. At CFEL there will be a collaboration of two experimental divisions and one theory group from DESY, one Max Planck research group at the University of Hamburg with two divisions, one detector group (DESY, Max Planck and University) and two Advanced Study Groups from the Max Planck Society and the University.

Two more directors will be appointed soon. Meanwhile, Henry Chapman and Andrea Cavalleri are busy seeking the best people for their research groups. When all positions are filled, the research centre will have 300 employees. The two directors do not only recruit



Architectural study with the interior view of the new CFEL building at Luruper Chaussee

young scientists and advertise CFEL at conferences, but they are also experimenting intensely at FLASH. Moreover, together with the other CFEL groups, they are planning first experiments at the Linac Coherent Light Source (LCLS) at SLAC in Stanford in 2009 where the CFEL team researches at a beamline.

Whilst Chapman and Cavalleri make plans how to fully exploit the FEL potential, they are also keeping an eye on the preparations for the construction of this new scientific platform. These preparations are already very detailed, going down to the exact place for power sock-

ets. The scientists expect the ground breaking at the turn of the year 2008/2009. The three-storey circular building will be located between the new PETRA III experimental hall and Luruper Chaussee. The effective area of 8000 square metres will mainly house laser labs and some offices. Moreover, there will be a number of chemistry and physics laboratories, an experimental hall, an auditorium and a cafeteria. At the end of 2011, the think tank scientists will be able to fully concentrate on their goal: to open up new research fields. ([she](#))

Royal Fellow Brian Foster

Professor Brian Foster from Oxford University has been appointed Fellow of the British Royal Society. He receives the award in recognition of his contributions to particle physics. With his admission to the UK's national academy of science, Foster stands in a line with Isaac Newton and Stephen Hawking.

Brian Foster has long been closely connected to DESY. He carried out research at the TASSO experiment at PETRA and was the spokesman of the ZEUS collaboration from 1999 to 2003. Currently, he is the European Director of the ILC Global Design Effort.



DIRECTOR'S CORNER

Work on the PETRA III project includes not only the re-building of the storage ring, but also the refurbishment of the pre-accelerators, beam transport lines and technical infrastructure. The main goal is to guarantee a high long-term operational availability and reliability.

This is essential especially in the context of the top-up operation mode foreseen for PETRA III, in which particles are continuously refilled in or-

der to keep the beam intensity for experiments constant with a high accuracy. (This is, by the way, also an interesting option for DORIS.)

Among the items on the refurbishment list are the positron converter, some magnets and magnet power supplies, cabling, machine controls and diagnostics, and the water cooling system ("Wasser-kunst" in DESY-speak). The technical groups in charge of the work had to stick to a tight

schedule. In some cases, they also had to overcome obstacles like e.g. delayed deliveries from suppliers. In a few exceptional cases, the completion of the refurbishment work had to be postponed and provisional solutions had to be found.

It is therefore especially pleasing that LINAC-II, PIA and DESY-II have already "seen beam" again and that the re-commissioning of DORIS for user operation can take place

in September as planned. This was only possible thanks to the strong commitment of all the colleagues involved. Many thanks to everybody for this!

Yours,
Reinhard Brinkmann

Dolt Provides Perspectives

Job seminar most popular among DESY PhD students

Data, plots, analyses and racking one's brain are daily routine for a PhD student at DESY. Since recently another fixed date goes with it: the Dolt Job Seminar, which has been organised by Dolt, DESY's diploma and PhD students' initiative, for about one year. On invitation of Dolt, former PhD students return to their DESY workplace and talk about what they are currently doing. Within a short time, the job seminar has gained about 40 PhD students and postdocs as regular participants, some of them even attending by video conference. The next "alumnus" is coming on 4 September: ex-FLC staff member Sebastian Schmidt will report on his work at a management consulting firm.

"There are many job possibilities which don't come to a PhD student's mind," says Lea Hallermann, one of the Dolt initiators. It is well known that physicists are most welcome at banks. Teaching is also a quite familiar profession for the



The Dolt Job Seminar at DESY always attracts many PhD students.

students. But what is a particle physicist doing in the world of patent law? What is daily routine like at large firms? And what is an e-commerce agency? The ex-DESY members readily talk about their everyday life and the many possibilities scientists have in the "real world". The last seminar was particularly well attended: An expert from the human resources department of Hamburger Hochbahn presented the perfect job application portfolio and the important factors for a good application. (baw)

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More information:
<http://doit.desy.de>

Visitor Number 10 000 at Zeuthen School Lab

At the beginning of the coming school year in September, the physik.begreifen vacuum school lab in Zeuthen is expecting its ten thousandth visitor. Since the inauguration of the lab in May 2004, the demand for a whole-day practical course has been unvaryingly high. Any vacancies are filled in no time.

Otto Stern Prize Awarded

Martin Goebel from the DESY ATLAS group was awarded the Otto Stern Prize for the best diploma thesis of the Hamburg University physics department. He received the prize on 9 July for his thesis "A Global Fit of the Electro-weak Standard Model with the Gfitter package".

DESY's EU Projects

CARE

The CARE (Coordinated Accelerator Research in Europe) project has further strengthened the collaboration within the European accelerator community in the last years. Since 2004, the Europe-wide infrastructure has been improved to promote scientific and technological developments in the field of accelerator physics. With a funding volume of 15 million Euros, scientists are focusing on research on high-field magnets, photoinjectors, intense proton beams and superconducting accelerator technology.

Research on superconducting accelerator technology, which makes up one third of the funding volume, is being coordinated by DESY. With the objective to optimise the production of cavities, increase the accelerator gradient and at the same time improve the operating reliability and develop diagnostic instruments, there has been much testing at FLASH in the past years. With great success: many findings and results will be used in future linear accelerators like the one of the European XFEL or the ILC, for example improvements in accelerating field control (low level RF system) or newly developed beam position monitors for the European XFEL.

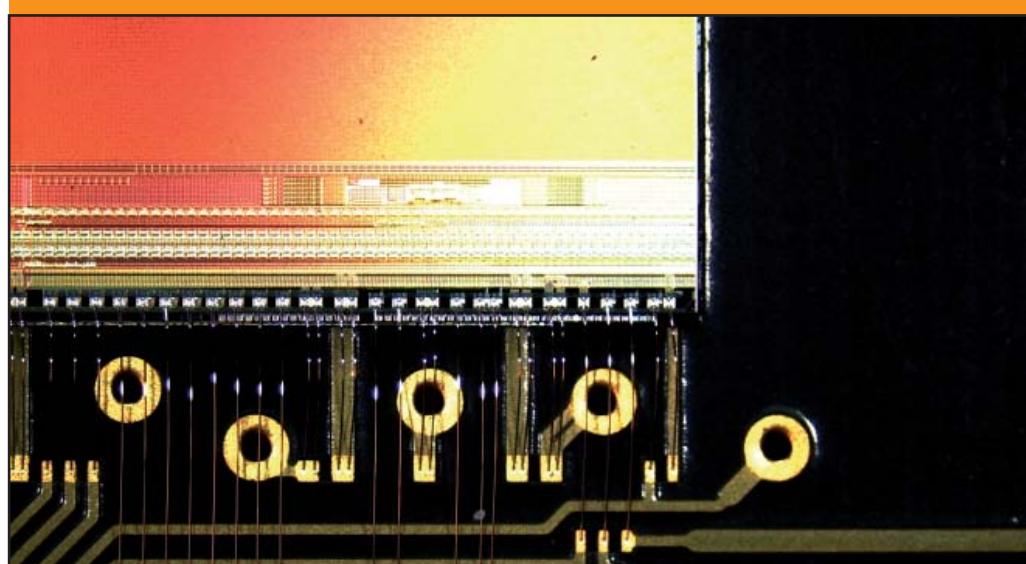
CARE is to continue till the end of this year. It will be followed by the EuCARD (European Coordination for Accelerator Research and Development) project. ([\(de\)](#))

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CARE: <http://care.lal.in2p3.fr/>

SRF: <http://jra-srf.desy.de/>

EuCARD: <https://webh06.cern.ch/EuCARD/>



Prototype of a MAPS (Monolithic Active Pixel Sensor): Pixel sensors very similar to these built for the International Linear Collider are currently developed for the European XFEL.

Together We're Strong

An IEEE Conference satellite workshop takes place at DESY

Faster, higher, farther! The motto of this year's Olympic Games is also valid for the development of research opportunities. But unlike the Olympic athletes who struggle to beat world records by fractions of hundredths, the development of accelerator experiments is progressing in such extreme steps that researchers have to clear completely new hurdles – their measuring instruments are too inaccurate.

In particular, the researchers at the new photon sources are facing a problem: The future light sources like FLASH and the European XFEL are overstraining all the detectors normally used in this discipline. They are generating light flashes in such short intervals that the time resolution of the detectors and their electronics simply cannot cope with it. Moreover, their brightness is so extreme that they require detectors which are able to record both single photons and a billion of them.

The requirements particle physicists put on their future detectors are not far from

this: Precision detectors like the ones designed for the ILC do not only need a good time resolution, but also an extremely good position determination.

Common problems unite. It is thus very convenient that the world's elite of instrument and detector researchers will meet in October at the IEEE conference in Dresden. At a so-called satellite workshop to this world's largest conference on instrumentation, researchers from the fields of instrumentation, photon science and particle physics will meet at DESY on 16 and 17 October. The organisers expect 150 participants who will exchange ideas on requirements for new detectors and current possibilities of particle detection. This will provide the basis for joint research projects to successfully clear the hurdles of the next generation of research facilities. ([\(tz\)](#))

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<http://satworkshop2008.desy.de/>

IEEE-Conference: www.nss-mic.org/2008

Helmholtz Alliance Statistics School

The Helmholtz Alliance "Physics at the Terascale" will for the first time hold a "Statistics Tools School" at DESY. From 29 September to 2 October, the participants will learn how to use statistical methods, tools and tricks needed to evaluate the imminent LHC data. The four day advanced training includes lectures and practical exercis-

es at PCs. The lectures will in part be held by experts from the LHC experiments. More than 90 participants have registered so far. More information and registration see: www.terascale.de/stat2008



The PETRA III hall is filling up. The ring arc is growing from south to north, i.e. against the future beam direction. The experiment huts beside it look like saw teeth.

Saw Teeth on the Concrete Plate

The interior works in the PETRA III hall are proceeding well

In April, the record ground of the PETRA III hall was still spic and span, the hall itself wide and empty. Since then, it has been filling up continuously, with the new elements of PETRA III being installed with millimetre precision.

At the moment, the missing ring arc is being erected. For radiation protection shielding, a total of 645 tunnel wall elements are required to close the ring from south to north. Each of these concrete blocks has a thickness of one metre and weighs 14 tonnes. "Sometimes the crane which is designed for a maximum load of 20 tonnes is sagging," says Hermann Franz, experiment coordinator at PETRA III. At the same time, the tunnel is filling up. The first machine girders have been mounted on their supports. The girders bear the magnets

which focus and deflect the positron beam.

Parallel to the machine works, the first experiment huts are being erected. In total, there will be 14 beamlines for the experiments in nine sectors. "We also call them saw teeth because of what their contour looks like," says Franz.

The first undulators have also arrived at DESY. They are the interface between machine and experiments and produce the extremely brilliant synchrotron radiation. The air conditioning system for the hall is also ready to start. In future, the whole hall will be kept at a constant temperature of 22 degrees Celsius to guarantee the precision of the beam. (*jde*)

Fit for the Future

To prepare the DESY infrastructure for future progress at an early stage, the processes in information technology, technological infrastructure and administration in Hamburg and Zeuthen are being evaluated. The objective is to optimally adapt the services on offer to the users' needs. The evaluation process starts with a survey of the actual

state at both DESY sites. With the help of external experts, the infrastructure is then to be optimised to better fit both current requirements and the strategic orientation of DESY research.

Science Café: First Birthday

On 18 September, the Science Café DESY celebrates its first birthday. One year ago, Waldemar Tausendfreund started an "experiment". His aim was to familiarise young people, especially pupils from grade 6 up, with science. He devised a special method: Far away from the class room, people eager for knowledge get together every week in a convivial gathering to meet a scientist presenting a topic from the fields of physics, mathematics, biology or related subjects. Priority is given to the vivid dialogue between old and young, amateurs and experts. The 40 meetings in the past year were attended by more than 650 visitors. The youngest guest was 8, the oldest 90 years old.

On the day of the anniversary, former DESY research director Jochen Schneider will answer all inquisitive questions about "Biomolecules at work – looking over the shoulder of life" (in German).

Info: <http://sciencecafe.desy.de>

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