DESY inFORM.

04/2011
Newsletter of the
Research Centre DESY

Please use the detour …

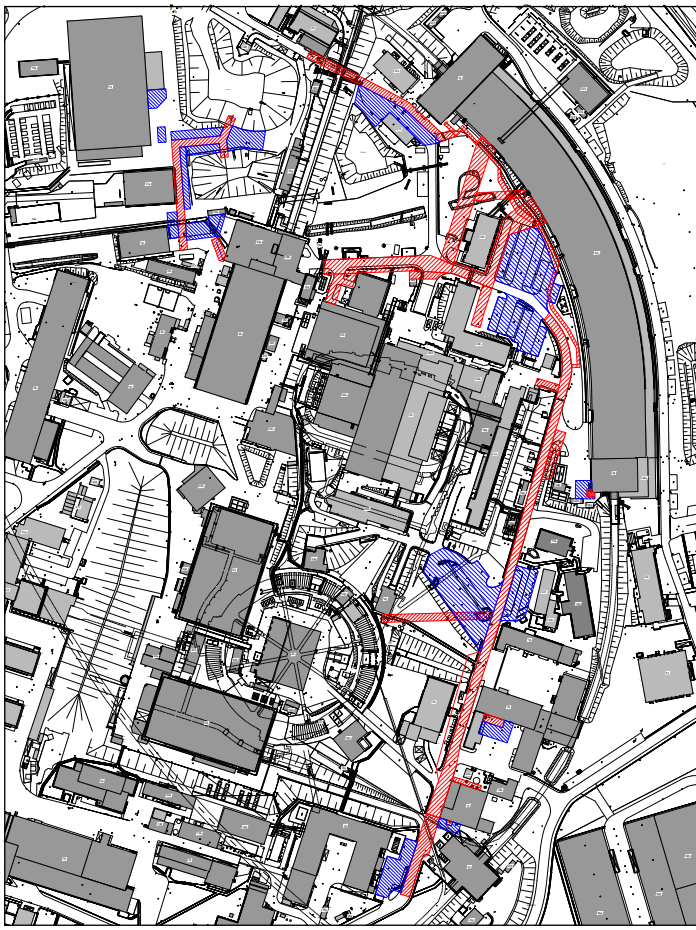
Installation of sewer pipes will cause considerable traffic obstruction at DESY

Environmental protection at DESY is visible in many places on the ground, but sometimes it is also necessary to go deeper: by the year 2015 DESY is obliged to attest that all its rain and wastewater pipes are leak-proof. After a leak test, the DESY construction department found out that about 20 to 30 percent of the pipes must be replaced. On top of the planned replacement of the pipes, it turns out that the distant heating and cold-water networks have become old, with pipes bursting regularly in the past years. An inspection of the freshwater network revealed that the pipes are not flushed appropriately because they are oversized.

This means a complete refurbishment of DESY's water network. The construction department and the MKK group have therefore designed a master plan to convert the complete pipe network at DESY to a state-of-the-art system, including a much better thermal insulation of the distant heating pipes.

And when there's digging already going one, one might as well shift the cable routes and install reserve conduits for data and communication lines at the construction sites of FLASH II and Nanolab. The synergy is obvious: unlike the numerous pipe administrations of a large city, DESY is able to coordinate all construction work alone.

In spite of the considerable traffic obstructions at DESY, the implementation of the pipe network master plan would not really be a problem if only there weren't already so many future construction sites: the FLASH II builders will already start work this summer, and the construction of both the CSSB building and Nanolab, to be connected with building 25f, is planned for next year. The pipe construction beneath the roads of DESY's northeast sector must have come to an end by then to ensure that the construction site traffic will have access to the construction sites at that time. This means that pipe digging has to run at full speed, everything has to go hand in hand. In fact, the construction site master plan has considerable side effects: for five months, the northeast



The refurbishment of the pipe networks goes along with considerable traffic obstructions at DESY The PETRA III experimental hall is in the right upper corner. The red hatched areas indicate the construction sites for the pipeline routes, the blue coloured areas show the parking zones blocked during construction time.

CONTINUED ON PAGE 2

Record of applications at DESY's light sources

DESY's light sources DORIS III and PETRA III announce a new record of applications: for the coming user period in the second half of 2011, scientists have submitted a total of 278 new experiment proposals, over a hundred more compared to former user periods. Especially the amount of PETRA III proposals has increased substantially because new beamlines are continually commissioned, but DORIS too has a slightly increased number of applications. Many users also have a demand for combined measurements at both sources since they provide different experiment parameters.

DIRECTOR'S CORNER

Dear colleagues,

in my last Director's Corner, I reported about our accelerator marketplace of ideas – this new activity was continued in November 2010 with another well attended event.

Also in autumn 2010, DESY and five other Helmholtz centres started an initiative to permanently establish future-oriented accelerator research and development as an independent programme within the Helmholtz Association. In collaboration with other institutes and universities, DESY plans to engage in the following fields: superconducting radiofrequency technology in the continuous wave mode, generation and dynamics of ultra-brilliant femtosecond electron bunches, electron-laser interaction and plasma acceleration. I am confident that the application for funds of the Helmholtz Association made under the leadership of DESY will be approved within the coming weeks.

The acquisition of new resources is indeed necessary to seriously plan new activities, because in the coming years we are working to full capacity with accelerator operation and current large projects (European XFEL, FLASH II, PETRA upgrade, and more).

At a closed meeting with all M group leaders in November last year, there was an intensive discussion focussed on the optimal organisation for the accomplishment of our future tasks.

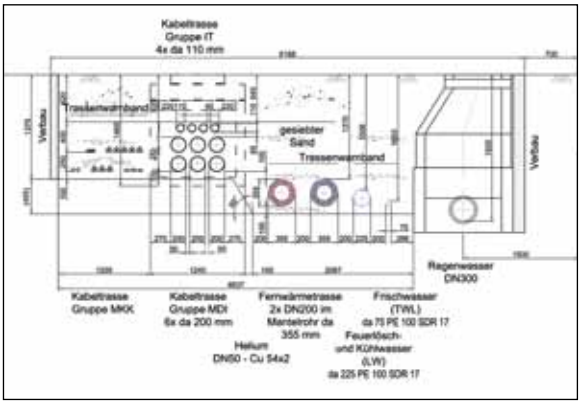
I have no doubt that we will manage all this with the traditional great commitment of all participants, a good and open communication and a well organised and efficient cooperation.

Yours

Reinhard Brinkmann

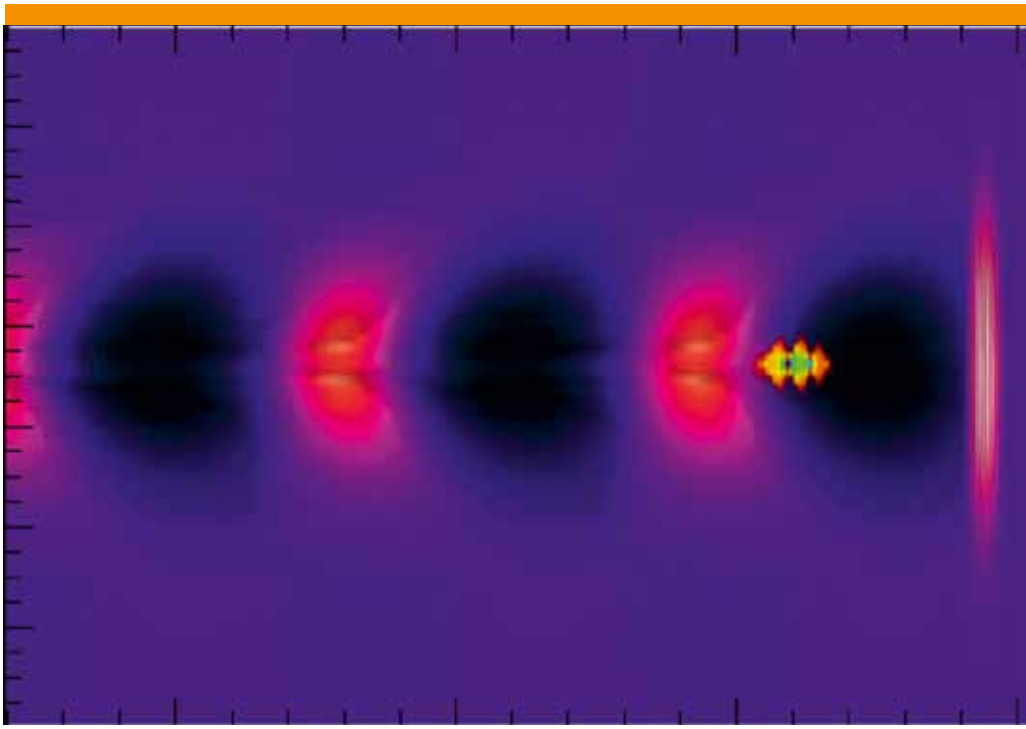
sector of DESY, extending from the builder's yard to HASYLAB, will not be accessible for vehicles. The parking areas in front of the HASYLAB building and of building 30 are needed for the construction site facilities. Instead, staff members will get about 120 new parking places in front of the FLASH experimental hall; additional substitute parking places will be announced in due time via a circular letter.

On 16 May, construction will start behind building 25f to prepare cable shifts during the summer shutdown of PETRA III. Shortly after, the first roads will be blocked. Since the roads will temporarily be excavated by three quarters of their width and more than four metres in depth, only vehicles of the technical and security departments are allowed to circulate; even pedestrians must make a considerable detour. Depending on its state of repair, the sewage pipes will be replaced or equipped with an inner lining, and there will be an installation of new power and data cables, and of new pipes for fresh, extinguishing and cooling water. The distant heating pipes will be replaced completely and adapted to state-of-the-art conditions. Another result of the master plan: the drainage system will be completely remodelled. The surface for the DESY roads that will be dug up are planned to be permeable, thus reducing the sealed soil surface at DESY. Should the rainwater not evaporate in the warm Hamburg summers, the drained rainwater will trickle off completely on the DESY grounds, sinking beneath the surface into the groundwater which is then used by the extraction wells to supply cooling water for the accelerators. Currently it is being investigated whether extra oxygen-rich rainwater may precipitate iron or manganese from the extracted water. This would allow using well water directly for cooling without time-consuming processing still necessary today.



Cross section of a typical pipeline route: numerous data and power cables lie alongside several rainwater, freshwater, extinguishing and cooling water, and distant heating pipes.

In September, the subterranean construction site will be closed again. Nevertheless, there is much to do until 2015. In these years, the sewerage systems construction at DESY will be continued counter-clockwise within quadrant sectors. *(tz)*



Simulation of an electron bunch in a plasma accelerator. This could be a way to accelerate electrons injected from DESY facilities as FLASH, PITZ or REGAE in a laser stimulated plasma

The plasma project

Helmholtz Young Investigators Group does new accelerator technology research

Particle accelerators need space. If you want to bring small particles to high energies, you need quite a lot of distance. At FLASH, for example, an accelerator of 80 metres length alone is needed to bring electrons to an energy of 1.25 giga-electronvolts."This accelerator here can manage the same energies," says Jens Osterhoff, holding up a sapphire with the size of 1.6 centimetres. "However, the properties of the particle beam are not quite as good as those of FLASH," he adds with a smile.

Since September 2010 Osterhoff is the head of a Helmholtz Young Investigators Group at the University of Hamburg working at DESY. In collaboration with two PhD students, one postdoc and one laser technician, he focuses on the new accelerator technology of plasma acceleration which is still in its infancy, but quite promising. "With a plasma accelerator, it is possible to supply particles with more energy per metre." The cavities to be built into the European XFEL, for example, reach up to 35 mega-electronvolts per metre, whereas a plasma accelerator can reach between 10 000 and 100 000 mega-electronvolts per metre.

So far, the beam quality generated in a plasma accelerator is not good enough to be used for sophisticated applications such as free-electron lasers. Up to now particles can only be accelerates over short distances. Osterhoff and his colleagues are doing research to make this possible. For example, there are plans for the FLASH upgrade to FLASH II to install a plasma beamline that may also be used by the young investigators group for their experiments. In contrast to more common accelerator types like FLASH and HERA, a plasma accelerator does not need cavities into which an electromagnetic field is coupled. In fact, the particles are accelerated in plasma. When a laser or electron beam is injected into plasma, the electron density changes in a wavelike manner. This produces very strong electric fields in the plasma. An electron beam injected at the right time will then be accelerated by these electric fields in the plasma.

Scientists want to use the high gradients produced by the plasma acceleration to build very compact accelerators. Wanting to use the particles from plasma accelerators for experiments and I order to get a good beam quality, the scientists will use a trick. They inject beams with already good properties into the plasma and accelerate them further. To test whether that works, electron beams from PITZ, REGAE or FLASH would be suitable. There is much to do until the plasma accelerators have reached maturity. With its accelerators, DESY offers the ideal conditions for this kind of work. *(gh)*

Winner's view

Your choice: for nearly four weeks, visitors of the DESY staff members' photo walk exhibition in the auditorium foyer had the opportunity to vote for their favourite photo. Here, you see the winning picture taken by Martin Wolff, showing the drift chamber of the ARGUS detector.

April

13 Science Café DESY (http://sciencecafe.desy.de)
Wie man mit Statistik lügt
Frank Lehner, DESY Bistro, 17 h

14 **Girls' Day**
DESY, Hamburg
Zukunftstag für Mädchen und Jungen
DESY, Zeuthen

15 Ein Tag vor Ort (www.eintagvorort.de)
Laborbesichtigungsprogramm für Physik-Studierende
DESY, Zeuthen

27 Public lecture
Röntgenlaser – Neue Erkenntnisse aus der Photonenphysik
Rolf Treusch, DESY, auditorium, 19 h

May

10-13 TERASCALE (http://terascale.de/geant2011)
Geant4 Training: Calorimetry in HEP
DESY, Zeuthen

11 Information lecture Gesund bleiben
Work-Life Balance
Norbert Struck
DESY, auditorium, 16 h

11 Science Café DESY (http://sciencecafe.desy.de)
Schöne neue Welten – Die Entstehung von Planetensystemen
Marc Hempel
DESY Bistro, 17 h

16-18 DIPAC2011(http://dipac2011.desy.de)
10th European Workshop on Beam Diagnostics and Instrumentation for Particle Accelerators
DESY, Hamburg

19-20 Symposium
Solar Energy for Science
DESY, Hamburg

23-24 PT-Tag
Treffen aller Projektträger
DESY, Hamburg

25 Science Café DESY (http://sciencecafe.desy.de)
Von Sonnenstrahlen und Geisterteilchen
Daniela Käfer
DESY Bistro, 17 h

25 Public lecture
Wenn Licht durch dicke Wände geht – Teilchenphysik bei kleinsten Energien
Axel Lindner, DESY, auditorium, 19 h

28 www.langenachtderwissenschaften.de
Lange Nacht der Wissenschaften
Berlin and Potsdam

+++ 29 October: DESY's Open Day and Night of Knowledge (DESY, Hamburg) +++

Go

Have you ever asked yourself why many things at DESY are still handled in printed form? Why procedures lack transparency? And why it is sometimes not clear where to find a certain process?

One of the goals of the business process optimisation project, labelled with the acronym GO, for "Geschäftsprozessoptimierung", is to improve these problems with an identity and access management system. This project will now activate another part of the recommendations issued by an expert committee on the basis of the INFRAFIT results.

The fundamental goal of the optimisation project is to create the organisational and technical requirements to make operation of business processes at DESY more efficient and more transparent for the parties involved.

To meet this goal, business processes are recorded and analysed, and selected processes are optimised. On the other hand, an identity and access management system for electronic handling is to be established that includes all necessary data of personnel and their functions. On the basis of these two procedures it is then possible to make selected processes accessible via a web-based service portal.

GO starts with a first phase of about one year, taking stock of business processes and information systems at DESY. As a result of this phase, a concept will be worked out, and there will be a cost estimate for a second phase expected to take about two years. On this foundation, the directorate will decide whether and to what extent the further realisation will take place.

More information:
http://go.desy.de
http://infrafit.desy.de

Science for the dessert

New perspective for a partnership with the southern Mediterranean region

by Stephan Haid

The DESERTEC idea to produce solar energy in the deserts of the Middle East and North Africa (MENA) constitutes a classical win-win situation. It's not only a fascinating ecological prospect to cover the increasing energy demand in the region and export energy to Europe. The MENA region will also make a considerable economic profit as soon as this gigantic infrastructure project creates an important part of value and long-term employment in this area. This also requires an advanced education and science system. Scientific cooperation between Europe and the southern Mediterranean region may build bridges into the future – for more stability, growth and sustainability. Research in cross-regional partnerships is an important factor for the reduction of poverty and for economic development.

The Solar Energy for Science initiative, started at DESY beginning of 2010, is a proposal for a strategic energy and science partnership between key research institutes of the MENA region and Europe, with the aim to support the advancement of renewable energies in the region with increased scientific cooperation.
Under the patronage of the UNESCO, a symposium on this issue will take place at DESY on 19 and 20 May. At this event, a wide range of participants, including renowned scientists like the Nobel Prize winners Carlo Rubbia and Walter Kohn and political decision makers from Europe and the MENA region, will continue to sharpen and advance the idea of this innovative energy and science partnership.

Considering the current situation and the political and social upheavals in the North African states, Europe is asked to send a clear signal to support the democratic change in the southern Mediterranean area. "Especially now, an intensive scientific collaboration between the north and the south is of considerable importance and may provide a perspective for a sustainable development of the whole Euro-Mediterranean area," Helmut Dosch emphasises.

SOLAR ENERGY FOR SCIENCE

INFO
www.solar4science.de

Elk test for nano materials

Agreement on Swedish collaboration at PETRA III

On 25 February, the agreement of a new international collaboration at a DESY facility was sealed at DESY: Leif Eriksson of the Swedish Research Council and the DESY Directors Helmut Dosch and Edgar Weckert signed a memorandum of understanding on Sweden's participation at the X-ray source PETRA III. The so-called "Swedish Materials Science Beamline" will use the brilliant synchrotron radiation beam at the planned PETRA III upgrade for material and nano science experiments.
In this collaboration, DESY will primarily be responsible for the construction of the facility; representatives of the scientific communities of both countries share the responsibility for the content of the experiments.
The collaboration with Sweden was at the same time the start of the so-called "Röntgen-Ångström-Cluster". In this unique association of neutron and synchrotron radiation research infrastructures, the regions of Northern Germany and Sweden will closely collaborate in materials science and structural biology. The Federal Ministry of Education and Research's State Secretary Georg Schütte and his Swedish ministerial

DESY for Japan

Support for our scientific colleagues

The disasters that struck Japan in March are shocking the whole world. Because of our long-time cooperation in many fields, DESY has strong connections to its scientific colleagues at Japanese research centres.

The accelerator facilities KEK and J-PARC are located in the area hit by the earthquake, between Sendai and Tokyo; in fact, J-PARC is situated directly on the waterfront.

We could not communicate by email immediately after the earthquake because of a blackout lasting for days, but after that there was the good news that in both centres no one was killed or injured. J-PARCs buildings remained undamaged thanks to high construction regulations; at KEK, some buildings had to be evacuated to verify the danger of collapse. Current investigations have shown that parts of the accelerator sections and infrastructure such as power and water supply and roads have been severely damaged.

The international aid for the Japanese people that endure this catastrophe with courage and determination is running on many channels. DESY too wants to offer help, especially to our friends, the affected research centres, to continue their research activities and get the accelerators running again. In a letter to the KEK and J-PARC directors, the DESY directorate expressed our sympathy for the affected people.

Simultaneously, Helmut Dosch offered assistance to the Japanese colleagues, for example by making available our computers for data processing, providing measuring time at our photon sources, inviting them to come to DESY as a visiting scientist, and by sending replacement parts and components.

“Words can’t describe this catastrophe,” said Helmut Dosch. “Nevertheless, I hope that our Japanese colleagues will overcome this setback as soon as possible – also relying on our help.” *(tz)*

INFO

Current informations from J-PARC and KEK in englisch: www.kek.jp

colleague Peter Honeth also used the Röntgen-Ångström Cluster start as an opportunity to come to DESY. *(tz)*

Leif Erikson (Swedish Research Council) and Helmut Dosch sign the agreement.
In the background from left: Ulf Karlsson (Univ. Stockholm), the State Secretaries Peter Honeth and Georg Schütte, Edgar Weckert.

IRUVX-PP ends on a high note

With a three-day meeting in Berlin, the EU project IRUVX-PP, the preparatory phase for the association of European FEL and short pulse sources - coordinated by DESY - was brought to an end.
The participating scientists drew a very positive résumé: in the project phase of three years, the partners established new networks at various levels that allow technical innovations and also the optimal use of the facilities, coordinated training and exchange of personnel and improved communication.
At the final meeting, the scientists summarised their results, including proposals for further activities. For the moment, these will be continued by the participating centres at their own expense.
“With IRUVX-PP, we have created the basis for a firm and long-term collaboration, and I hope that the results will convince the decision makers,” said coordinator Josef Feldhaus. Currently, the directors of the participating institutes are negotiating a memorandum of understanding which is supposed to seal future collaboration.

Moving goes on

With the shift of construction phases in building 1, a number of service groups are changing their locations: the DESY doctor (BA) returned to their old practice rooms in the basement of building 1 (now building 1a). Due to ongoing construction work in the foyer building, access is only possible at the side entrance of building 1a, with signs showing the way. The enlarged CMS remote centre took up operation in its new rooms in the upper floor of building 1a.
The renovation works in the adjacent building 10 also affect the ZE workshop and the ZE test room, and the management and engineering offices of the ZM department. As of mid-April, ZM and ZM1 will temporarily move to the guest houses 15a and 15b. The ZE workshop including the test room will change to hall 1, the SMD workshop to HERA east hall. After construction work being completed, the ZE management already moved back to building 1a. Electronics manufacturing orders can then be placed right there.

www-Feedback

Do you have any questions or suggestions concerning the new DESY website? Is something not represented or working correctly, or are there deadlinks? In these cases, please send an e-mail to www-feedback@desy.de

Officially online as from 6 April: the MINTforum Hamburg website. DESY is represented with two activities - with the hands-on school lab "physik.begreifen" and the Science Café DESY.

Do you know MINT?

New network to get young people interested in natural sciences

by Karen Ong

MINT stands for mathematics, informatics, natural sciences and technology. In fact, these are issues of major importance for our society but, unfortunately, they are rather unpopular among pupils. However, there are many institutions and initiatives in Hamburg that have set themselves the goal to counteract this trend among young people. From day-care children to secondary school graduates, attractive offers are supposed to arouse interest for MINT subjects.

Under the name of "MINTforum Hamburg", a network was created to link and join the forces of MINT actors from schools, universities, authorities, enterprises and foundations. This project is an initiative of the Joachim Herz foundation, the Körber foundation, the federal state institute for teacher education and school development, and the Nordmetall foundation. The aim is to publicise the MINT offers in Hamburg.

MINTforum.de will also be the name of a new website that went online on 6 April at the next network meeting; an information platform for pupils, teachers, parents and grandparents who want to know more about the range of exciting MINT activities in Hamburg for youngsters. DESY also offers a variety of events, for example a day at the hands-on school lab or fascinating talks at the Science Café DESY.

INFO

www.mintforum.de

HELMHOLTZ ASSOCIATION

Data management for science

The Steinbuch Centre for Computing (SCC) at Karlsruhe Institute of Technology KIT has developed and put into operation a novel concept for the storage, administration, archiving and analysis of scientific data. The Large Scale Data Facility (LSDF) consists of an infrastructure providing storage and processing resources for research data, with experts supporting users in the processing and analysis of data.

The centre's research topics focus on the improvement of services, such as fast and safe access to storage and computers, on the automation of workflows to shift data to different levels within a storage hierarchy, on long-term archiving and the development of data interfaces to the LSDF, and their deep integration into the scientific routine of users.

The LSDF is open to users from all scientific disciplines of the Helmholtz Association of German Research Centres and from other universities and research institutions in Germany as well.

www.helmholtz.de/hermann

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First election of PhD students

On 24 March, at a plenary meeting, all PhD students working on the DESY campus elected the first official PhD students' representatives. For the coming year, Marc Wenskat and Jasper Hasenkamp will represent the PhD students' interests vis-à-vis the DESY directorate, for example.

The film on particle physics is available

Together with the relaunch of the DESY website, the particle physics film went online. Following the link www.desy.de → About DESY → DESY Videos you get information on particle and astroparticle physics at DESY in twelve minutes.