DESY inFORM.

06/2009
Newsletter of the
Research Centre DESY

Total overhaul

Building 1 to be completely restored with Helmholtz and Federal funds

Starting this summer, one of the most "ancient" buildings at DESY – laboratory building 1 – will be completely refurbished, complete with its long corridor, the foyer building and all the building's wings. All old windows will be replaced and all external walls will be fitted with thermal insulation; the electric system, water and heating pipes will be completely modernised. Moreover, new fire protection elements will be installed and the bits of ceiling in building 1 that contain asbestos will be removed. During the rebuilding phase it will not be possible to work in the completely closed-off building sectors that are under construction. Therefore, many working groups will have to move temporarily to other places and later return to completely refurbished offices.

Building 1 (front left) is one of the oldest and most distinctive buildings at DESY (here an aerial view from 1967).

Moreover, there will be some major alterations: Building 1e, the wing currently occupied by parts of the HERMES, MEA, FLC and ZEUS groups, will be extended with another storey connecting to the already existing upper storey in 1d. Part of the directorate will move to the upper storey of the foyer building and the entrance hall will also be submitted to a complete remodeling. As a consequence, the library has to move from its current location. The new "home" will be the wing of building 1d, including the subjacent passage in the basement, known at DESY as "glass windows passage" (although there are no glass windows anymore). The books will be more protected in this environment and the library staff will work closer to the library archive, which in future will be located in the basement of building 1d. The meeting and social area with its supply of daily newspapers, currently in the foyer building, will be reopened in building 1d.

Many of these remodeling measures will improve the energy efficiency of building 1, since 1.9 million Euros for the renovation are government funds designated for energy saving measures in federal buildings. Another 8.9 million Euros are granted from a Helmholtz fund.

Remodeling will start in August and will go through five construction phases. The first phase starts in the 1d hallway and 1e wing. Six months later, the construction workers will move into the wing of 1d and the 1c hallway, and then they will carry on starting from the foyer building in the direction of 1a, 1b and 1c. In 2012, all staff members will have returned to their remodelled, perfectly insulated and refurbished offices.

In case you want to see what your future office will look like, have a glance at the CMS control room in 1b. All the offices will be equipped with a new suspended ceiling, wall-to-wall carpeting and newly painted walls, including new windows, new electrical installation and lights, and new heating pipes. The solid wood closets will not be removed – they proved to be very useful anyway! *(baw)*

CONTINUED ON PAGE 2

European XFEL – No admittance on construction site!

Ever more frequently, interested people happen to visit the European XFEL construction site "DESY-Bahrenfeld" behind lab building 2. Granted, watching the events on a major constructing site is fascinating for young and old, but it is also very dangerous. Lorries and other construction machines cross, heavy loads hover suddenly above one's head, pointed objects are lying on the floor and so on. The risk of injury is very high! The DESY directorate and the construction management therefore wish to make this very clear: Access to the construction site is strictly forbidden! This is for your own safety.

DIRECTOR'S CORNER

Dear colleagues,

the world economy crisis concerns all of us. Although it may sound strange: DESY gets a short-term benefit from these dramatic developments at the world's financial markets.

For our part, we are glad to have secure jobs at DESY and that the attractiveness of our job offers is increasing. Moreover, the collapsed prices for raw materials and other goods reduce the costs for the building and operation of large scale facilities. The current prices for electricity are considerably lower than the panic prices in summer 2008. The economic stimulus packages from both the federal government and the federal states will most likely increase the low assets at DESY by an additional 10 million euros. This money will fund urgent operational safety measures for FLASH and necessary restoration measures at DESY buildings.

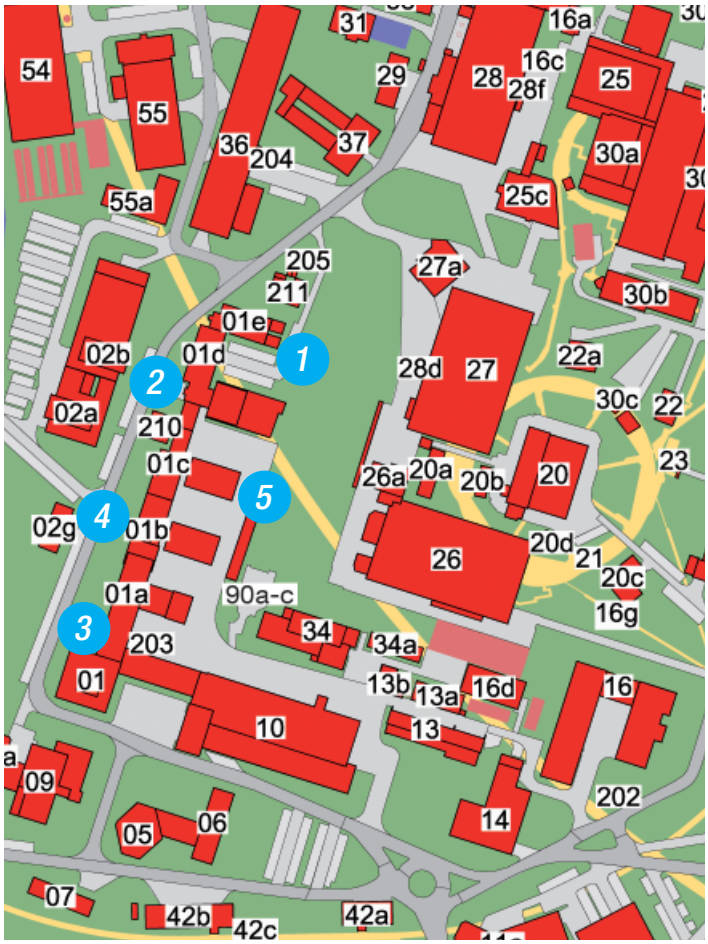
The short-term advantages of the crisis will, however, not last very long. Due to new debts and dramatically dropping public revenues, there is the risk that things may be very different after the federal elections.

However, the upcoming conference of the German federal states' leaders with the Federal Chancellor will announce the Joint Initiative for Research and Innovation which – in spite of the budget crisis – will bring us, as a member of the Helmholtz Association, an increase of research funding until 2014. Nevertheless, the many projects of DESY in this period of time will exceed the budget. Thus, we must continue to save. Raising additional funding will be a necessity to keep the laboratory under full sail.

With the experiences of the past six years, I am sure that all of us will successfully master the expected turbulences.

Yours,
Christian Scherf

Continued from page 1.



Schedule of construction phases

Each construction phase will take about half a year. The sector of the building will be completely closed off during conversion time; transit will not be possible and all "inhabitants" will temporarily have to move to other offices.

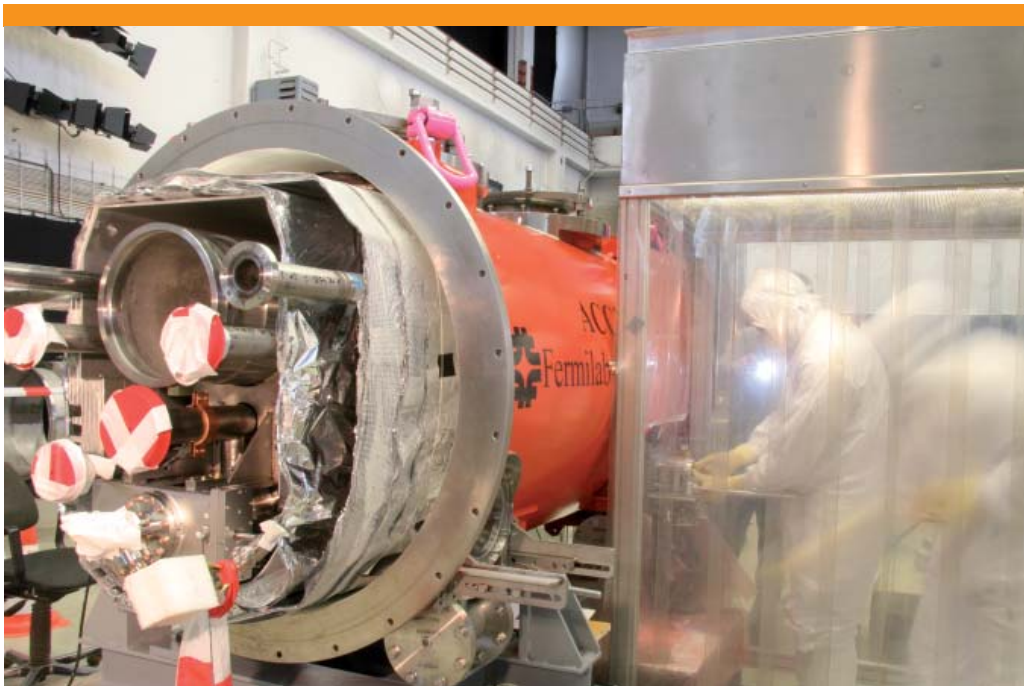
Phase 1: 1e and 1d (corridor). Building 1e will get a new storey that will be connected with 1d. MEA, FLC, FLA and ILC will move in here when it is finished.

Phase 2: 1d (wing) and 1c (corridor). This will be the new location for the library, which requires a complete remodelling of the basement. This construction phase also concerns the FLA, H1, ZEUS, CMS groups and the directorate.

Phase 3: Foyer building 1 and the first sector of the hallway including 1a (wing). The refurbishment of the foyer building will create new offices for the directorate. The PR department will return to the same offices. The exhibition area will also remain at the same place but the foyer building will get a completely new look.

Phase 4: 1a (corridor) und 1b (wing). This sector will be submitted to "normal" remodelling and restoration; moreover, workshops will be installed in the basement.

Phase 5: 1b (corridor) and 1c (wing). Like Phase 4.

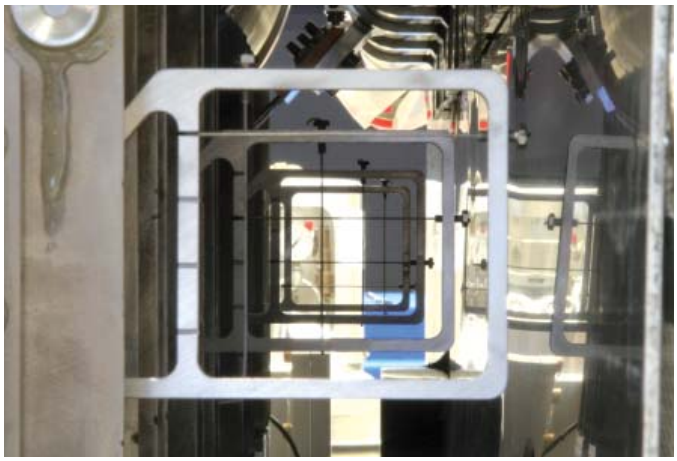


In a mobile clean room, technicians from Fermilab practise installing a coupler into the cryomodule.

Large inspection

The new 3.9-GHz module for FLASH goes through a thorough checkup

„Check parcel immediately after delivery and report damages to the carrier." You find notes like these in the shipping conditions of transport companies. However, after the transport of an accelerator module that weighs three tons and is worth three million Euros, the delivery check is more comprehensive than usual.



The wire crosses are used to measure the displacement of cavities within the module. The transport did not cause any harm.

This is currently happening with the 3.9-GHz module that was shipped from Fermilab to DESY at the end of April. In winter, it will be built into the FLASH accelerator and produce a higher particle bunch density, thus generating brighter and shorter laser flashes.

At the moment, the module is carefully inspected in hall 1. During its journey, the two-metre unit was suspended in a special transport facility. "Even so, we were very eager to see whether it had been given any hard shakes during transport by plane and lorry from the United States via Glasgow and Paris," said Elmar Vogel, who is in charge of the project from the DESY side and accompanied the module on the last part of its journey.

What a relief after the first measurements. The module had not been submitted to more than two G during take-off and landing and during lorry transport on the notorious A1 highway. Even the precise measurement of the module made evident that the small cavities were still perfectly in line. No sign of transport damages.

Nevertheless, the scientists from Fermilab and DESY will disassemble the module again. The support of the cavities based on small needle bearings will be submitted to fine adjustment once more before the module is equipped with RF couplers and other supply systems.

In autumn, the accelerator operation of the module will be put to the acid test at -271 degrees centigrade at the cryomodule test bench CMTB. For this purpose, the test bench designed for the 12-metre-long 1.3-GHz modules has to be converted for the two-metre module and equipped with a 3.9-GHz supply.

The results obtained from the tests and the experiences from applications at FLASH will be integrated in the design of the 3.9-GHz system for the European XFEL. In any case, the first one of the modules passed the air and road transportability test without any problems. *(tz)*

June

3 Public Lecture
Illuminati – Die wahre Geschichte der Antimaterie
Philip Bechtle, 19 h, DESY, auditorium

4 Science Café DESY (http://sciencecafe.desy.de)
Hunderte von Planeten um fremde Sonnen – Uns noch unbekannte Welten
Waldemar Tausendfreund, 17 h, DESY Bistro

10 Public Lecture
Weltbilder auf dem Prüfstand – DESY und die Zukunft der Teilchenphysik
Karsten Büßer, 19 h, DESY, auditorium

11 Science Café DESY (http://sciencecafe.desy.de)
Von der Vision zur Wirklichkeit – 50 Jahre Physik mit Photonen bei DESY
Prof. Georg Zimmerer, 17 h, DESY Cafeteria

13 **Berlin night of sience, in Berlin und Potsdam**
17-1 h, Humboldt-Universität zu Berlin, Adlershof
www.langenachtderwissenschaften.de

18 Science Café DESY (http://sciencecafe.desy.de)
Röstaromen, Induktionsherde und Co – Die Physik des Kochens
Alexandra Junkes, 17 h, DESY Bistro

24-25 Brainstorming Meeting
Perspectives for time-resolved studies and imaging with laser based and FEL photon sources
DESY, Hamburg, auditorium

25 Science Café DESY (http://sciencecafe.desy.de)
Sind wir stabil? – Protonenzerfall und große Vereinheitlichung der Kräfte
Laura Covi, 17 h, DESY Bistro

29-3 July Physics at the Terascale (www.terascale.de)
Workshop on Detctor Understanding with First LHC Data
DESY, Hamburg

July

1 Public Lecture
Von FLASH zum XFEL
Elke Plönjes, 19 h, DESY-Hörsaal

2 Science Café DESY (http://sciencecafe.desy.de)
Ist 15 nur wahrscheinlich 3 mal 5? – Die Stärken und Schwächen von Quantencomputern
Leonhard Horstmeyer, 17 h, DESY Bistro

5 www-zeuthen.desy.de/TdoT
Einblick – Tag der offenen Tür in Zeuthen
10-17 h, DESY, Zeuthen

7 HertzLecture 2009
Dark Matter in the Universe
Prof. Joseph Silk, University of Oxford
17:30 h, DESY, Hamburg, auditorium

6-10 PASCOS 2009 (http://pascos2009.desy.de)
15th International Symposium on Particles, Strings and Cosmology
DESY, Hamburg

17-22 August: Lepton-Photon 09 +++ 20-23 September: GISAS 2009 +++ 7 November: DESY's Open Day (Hamburg)

One of the attractions at the 820th Port Festival in Hamburg: the mobile "Weltmaschine" exhibition.

Good grades for research

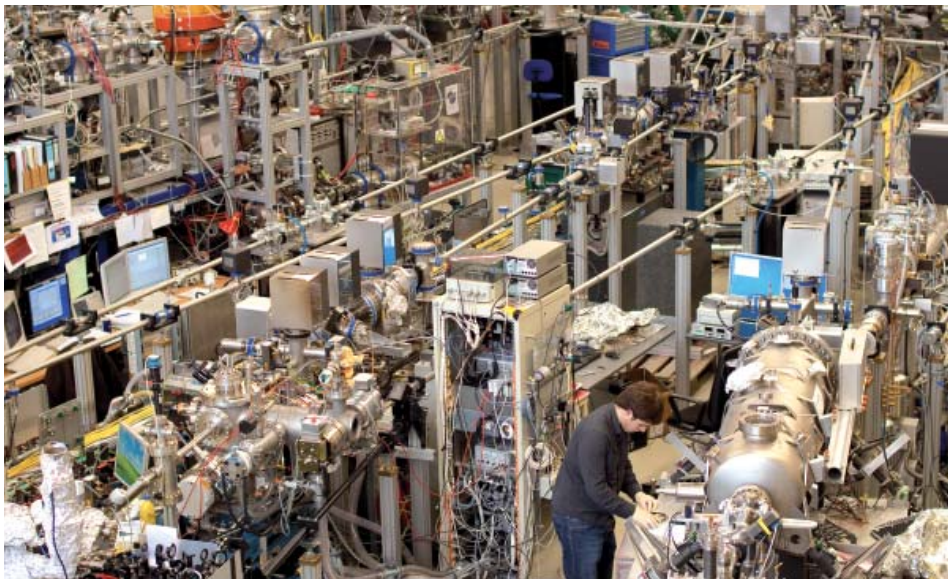
The evaluation of the research field „Structure of Matter“ shortly before completion

by Ilja Bohnet

The time of examinations is over now: at the end of April, the evaluators scrutinised the Helmholtz programme “Large-scale Facilities for Research with Photons, Neutrons and Ions (PNI)” at the Helmholtz Centre Berlin (HZB). With this, the evaluation of the research field “Structure of Matter” is nearly completed. Four additional programmes of this research field already went through the evaluation, including “astroparticle physics” and “elementary particle physics” in which DESY is strongly involved (see DESY inForm issue 04/2009).

With its powerful photon science light sources, DESY is making major contributions to the PNI programme too. Mid of March, the experts evaluated the laboratories and research facilities at DESY and other participating Helmholtz Centres. The result adds to the previous positive assessments: quoting the oral feedback of the evaluators chaired by Joël François Mesot from ETH Zurich, the evaluation of the PNI programme was also very successful for DESY.

Meanwhile, all evaluations in the “Structure of Matter” field have been submitted in written form to the programme spokesmen and before long they will be presented to the persons in charge of the programme. For DESY, Joachim Mnich is the programme spokesman for elementary particle physics, Christian Spiering the deputy programme spokesman for astroparticle physics and Edgar Weckert the programme topic spokesman for photons. From the evaluations, the Senate Commission of the Helmholtz Association, together with the Helmholtz Office, will deduce a funding recommendation for the centres for the programme period 2010 to 2014. This will be submitted for decision to the Helmholtz Senate and the Directors of the centres in the coming half year. DESY primarily expects a confirmation of its structure and development planning, as it is described in the programme proposals for its three research programmes.



The FLASH research programme was also scrutinised by the evaluators.

EMBL links up

Annex to PETRA III hall

Since the end of February there is one more construction site on the DESY campus: an annex is being built at the south end of the PETRA III hall, adjacent to hall east. The two-storey building will house new laboratories, offices and a seminar room on an area of about 500 square metres. Scientists from EMBL (European Molecular Biology Laboratory) and users of the EMBL beam line at PETRA III will work in these premises as of November.

This will considerably shorten the walking distances for scientists: the preparation of a sample, for example the crystallisation of protein molecules takes place in the new building 48e.

View of the construction site of building 48e.

After measuring the samples with synchrotron light at the measuring station in the PETRA III hall, the analysis may be carried out in building 48e. “The direct proximity of sample preparation and data analysis to the measuring station is a very important component of our ‘integrated facility’ concept,” says Thomas Schneider from EMBL. This outstanding infrastructure helps scientists to reach their goal: “Our users should be able to bring their samples and leave with the analysis done,” Schneider states.

The construction of this building is carried out with close DESY collaboration, strengthening the cooperation between both research institutes. *(jde)*

Profile GKSS

What do they investigate?

by Elena Herzen

The GKSS Research Centre in Geesthacht was founded in 1956 and is a member of the Helmholtz Association of German Research Centres. Since then, GKSS, with about 800 employees, works on topical questions in the field of environment and technology, in line with the slogan “knowledge generates utility”.

The Institute of Materials Science at GKSS is particularly involved in the production and testing of lightweight materials that have to meet the increasing environmental and technological requirements. Scientists at the Institute for Coastal Research for example analyse the climate change effects on the coastal system. The Institute of Polymer Research develops among other things membranes for environmentally compatible chemical processes and biomaterials in the field of regenerative medicine for new therapy methods.

Since the end of 2005, a sector of the Institute of Materials Research runs the HARWI II (Hard Radiation Wiggler) experimental facility at DESY to carry out tomography and diffraction experiments at the ring accelerator DORIS III. Tomography is also available at the measuring station BW2.

The aim is to examine substances, materials and biological matter with synchrotron radiation in a non-destructive way and to obtain deeper insights into the very heart of the samples. GKSS installs the measuring stations but uses only 30 percent of the experiment time for its own research. Seventy percent of the time is made available to external research groups. GKSS is one of several external research partners that may permanently and independently use the DESY light sources for their experiments.

INFO

www.gkss.de

Diffractometer at the GKSS measuring station (photo: Sabine Kayser).

Brilliant future at PETRA III

With two new measuring stations, GKSS offers more facilities

by Elena Herzen

There is an atmosphere full of anticipation at the GKSS outstation at DESY. The commissioning of the storage ring PETRA III this year will also be the starting signal for two new measuring stations: IBL (Imaging Beamline) and HEMS (High Energy Material Science Beamline).

With PETRA III, DESY expands its already wide range of X-ray light sources and enables GKSS to work with a much smaller but more tightly collimated and more intense beam of light. IBL is specialised in tomography with soft and hard X-ray radiation for the investigation of smallest samples in the micro and nano range. The applications of these measuring methods are manifold: in materials science, tears and ruptures in materials are made visible; in biology and geology, smallest structures of plants and insects are displayed; in medicine, bone structures or implants are visualised. At the HEMS measuring station, however, the use of very high photon energies allows more penetration depths. In this case, the diffraction measuring method is used to examine for example the bending performance and crack formation of materials at mating, welding and riveting.

IBL and HEMS enhance the current GKSS range of facilities at the beamlines HARWI II and BW2 at the DORIS ring, thus extending the target group. At the new light source, even small objects can be made visible with extremely high resolution whereas HARWI II especially allows the investigation of large structures, for example whole welding seams. Therefore, the choice of the measuring instrument depends on the size of the sample, the research question and the goal. In the future, it should also be possible to carry out preliminary studies at HARWI II and afterwards go into detail at IBL and HEMS. Thus, GKSS will now offer four measuring stations that complement each other and intensify research.

Workshop pride in Zeuthen: the new spark-eroding machine.

Current news!

New spark-eroding machine at DESY

by Ulrike Behrens

Since March, DESY in Zeuthen is the proud owner of the first and only spark-eroding machine at DESY. Although erosion is known for its adverse effects in nature, it is most beneficial in workshops.

The machine produces work pieces, for example metals, by thermal removal. In spark-eroding machining, small pieces are melted from the material of the work piece using electrical discharges. An electrode, in this case a wire, is placed near the work piece into a vessel of deionised water. The electrode will remove material by means of rapidly recurring current discharges. Even complex geometrical shapes can be produced with this technique, including for sophisticated conditions like complicated surfaces, variable surface roughness, extremely hard materials or high-strength ceramics – only electrical conductivity is needed.

Manufacturing is possible for work pieces with a maximum height of 40 centimetres, geometrical requirements can be carved out with high accuracy.

DESY workshops in Hamburg and Zeuthen have to cope with miscellaneous tasks and the spark-eroding machine will be a great help for all kinds of manufacturing processes. It also means that DESY saves money because this sophisticated treatment can be done in-house.

HELMHOLTZ ASSOCIATION

Hepatitis B vaccine at low prices

Over two billion people are infected with the Hepatitis B virus and 350 million suffer from chronic Hepatitis B, in many cases with considerable consequences. A vaccine that protects from this kind of virus is so far too expensive for many people in poorer countries. In a German-Indian collaboration researchers from the Braunschweig Helmholtz Centre for Infection Research (HZI) have now developed a new method to obtain Hepatitis B vaccine at particularly low cost from a genetically modified yeast fungus, the fungus producing a component of the viral envelope. „We have published this information in an open access journal and waived patents, thus making it freely accessible to all," says Ursula Rinas of HZI, who heads the German team involved in the project.

In future the researchers aim to use the same system to produce a vaccine for Dengue fever.

http://www.helmholtz.de/hermann

Imprint

Publisher
DESY-PR
Notkestraße 85
D-22607 Hamburg

Contact
email: inform@desy.de
telephone +49/40/8998-3613
www.desy.de/inform
(online version + newsletter subscription)

Editors
Christian Mrotzek (V.i.S.d.P.)
Jan Dreyling-Eschweiler
Barbara Warmbein
Ute Wilhelmsen
Thomas Zoufal (editor-in-chief)

Production
Britta Liebaug (layout)
Veronika Werschner (translation)
Kopierzentrale DESY (print)

Go into research! Answers Day

On 13 June, the University of Hamburg invites for a discovery day: "Hands-on Research". Talks, experiments, exhibitions, panel discussions and much more will be presented to you at a special afternoon, giving answers to exciting questions. On topic: What happened at the Big Bang? What is the universe made of? In the buildings of the university at Martin-Luther-King-Platz 6 you will find the "Weltmaschine" exhibition explaining how scientists from all over the world try to answer these fundamental questions at the Large Hadron Collider LHC. The admission to all events is free.

Whole programme at www.open-uni-hamburg.de.