

Towards the next 50 years!

Glamorous ceremony and dance until after midnight

The morning of 19 May started with bad news. Chancellor Merkel had to cancel her visit to DESY because of a crisis meeting with her cabinet. And that was not enough: Hamburg's Science Minister Gundelach also had to send a representative, for health reasons. But this could not ruin the good mood of the DESY crew. "Now more than ever" was the motto, and it was a glamorous festivity that highlighted the past and envisioned the future. Most of all it celebrated the present day with a banquet, stage shows and the "Soulisten" band. It was way past midnight when the DESY party ended with frenetic applause for the musicians.

About 2500 guests from all over the world met in the spruced-up AMTF hall that had been turned into a festival hall on this occasion, before becoming a test hall for the European XFEL accelerator modules. From the "little girl DESY", as Helmut Dosch said in his welcome address, it has been a long and successful way to the "largest test hall of its kind", a symbol of the large and internationally integrated future projects at DESY. According to Bernd Reinert, Hamburg State Councillor for Science and Research, what was planned as a national particle physics centre had, in a way, accelerated itself to one of the world's leading centres of structural research. When mentioning the Innovation Alliance which is to secure Hamburg's competitiveness, he said "nothing goes without DESY."



At the "Beacon of DESY" quiz, the directors gave proof of their knowledge of the research centre.

A special kind of time travel was the "Newsflash", a news cast from the year 2030, delivered by German TV news presenter Jan Hofer. Will Hamburg become the capital of a unified federal north state, and Helmholtz become the umbrella organisation of all European large-scale research institutions? Will a globally leading "Hamburg Aviation Cluster" revolutionise aircraft construction, and will we possibly be flying in an Airbus with birds' wings? And will physics finally help the Hamburg football teams to achieve a major breakthrough?

Even though this was a tongue-in-cheek outlook, this news offered the opportunity to a round of talks with TV host Gert Scobel and leading representatives of German science and industry. Where is science taking us? What are the visions of DESY? Helmut Dosch gave a clear answer: in particle physics, it is first and foremost the exploration of dark matter, whereas the new light sources enable us to "film" chemical reactions, a bit like getting a live connection with the nano-

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OLYMPUS shipped

The first parts of the OLYMPUS experiment have been loaded into containers in the United States. In about one month, the containers are expected to reach DESY. The fixed target experiment (see DESY inForm 04/2010) will be connected to the DORIS storage ring. In summer, OLYMPUS will be installed in the DORIS hall, taking the

former place of the ARGUS detector. OLYMPUS will take data as of the beginning of 2012.

OLYMPUS stands for "pOsitron-proton and eLEctron-proton elastic scattering to test the hYPothesis of Multi-Photon exchange Using DORIS".



DIRECTOR'S CORNER

Dear colleagues,

on 19 May, DESY turned 50 for the last time in a long row of celebrations. It was a lot of fun for everyone. We lived through a whole year full of retrospectives and insights. It was a long and exciting story that DESY and all the people with links to DESY could tell. Again, I would like to take the opportunity to thank Erich Lohrmann and Paul Söding for their wonderful résumé of the many events of the last 50 years.

The closing ceremony in the impressive (test) hall gave a forward-looking perspective: to develop the power to meet the challenges of the future on the basis of 50 years of history. We will definitely need this power. DESY's large projects, new investments and research activities are quite challenging. The running optimisation of the infrastructure and many individual projects in all sectors require considerable efforts but nevertheless are indispensable to carry out the future tasks. Speaking of

which: I would like to express my gratitude to all DESY colleagues for their commitment and participation in the Girls' Day at DESY – a small but visible yearly project.

The cancellation of the Chancellor's visit made it evident that the solidity of the public budget is in a bad shape in times of global Euro speculation. However, we hope that the Helmholtz Association will be growing by five percent in the coming years, as confirmed in Pact II. Part of this growth will be used for new

measures and to strengthen current activities. I very much hope that this will lead to more relief of our narrow financial budget after having been confronted in our history with serious financial difficulties on many occasions. On this historical background, I wish you all the best for the coming 50 years.

Yours,
Christian Scherf

cosm. This vision is mainly pursued by Massimo Altarelli from the European XFEL. With free-electron X-ray lasers, we will improve our understanding of the process of catalytic reactions and be able to design "intelligent materials". This is also the aim of Georg Mecke from Airbus, who wants to save paint and repair expenses with novel airplane surfaces. Jürgen Mlynek, president of the Helmholtz Presentation, emphasised that in the future, research must be interlinked more closely in Europe and worldwide than is currently the case, in order to answer the big questions of the future. This is also true for universities that already today are collaborating on an international level, the president of the University of Hamburg, Dieter Lenzen, added.



State Secretary Georg Schütte delivers the official speech.

collaboration.

After the official ceremony, the evening programme was not so much centred on the future but firmly grounded in the enjoyment of the present. May plaice and fillet of beef was followed by entertaining the guests with an exciting directors' quiz show presented by Delf Deicke and "Hera Know-all" aka Hannelore Grabe-Çelik. In a very tight competition, Christian Scherf turned out to be the best DESY expert and earned himself the title of "Beacon of DESY".

Later on, the „Soulisten“ rocked the hall, heavily warming up the DESY crew. From A for apprentice via M for management, S for science to Z for Zeuthen – they all grooved until after midnight, and spectacularly demonstrated: "We are one DESY." (uw)

2 To strengthen and keep efficient basic research is an important task for the future in the eyes of Georg Schütte, State Secretary at the Federal Ministry of Education and Research. Long-term fundamental research is the basis for

groundbreaking new applications in the future. This also includes "freedom for clever thoughts" by removing the barriers for interdisciplinary and international

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Photos of 19 May:
<http://desy50.desy.de>





Girls' Day

Industrial mechanic - is that the job I want? A girl at the Girls' Day in Hamburg is mounting components on a printed circuit board. She takes the opportunity to dabble in a job which is still considered as a typically male occupation. In Brandenburg, this educational work programme is carried out under the title "Future day for girls and boys".

WHAT'S ON AT DESY

June

- 2** Public Lecture
50 Jahre DESY – Ein Rückblick
Erich Lohrmann, DESY, Hamburg, auditorium, 19 h
- 5** Lange Nacht der Wissenschaften in Berlin
www.langenachtderwissenschaften.de
- 7-12** LHC Conference (<http://plhc2010.desy.de>)
Physics at the LHC 2010
DESY, Hamburg
- 9** Science Café DESY (<http://sciencecafe.desy.de>)
Am Anfang war ... – Wie ist eigentlich unser Universum entstanden?
Isabell Melzer-Pellmann, DESY Bistro, 17 h
- 9** Public Lecture
Neue Horizonte in der Teilchenphysik – Vom Higgs-Teilchen zur dunklen Materie
Karl Jakobs (Univ. Freiburg), DESY, Hamburg, auditorium, 19 h
- 14-15** Kick-off Meeting (www.terascale.de)
Linear Collider Forum
DESY, Hamburg
- 19** DESY runs (www.hsh-nordbank-run.de)
HSH Nordbank Run
Hafencity, Start 10 h
- 23** Science Café DESY (<http://sciencecafe.desy.de>)
Kunst trifft Wissenschaft
Axel Lindner, DESY canteen, 17 h
- 29** Employees meeting
DESY, Hamburg, auditorium, 9:30 h
- 30** European XFEL (www.xfel.eu/de/tunnelfest)
Tunnel- and borer christening ceremony
Schenefeld, construction site, 11 h

July

- 7** Science Café DESY (<http://sciencecafe.desy.de>)
Zurück in die Zukunft – Ist Vergangenheit veränderbar?
Waldemar Tausendfreund, DESY Bistro, 17 h

Precision math in high energy physics

10th DESY workshop “Loops and Legs in Quantum Field Theory”

by J. Blümlein, S. Moch, T. Riemann

End of April, for the tenth time, the international conference “Loops and Legs in Quantum Field Theory” took place, organised by the theory group in Zeuthen. Since 1992, about 80 to 100 theoretical physicists from all over the world, working in the field of precision mathematics of high energy processes with quantum field theory methods, meet every two years to exchange the newest research results. Participation at this conference has strongly increased in the past years. This year, the conference took place in the Garden Kingdom of Wörlitz, belonging to the UNESCO World Heritage. More than 100 scientists from 15 countries, with a large number of young scientists among them, discussed results and new methods to achieve an ever increasing progress in the area of quantum field theory and its use for experimental measurements.

In 1992, the first workshop of this series took place in Teupitz near Berlin and it was dedicated to physics of deep-inelastic scattering – at the beginning of measurements at HERA. In 1994, just in time for the beginning of LEP200, the conference focussed on the field of e^+e^- physics at high energies. The following workshops took place at various sites



Participants of this year's workshop “Loops and Legs in Quantum Field Theory” in Wörlitz.

that combine both beautiful scenery and cultural attractions and at the same time intensive discussions in the quietness of the countryside. So far, more than 3000 pages of conference reports were published including nearly the complete research development in this field. There were decisive highlights and “records” in the calculation of particle reactions with a complicated topology, or high loop order, being important for

the current and planned high energy experiments. Special evening talks were often held by Nobel and EPS laureates, in most of the cases before they received the award. Over the years, the workshop became an international institution that offers an important and regular forum between the poles of precision measurements and theoretical calculations.

Opera for particles: AIDA

A new project to advance research infrastructures approved with excellent grades

Out of 47 project proposals submitted to the European Commission, AIDA came second. AIDA stands for Advanced European Infrastructures for Detectors at Accelerators, a project to promote detector research and development for all future particle physics projects. It includes everything: detectors for a future linear collider, the sLHC, b factories and neutrino experiments. The project does not only work inter-institutionally but also inter-disciplinarily – this is unique. AIDA has 32 partners rep-

resenting more than 70 European universities and research institutes from a total of 20 countries.

AIDA got an excellent score of 14.5 out of 15; however, there is one catch: the European Commission cut the proposed funding from ten million Euros to eight million for the four years, with DESY receiving approximately one million. The project partners are now aligning the project plans to the reduced budget, trying to keep the planned ac-

tivities as much as possible. The negotiation phase with the European Commission will go on until July and end with the signing of the agreement. The starting date of AIDA is expected for spring 2011. (gh)

Concentrated analysis power

University of Hamburg participates in the National Analysis Facility

It is written all over their faces that Yves Kemp (DESY) and Hartmut Städie (University of Hamburg) are very happy. They are currently commissioning the upgrade of the National Analysis Facility (NAF) – just in time for the first LHC data. The NAF has been set up at both DESY sites in the framework of the Helmholtz Alliance “Physics at the Terascale” and is intended to support the German physicists’ community to analyse data from ATLAS, CMS and LHCb as well as ILC and CALICE. Thanks to the economic stimulus package of the German government, additional investment funds of the City of Hamburg and a close collaboration with the University of Hamburg, the Hamburg facility could now be extended by 50 percent.

With about half a million Euros, the CMS group from the University of Hamburg made contributions to the hardware – and because they will provide the computing power of approximately 500 CPU



Two IT employees install the last computer from Hamburg university for NAF.

cores to all CMS groups in Germany, they fit perfectly into the DESY analysis farm. The hard disc space was also up-

graded to 240 Terabytes, mainly for the dCache storage system which will supply data to both the grid and NAF, thus playing a central role in the analysis. The goal of NAF is to make available all data needed by the users for analysis. This goes beyond DESY’s role as a Tier-2 centre in the global grid, and it enhances the grid with a more efficient analysis environment: “We have both enough computing power and sufficient storage space to give German groups the possibility to do their analyses in the NAF,” said Yves Kemp, one of two NAF technical coordinators.

Currently, the LHC is in its starting phase, but the amount of data is rapidly increasing, with the possibility that the extended NAF will soon reach its limits and need another upgrade. Until then, however, it will demonstrate its bundled strength. (tz)

All birds use the same navigation system

Decoding the birds’ magnetic sense of direction takes a step forward

What do homing pigeons, robins, garden warblers and domestic hens have in common? They all use the same navigation system! Although these bird species have rather different lifestyles, they still have the same fundamental prerequisites for terrestrial orientation. Already in 2005, Gerald Falkenberg – at that time man in charge of the DORIS III measuring stations – and two scientists from Frankfurt investigated the beaks of pigeons. The researcher couple called Fleissner had discovered that one of the sensory organs of pigeons – the one responsible for the magnetic sense – is located in the beaks of these animals. With measurements at the DORIS beam L they were able to determine the content and compound of iron in the nervous terminals located in the dermal lining of the beak. With these measurements, they managed to refine

the magnetic sensory organ model which describes how homing pigeons are able to orientate themselves with the help of the terrestrial magnetic field. The new measurements gave a surprising result: not only homing pigeons that are covering long distances on their flights have these magnetic sensory organs, but also sedentary birds like the domestic hen.

Falkenberg who is currently installing a measuring station at PETRA III is looking forward to measuring there: „The Fleissner samples will be among the first that I will submit to the beam.” After all, the light emitted by PETRA III will allow a much closer look into the magnetic organ: it is many thousand times finer than the DORIS beam and the scientists will be able to review more precisely their magnetic sense model. Up to now,

they could describe the exact structure of the ferrous ends of the nerve fibres only through observations with the electron microscope. PETRA III will put these to the test.

For Falkenberg, working at this project was especially exciting. “Normally users work more or less independently, but cooperation with the Fleissners was very close.” Falkenberg did not only take care of the scientists’ couple during measuring but he also was involved in data evaluation and participated in their interpretation. The Fleissners were one of the few user groups he was mentoring at DORIS when he was already responsible for the installation of the measuring station at PETRA III. This was very attractive for Falkenberg: “It is very exciting to be involved when a so far unknown sensory organ is being decoded.” (gh)

Helmholtz-Russia Cooperation

The Director General of the Russian research organisation Rosatom, Professor Sergey Kirienco, and the President of the Helmholtz Association, Professor Jürgen Mlynek, signed an agreement to extend cooperation in basic physics research and the construction of large-scale facilities. Already today, Russia makes substantial contributions for the building of large-scale research projects of international importance, such as the planned heavy-ion accelerator FAIR, which is being built under the aegis of the GSI Helmholtz Centre for Heavy Ion Research in Darmstadt. Other examples of large-scale scientific endeavours in which Russian participation is essential are the European X-Ray Free Electron Laser XFEL at the DESY research centre and the experimental fusion reactor project ITER in France. The agreement also includes measures like the training of research management professionals. For this purpose, the Helmholtz Association and the Helmholtz Management Academy developed a professional extra-occupational further training programme.

www.helmholtz.de/hermann



The additional storey of the school lab building will offer more room for pupils to do experiments.

physik.begreifen grows

DESY's school lab will be topped up

Two times a year it is possible to make reservations for hands-on courses at the DESY "physik.begreifen" school lab, and at each opportunity, the courses are booked out within two hours. This situation will possibly change next time, giving the pupils more time to make reservations for one of the sought-after hands-on physics courses.

This is due to an upgrade of the school lab, funded by the City of Hamburg: building 34a will be considerably extended; an easy task because of its modular construction. Two additional modules will complete the ground floor of the building that is also getting a new storey. Instead of one laboratory, three laboratories and one seminar room will be available to the classes. These addi-

tional rooms and a full-time teaching position as of September significantly increase the availability of the hands-on courses. "Instead of five dates per week we can offer eight or nine," school-lab head Karen Ong beams.

And not only more dates but also more experiments will be offered: currently, a new hands-on course is being developed – the e-lab. In this course, senior pupils learn about "particles and fields".

The handing over of the building will already take place on 2 July, and the new rooms will be used after the summer holidays. (gh)

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Accelerator marketplace of ideas

The accelerator facilities have been DESY's flagships for 50 years. In order to keep it that way, an accelerator marketplace of ideas has been created: on 16 and 17 June, ideas will be collected and further developed that provide something "new" for the accelerator physics and tech-

nology sector. Everyone is cordially invited to make contributions and present his or her ideas in a 10-minutes talk. More information and registration at: <http://beschleuniger-ideenmarkt.desy.de> (on the DESY intranet)