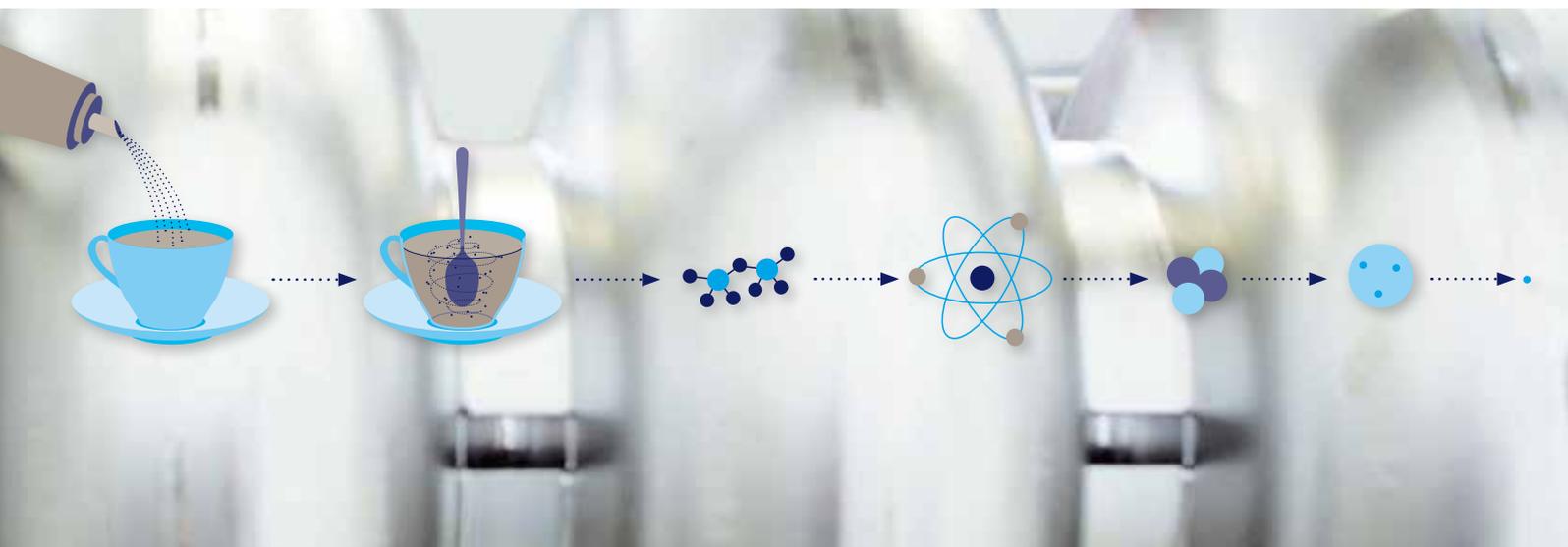


## DESY budget put to the test

International committee evaluates strategy for the coming five years



From coffee to quarks – the inner structure of matter. Illustration: DESY

By **Arik Willner**

Every five years, DESY is being audited by an international experts' committee evaluating the strategy of the next funding period. This year is one of these years – the Helmholtz research field Structure of Matter, which also includes DESY, is being put under scrutiny. The result of this evaluation will fix the basic budget of DESY. It extends to all aspects, ranging from the big accelerator down to the tiny screw. Here's how the so-called POF evaluation works.

In Germany, there are four large associations of non-university research centres and institutes: the Leibniz Association, the Max Planck Society, the Fraunhofer-Gesellschaft and the Helmholtz Association. Together with 17 other research centres, DESY is a member of the Helmholtz Association, which has subdivided its various research activities into six research fields: Energy; Key Technologies; Earth and Environment; Health; Structure of Matter; and Aeronautics, Space and Transport. Research at DESY is completely

allocated to the field Structure of Matter. Helmut Dosch, Chairman of the DESY Board of Directors, is currently the coordinator of this field, which also makes him one of the vice presidents of the Helmholtz Association. The research fields are again split up into research programmes. DESY participates in all three programmes in the field Structure of Matter.

The Helmholtz centres are funded within the framework of the so-called "programme-oriented funding" – POF for short. This was agreed by the Federal and the Länder governments, the main sponsors for non-university research. The funds are being allotted to the individual research programmes and every five years, each programme is being evaluated from scientific and strategic points of view by an international committee.

This year, the programmes of the research field Structure of Matter are put to the test, starting in February with "Matter and the Universe". Many

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colleagues working in particle and astroparticle physics at DESY made decisive contributions for this evaluation in Karlsruhe. At the end of March, in Dresden, there will be the evaluation of "Matter and Technology", in which our accelerator physicists and detector developers will be engaged. Finally, from 14 to 17 April, DESY will host about 200 participants evaluating the



## DIRECTOR'S CORNER

Dear colleagues,

Every five years, the “evaluation caravan” of the Helmholtz Association comes back again. For the third time, we are going through the scientific assessment of programme-oriented funding. This will give us five years of financial security and, with the new tool for the promotion of large-scale facilities in this field, hopefully a funding increase. In the evaluation, important declarations are made with regard to quality of research at DESY, but also to the importance of the planned strategic investments, e.g. the detector lab for the LHC.

In summer, we will know how we are positioned. As a next step, the Scientific Council will evaluate the Helmholtz Association as a whole. After ten years of so-called “System Evaluation”, the Federal Minister of Education and Research Johanna Wanka requested a new assessment. The Scientific Council plans to present the result in autumn 2015.

These developments are embedded in the ongoing work of the new Federal Government, the implementation of the so-called debt limit until 2019 and the expiration of the three research pacts for Germany. All of us must do everything to include DESY activities in a future agreement continuing this extraordinary special funding.

In the coming months, we will complete the various construction projects and successfully start operation of FLASH II, the PETRA III extensions and the European XFEL. And then when we look back, we will be rubbing our eyes and asking ourselves: how did we manage to accomplish all this?

Good luck to all of you in mastering these significant challenges!

Yours  
Christian Scherf

programme “From Matter to Materials and Life”. This includes photon science at DESY – from the laser setup in the laboratory up to the large-scale facilities PETRA III and FLASH.

But how does the POF evaluation work? What are the consequences for DESY? Could the outcome be that we have to close down DESY because of a low rating? There is no danger that DESY will cease to exist overnight. Already last year, DESY submitted its start values for the coming five years to the Senate of the Helmholtz Association. Basically, the start values are nothing else than the allocation of the DESY basic budget for 2014 – about 200 million Euros – to the three programmes of the research field Structure of Matter. The start values have already been accepted in 2013 by the Helmholtz Senate, which also includes the funding agencies. Therefore,

we are already able to plan on the annual budget of 2014 within the next five years. The important question is, how the budget of the centre will increase in the years 2015 – 2019. In case of a low rating in the POF evaluation and consequently no budget increase, this means that inflation will cause a real cut of annually 2 to 3 per cent. An increase on the inflation level (about two and a half per cent) would secure our budget; however, every further increase of the DESY annual budget would facilitate new research activities. Each additional per cent augments the DESY budget to about two million Euros per year. This accumulates to 30 million Euros over the five-year POF period – a considerable sum!

Apart from the financial effects of the evaluation, there is also a scientific-strategic component which is just as impor-

tant. A regular international evaluation strengthens a large-scale research centre like DESY. International evaluations secure excellence because constructive criticism from experts reveals planning errors and guarantees global assessment standards. Another effect: the evaluation also includes measures which will not be funded from the basic budget but from other funding pools. With positive references to these measures, it is possible to support potential third-party funding applications. The current POF evaluations have a great influence on DESY and its research activities – even when there is no danger of DESY closing down. It is more a matter of maintaining and expanding DESY’s top position in the world. This alone is worth every effort!

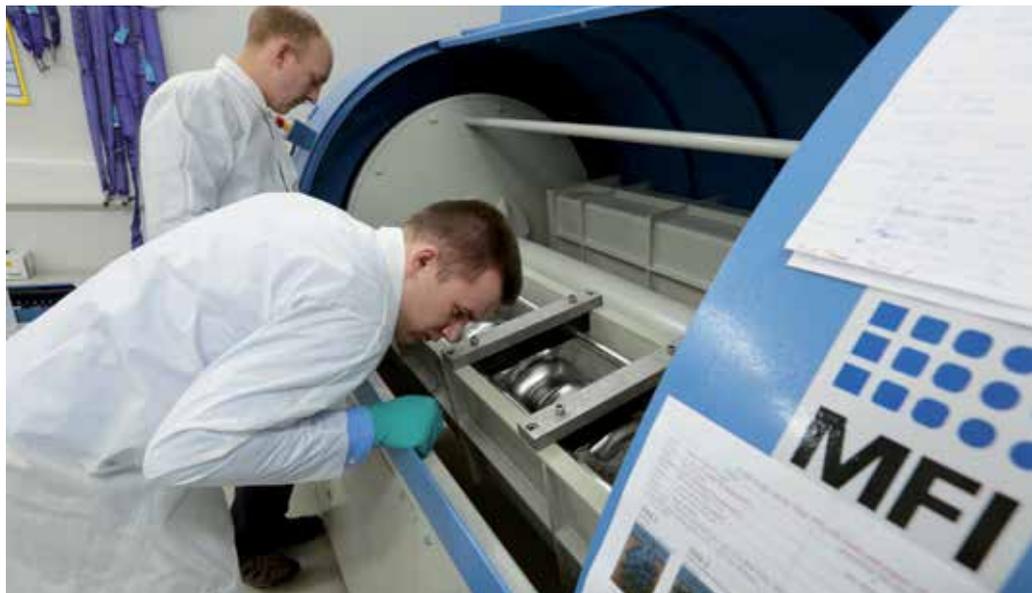
# Accelerator – stonewashed

How cavities are refined in a type of tumbler

Usually it's basic research – especially for particle accelerators – that pioneers new technology. But in this case the researchers obviously had a little inspirational snoop at Levi's or any other jeans manufacturer's. Recently, DESY's superconducting TESLA cavities have started to be surface-treated with a stonewashing equipment – accelerators stonewashed, so to say.

While jeans are only stonewashed for show, there is a fundamental scientific background to do this with the 9-cell cavities: in order to reach highest accelerating fields, the inside of the cavities must be as smooth as a mirror. One way to achieve this is to repeatedly polish the interior of the cavities. This treatment is now systematically tested by the ILC HiGrade group. "We want to reach gradients of 35 megavolts per metre and more for the ILC. This requires a surface that is very clean and smooth up to a few nanometres," said Aliaksandr Navitski, who conducts the testing. For their experiments, the team from of DESY and the University of Hamburg uses a number of cavities especially manufactured for these tests, parallel to the current production of European XFEL cavities.

The stonewashing treatment has four stages. The cavities are filled with different polishing granules and rotate on two axes – a bit like the Earth rotating around the Sun and also around itself – for hours in a type of cement mixer. The first filling, a mixture of stones and water, eliminates impurities that develop mainly locally in the region of the weld of the individual half cells. It removes ten micrometres per hour from the surface. After eight hours, the mixture is exchanged: fine stone granules melted into synthetic material provide an increased degree of fineness. The fine sanding is achieved in the final two stages of stonewashing: the cavity is filled with small hardwood blocks and fine-grained aluminium oxide and water, and in the last stage with colloidal silicon oxide, and mixed for 30 to 40 hours before the highly polished cavity is finished.



Using different polishing materials, ranging from centimetres to millimetres in size (top), the resonators are refined in a type of tumbler (below). Photos: DESY/Dirk Nölle

"Polishing the inside of a cavity with a mixing machine had already been done at DESY in the 80's for one-cell PETRA cavities," said Eckhard Elsen from the FLA group. "However, our current experiments with 9-cell cavities are mainly based on the experience of Fermilab, Jefferson Lab and Japanese colleagues."

For now, after each "wash cycle", the cavities are precisely measured in the ILC HiGrade laboratory. "We want to analyse the systematics of stonewashing," said Navitski. "The evenly distributed filling of

the cavity with the appropriate mixture of abrasives and liquid is as important as the tumbling time at each polishing stage." For the construction of the ILC, this technology could replace the currently used method of electropolishing with fluoric acid. This would not only mean getting rid of the undesirable acid: "The mechanical polishing has the advantage of removing residuals of other metals, e.g. aluminium. This is not possible with electropolishing," said Navitski. (tz)

## Happy Birthday, Synchrotron!

50 years ago, for the first time electrons completely circled the newly built ring accelerator DESY. This was the start of the particle acceleration era in Hamburg. It was on 25 February 1964, shortly before midnight, when the first particles repeatedly rounded the vacuum system of the about 300-metre long synchrotron. The first electrons in the particle carousel reached an energy of 2.5 gigaelectronvolts in about 8000 rounds, and already on the following day, it was possible to obtain 5 gigaelectronvolts (GeV); just about the designed final energy, which is one GeV higher. Photo: DESY

## WHAT'S ON AT DESY

### March

- 17.-21.** Meeting  
H.E.S.S. Collaboration Meeting  
Universität Potsdam
- 21.-25.** Event (<http://masterclasses.desy.de>)  
International Masterclasses  
DESY, Hamburg and Zeuthen and HU Berlin
- 26.** Science Café DESY (<http://sciencecafe.desy.de>)  
Things we see everyday in nature, and what these things tell us –  
An excursion through resonance, rainbows and radiation  
Scott Mandry, DESY, Hamburg, DESY-Bistro, 17.00 h
- 27.** Event  
Girls' Day  
DESY, Hamburg
- 27.** Event  
Zukunftstag für Mädchen und Jungen in Brandenburg  
DESY, Zeuthen
- 27.** Lecture Series: Staying Healthy  
Venengesundheit  
Dr. med. Guido Bruning,  
Head physician of the Centre for Venous and Dermatologic  
Surgery of the hospital Tabea, Hamburg-Blankenese  
DESY, Hamburg, seminar room 2, bldg. 2a, 16.00 h

### April

- 2.** Public Lecture  
Neues vom Higgs  
Gudrid Moortgat-Pick, DESY, Hamburg, 19.00 h
- 10.** Bridfas Lecture ([www.bridfas-hamburg.de](http://www.bridfas-hamburg.de))  
The Silk Road and the Sea - China's Window on the World  
Anne Haworth, DESY Hamburg, auditorium, 19.30 h
- 23.** Science Café DESY (<http://sciencecafe.desy.de>)  
Goldene Schichten – Vom Atom zum Kontakt  
Stephan Roth, DESY, Hamburg, DESY-Bistro, 17.00 h
- 24.** Event  
EURAXESS Roadshow  
DESY, Hamburg, CFEL, 10.00-16.00 h
- 24.-25.** Meeting (<http://prc.desy.de>)  
PRC Meeting  
DESY, Hamburg
- 27.4.-** Workshop ([www.desy.de/LL2014](http://www.desy.de/LL2014))  
**2.5.** Loops and Legs in Quantum Field Theory  
Weimar, Hotel Kaiserin Augusta

# Women's Career Day

## New platform for female scientists

By Ingeborg Adler

The first Women's Career Day that was held in the beginning of February on the DESY campus in Hamburg with workshops for career planning was in great demand: with more than 100 registrations, the two-day event was completely overbooked; 30 women had the opportunity to participate on each day. This was the first time that a workshop series was offered exclusively to women. One of the objectives of the organisers – Wiebke Kircheisen, head of the equal opportunities' division at the Hamburg Centre for Ultrafast Imaging (CUI), and Mirko Siemssen, coordinator of the PIER Helmholtz Graduate School – was to offer an English platform for cross-institute networking to female

scientists doing MIN research. "Those with career prospects in this field must have a professional appearance – in English," said Kircheisen. Francesca Moglia (Italy) from the Institute for Laser Physics said: "We need a lot more of these offers, especially in English, including job application training. Women on the campus come from all over the world, and many of us will find our future career just there."

The organising team insisted in a careful selection of the trainers; women who have gained a longstanding experience in the scientific community and as executives. Siemssen said: "Female role models in professions dominated by men are an important aspect to foster

women's careers in these fields." Because of the great demand, a second Women's Career Day took place beginning of March. The organisers plan to offer this event twice a year in the future.

### CONTACT

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# German-Turkish Year of Research

## DESY and European XFEL intensify cooperation with Turkish scientists

By Frank Lehner

2014 is the German-Turkish Year of Research. The Federal Ministry of Education and Research BMBF organises these themed years of research to strengthen cooperation in research, education and technology with the participating countries. A Turkish delegation of scientists visited DESY and the X-ray laser European XFEL in January to get an idea of the research facilities in Hamburg. Moreover, numerous contacts have already been established with Turkish universities and research institutes. With the Turkish Accelerator Center (TAC), a consortium of 12 national universities, Turkey pursues ambitious plans. A low-energy linear accelerator to be used as a free-electron laser in the infrared range is currently under construction. There are also plans for additional research infrastructures, e.g. a synchrotron radiation source. For the time being, several guest scientists from TAC work at DESY and the European XFEL to gain experience in the construction and operation of large-scale facilities. It is especially interesting that Turkish groups of scientists – with support on a high political level – have



The Turkish delegation with DESY and European XFEL representatives in the XFEL tunnel. Photo: ANL/Ercan Alp

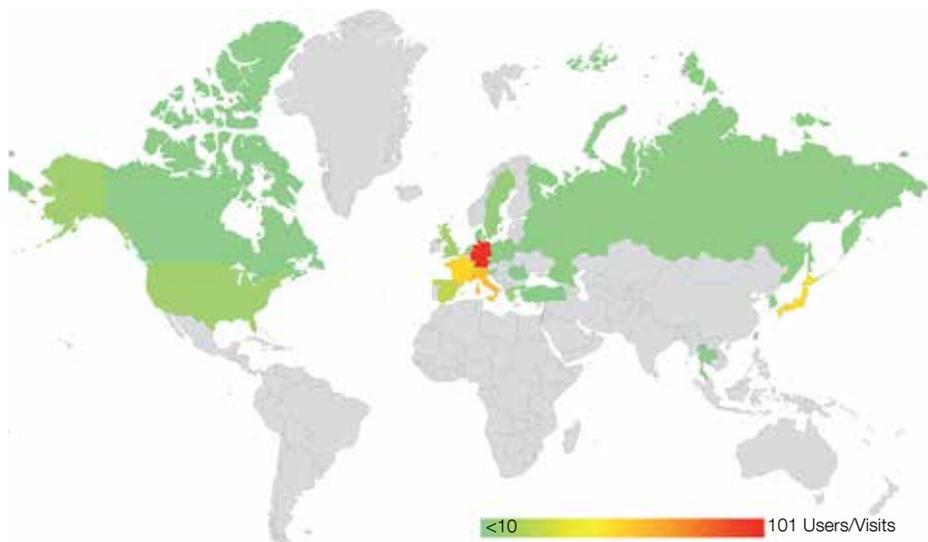
expressed their strong desire to become a member of the European XFEL. The German-Turkish Year of Research will help to further intensify cooperation. A first workshop with scientists from DESY and the European XFEL is already envisaged in Istanbul for the beginning of July.

Within the framework of the German-Turkish Year of Research, the BMBF promotes publicity-effective activities that make a specific contribution to the

goals of the joint year of research, education and innovation. DESY and the European XFEL plan to submit a common proposal. This is why we would like to ask for the contribution of ideas, especially from our colleagues of Turkish origin.

### CONTACT

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#### Proud facts & figures from the DESY Test Beam:

2013 was a very busy operating year with around 400 users at the DESY Test Beam Facility. The users, mostly particle physicists from nearly all over the world, came to work on development and testing of new detectors. After a single year of collecting users' affiliation data, the Test Beam Facility managed to register scientists from 25 countries, meaning they could colour in half of the world map. More than half of the users in 2013 were first-time visitors. After the end of the current shutdown this summer the three beam lines are completely overbooked. <http://testbeam.desy.de>

## Passing the baton

### Hermann Franz follows Peter Gürtler as deputy director for photon science

By *Wiebke Laasch*

Hermann Franz becomes new deputy director of the DESY photon science sector. He is the successor of Peter Gürtler who will go into retirement in April. After working in Munich, Garching and Ancona (Italy), Franz came to DESY in 1998 and focused on both fields, structure and dynamics of non-ordered systems on the one hand and the further development of DESY synchrotron radiation sources and their instrumentation on the other hand. He was a member of the PETRA III project management and is currently group leader for experiments at PETRA III (FS-PE). Parallel to this, Franz is in charge of the important function of ombudsman for ensuring good scientific practice at DESY. After finishing his doctoral thesis in 1979 at the University of Hamburg, Peter Gürtler made spectroscopic investigations of matrix-isolated systems with synchrotron radiation at DESY. One of his first projects at DESY was the construction of the first wiggler for a synchrotron radiation source in Europe. Moreover, he substantially advanced the building and optimisation of the VUV beamlines at DORIS III and he played a decisive role



Hermann Franz at the PETRA III building site (top) and Peter Gürtler with DESY's first wiggler in 1984 (below)

Photos: DESY

in the development of the still new HASYLAB to today's photon science sector with 400 staff members. Since 2000, he was deputy director and in this executive function, he significantly contributed to the success of the numerous extension projects in the photon science sector.

**Helmut Dosch elected as MRSI Honorary Member**  
DESY Director Helmut Dosch has been elected as Honorary Member of the Materials Research Society of India (MRSI) at the annual meeting of the society in mid-February. The MRSI today counts 3600 members and was formed nearly 25 years ago to serve as a platform and as a drive for materials research in India.

#### Science Café in English

In March, the DESY Science Café will be held in English. On 26 March, PhD student Scott Mandry from University College London (UCL) will give a talk on „Things we see every day in nature, and what these things tell us – An excursion through resonance, rainbows and radiation“ (5 p.m. at the DESY Bistro in Hamburg). Admission is free as always.

#### Annual performance review and remuneration

The DESY human resources department again offers a training programme for the annual performance review and remuneration topics. There will be an all-day basic training for all employees and executives. Additional half-day trainings in a modular system offer the opportunity to go into detail of special subject areas, e.g. conflict resolution. More information and registration at <http://v2.desy.de>

#### Encouraging girls to take MINT jobs

DESY continues to promote MINT (mathematics, information technology, natural sciences, technology) school subjects for girls. On the 6th MINT action day for girls, female DESY role models talked about their motivation and their everyday life at an exhibition in Itzehoe in February. The idea was to motivate girls in grades 8 to 12 to see the corresponding school subjects from a new perspective. This also included information on how to apply. In the same month, 25 girls from 7th and 8th grade had the opportunity to do experiments at the DESY school lab in a girls-only group. Following this, DESY students took the girls on a tour to show them the real world of science. „There are plans for more MINT actions because schools are very interested in these programmes,“ said DESY equal opportunities' officer Sylvie Faverot-Spengler.



About 100 pupils presented 60 projects at DESY. Photo: DESY/Marta Mayer

## Make your ideas come true

### “Jugend forscht” regional competition at DESY

“Make your ideas come true” – some 600 young researchers followed this call and entered about 300 projects into this year’s “Jugend forscht / Schüler experimentieren” youth science and experiments competition round in Hamburg. Just like last year, DESY was one of the three locations for the presentation of these projects. On 20 and 21 February, the regional competition took place in Hamburg Bahrenfeld, in the “Physik begreifen” school lab rooms at DESY. Dedicated pupils presented a total of 60 projects in the fields of working environment, biology, chemistry, geo and space sciences, mathematics/informatics, physics and technology. A first prize and hence the ticket for the next competition round was won by five “Jugend forscht” projects, including the investigation of xylitol as a protection against caries in chewing gums, the production and test of an odour blocker and the question whether it is possible to use the beat of a pulsar for chronometry. The state competition will take place in April at Airbus, Finkenwerder. At the end of May, the winners of the state final will travel to the crowning

event, the nationwide final in Künzelsau, Baden-Württemberg.

True to the motto “practice makes perfect”, pupils up to the age of 14 had the chance to present their experiments in the “Schüler experimentieren” sector. For example, they tested the effects of different oxygen concentrations on midge larvae in ponds, they examined whether salts are usable for mould elimination or if it is possible to predict bad weather. They too aimed to participate in the Hamburg state competition. “We try to motivate pupils to do their own experiments and to find out how exciting natural sciences can be,” said Karen Ong, head of the DESY school lab. “‘Jugend forscht’ is a talent factory which introduces young people at an early stage to the tools of scientific work. These are core competences for our knowledge society.”

In 2014, „Jugend forscht“ applications hit a record with the registration of a total of 12 298 young researchers nationwide. This is the highest number of applications in the 49-year history of Germany’s best-known young researchers’ competition. (uw)

## New research magazine to complement DESY inForm

To improve DESY’s publications and sharpen their profile, DESY inForm will offer more space and possibilities for internal information in future issues. This in turn means that topics that might interest a broader audience will find a place in a new DESY research magazine. We hope that you will enjoy both publications! Both, DESY inForm and the new research magazine will be released quarterly. The first edition of the new research magazine will be published in summer. The next DESY inForm issue will follow in July.



### 50 per cent discount for “Teilchenzoo” exhibition

The Science Center Universum in Bremen offers tickets at a 50% discount to DESY employees.

Coupons for the reduced tickets are available at DESY PR, bldg. 1, foyer. The reduction of 50% applies to either one DESY employee plus companion, or to a family ticket.

<http://www.universum-bremen.de>  
<http://teilchenzoo.desy.de/exhibition>



#### Imprint

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 Kopierzentrale DESY (print)

