

## Starting shot for experiments at the European XFEL

DESY-led team starts scientific operation of Europe's new X-ray laser



Scientific operation at the European XFEL has started: A team of researchers led by DESY has successfully conducted the first scientific experiments at Europe's new X-ray laser. The aim of the team, headed by Anton Barty and Henry Chapman from the Center for Free-Electron Laser Science (CFEL), is to decode the atomic structure of different biomolecules using the SPB/SFX scientific instrument – and thus take the first step towards exploiting the high repetition rate of the European XFEL to record movies of biomolecules in action.

“We are very happy that the first users have now arrived at European XFEL so we can do a full-scale test of the facility,” said European XFEL Managing Director Robert Feidenhans'l. In parallel to activities at the SPB/SFX instrument, scien-

tific experiments also began at the FXE instrument. FXE was designed to create molecular movies showing the progression of chemical reactions, which, for example, will help to improve our understanding of how catalysts work, or how plants convert light into usable chemical energy during photosynthesis.

The SPB/SFX instrument, headed by European XFEL scientist Adrian Mancuso, will be used to gain a better understanding of the shape and function of biomolecules, such as proteins, that are otherwise difficult and sometimes impossible to study. During the early phase, the scientists carefully tested and calibrated their instruments. “At first, we must learn how to use the new machine,” explained Barty. “This really is pioneering work, no one has done this before.”

DESY scientists Henry Chapman and Saša Bajt watch the screen of Richard Bean (front) at the European XFEL SPB/SFX scientific instrument.

Picture: DESY, Lars Berg

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Dear DESY colleagues,

This year, the course is being set in many areas for the future design of our locations in Hamburg and Zeuthen. Many plans have already been initiated – we have discussed the issue in depth within the framework of our strategy process, presented the current developments to the Foundation Council and to the Scientific Council and instigated an active exchange with the authorities in Hamburg and Brandenburg. The International Science Park Hamburg with its construction plans for the Trabrennbahn area is becoming more and more concrete. Much like in Hamburg, planning in Zeuthen includes a campus master plan, which, in addition to the Science Data Management Centre for the CTA research project, encompasses a number of other exciting building-related aspects.

This dynamic development will continue during the last few months of the year. A meeting with Hamburg's First Mayor Olaf Scholz and Second Mayor Katharina Fegebank will give us, together with the University of Hamburg, the opportunity to present our vision for our location. Moreover, we will kick off the construction procedures for the first building to be funded with the help of additional grants from the Federal Government. In addition to a visitor centre, the building will house other central functions of the Hamburg campus. Other themes that we will advance this year and the next are, among others, a uniform signposting system, façade greening and various mobility projects.

All these projects contribute to the development of our locations into sustainable, liveable environments in which we will continue to work well and with pleasure in the future, in close cooperation with our campus partners. In order to optimally take into account your wishes and ideas in this process, we will organise a DESY-wide survey on campus development. Detailed information will soon be sent by email. I am looking forward to your participation and eagerly awaiting the results of this survey.

Yours  
Christian Haringa

The first challenge is to deliver the samples into the X-ray beam. The X-ray flashes of the European XFEL follow one another at an incredibly fast rate, with one flash every 220 nanoseconds – which means that in less than a millionth of a second, four flashes arrive at the scientific instruments. The samples consist of tiny protein crystals, which can be X-rayed only once as the intense X-ray flashes vaporise the crystals almost immediately. Thus, a new crystal must be delivered into the X-ray beam every 220 nanoseconds – thousands of times faster than in previous experiments.

The detector must also operate fast enough to record a diffraction pattern from the protein crystals every 220 nanoseconds, which means taking four images in less than a millionth of a second. To accomplish this feat, the European XFEL is equipped with the fastest X-ray cameras in the world, which were tailor-made for the individual scientific instruments. The detector used at the SPB/SFX instrument was designed and produced by an international consortium led by DESY's photon science detector group. Recording diffraction patterns at this repetition rate is uncharted territory

and requires a very careful analysis of the measurement data, in which the detector characteristics also need to be included. "Only then can we use the high repetition rate to record movies of biomolecules in action, rather than imaging static structures. As with a cine film, these molecular movies require a sufficient number of individual frames calculated one by one from the data," explained Barty.

As expected, interest in beamtime at the new facility is high: The first user group, coordinated by Chapman and Barty, consisted of over 80 researchers from across the globe. It was open to any member of the science community who wished to contribute or learn about the capabilities of the new facility. "These first experiments owed their success to a very collegial team spirit among all the participants – the users as well as the instrument scientists and the scientific support groups from European XFEL," underlined Chapman. "Many, many people have worked long and hard to build this facility and this scientific instrument," added Mancuso. "Now we see the first real data, working in cooperation with our users – this marks the beginning of new experimental territory."

(tim)



Ribbon-cutting ceremony

The European XFEL was inaugurated on 1 September in an international event. Research ministers and other prominent guests from across Europe officially launched the research operation. Germany's Federal Minister of Education and Research Johanna Wanka (centre) stressed the importance of the new international research institution: "The establishment of the European XFEL has created a unique cutting-edge research facility, which promises groundbreaking insights into the nanocosmos. The foundations for tomorrow's innovations are laid by today's basic research."

Picture: European XFEL

# Dark Matter: Art on campus!

Fifteen artists from all over Germany present their artwork at DESY in Hamburg

From 13 October to 9 November, the DESY campus will become an art gallery. Fifteen artists from all over Germany will use the HERA hall west, the AMTF hall, the auditorium foyer, the XFEL mock-up tunnel and even the shielding block storage area to present their work on the theme of “Dark Matter”. 31 October is the date of the first international Dark Matter Day.

In the planning phase, the artists got together with DESY scientists during a workshop to gather more information on the research subject – why we know that there has to be dark matter, how we search for it and how its discovery might change our view of the world. The artists too spoke about their work and work processes. In the course of the workshop, it became clear that artists and scientists have much in common. Eagerness to experiment, problem-solving strategies, coping with failures and of course curiosity are the common features of both occupational groups. Moreover, both basic research and art are part of human culture.

With the exhibition, DESY is trying out a completely new format addressing a completely new target group. However, DESY colleagues too will benefit from the event: Unlike external visitors, you will be able to discover the artwork on the campus by yourself, and you may even get hold of some of the artists.

The Dark Matter project goes back to an idea of CMS scientist Christian Schwannenberger and Hamburg artist Tanja Hehmann. Together with two of her artist friends, artists from all over Germany interested in science were asked if they would like to contribute. The artists come from various fields: painting, graphics, photography and film, sculpture, installation, intervention as well as sound and multimedia.

“Already in our first project discussions, Christian Schwannenberger and I noticed how many interfaces there are between artistic and scientific work,” said Hehmann. “Thus, the Dark Matter project itself can



One of the many exhibited works: Tanja Hehmann, Contortor I

be understood as an allegory for artistic and scientific research. To intervene artistically in places where people work and do research makes the exhibition a performance in itself.”

In the vicinity of Building 11b, for example, visitors will find a structure made from shielding blocks. The walk-in sculpture of the artist duo Marc Einsiedel and Felix Jung (“we are visual”) is called “Dark Issue”. It rededicates the function of the blocks – to shield off radiation – for the visitors. “Radiation can neither get in nor out of the structure. When entering it, the spectator is isolated from all external influences,” said the artists to



Jan Köcheremann, model of the Frassek Space Collector

describe their work. This way, every visitor can make their own personal experience with dark matter.

In the HERA accelerator, Chris Pfeil from Cologne will give a sound performance on two days; in the AMTF hall, a geodome of artist Jana Schumacher lets in light only at spots that look like clusters of galaxies; in the XFEL mock-up tunnel, a filmed, slowly rotating stone of artist Sybille Neumeier illustrates not only the challenges of systematic observation but also the principle of gravitational lensing; and a replicated Frassek Space Collector of artist Jan Köcheremann will travel around the campus.

More works of art can be seen in the auditorium foyer, Building 1, the HERA hall west, the AMTF hall and the office container 223 in front of the AMTF hall. The fascination for the matter is noticeable in each work. A campus plan with the locations of the works is available from PR. Have fun exploring the artwork! (*baw*)

## INFO

<http://artmeetsscience.desy.de>  
<http://www.darkmatterday.com>

**Science Award for Stephan Roth**



DESY physicist Stephan Roth received the Science Award of the Coating Science International Conference (COSI) for the development of a new X-ray measuring method. Roth, who is also a professor at the Royal Institute of Technology (KTH) in Stockholm, Sweden, developed an in-situ and real-time measuring method that allows the study of surface processes during film formation of functional spray coatings, e.g. of solar cells.

**Helmholtz Doctoral Prize for Johann Haber**



Physicist Johann Haber was awarded the Doctoral Prize of the Helmholtz Association for his thesis „Hard X-ray Quantum Optics in Thin-Film Nanostructures“ elaborated at DESY. In his doctoral thesis, Haber, who is currently working as a scientist at the US accelerator centre SLAC, verified the strong interaction between X-ray radiation and resonant matter.

**Young Scientist Prize for Björn Arndt**



DESY PhD student Björn Arndt from the DESY NanoLab group of Andreas Stierle was awarded the Young Scientist Prize of the 12th International Conference on the Structure of Surfaces (ICSOS-12). Arndt was distinguished for his work on surface X-ray diffraction on magnetite. The award was presented at the conference at the Georgia Institute of Technology in Atlanta (USA) in July.

**Armenian Gold Medal for Jörg Rossbach**



For his outstanding contributions to the international cooperation between Armenian and German scientists during the past three decades and to the development of accelerator physics and technology in Armenia, Jörg Rossbach, professor emeritus of the University of Hamburg, was awarded the Gold Medal of the Armenian State Committee of Science. Rossbach is part of the accelerator group at the University of Hamburg.

# Technology in large-scale research

## DESY information day for engineering students



Participants of the first DESY EBEC DAY in the foyer of Building 1. Picture: DESY, Thomas Zoufal

*By Jochen Barnstedt*

At the beginning of September, on the initiative of the recruitment department, DESY in Hamburg hosted the first DESY EBEC Day for engineering students. EBEC, which stands for “European Best Engineering Competition”, is an annual Europe-wide competition of engineering students, in which students from more than 88 universities and technical universities all over Europe compete with each other in several selection rounds.

The event is organised by the Board of European Students of Technology (BEST), which aims to network students across Europe to promote technology exchange and encourage intercultural cooperation. At a career fair in March at the Warsaw University of Technology, DESY recruitment and the BEST organisers came up with the idea to invite teams of contestants from Poland and Germany after the EBEC final round in Brno, Czechoslovakia, to come to Hamburg so they could gain insight into the world of engineering at a large-scale research centre.

The teams of the universities of Cracow, Aachen and Erlangen eventually met on the campus in Hamburg for two days, where they familiarised themselves with the scientific-technological environment at DESY and exchanged experiences with each other. Keynote talks by Thomas Adams and Cornelius Martens from the mechanics workshop, Otto-Christian

Zeides from the electronics workshop and Holger Schlarb from the accelerator division offered the students insights into the working methods of engineers at DESY.

In addition, on the first day of the event, an introductory lecture and a campus tour guided by Marc Wenskat from the particle physics division gave the students the opportunity to get to know DESY from the scientific perspective. Moreover, they visited specialist departments to learn about the work of engineers in practice. On the second day, often in a very humorous way, the students presented the tasks they fulfilled within the framework of the EBEC event.

From the point of view of recruitment, the event format was very successful and proved to be extremely interesting and profitable for both parties. The plan is to repeat the event and extend its scope in the coming years. All those – especially from the technical groups – interested in participating in the next DESY EBEC DAY can get more information from the recruitment department.

**CONTACT**

recruitment@desy.de  
Phone: +49 40 8998-3392

# The DESY Innovation Village

A home for start-ups on the Hamburg campus

By Maïke Bierbaum

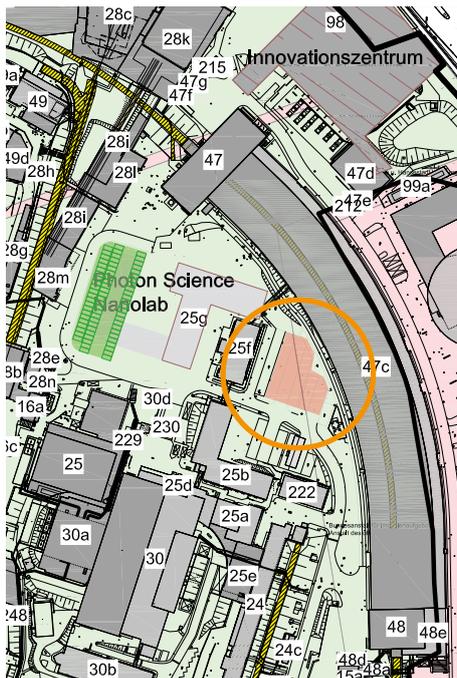
An “innovation village” is to be set up on the campus in Hamburg, or more precisely: containers providing office space for DESY start-ups. Located on the inner side of the Max von Laue experimental hall, the DESY Innovation Village will be completed by early summer 2018. This step became necessary because of the high growth rate of the DESY start-ups, which need to recruit more employees and thus require more space. The innovation centre at Luruper Chaussee, which is planned in cooperation with the University of Hamburg and the City of Hamburg, will only be ready for occupancy by mid-2019. In the meantime, the young enterprises will find an interim home in the DESY Innovation Village.

In addition to office space, the start-ups working in the DESY Innovation Village will be offered common areas such as workshops, meeting rooms and kitchenette for customary rents until the innovation centre will be completed. This practical solution will help to avoid unnecessary competition for office space between the scientific groups and the DESY start-ups. Ideally, the flexible space design and a cooperative atmosphere among the tenants will contribute to further the healthy growth of the start-ups.



The planned container village. Picture: DESY

The first tenants will move into the container village already this year: Class 5 Photonics, a company specialising in laser technology in the femto-second range, urgently needs more office space in order to recruit new em-



The DESY Innovation Village is being built in front of Building 25f. The parking lots (marked in green) will be moved to the other side of the building. Picture: DESY

ployees. In early summer 2018, the DESY Innovation Village will eventually be completed, enabling all the other start-ups, which are currently scattered all over the campus, to also move into the common building. In addition, the container village will host events on innovation and company start-up issues, which will be open to all DESY employees.

Later, after the start-ups have moved into the innovation centre, the container village will provide an ideal location for funding and validation projects as well as start-ups in the pre-foundation phase. Co-working space may also be created if needed. The modular and flexible container design allows various scenarios for future use, which is planned to last about ten years.

## AWARDS

Honorary Doctor for Henry Chapman



Henry Chapman, leading scientist at DESY and professor of physics at the University of Hamburg, was named Honorary Doctor of the Faculty of Science and Technology at Uppsala University in Sweden. Together with researchers from Uppsala, Chapman conducted innovative experiments on biomolecules at free-electron lasers that created a whole new interdisciplinary research field, as the university emphasised. The title will be conferred in January.

Saša Bajt becomes OSA Senior Member



DESY group leader Saša Bajt from the Center for Free-Electron Laser Science (CFEL) was elected Senior Member of the Optical Society (OSA). Only OSA members with significant accomplishments in the fields of optics and photonics may become Senior Members. The new Senior Members, which are selected in a comprehensive peer review process, were nominated at the OSA annual meeting in Washington, D.C., in September.

Humboldt Research Fellowship for Jolijn Onvlee



Jolijn Onvlee, a researcher in the Controlled Molecule Imaging group of DESY scientist Jochen Küpper at the Center for Free-Electron Laser Science (CFEL), was awarded a two-year Alexander von Humboldt Research Fellowship for her research proposal aiming to study hydrogen bond dynamics in the indole–water complex at CFEL. Indole ( $C_8H_7N$ ) is a structural fragment that is widely found in nature. The goal of the work is to record a molecular movie tracking the ultrafast structural changes of the indole–water complex when the hydrogen bond breaks.

**Three new Helmholtz Young Investigator Groups at DESY**

The Helmholtz Association is funding three new Young Investigator Groups at DESY: Priscilla Pani and her group will search for dark matter by analysing the high-energy proton–proton collisions in the ATLAS detector at the LHC, the world’s largest particle accelerator, located at the CERN particle physics research centre near Geneva, Switzerland. Abideh Jafari hopes to be the first to measure the interaction between the top quark and the Z boson directly and with high precision using the CMS detector at the LHC. Torben Ferber aims to use the Belle II detector at the SuperKEKB accelerator facility in Japan to search for dark matter and axion-like particles.

With an annual grant of 300 000 euros each, the three young scientists will be able to set up their own research groups at DESY over a period of six years. The Helmholtz Association and DESY will each be providing half of this grant. “I am extremely pleased that three of our candidates were able to convince the panel with their projects,” emphasised DESY Director Helmut Dosch. “Promoting young scientists and opening up individual career opportunities are matters that are particularly dear to DESY.” All in all, the Helmholtz Association is funding 16 new Young Investigator Groups at its 18 research centres.

**Two new German–Russian research groups**

The Helmholtz Association and the Russian Science Foundation (RSF) selected the first six groups for their new “Helmholtz–RSF Joint Research Groups” funding programme. DESY is participating in two of these groups. In the field of information and data science, a cooperation between the Kurchatov Institute in Moscow and DESY will develop a powerful data processing platform, which is to be used, among others, at the European XFEL X-ray laser.

In the field of biomedicine, a cooperation between Tomsk State University (TSU) and DESY is to develop a new high-energy X-ray camera for Compton imaging, a very promising new technique for studying biological specimens. For a period of three years, each Helmholtz–RSF Joint Research Group will receive funding of up to 130 000 euros per year from the Helmholtz Association’s Initiative and Networking Fund and an equal amount from the RSF.

**Class of 2017: 102 summer students from 28 countries**

From July to September, 102 young scientists from 28 countries attended this year’s summer student programme at the DESY locations in Hamburg and Zeuthen. For seven weeks, the students were given an insight into the various research areas at Germany’s largest accelerator centre. The DESY summer school is one of the largest and most international in Germany.

The 85 students in Hamburg (top) and the 17 students in Zeuthen (bottom) did not only learn the theoretical foundations of accelerator, particle, astroparticle and X-ray physics, but were also involved in practical work in on-going research projects. “However, it is not just the science that is decisive for the students – a special focus lies on the

contact of the students with each other,” explains Olaf Behnke, one of the Hamburg organisers. “The diversity of nationalities creates a special atmosphere.” Internationality and practical experience in particular make the annual DESY summer programme very popular among students. The number of applications regularly exceeds the number of available places. Applications can be submitted starting in December for the next year. For the 2018 summer student programme, applications will be accepted from 15 December 2017 until 31 January 2018.

**INFO**

<http://summerstudents.desy.de>

## Interdisciplinary radiation symposium

By Gero Kube

More than 80 experts from 13 countries gathered at DESY in September for this year's International Symposium on "Radiation from Relativistic Electrons in Periodic Structures" (RREPS-17). The conference series was launched in 1993 at the Nuclear Physics Institute of Tomsk Polytechnic University in Russia to strengthen research on radiation from relativistic particles in natural and artificial periodic structures. Since then, it has become a lively forum attracting scientists from different fields and from many countries all over the world.

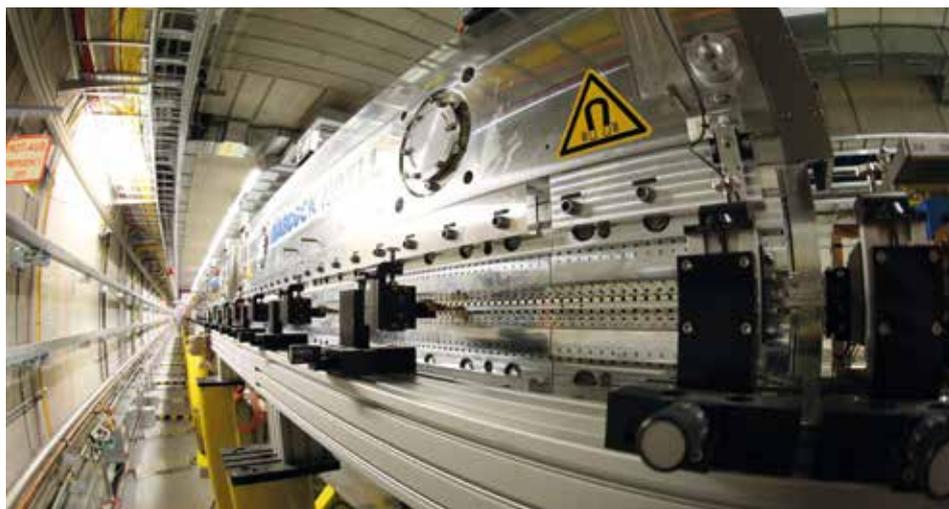
The RREPS scientific programme is devoted to applied research focused on radiation from charged relativistic particles in condensed matter, including the following topics: general radiation properties of relativistic particles, Cherenkov radiation, transition radiation, parametric X-ray radiation (PXR), diffraction and Smith–Purcell radiation, coherent bremsstrahlung and channelling, crystal-assisted processes and application of monochromatic X-ray, gamma ray and terahertz beams produced at electron accelerators.

These radiation mechanisms result from specific processes described by atomic physics as well as classical and quantum electrodynamics. Over the past years, significant progress was made in understanding the various physical phenomena induced by the interaction of high-energy charged particle beams with periodic structures such as crystal lattices, layered targets and nanostructures, both from the theoretical and the experimental point of view. This progress was initiated, among others, by the RREPS symposia, which bring together experts from various fields with different backgrounds.

The purpose of the RREPS-17 symposium at DESY was to provide an up-to-date overview over future trends in the field of electromagnetic radiation generation by relativistic charged particles in condensed media. Based on the experience of the past symposia, it is expected that new research projects will be generated by international collaborations between the symposium participants, merging the experience of theoretical and experimental physicists. New high-quality and ultra-relativistic electron beams, such as the ones expected to be produced by the accelerator of the European XFEL X-ray laser, will provide new opportunities for research.

# Free access to Europe's light sources

The EU project CALIPSOplus connects Europe and the Middle East



Undulator for the generation of X-ray radiation at DESY's research light source FLASH. Picture: DESY, Dirk Nölle

In research and science, national borders should no longer play a role. This major European goal is the declared aim of the CALIPSOplus project, in which DESY is participating with its X-ray light sources PETRA III and FLASH. The EU project, which was launched in 2017, coordinates the most important synchrotron radiation sources and free-electron lasers in Europe and the Middle East within the European Research Area (ERA) programme. The purpose of ERA is to promote the open and free exchange of scientific findings and to make technologies accessible to all. True to the motto "Open Science", it will enable easy access to the light sources and offer broad support for experiments, equipment, data analysis and data management. Industrial enterprises are involved as well.

The 19 participating partners receive grants from the CALIPSOplus project (for "Coordinated Access to Lightsources to Promote Standards and Optimization") amounting to a total of ten million euros over a period of four years. The project is coordinated by Helmholtz-Zentrum Dresden Rossendorf (HZDR).

A special focus of the project is on the 13 latest EU members. In order to convey knowledge about modern light sources and offer easy access to the facilities to scientists in middle and eastern Europe, visits to universities and special courses are planned. Many institutions, particu-

larly in eastern Europe, lack the money to cover the travelling costs for their scientists. CALIPSOplus will offer help here, as well as with networking. Unexperienced scientists, for example, will cooperate in small teams with experienced light source users.

A central platform that will have an effect beyond the four-year term is the website [www.wayforlight.eu](http://www.wayforlight.eu), which forms the basis for all the activities and offers included in the project. The platform will provide all relevant information about the experimental stations at Europe's light sources and about the application process for beam time. (uw)

### Partners of CALIPSOplus

Helmholtz-Zentrum Dresden-Rossendorf, DESY, European XFEL GmbH, Helmholtz-Zentrum Berlin für Materialien und Energie, Karlsruhe Institute of Technology, Paul Scherrer Institute (Switzerland), Ankara University (Turkey), Aarhus University (Denmark), Consorcio para la Construcción, Equipamiento y Explotación del Laboratorio de Luz de Sincrotrón (Spain), Centre National de la Recherche Scientifique, Installation Européenne de Rayonnement Synchrotron and Société Civile Synchrotron Soleil (France), Diamond Light Source (UK), ELETTRA – Sincrotrone Trieste SCPA and Istituto Nazionale di Fisica Nucleare (Italy), Lund University (Sweden), Stichting Katholieke University (Netherlands), Jagiellonian University in Kraków (Poland) and Synchrotron-Light for Experimental Science and Applications in the Middle East – SESAME (Jordan).

# “Exceptional results”

## EUCALL completes mid-term review and second annual meeting

By Graham Appleby

In June, the European Cluster of Advanced Laser Light Sources (EUCALL) successfully completed its mid-term review in Brussels. During the review, the progress and achievements of the project, which is funded through the European Union’s Horizon 2020 Research and Innovation programme, were presented to the EU project officer and an external reviewer. The review recognised that EUCALL has fully achieved its objectives and milestones for the first funding period and is creating a wealth of advanced results, instruments and tools.

end of November. A second workshop on “High Impact Science at Advanced Laser Light Sources” – to be held at DESY in spring 2018 – will address urgent scientific and societal challenges and how EUCALL’s facilities could contribute to solving these. A further topic deals with building a network for target delivery at high-repetition-rate laser facilities.

Also in June, EUCALL held its second annual meeting at the European Synchrotron Radiation Source (ESRF) in Grenoble, France. Sixty-six project participants



Participants in the second EUCALL annual meeting at the European Synchrotron Radiation Source (ESRF) in Grenoble, France. Picture: ESRF / C. Argoud

The development of the SIMEX software tool was highlighted as a significant result. SIMEX is a new open-source simulation platform for users and facility operators to simulate photon science experiments from source to detector. It includes a software package for simulating experiments at the different light sources. SIMEX currently supports simulations of coherent diffractive imaging as well as of imaging and scattering experiments on laser-excited or compressed matter.

The reviewer also identified EUCALL’s networking activities to be of great value for structuring an emerging community. For example, EUCALL is organising a workshop on “Biology at Advanced Laser Light Sources” at European XFEL at the

gathered to present and discuss the progress and status of the project. Among other things, attendees discussed possible collaborations after the EUCALL project ends in September 2018. The participants unanimously agreed to continue EUCALL’s cooperation in the future.

### INFO

EUCALL workshops: [www.eucall.eu/events](http://www.eucall.eu/events)  
SIMEX download: [www.github.com/eucall-software/simex\\_platform](http://www.github.com/eucall-software/simex_platform)

### Volkmar Dietz heads DESY Foundation Council

On 15 September, Volkmar Dietz from the Germany Federal Ministry of Education and Research (BMBF) took over as chair of the DESY Foundation Council. He is the successor of Beatrix Vierkorn-Rudolph, who retired. Volkmar Dietz graduated in solid-state physics, with measurements at HASYLAB, and heads the BMBF Department 71, “Large-scale equipment for basic research”.

### Green light for Max Planck School of Photonics

The German Federal Ministry of Education and Research (BMBF) supports the establishment of a new network of excellence in photonics. The Max Planck School of Photonics (MPSP) unites the competencies of the German photonics community and supports high potentials among the younger scientists. This national network of excellence is led by the Fraunhofer Institute for Applied Optics and Precision Engineering (IOF) in Jena. Six leading DESY scientists are involved in the network: Henry Chapman, Franz Kärtner, Ralf Röhlsberger, Nina Rohringer, Robin Santra and Christian Schroer.

### Excellence projects reach important milestone

At the end of September, the German Research Foundation (DFG) announced which excellence projects were nominated for a Cluster of Excellence application. Several cluster initiatives with DESY participation were selected, among others from the universities of Göttingen and Kiel and two from the University of Hamburg: “AIM – Advanced Imaging of Matter” will clarify how atoms move and thereby form structures with special functionality, and whether it is possible to systematically control these principles. “Quantum Universe” will investigate the physics of the big bang, striving for a holistic approach that includes dark matter and dark energy.

A total of 88 out of 195 submitted draft proposals were chosen for the final round and their authors invited to hand in full proposals. These will be evaluated again until September 2018. The aim is to fund 45 to 50 Clusters of Excellence over a period of seven years with a total of around 385 million euros.

## Energy efficiency network

In 2014, the German Federal Government and the leading German industry associations and organisations agreed to implement and support 500 new energy efficiency networks of enterprises until the end of 2020. In this way, the Federal Government hopes to save up to 75 petajoules of primary energy (fossil fuels, renewable and nuclear energy) or five million tonnes of greenhouse gas emissions until 2020. This corresponds to the average power consumption of around five million three-person households per year.



DESY is one of 13 enterprises that established the Hamburg industrial energy efficiency network, together with the Hamburg Industry Association (IVH) as network supporter. The network was launched at the beginning of 2016 for a duration of three years. Its goal is to save 60 000 tonnes of carbon dioxide per year by the end of 2018.

In addition to other smaller projects, DESY's main contribution is the operation of a facility to recover energy from the helium cooling plant. The plant cools helium down to 2 Kelvin (-271 degrees Celsius) for the operation of the superconducting components of the European XFEL and FLASH as well as the AMTF hall. With nearly a quarter of the total power consumption at DESY's Hamburg location, the cooling plant is one of the main energy consumers at DESY.

Using heat extraction, about 17 000 kilowatt hours at first and currently even some 24 000 kilowatt hours of heat are fed into the DESY local heating network per day. More than one third of DESY's total heating energy demand is thus met by heat recovery. In this way, DESY will contribute about 1300 tonnes of carbon dioxide savings to the overall saving target. (hw)

# Integration through education

## 26-year-old refugee from Afghanistan starts vocational training at the DESY library

By Antje Daum

Qais Haidari, a refugee from Afghanistan who has been living in Hamburg since autumn 2015, started a training programme as a media and information service specialist at the DESY library on 1 September 2017.

For Qais Hadari, a big wish has thus come true. After graduating from high school in Kabul, he successfully completed a two-year course of studies at the National Institute of Management and Administration (NIMA). Like every young man in Afghanistan, Qais wanted to live in peace. However, he had to leave his country and his family after being threatened by the Taliban. Then, after an adventurous escape across Turkey and the Mediterranean Sea, he reached Hamburg, where he hopes to start a new life.

Eventually, with the help of Hülya Eralp from the Hamburg coordination centre for continuing education and employment (KWB), which was established jointly by the Hamburg employer associations, social security office and employment agency, the 26-year-old applied for training as a media and information service specialist at DESY. He was very convincing and was therefore invited to a personal interview together with other candidates.

Although the young man spoke little German at the time, he was convincing in the interview as well. However, since good language skills are an essential prerequisite for attending vocational school, in spring 2017 Qais first did a three-month internship at the DESY Hamburg library, where he also had the opportunity to learn more about DESY – and the DESY library staff could get acquainted with him. In parallel, Qais improved his German language skills in a further intensive language course.

It soon became evident that Qais became integrated at DESY very quickly, and he was readily accepted as an



Qais Haidari and the author in the DESY Hamburg library.

Picture: KWB, Janna Bischoff

additional trainee in the library. This was actually quite challenging for the library staff, as the capacities were already almost exhausted with training and pupil internships. However, the common willingness at DESY to contribute to integration made this exception possible. The Helmholtz Association also provides support: It contributes half of the training costs in the first year as part of its refugee initiative.

Meanwhile, the first weeks of Qais' training are over, and he enjoys the contact to the other trainees at DESY. He knows how important it is to learn German. For this, he needs to go on taking German language courses and requires support beyond vocational school. He also needs help in his private life, as he still lives in a refugee accommodation in the vicinity of DESY. His dream is to have a small apartment of his own.

# Good nutrition at DESY – DESY eats healthy

Fourth DESY Health Day – about 500 DESY colleagues catch up on latest advice

By Natascha Peleikis

We finally did it! Since the start of corporate health management at DESY, we have often been asked: “Why don’t you offer something about nutrition?” That’s easily said, but difficult to realise. On this subject, you’ll find lots of experiences, opinions, ideologies and many sometimes contradictory single-case studies and recommendations. We therefore tried to find speakers who are either doing their own research and reporting on it or able to sort a little through the confusing market of nutritional advice and philosophies.

We think we found a successful mixture. The diabetes researcher Achim Peters from the University of Lübeck presented the conclusions from his research on the correlation between stress, cortisol, insulin, genetic disposition, our eating behaviour and our physical appearance. In essence: We always eat as much as our brain needs at the moment; according to Peters, this depends on whether or not we are stressed. If and in which way this results in a gain of weight depends on our genetic disposition. Incidentally, he mentioned that stress rather



Healthy: a balanced mixed food with plenty of vegetables. Pictures: DESY, Marta Mayer

than overweight is the risk factor for lifestyle diseases. About 150 persons attended his lecture in the auditorium.

In a broadcast from Zeuthen, Gisela Olias outlined the latest advice of the German Institute of Human Nutrition in Potsdam-Rehbrücke on healthy food. Then Matthias Riedl, known from the NDR television series “Ernährungsdocs” (“Food docs”), provided answers to the question what strategies are currently considered promising for weight loss. His lecture attracted more than 250 listeners. The live broadcasts from the auditorium were also well used, with 40 viewers tuned into the webcast.

Both institutes, Zeuthen and Hamburg, offered an extensive framework programme, which was well received at both locations. Workshops and short lectures on slow food, the use of condiments and cold kitchen were well attended. All the check-ups were booked out. Many interested people gathered at the information booths.

The feedback confirmed that the event was well received. We are glad that Alsterfood and hence the DESY canteen in Hamburg will participate in an “NDR-Ernährungsdocs” campaign. With the



Sharpened senses help to enjoy food more consciously.



The presentations were broadcast live between both DESY locations.

start of the new season at the beginning of 2018, cooking in Hamburg will be done according to “Ernährungsdocs” recipes.

## INFO

<http://gesund.desy.de>



The information booths in the Hamburg auditorium foyer were well attended.



Personal information



Fun with vacuum experiments in the school lab. Picture: DESY, Lars Berg

## physik.begreifen turns 20

### Hamburg school lab celebrates anniversary

By Kim Susan Petersen

The DESY school lab in Hamburg – named “physik.begreifen” (“grasping physics”) – just celebrated its second round birthday. On the occasion, the school lab team, headed by Karen Ong, organised a colourful festival.

“At our school lab, pupils can experiment on their own and experience how research works,” said DESY Director Helmut Dosch in his address to about 100 guests at the ceremony in the auditorium. “It is our special concern and an important social mission as well to get young people enthusiastic about the natural sciences.”

Hamburg School Senator Ties Rabe, whose ministry has been supporting the project from its inception, praised the initiative: “The DESY physik.begreifen school lab is a wonderful example of cooperation between a top-class research institute and the Ministry for School and Vocational Training.”

A special honour was the visit of former DESY Director of Administration Helmut Krech, who initiated the project twenty years ago. Since then, more than 88 000 pupils have been taking advan-

tage of the offer. Nowadays, the school lab welcomes up to ten school classes per week.

“physik.begreifen was the first school lab within the Helmholtz Association and as such truly trendsetting,” said Joachim Mnich, who is now in charge of the DESY Hamburg school lab. “Meanwhile, more than 30 school labs have been created at Helmholtz centres, and the need to promote interest in science and technology remains high.” For this reason, DESY has also been running a school lab in Zeuthen since 2004.

The official part of the celebration was followed by a science slam during which three DESY scientists – Leif Glaser, Ingrid Gregor and Daniel Horke – entertained the audience with humorous insights into their research. During the final tour through the various experimental rooms of the school lab, Ong pointed out: “We attach particular importance to the fact that the pupils work independently and get to the bottom of physical phenomena. They are of course allowed to make mistakes, that’s part of the game.”

#### Helmholtz with a new look

The Helmholtz Association has a new look. The new corporate design of the largest German research institution was presented in mid-September at the annual meeting of the association in Berlin.

“Helmholtz – Research for Grand Challenges” is the new claim of the research association. “In the past years, Helmholtz underwent an enormous change. Today, we are a strong association of 18 centres, with top-class research worldwide in six fields,” said Otmar D. Wiestler, the President of the Helmholtz Association. “With our mission to help solve the grand challenges facing society, we have developed into an even more prominent brand both nationally and internationally. We are now conveying this with our new, distinctive appearance.”

The font “Hermann” was specially developed for the reduced word mark. It emphasises the technologic and innovative aspects of the Helmholtz Association through its roundings at a 45-degree angle. “The digital impression of the Hermann font also hints at a topic that is already of great concern to us and that will shape the Helmholtz Association even more strongly in the years to come: information and data science,” explained Wiestler. “All our research areas generate enormous amounts of data, which must be processed and analysed intelligently in order to generate knowledge. This is a challenge we face as a community.”

[www.helmholtz.de](http://www.helmholtz.de)

#### Imprint

**Publisher**  
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Notkestraße 85  
D-22607 Hamburg

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

**Editors**  
Ulrike Behrens  
Ilka Flegel  
Till Mundzeck (editor-in-chief)  
Barbara Warmbein  
Heiner Westermann  
Ute Wilhelmssen  
Thomas Zoufal

**Production**  
Britta Liebaug (layout)  
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