



Commitment

How people at DESY hold a public debate about the value of science

Discovered

Paul Söding on the discovery of gluon

Young

Summer school attracts students to DESY

Articulate

Two DESY colleagues take to the festival stage





Picture: W. Bartsch, Hamburg

Dear DESY colleagues,

Seven months ago I started as the new Director of the Accelerator Division (M-Division) here at DESY. It has been an intense period of change and excitement for me after having been in the USA for more than 33 years, with 27 of those at the Lawrence Berkeley National Laboratory where I started right after earning my Ph.D. from UCLA in Los Angeles. I have felt warmly welcomed by the people at DESY during these five months and have enjoyed visiting the various accelerators and infrastructure that drive the science that make DESY one of the premier accelerator laboratories around the world. The M-division is at the heart of these machines and, being at a laboratory where accelerators are essential tools for the science, it contributes to society and where there is an amazing staff of experts with top-notch expertise were some of the key reasons I decided to come to DESY and help to continue its great tradition.

DESY has always been a pioneer in the development of accelerators that are bold and set new operational levels that enable forefront science to be conducted. Where DESY was known for running the HERA collider and discovering the gluon, now it operates high-performance free-electron lasers such as the world's first vacuum ultra-violet FLASH facility and the European XFEL, both powered by superconducting radio-frequency based accelerators, technology that was pioneered here at DESY. In addition, we operate the world's brightest hard X-ray storage ring PETRA III.

Charting out the best path forward to ensure that the accelerators that we operate today are performing at their best level and planning for future machines that will attract the best and brightest scientists to develop them and use them are hence essential for the continuation of the successes that DESY has enjoyed over the past 60 years. Combined with a vision in DESY to advance the state of the art in accelerators, including plasma accelerators which formed to core of my activities for the past three decades, a stable and long-term horizon funding model and a commitment from the Helmholtz foundation and the BMBF that accelerators are essential pillars for our future, compelled me to make a change and join this great laboratory.

Sincerely,
Wim Leemans

Cover picture:

Part of a great movement: together with DESY employees, citizens of Zeuthen show with their personal posters what science means to them.

Picture: Mattias Zeising, neonrauch

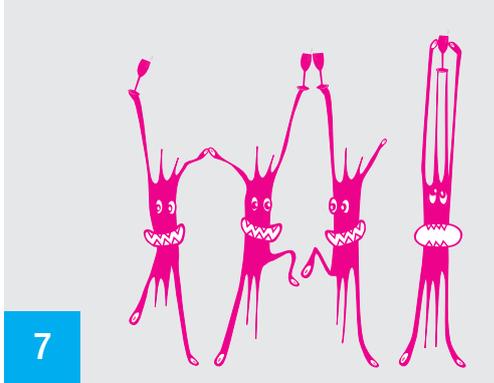
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On our own behalf

You'll have noticed: there is a new face at the head of the PR department. Kerstin Straub (centre) has been heading communications activities at DESY since June. In the interview on page 19, she tells us how she likes it at DESY and what brought her here. The 55-year-old succeeds Christian Mrotzek (2nd from right), who is now responsible for setting up the DESYUM visitor centre (page 14). And another change: we are now printing DESY inform on 100 percent recycled paper.



The PR team around Kerstin Straub (centre)
Picture: Gesine Born, DESY

COMMITTING TO SCIENCE

How the value of research is publicly discussed in science through campaigns



Ideas on paper: In the foyer at DESY in Zeuthen, everyone can take part in the WISSEN SCHAFFT campaign with a personal poster.

Pictures: Ulrike Behrens and Susann Niedworok, DESY

What do we achieve through knowledge? What does science mean to us? And how does science contribute to society? Over the past years, more and more people have focussed on these issues. In recent months, campaigns such as Fridays for Future have received increasing attention due to issues such as climate change and the associated demand that politicians take scientific findings into account in their decisions.



Ulrike Tippe, TH Wildau

To show the true colours for science in Brandenburg was the motivation for the three initiators AIP in Potsdam, DESY in Zeuthen and TH Wildau to launch the campaign WISSEN SCHAFFT in May 2019, based on a word play on the German word for science and the

sentence “Science creates...” to be completed individually. The goal of this campaign was to come into contact and discuss with people who so far had not been in dialogue with science.



Juliana Stachurska, DESY

Why this campaign? The German constitution celebrates its 70th anniversary. It is the foundation of our social co-existence in Germany. Article 5 of the constitution states that “art and science, research and teaching are free.” This freedom is the basis of scientific work. Free research is and must remain a substantial element of the democratic society. “We believe it to be very important that all people who make decisions on how we carry out and regard science, should always defend this freedom,”

explains Christian Stegmann, one of the initiators of the campaign.

Already in April 2017, on Earth Day, the March for Science took place for the first time under the motto “Science, not Silence” in more than 600 cities worldwide. Numerous organisations as well as individuals support these goals, among them the Alliance of Science Organisations in Germany, and Helmut Dosch as Chairman of the DESY Board of Directors and Christian Stegmann as head of the DESY institute in Zeuthen. At the first march in 2017, many DESY staff members had taken to the streets in Hamburg and Berlin.

In 2019, 13 cities in Germany participated in this event. In addition to climate policy, the main topics were scientific scepticism



Christian Stegmann, DESY

Take your stance:
Also on the long night
of science in Zeuthen
performers show
their statement.



in society, the increasing influence of conspiracy theories and the threat to democratic discourse posed by populism.



Yichen Li, ATLAS

In Brandenburg, the WISSEN SCHAFFT campaign used the March for Science as a kick-off and called for commitment to science on a poster – including a personal statement – and to go public with a photo. The campaign is intended for all to participate and show what science means to her or him. All pictures can be published by using the hashtag #wissen-schafft on Instagram, and viewed at www.wissen-schafft.org. More actions are planned; Christian Stegmann for example has started discussions with the public at the weekly market in Zeuthen. Stegmann is optimistic: “I don’t know if

we will reach our goals to communicate more clearly the value and the principles of science. However, any dialogue with people who we would usually not talk to makes the campaign successful.”

The major science organisations and universities in Germany also commit themselves to the values of our democracy.



Ulrike Behrens, DESY

The campaign “Freedom is our system. Joint forces for science” is an initiative of the Alliance of Science Organisations in Germany. “Democracy is precious and must be protected!” is the title of the statement of the senate, the university executive board and the personnel representation council of TU Dresden on the upcoming state elections, with the aim to promote cosmopolitanism and tolerance.

The joint engagement of young people, researchers and science organisations is an important signal showing the standing of science in our society. **ub**



Stefan Klepser, DESY

Links:

- <https://fridaysforfuture.de>
- <https://wissen-schafft.org>
- <https://marchforscience.de>
- <https://wissenschaftsfreiheit.de/kampagne>
- <https://tu-dresden.de/tu-dresden/newsportal/news/demokratie-ist-ein-wertvolles-gut-welches-es-zu-schuetzen-gilt>

Making a career together

30 institutions have founded the “Dual Career” network in Hamburg



Ceremonial founding act in the Hamburg town hall (from left): Kerstin Bartling and Jetta Frost from Universität Hamburg, Senator for Science, Research and Equality Katharina Fegebank, and Christian Haringa and Bettina Aßmann from DESY. Picture: BWFG, C. Hoehne

Excellent science needs outstanding scientists and good framework conditions for recruitment and support of these top talents. An important precondition to attract bright minds to Hamburg is that their partners are also offered the possibility to find attractive career opportunities. Therefore, in May, some 30 institutions from the metropolitan area of Hamburg joined forces to establish the “Dual Career Network Hamburg + the North”. This is the first regional dual career network in northern Germany and is coordinated by DESY and University Hamburg.

The goal of “Dual Career Network Hamburg + the North” is to support scientific, cultural and economic institutions in their effort to recruit top talents for the Hamburg metropolitan region and the North. Inter-institutional counselling and services will help to offer a job perspective to (highly) qualified partners. After all, those who are heading for new challenges are not always willing to do this alone. More and more frequently, couples where both partners are highly qualified partners seek new career opportunities together. *tz*

Hot experiments

Summer of Knowledge in Hamburg

Like a small Night of Knowledge, but much hotter: from 20 to 23 June, the first “Summer of Knowledge” took place on Hamburg town hall square. The weather was marvellous during these four days and about 50 000 visitors bustled about on the town hall square and learned about local science in four topical tents.

The tent where DESY and its partners presented research with super light sources was the one with the highest visitor count. DESY staff members and our research partners talked about superconductivity, particle accelerators and about all the scientific questions that these are able to solve. Show-element experiments such as the superconducting train and DESY’s new VR experience added to the illustration of our research.

It was the 100th anniversary of the university that led Hamburg to the organisation of a central summer festival of research, replacing the usual “Night of Knowledge” that takes place every two years with the participation of almost all research institutions from the metropolitan region. The DESY DAY, which was cancelled for the benefit of this summer science event, will take place in celebration of DESY’s 60th anniversary next year. *tz*



Most-asked question on superconducting train: “What happens if I touch it?”
Picture: DESY, Gesine Born



Barbara Warmbein and Ismar Kiseljacovic answered questions from the visitors. In the case of the superconducting train: “Do not touch, you might get burned”. Picture: DESY, Kristin Hüttmann

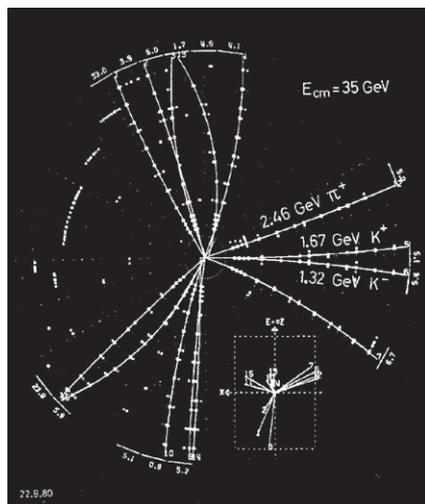
Happy Birthday, gluon!

40 years ago, scientists discovered the gluon with the help of the PETRA accelerator

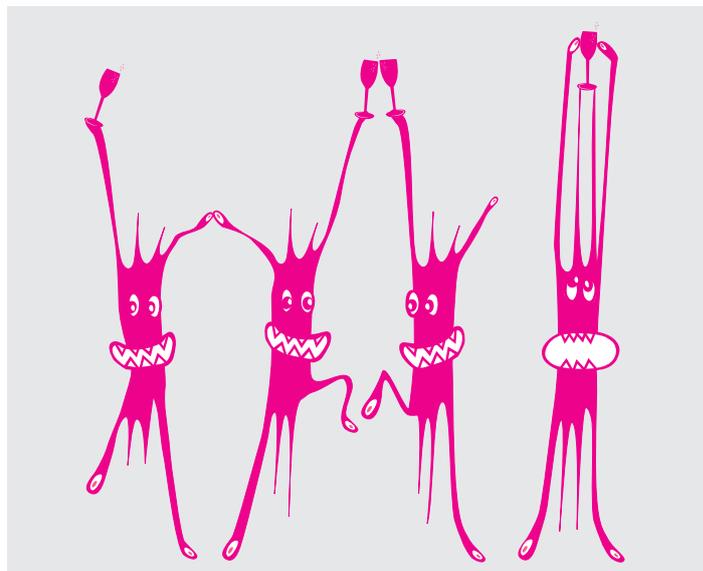
1979 was an extremely exciting year for DESY. Those who were around then, like me, will never forget it. So what made it so special? Four years before, DESY had decided to build the largest technically feasible electron-positron storage ring that could be realised on the DESY premises: PETRA. DORIS, the first DESY storage ring, proved to be a powerful tool to investigate quarks and leptons. However, with their own ring that was completed before DORIS, our colleagues at Stanford University had the edge over DESY and were duly rewarded with the Nobel Prize for the discovery of the charm quark and the τ -lepton. DESY was set to make up with the construction of the world's largest e^+e^- storage ring. This would open a real treasure trove: new heavy quarks and leptons, SUSY particles, scalar and vector bosons, new interactions – the new venture towards unexplored energies promised a tempting discovery potential! It would finally make possible precision measurements of the electroweak interaction. At that time, the standard model did not exist, everything was possible. The worldwide interest was enormous and led to the spontaneous formation of four large experiment collaborations, corresponding to the four planned collision points. Now, DESY was a real international affair.

Obviously, DESY was not the only player in this field. Stanford and the Rutherford lab in the UK pursued similar plans. However, funding stagnated in England and Stanford was outpaced by the brilliant achievements of DESY's machine director Gus Voss and his staff. They built PETRA in record time. Completed in autumn 1978, the machine reached a beam energy of 13 GeV in spring 1979.

In spite of great enthusiasm and hard efforts we, the experimenters, were not able to keep up with the pace of the machine builders in the design and construction of the detectors. The collaborations had set different priorities and implemented ambitious innovations. Everyone wanted to be the best or at least the first. In the end, three detectors (JADE, MARK-J und



The gluon was first observed at PETRA in 1979. For this discovery four DESY scientists were awarded the EPS particle physics prize in 1995 – considered as the “European Nobel Prize in Physics”.



The “Particle Zoo” exhibition of the Science Center Universum® Bremen describes the gluon as “chilled and communicative”. Illustration: Britta Liebaug

TASSO), which were only partially completed and needed improvement, were built into the PETRA ring and supplemented by a reliable detector of DORIS (PLUTO).

Now, the quarks generated at PETRA had such high energies that their collision products formed two opposed particle bunches. Experts call them jets. This was not unexpected. However, we discovered something exciting: the occasional appearance of a third jet. The evidence was found by Sau Lan Wu from the University of Wisconsin, its group belonging to the TASSO Collaboration headed by Günter Wolf and Björn Wiik, the future DESY director. They had developed an algorithm to identify and analyse jet topologies. A third jet could only be the fragmentation product of a gluon emitted by one of the quarks. Gluon was the name of a hypothetical field quantum of strong interaction. In fact, our data matched with the theoretical expectations of gluon bremsstrahlung caused by quarks.

At an international conference in June 1979, Wiik was able to present spectacular results which could be confirmed by further data in the weeks that followed. At the Lepton Photon Conference in August at Fermilab in the US, the other collaborations making measurements at PETRA confirmed the three jet topologies. Conference summary speaker Haim Harari from Israel put it in a nutshell: “The gluon exists!” The particle that makes up most of what we are, was established.

*Text: Paul Söding
long-time director of research and
long-time head of the Zeuthen institute*



All six European XFEL instruments now operational

The first experiments have now started at the instrument for High Energy Density (HED) experiments. HED is the sixth and thereby last instrument of European XFEL's current design configuration to start user operation. With six instruments on three SASE beamlines operational, European XFEL now has the capacity to host three times as many user experiments as compared to when operation began in 2017.



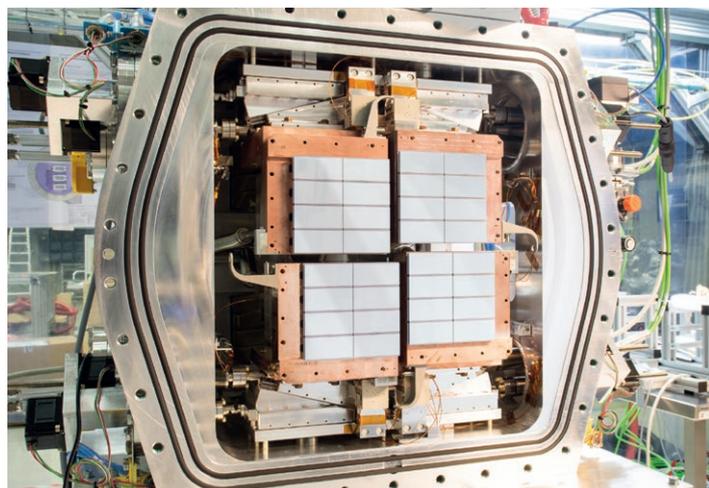
Ultrahigh-speed network connection to Poland

European XFEL and the National Center for Nuclear Research (NCBJ) in Otwock-Świerk near Warsaw plan to establish the first ultrahigh-speed connection for research data between Germany and Poland. The aim is for the new Supercomputing Center at NCBJ to be used for the processing and analysis of data generated at the European XFEL. The dedicated network connection between the DESY computer centre, which hosts European XFEL's primary data, and NCBJ will feature a data transfer rate of 100 gigabits per second.

DESY, European XFEL and Israeli scientists enhance cooperation in photon science

DESY, European XFEL and the Israeli National Committee for Synchrotron Radiation intend to cooperate more closely in future in the field of research with accelerator-based photon sources. In a one-day workshop which took place in Jerusalem in June, the three institutions discussed possible collaboration projects, for instance for PETRA IV, FLASH2020+ or SESAME.

The workshop, where Nobel Prize winner Ada Yonath was one of the speakers, was attended by 18 scientists from DESY, European XFEL, CSSB and CFEL, as well as around 40 researchers from several renowned Israeli institutions such as the Technion in Haifa or the Weizmann Institute of Science in Rehovot.



Fastest soft X-ray camera in the world installed at the European XFEL

After ten years of research and development work the world's fastest soft X-ray camera has taken up operation at the European XFEL. The DSSC detector (DePFET Sensor with Signal Compression) shoots 800 images in just under 200 millionths of a second, being able to keep up with the rapid pace of X-ray flashes of the European XFEL. During operation, the megapixel X-ray camera delivers around half a terabyte of data per minute, equivalent to about 100 DVDs. The DSSC detector enables researchers to investigate ultrafast magnetic processes, for example. Most electronic components as well as the housing of the detector which is able to detect single photons have been developed at DESY.

Wilfried Wurth

1957-2019

On May 8, 2019, Prof. Wilfried Wurth died unexpectedly at the age of 62 during a business trip to Sweden. This was a shock for his family and to many colleagues and friends all around the world, especially at DESY and at the Universität Hamburg. Wilfried Wurth studied physics at the Technical University of Munich. For his diploma thesis and PhD he joined Prof. Dietrich Menzel's Institute for Chemical Physics of Surfaces at the TUM. After two years of post-doctoral research at the IBM Almaden Research Center in San Jose, USA, he returned to TUM, did his habilitation and worked as a senior researcher and lecturer. Wilfried Wurth did experiments at synchrotron radiation sources in Germany, Italy, the US and Japan, but also calculations mainly with the x-alpha method during and after his stay at Almaden. He has done pioneering work exploring the use of the Auger Resonant Raman Effect for unravelling ultrafast electron transfer dynamics in layers of atoms and molecules on surfaces. During the last years of his Munich time he designed and constructed a source for size-selected clusters and extended his X-ray based investigations to nano objects, a branch of science that he continued after his move to Hamburg.

Attracted by the free-electron lasers (FEL) under construction or in an advanced planning stage at DESY, respectively, Wilfried Wurth accepted the offer to become full professor for experimental physics at the Universität Hamburg in the year 2000. He moved into offices and laboratories on the DESY campus and collaborated intensively with the Hamburger Synchrotronstrahlungslabor HASYLAB.

From the beginning, Wilfried Wurth was heavily engaged in realising the world's first VUV/soft X-ray FEL named FLASH starting user operation in 2005, and in building beamlines and novel instruments for the best possible science with this revolutionary facility. He has been one of the most prominent researchers at FLASH and was also spokesperson of the BMBF priority programme FLASH. This first priority programme in the field of condensed matter was created to bundle research at the free-electron laser within the framework of collaborative project funding, which allowed university groups to actively participate in the development of novel instrumentation. His contributions to advisory bodies such as the ELETTRA SAC and various review panels on synchrotron and FEL radiation sources were highly appreciated. He also chaired for many years the Komitee für Forschung mit Synchrotronstrahlung (KFS) in Germany.

Wilfried Wurth's own research focused on the investigation of ultrafast processes, such as real-time observations of chemical reactions at surfaces and the dynamics of electrons in solids and at interfaces. For example, his group succeeded in conducting breakthrough experiments on dynamic processes in condensed matter. Much of his scientific legacy is reflected in his review paper entitled "10 years of pioneering X-ray science at the Free-Electron Laser FLASH at DESY", which became online available shortly before he passed away.

Wilfried Wurth was very instrumental in setting up the Center



DESY mourns the loss of Wilfried Wurth: He was one of the pioneers of free-electron laser research. Picture: DESY, Gesine Born

for Free-Electron Laser Science CFEL, a joint enterprise of DESY, the Max-Planck Society and the Universität Hamburg with the goal to develop novel approaches for the investigation of structure and dynamics of matter. Since 2007 Wilfried Wurth led the Advanced Study Group of the University at CFEL, which bundled the activities of the various university groups involved. He was one of the leaders of the international consortium for rapid realisation of the Soft X-ray Material beamline (SXR) at LCLS, which was essential for the early scientific success of LCLS. All together, these CFEL activities facilitated German and European scientists to be successful in the peer review proposal selection process and to gain hands-on experience with X-ray FELs early on, which is very important for early success of the European XFEL.

In 2014 Wilfried Wurth was appointed Lead Scientist at DESY for taking the scientific lead at FLASH by keeping his commitments of a Professor at the Universität Hamburg. In this new position he particularly aimed to maintain the status of FLASH as pioneering X-ray light source and to make sure that FLASH will continue to be one of the world's leading facilities for research at free-electron lasers.

Throughout all his professional life Wilfried Wurth regarded strong links to the University, teaching students and guiding PhD students and post-doctoral fellows as most important and highly motivating.

We will very much miss him at DESY. He was a great, visionary scientist and academic teacher, and a wonderful personality. Leading by example, he had enormous impact on photon science research and technical developments at DESY, on the education of students at the physics department, and on the synchrotron radiation community at large.

DESY and the University of Hamburg are organising a memorial symposium for Wilfried Wurth at DESY on 20 September 2019.

*Text: Jochen Schneider
long-time director of
research with photons*



08 – 09 | 2019

City cycling

DESY is present in Hamburg and in the district of Dahme-Spreewald

Period: 30 August – 19 September 2019

<https://www.stadtradeln.de>



09 | 2019

Works Council's Staff Meeting Hamburg

12 September, 9:30 – 12:00

auditorium (Bd. 5) and foyer

Works Council's Staff Meeting Zeuthen

24 September, 10:00

Seminar room 3

10 | 2019

Panel discussion

Internationale wissenschaftliche

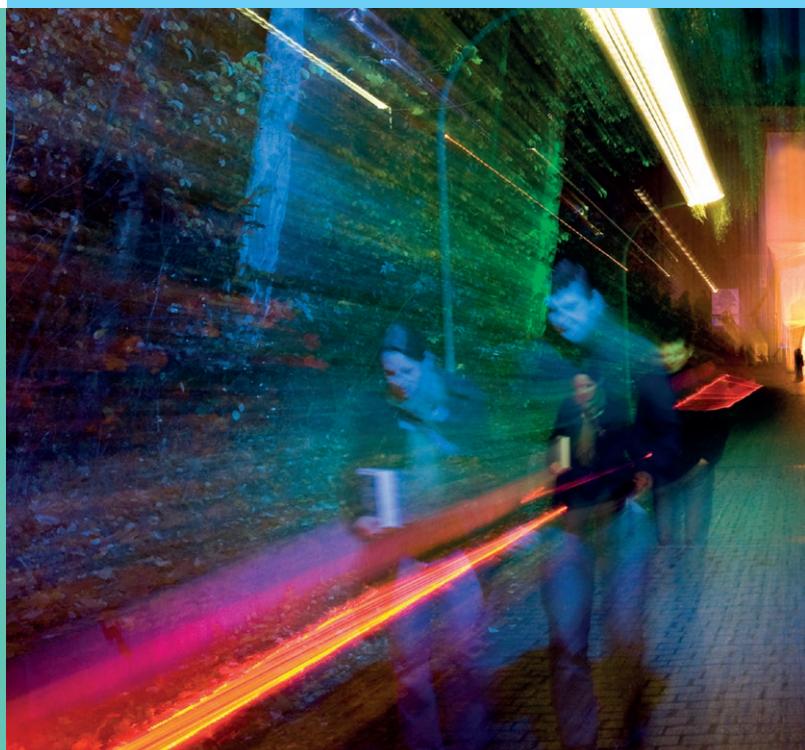
Zusammenarbeit in einer Welt

globaler Spannungen

21 October, 19:00 – 21:00

Host: Ranga Yogeshwar

Hamburg, auditorium



10 | 2019

Social Hour

“Oktoberfest” at DESY

27 October, 16:00 – 20:00

canteen annex



12 | 2019

DESY birthday

Hamburg, auditorium

18 December, 12:00 – 15:00



09 | 2019

Evening lecture in Hamburg
Die wunderbare Welt der Teilchen am CERN
25 September, 19:00, auditorium
Dr. Christoph Rembser (CERN)

DESY Science Day 2019
16. Oktober, full day
Hamburg, auditorium

TERMINE EVENTS



09 – 11 | 2019

Science Café DESY
Every fourth Wednesday of the month
in DESY-Bistro

25 September, 18:00
Dr. Sarah Bühler
Eine Reise durch Raum und Zeit – Die Entstehung von Galaxien

23 Oktober, 18:00
Dr. Paul Schütze
Teilchenspuren im Fokus – DESYs
„Strahlen-Teleskope“

27 November, 18:00
Dr. Lars-Hendrik Schilling
Chemie ist, wenn es stinkt und kracht

<http://sciencecafe.desy.de>

Nobel laureate

Ada Yonath celebrates her 80th birthday

In July, the Israeli scientist Ada Yonath celebrated her 80th birthday. The structural biologist was head of a Max Planck Working Group at DESY from 1986 to 2004 when she decoded the structure and function of the ribosome, the protein factories in biological cells. For her work performed with the help of modern X-ray analysis methods at DESY's synchrotron radiation source DORIS and other research light sources she won the Nobel Prize for Chemistry in 2009, together with the scientists Venkatraman Ramakrishnan and Thomas A. Steitz. For a long time, it was doubted that it was ever possible to decode such complex structures as for example those of the ribosome. Ada Yonath carried out the decisive pioneering work to unveil the structural design of these vital molecules by means of X-ray structural analysis.

Even after her retirement in 2004, Ada Yonath, who is also affiliated to the Israeli



With X-rays, Ada Yonath created vivid pictures of ribosomes. Picture: DESY, Gesine Born

Weizmann Institute, kept close links to DESY and its research. In 2016, the new PETRA experimental hall east was named after her. It is one of two extension halls that were built in order provide more

opportunities for scientists to do research with the sought-after light of the extremely brilliant X-ray source. DESY congratulates Ada Yonath on her 80th birthday. **tz**

Superconductivity pioneer

Peter Schmüser also celebrates his 80th birthday

He was never employed by DESY but always part of the DESY world: Peter Schmüser, a pioneer of research at superconducting cavities. A colloquium in honour of Schmüser's 80th birthday was held in June.

For more than 40 years, Schmüser has been active at DESY in many fields: as a particle physicist, he started to work at electron scattering experiments in the sixties, later he participated in experiments at the storage rings DORIS and PETRA.

For the planning and construction of the superconducting HERA proton ring, Schmüser switched to accelerator physics. The development of superconducting 6-Tesla magnets for this ring was unknown territory at that time and an enormous challenge. Peter Schmüser contributed crucial ideas for the solution



Pioneer of research at superconducting cavities: Peter Schmüser. Picture: DESY Margitta Müller

of several problems: this is one of the reasons why – after more than 30 years – the HERA proton magnets have not lost any power and can now be used

again in the “light-through-a-wall” experiment ALPS II.

Moreover, in the development of superconducting TESLA cavities and in the commissioning of the world's first free-electron laser called FLASH today, Schmüser set global standards regarding the increase of accelerator field strengths and the development of new diagnostics technologies for ultra-short electron bunches.

Peter Schmüser's lectures were legendary, particularly those of accelerator physics, which he gave as professor of the university of Hamburg; his textbooks have become classics. On occasion of his 80th birthday, DESY presented the Silver Pin of Honour to Peter Schmüser for his contributions to the research centre and his teaching. **tz**

The University of Hamburg is excellent

The university has been successful again in its strategy for excellence



Confetti rain: Employees celebrated the announcement that the University of Hamburg is now a university of excellence.

Picture: VHH, Schöttner

Since 19 July it is official: the university of Hamburg is a university of excellence. Apart from the boost in reputation, this success also brings a substantial financial boost. Over the coming seven years, the university will receive a total of about 100 million euros. These funds will be used in 24 projects – including in general education offers for students and for additional professorships and for attracting guest scientists to Hamburg.

In autumn 2018, in the excellence strategy of the federal and state governments, the Hamburg university already obtained four clusters of excellence funded with several million euros by the German government. Two of them have DESY participation: the research centre is substantially involved in the clusters of excellence “Quantum Universe” and “Advanced Imaging of Matter” (AIM). AIM is the follow-up of the successful cluster of excellence “The Hamburg Centre for Ultrafast Imaging” (CUI). *khü*

Innovation through cooperation

DESY and Class 5 Photonics build new high-performance femtosecond lasers

Supernova DFG is the name of the novel laser system that DESY is developing jointly with the DESY spin-off Class 5 Photonics. A team of Tim Laarmann’s femtochemistry and cluster physics group works side by side with the product developers of Class 5 Photonics.

Supernova DFG is in the mid-infrared spectral range (MIR) and is meant to extend the possibilities of laboratory investigations, because today’s laser systems do not offer the necessary efficiency to carry out reliable complex studies at vital molecules such as proteins or DNA. The goal is to improve the efficiency by a factor of 20 by increasing the laser output. For this purpose, for example, new optical crystals are being investigated and a new laser architecture realised. Supernova DFG will be an attractive tool for non-invasive diagnosis of extremely small molecule concentrations.



Torsten Golz (Class 5 Photonics) and Malte Sumfleth (DESY) carrying out development work in the laser laboratory. Picture: Maike Bierbaum, DESY

Text: Maike Bierbaum
DESY Innovation team



First APC meeting in Zeuthen

At the end of May, the constituent meeting of the Astroparticle Physics Committee (APC) took place at DESY in Zeuthen. Christian Weinheimer, professor at the University of Münster and former chairman of the Committee for Astroparticle Physics KAT, was elected chairman of the committee. His deputy is Antoine Kouchner, Director of the Laboratoire Astroparticule & Cosmologie in Paris. "The department has very exciting projects planned for the coming years and has a great and internationally highly visible team of scientists at the Zeuthen site," said Weinheimer. From now on, the APC will meet twice a year, once together with the PRC, alternately in Zeuthen and Hamburg. The next meeting will take place on 12 and 13 November in Hamburg.



DESY takes part in the initiative "Klischeefrei"

In order to interest more women and girls in technical and scientific professions, DESY has joined the nationwide initiative "Klischeefrei". The initiative advocates career orientation free of gender stereotypes. At DESY this is particularly relevant in the STEM disciplines, i.e. jobs in science, technology, engineering or mathematics. "One way to get more women into STEM occupations and also into management positions is to start at the very beginning - in other words right from the choice of career," explains DESY's Head of Administration, Meike Johannsen. "We want to inspire girls and boys alike to do research in the sciences and to work in technical professions."

Saul Perlmutter on critical thinking

On 24 June 2019, more than 200 people crowded into the auditorium of the Center for Structural Systems Biology (CSSB) to listen to Saul Perlmutter, winner of the 2011

Nobel Prize in Physics and professor of physics at the University of California, Berkeley. In his talk on "Science, Reality, and Credibility", Perlmutter spoke about ways in which critical thinking used in science could be taught to a wider audience also of non-scientists. He came to Hamburg upon invitation from DESY Zeuthen. The talk was organised and presented by PIER.

From classroom to control room

Students will take over DESY's testbeam in October. The two teams who won this year's "Beamline for Schools" (BL4S) competition are a group of students from Praedinius Gymnasium in Groningen, the Netherlands (see picture) and another group from West High School in Salt Lake City, USA. A total of 178 teams from 49 countries around the world submitted their proposals this year. The two winning teams will carry out their proposed experiments in collaboration with researchers from CERN and DESY. The first BL4S competition took place in 2014, this year CERN is moving to DESY because CERN's accelerators have been switched off for a two-year upgrade break.



News from the DESYUM Visitor Centre

Starting in 2023, the DESYUM visitor centre is set to become the central DESY entry point for a broad range of people – from the general public, school groups and students to trade visitors. In an exhibition measuring around 1000 square metres, they will be able to learn about our research and understand

the significance it has for science, possible industrial applications and people's lives. The DESY Directorate, together with the ITT and PR departments, drafted initial ideas for the "DESYUM Visitor Centre" in the first half of 2018 and summarised them in a vision study. Now, the plans for the new building are becoming more concrete. The DESY construction department has drawn up a demand plan for the building. It is to be built next to building 6 and will also become a meeting point for DESY people and guests. Five architectural offices have submitted their designs for the competition, winners will be announced at the end of September. Meanwhile, the public tenders for the planning services of the building, such as the technology for the building services, are also underway.

Christian Mrotzek in cooperation with Jörg Niderehe from the construction department is responsible for the construction of the visitor centre. Mrotzek develops the basic concept for the exhibition in cooperation with the scientific committee of DESY and external experts, which Niderehe then integrates into the overall construction.

Neutrino observatory IceCube receives significant upgrade

The international neutrino observatory IceCube at the South Pole will be considerably expanded in the coming years. After initial partial approval, the National Science Foundation (NSF) has now released the remaining funding for the IceCube upgrade project. The funding will help to intensify preparations for the installation of seven more strings in 2022/23. In addition to the existing 5160 sensors, a further 700 optical modules will be installed in the eternal ice of Antarctica. The NSF has approved 23 million US dollars for the expansion, the Helmholtz Centres DESY and Karlsruhe Institute of Technology (KIT) are supporting the construction of 430 new optical modules with a total of 5.7 million euros, with which the observatory will for example be expanded into a neutrino laboratory.



Anna Nelles appointed W2 professor



DESY scientist Anna Nelles became W2 professor at Friedrich Alexander University Erlangen-Nuremberg in April. Supported by the W2/W3 programme of the Helmholtz Association, she is establishing a new research activity in astroparticle physics aimed at the detection of neutrinos using radio detectors. This ideally complements the scientific activities at IceCube and sustainably strengthens the astroparticle physics at the Zeuthen site.

Anna Nelles came to DESY in Zeuthen in 2018 with an Emmy Noether group. For her work on the radio detection of air showers and neutrinos, she received an IUPAP Young Scientist Award at the ICRC conference in Madison, USA, at the end of July.

Ingrid-Maria Gregor becomes W2 professor at the university of Bonn



Ingrid-Maria Gregor, group leader of the ATLAS group at DESY, started a professorship for experimental physics at Rheinische Friedrich-Wilhelms-Universität Bonn in spring. The particle physicist is an expert for detector development with silicon technology and works on the construction of new subdetectors for the ATLAS detector at CERN in Geneva. She

graduated with a PhD from the University of Wuppertal, working on the ATLAS experiment, before she joined DESY. Here she first worked at DESY in Zeuthen as a scientist on the HERA experiment HERMES before moving to the ZEUS detector in Hamburg. Even before the LHC went into operation, she switched back to the ATLAS experiment, coordinated the test beam activities at DESY and has headed DESY's ATLAS group since 2015.

Çiğdem İşsever new Lead Scientist



The internationally renowned particle physicist Çiğdem İşsever joined DESY in Zeuthen as Lead Scientist at and Professor of Experimental High-Energy Physics at Humboldt-Universität zu Berlin. Before coming to Berlin she was a professor at the University of Oxford. She will take up her post in Berlin at the beginning of August, researching the self-coupling of

the Higgs particle and new elementary particles interacting with the Higgs boson. İşsever holds an ERC Advanced Grant from the European Union that supports established top researchers with up to 2.5 million euros over five years in realising new, groundbreaking approaches in their research.

DESY start-up CYCLE wins Innovation Award

CYCLE proudly presents its first trophy: at the "Laser World of Photonics" trade fair, the SOPRANO laser system was awarded the

Innovation Award in the Biophotonics & Medical Technology category. SOPRANO does not sing, however – the compact and comparatively inexpensive femtosecond laser has been specifically developed for three-photon microscopy and is therefore ideally suited for imaging living cells. SOPRANO delivers 1300-nanometre and 1700-nanometre laser light simultaneously and can therefore be used for investigations up to 1 mm deep.

Ruth Signorell joins DESY



Ruth Signorell from ETH Zurich has been awarded the Mildred Dresselhaus Guest Professor Program 2019 of the Hamburg Centre for Ultrafast Imaging (CUI). The guest professorship programme includes a longer research stay at the "Advanced Imaging of Matter" excellence cluster at DESY in Hamburg and prize money of 20,000 euros.

Signorell is an internationally recognised expert in physical chemistry with research focus on spectroscopy for nanosystems, especially for properties of molecular clusters and aerosols. She will conduct research together with Jochen Küpper and Francesca Calegari, both of whom work at the University of Hamburg and in leading positions at DESY.

ERC-Grant for Rafael Porto



DESY's new astroparticle physics division already has ERC grants under its belt: Rafael Porto, new scientist in the division, secured an ERC consolidating grant of two million Euros over a period of five years to continue his work in gravitational wave physics. Under the heading "Precision Gravity: From LHC to LISA", Porto's multidisciplinary group, consisting of a number of postdocs and

PhD students with expertise in gravity and particle physics, will work together under the umbrella of gravitational wave science in order to "redefine the frontiers of analytic understanding in gravity", according to Porto. The group is based in Hamburg.

Hamburg Prize for Physics awarded to Matthias Troyer



This year's Hamburg Prize for Theoretical Physics from the Joachim Herz Stiftung goes to Matthias Troyer, a professor at ETH Zürich and quantum computing researcher at Microsoft. He receives the prize for his contributions to the development of so-called quantum Monte Carlo algorithms. These algorithms can predict how tiny particles will interact within quantum mechanical many-

body systems such as atoms and molecules. The Joachim Herz Stiftung awards the annual prize in conjunction with the Wolfgang Pauli Centre (WPC) at the University of Hamburg, DESY, and the Cluster of Excellence "CUI: Advanced Imaging of Matter" at the University of Hamburg.

Observation of cosmic showers

Successful test of Cherenkov camera at the CTA telescope prototype



Group picture with telescope: the NectarCAM and MST team after successful installation of the camera. Picture: DESY, Markus Garczarczyk

Scientists have successfully tested the Cherenkov camera NectarCAM at the CTA telescope prototype in Berlin Adlershof. Thanks to the support from the DESY workshops, the camera weighing almost 1.6 tons, equipped with sensitive photo multipliers and electronics which were partly developed and built at DESY, was successfully mounted into the telescope without any difficulties. Good weather conditions meant that already

during the second night the camera was already able to record the weak light of cosmic air showers at the nocturnal sky of Berlin. The successful test campaign took place until the end of June.

The Medium Size Telescopes, MSTs, of the Cherenkov Telescope Array CTA are the core component of the observatory. Forty of these telescope types are needed to achieve the desired sensitivity within the energy range between 150 GeV and 5 TeV. The Davies-Cotton optics of the MSTs is based on a reflector with a diameter of 12 metres and a focal distance of 16 metres. The reflector is subdivided into 86 hexagonal spherical mirror facets and their tilt angles can be adjusted with actuators. Two different designs of a Cherenkov camera are being developed for the MST. In May, after a long common planning phase of the DESY MST team and their French partner, the NectarCAM was integrated for a test campaign into the MST telescope structure in Adlershof.

Text: Maria Krause
DESY-CTA



New high-tech lab

DESY's Detector Assembly Facility is ready for operation

DESY has a new centre for detector development and assembly. Strictly speaking, it consists of two centres – one in the historic "Hall 1", where the first experiments at the DESY accelerator were carried out, and one in the former research building of the former GKSS in building 25. Since June, both areas of the "Detector Assembly Facility" DAF (see inForm 2/18) are operational and commissioning is in progress.

In the Detector Assembly Facility, DESY and its national and international partners are building and testing central and extremely complex parts for the large particle detectors ATLAS and CMS at CERN in Geneva. At the heart of each of the two DAF areas are ultra-modern clean rooms that have been built into the existing buildings. In one, several thousand high-precision silicon detectors are developed, built, and tested; in the other, they are assembled into complete detector disks: the end caps of the silicon track detectors for ATLAS and CMS.

"The DAF will not only play a central role for the upcoming upgrade of the LHC detectors, but will also be an important facility for the construction of high-performance detectors in the future," said DESY Research Director Joachim Mnich. "The DAF thus underlines DESY's role as the central laboratory for particle physics in Germany". In the next 12 months, further instruments will be installed for



High-tech in historic halls: the Detector Assembly Facility is now ready for operation. Picture: DESY, Barbara Warmbein

serial production. During the peak phase of production, DAF will produce more than 3000 modules for the two track detectors within about 16 months. After final assembly and extensive testing, the two end caps will be transported to the LHC experiments at CERN in Geneva in a few years' time. *baw*

Successful storage service

Largest data archive of astronomy

In February 2019, scientists from the international LOFAR collaboration published sensational results in a special issue of the journal "Astronomy and Astrophysics". The first part of a sky survey with a radio telescope designed for low frequencies was concluded and hundreds of thousands newly discovered galaxies were found in more than 326 000 observed extragalactic radio sources. Shortly after, an email by Onne Zweers, one of the system administrators of the LOFAR data archive, reached the developer team of the dCache project, thanking them for their collaboration. He pointed out that dCache, which has now reached 40 petabytes, is the system behind the world's largest astronomical archives of measuring data. For many years, dCache has been used as a mass-storage system in scientific computing centres all over the world and it is being developed as open source software by a developer team at DESY in Hamburg, Fermilab in Chicago and the Nordic e-Infrastructure Collaboration NeIC in Oslo. External developers such as Zweers also contribute codes regularly.

At DESY, dCache supplies all data for the Grid infrastructure of high energy physics (especially ATLAS, CMS and Belle II) and astroparticle physics (IceCube); it is the long-term archive for HERA and CTA data as well as for photon science data of PETRA III, FLASH and XFEL. It is also used as a mass storage behind the DESY cloud. Altogether, the Hamburg dCache entities alone cover about 30 petabytes. Throughout the world, dCache provides ten thousands of users with hundreds of petabytes and many hundreds of millions of files.

With the application in the LOFAR collaboration, where the data is stored on the dCache instances at SURFsara (Dutch Centre for Supercomputing), Forschungszentrum Jülich and PSNC Poznan (Polish Institute for High Performance Computing and Scientific Computer Networks), dCache has proven its worth on a grand scale in radio astronomy. In this field of research, LOFAR, and soon the Square Kilometre Array SKA, are expected to lead to an enormous increase in the amount of data to be processed, which in a few years will even exceed that of the LHC. This poses enormous challenges to middleware and system architectures with which the data is analysed. With dCache, DESY is already contributing to the Petascale computing landscape.

*Text: Jürgen Starek
dCache Senior Developer
at DESY-IT*



Clouds and the like

Storage and work with the Cloud

Today, we all want to use – or should use – the cloud. What exactly is a cloud? What do I need it for? Do we have that at DESY? Or should I rather use services like google? Are my data stored safely in the cloud?

But first things first: a cloud consists of computers that offer services through the internet. The best known clouds are those used to store data. Often, it is also possible to process these data directly with programmes from the Office cloud in the web browser. There are also computing clouds that make calculations. And lately, gaming clouds are also under discussion.

Whereas the latter will most likely not be offered at our institute, we have storage and computing clouds at DESY. DESY employees and national and international communities are using them intensively. DESY's storage cloud is called Sync & Share, which describes its purpose more accurately, and it can be accessed over : <https://sas.desy.de>.

Instructions are available at:

https://it.desy.de/services/storage_services/desy_sync_share/index_eng.html.

DESY's computing clouds are described at:

https://it.desy.de/services/computing_infrastructure/index_eng.html

Whenever possible, you should use the DESY clouds and avoid external providers with non-European servers. This is the best way to make sure that you and we are in control of data access. In fact, externally initiated collaborations prefer to use Google and the like – however, they are always welcome to use DESY Sync & Share. In case you have questions, please feel free to contact UCO:

Email: uco@desy.de

Phone: -5005

Last but not least: clouds are no universal cure – confidential data should preferably not be stored in the cloud – and if so, only encrypted!

*Text: Martin Gloris
DESY-IT*



Picture: DESY, Marthia Mayer

Sommer School at DESY

Students from all over the world visiting Hamburg and Zeuthen

The summer students arrived at DESY in mid-July. 106 students from 27 nations spend seven weeks researching on the campuses in Hamburg and Zeuthen. DESY inform met some of them and asked them about their impressions.



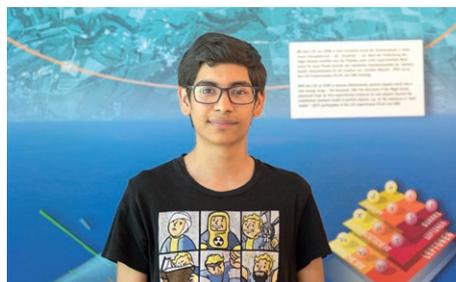
Picture: DESY, Susann Neworok

"At DESY I am working at the CFEL in the team of Henry Chapman. We want to build a mobile sample delivery device to test nozzles for serial crystallography. I am thrilled by the atmosphere here – everyone helps us whenever they can. But I am also impressed at the great level of science we are facing, the physics is fascinating, and the people working here are brilliant."



Agathe Depraz Depland (23)
University Claude Bernard, France

"It is great to exchange ideas with other students and to experience everyday life as a researcher. I can work on my physics projects until late in the evening, discuss with others and watch how the community here invests in learning and reaching further steps in science."



Farouk Mokhtar (21), University of Science and Technology at Zewail City, Egypt

"Here, as a Summer Student, I can improve my knowledge about different aspects of physics, with an experimental and a theoretical approach, with the lessons we have every day and I can learn how to work in a real research group by realizing a two-months project together with the researchers."



Marco Bortolami (23),
University of Padova, Italy

"I came to DESY because I've become quite interested in the study of particle physics and this summer programme was an incredible opportunity to learn more about that."



Carlos Octavio Maciel Santillan (23)
Universidad Autónoma de Baja California, Mexico

"After a week here in DESY, I have felt a very warm and welcoming atmosphere, especially thanks to the strong bond within co-workers in my team. It is also an enriching experience to get to know the other summer students and their different backgrounds."



Lorenzo Cotrozzi (22),
University of Pisa, Italy

"Here on campus in Zeuthen I experience highly qualified and motivated people, respectful and pleasant atmosphere, great facilities and on top of that: a beautiful lake."



Gloria Wolkertorfer (22),
Technical University of Graz, Austria

Bundling up creativity

Six questions to Kerstin Straub, new head of communications at DESY

Since the beginning of June, DESY's PR department has a new manager: Kerstin Straub. Before joining DESY, the experienced journalist and PR expert worked at the child welfare organisation Plan International where she successfully expanded the public relations activities. Kristin Hüttmann of DESY inform met the 55-year-old for an interview.

You came to DESY about three months ago – have you arrived yet?

Yes, I have. This was easy because all doors are open to me. Indeed, there are many doors and I will need some time to follow all invitations. However, I am looking forward to every meeting which will give me the opportunity to learn more about DESY. This is of great help to understand what motivates people at DESY and what is important now and in the future for this research centre.

You are not a physicist – your head must be spinning with all the synchrotron radiation, undulators and neutrinos?

Sure, sometimes – but I actually rather feel positively charged with this! The DESY world is really multifaceted and highly creative and this inspires me. In fact, my questions are welcome and it always fascinates me how vividly scientific subjects are explained to me. My colleagues from the press and public relations department do this in a fantastic way and I can always count on these experts.

Why did you apply for the job at DESY?

DESY becomes more and more present in public awareness. It was all over the media with its plans for the Science City Bahrenfeld, campus development and PETRA IV in January – exactly the time when I wanted to make a professional change. I thought: wow, that's really exciting! It's a matter of holistic design of our future. Then I saw the job advertisement and reacted immediately.

How do you see your role at DESY?

There is a lot of creativity on this campus – in all fields. I understand that there is a demand for coordination and for the implementation of a common communication strategy. This also includes an up-to-date presentation of our website. Simultaneously, with its campus development, DESY will increasingly influence social life – a chance to extend press and public relations work correspondingly. During my first weeks at DESY, I gained the impression that people want to move things according to the DESY 2030 strategy and at the same time create something lasting. To bring this together, to support this, with the goal to communicate the strengths of DESY as effectively as possible – this is how I see my role now.

Will a new communication strategy be necessary?

The course has already been set – a good job has already been done within the framework of the strategy process. Now it is important to pick up the threads once again and to implement



DESY's new PR manager: Kerstin Straub. Picture: DESY, Gesine Born

the strategy. One big area of focus is the new website – making it more attractive, more modern, tailored to each target group. Contemporary methods of approach via social media channels with influencers and bloggers are vital and are already developed at DESY. Recruitment, for example, created DESYcareer, a new appealing channel on Instagram. The diversity of all channels at DESY also represents a challenge – therefore, the design of a new website must be regarded as a joint task.

And what do you do when you are not working?

I spend time with my 13-year-old daughter Cecilia and her faithful friend Pauly, our Labrador. We love the outdoors, especially the Elbe. Currently, my favourite place is the Strand-perle restaurant – not far from DESY, with delicious food on the beach and overlooking the harbour!

Personal details:

Kerstin Straub (*1964) is a publishing manager and professional television journalist and presenter. In the past eight years, she was head of communications for the child welfare organisation Plan International. Previously, she worked as an author, editor and presenter for radio and television channels, such as NDR, HR, RBB, n-tv, RTL and Pro-Sieben – with special interest for science: she organised and led many press conferences and congresses.

Helmholtz Sustainability Summit

The topic “Research for Sustainable Development” touches on the focus topics of the Helmholtz Association so that not only DESY but also other Helmholtz Centres are in the process of shaping centre-specific sustainability at Helmholtz through resource-saving, future-oriented projects. For the first time this year, the Forum Sustainability working group is inviting participants to an event at which the broad range of sustainability will be explained and discussed using practical examples.

The event will open on 28 November with a panel discussion on research and work in the Helmholtz Association with a commitment to sustainability, and include the demonstration of current areas of conflict.

Experts from all Helmholtz centres will report on their concrete experience in the implementation of sustainability projects and answer questions at numerous workshops, on 29 November. The topics range from “Participation & Strategy Development” to “Strategic Personnel Development” to “Energy Management”.

Workshops such as “Research in social responsibility” or “Ethics recommendations” will certainly open up new perspectives on the daily work of researchers, technicians and administrative staff. In addition, there are many opportunities to exchange ideas with other people interested in sustainability.

All those at DESY who are interested in sustainability are cordially invited. The meeting will take place at MDC in Berlin-Buch. Programme and registration for the event at: <http://www.dlr.de/SUSU2019>

*Text: Denise Völker
DESY sustainability
manager*



*Text: Miriam Huckschlag
DESY Relation Management*



Picture: Frank Embacher

Experiment festival

A tent of knowledge at the A Summer's Tale festival

Summer time is festival time – time to enjoy music, dance in the open air and learn something about research at DESY? Does this go together? Of course! With the purpose to prove this, two young DESY colleagues, Marc Wenskat and Jan Schunck, shouldered their trekking backpacks and camping gear and went to the A Summer's Tale festival that took place from 1 to 4 August near Lüneburg.

The Experiment festival adventure begins: among plenty of green, you can see the top of the “Fliegende Bauten” theatre and a small river flowing alongside the grounds. You can hear the first bars of music blown by the wind, you can smell a mixture of forest, barbecue and sweets – the joyful anticipation rises. Marc and Jan exchanged tickets for wristbands, pitched up their tent and got into contact with Jonas, the person in charge of the tent of knowledge – ready to go. Equipped with laptop and site plan, they managed to find the way to the stage which was particularly reserved for science and there was a large tent forming a triad with a beer bar and a food court – the festival knows what physicists want.

For the next four days, the tent of knowledge became the home for both scientists who gave four talks presenting the

latest findings of photon science and particle physics at DESY. Even before the beginning of the festival the talks were booked out.

“There was a great atmosphere in the tent, a super audience. Initially I was a bit nervous even though I have frequently been on stage before. However, the festival experiment has been a success, a great experience,” beamed Marc when he was back in Hamburg. According to Katja Kroschewski, responsible among others for art and cultural projects at DESY, the participation of DESY in the music festival programme was a logical step: “This was a wonderful opportunity for DESY to place its research themes in a different setting for a mostly young target group. The connection of science and art can be quite inspiring for all participants. Festivals offer more than bands and beer. These are spaces where it is possible to make new discoveries in a relaxed atmosphere. With Jan and Marc we have two enthusiastic scientists and excellent brand ambassadors.”