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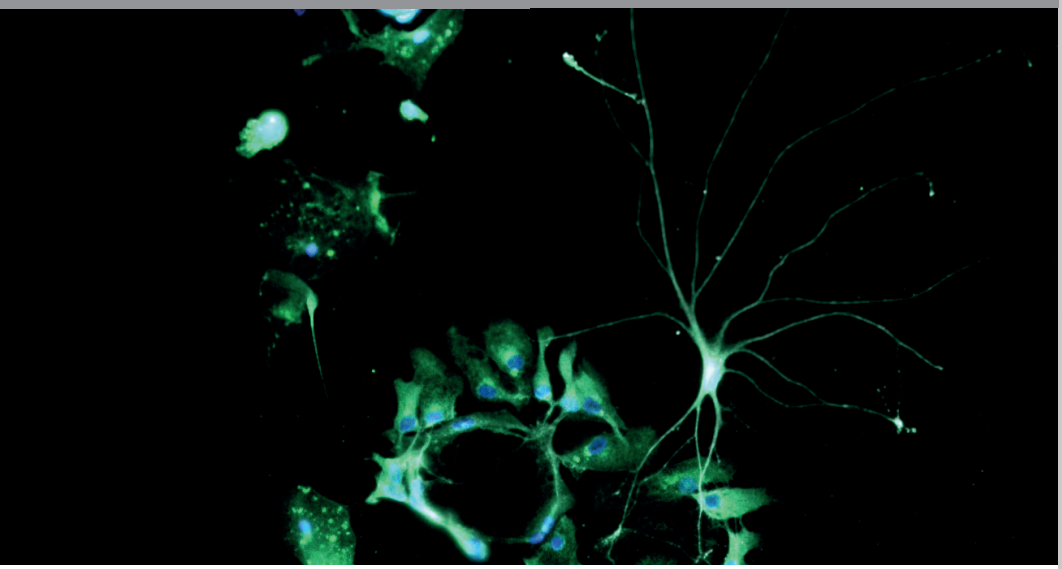
News from the Helmholtz Association

HELMHOLTZ GEMEINSCHAFT



Glial cells were isolated from a patient's cerebral cortex and in cell culture converted into functional neurons (here: nerve cell with long dendrites). Photo: Karow et al., Cell Stem Cell 2012

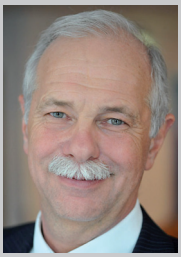
Hitting a Nerve

One of the major challenges of our time, alongside climate change, is demographic change. Society undergoes changes at many levels: cultural composition, age structure, immigration and emigration, birth and death rates. One significant aspect is the increasing life expectancy and the resulting consequence of growing numbers of older people. This is an issue not only requiring pension and health schemes to adapt to but also research.

For instance, scientists within the Helmholtz Association work on the improved understanding of ageing processes and the causes of an increased propensity towards disease in old age. New prevention methods and tailored treatment methods are to help to remain healthy for longer and in old age in particular. Dementia is a typical disease of old age, often caused by Alzheimer's or Parkinson's disease. The research team around Prof. Dr Dieter Edbauer from the German Center for Neurodegenerative Diseases (DZNE) now has discovered an important factor as regards these diseases. In the case of frontotemporal dementia, the so-called FUS protein forms deposits within the nerve cell body, although it ought to be restricted to the nucleus. The researchers have demonstrated that FUS influences the neuron's skeleton and thus its growth. Moreover, FUS causes another important protein, Tau, to be folded into structures that are too long. Altogether, this results in neuronal malfunction and in part even in nerve cell death.

A decisive step has been accomplished also on the path towards healing injuries to the brain: At the Helmholtz Zentrum München, the teams around Prof. Dr Magdalena Götz and Prof. Dr Benedikt Berninger (now University of Mainz) have been able to transform glial cells from human brains into neurons. By using two regulatory proteins, the researchers have for the first time created functioning neurons directly, without the hitherto necessary detour involving stem cells. "We will search for active agents that will allow for the activation of glial cells in trauma patients in order to thereby activate self-healing in the injured brain", says Götz. Incidentally, this year's Nobel Prize in medicine went to Prof. Shinya Yamanaka, University of Kyoto, for the development of said "detour", the transformation of differentiated cells into stem cells.

Dear Readers,



Science in particular thrives on international co-operation. Often, the best heads in a given research field are located in different countries across the globe, so that increasing numbers of scientists network well beyond national boundaries. The Helmholtz Association likewise supports this trend, for instance, by funding German-Russian and German-Chinese research projects and by initiating new co-operation projects. Intent on establishing ourselves as a strong partner in the global science system, we maintain international offices in Brussels, Moscow and Beijing. For ten years now, our Brussels office has been successfully representing the Helmholtz Association's interests in structuring the European research landscape. I would like to use this opportunity to thank the Brussels colleagues for their dedication and excellent co-operation and cordially congratulate them on their anniversary.

Wishing you enjoyable reading and a successful new year,

Yours faithfully, Jürgen Mlynek, President

In this issue:

You can access more reports and more in-depth information in our online issue:

www.helmholtz.de/hermann

In Brief

Fast Magnetic Field Changes

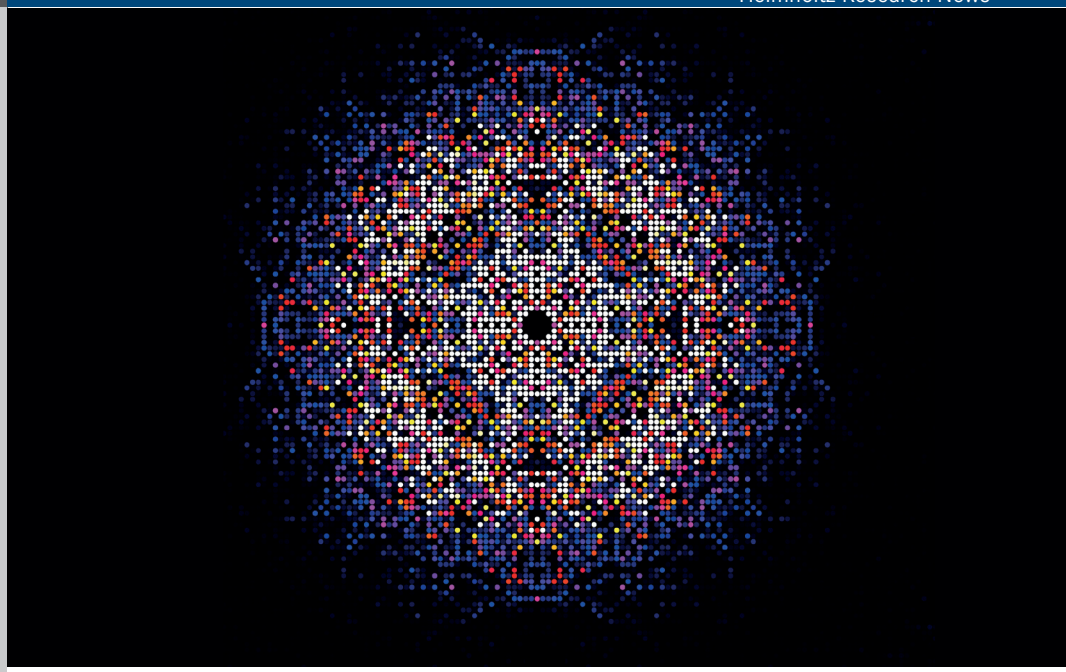
A German-French team of geophysicists has discovered that fast changes in the Earth's magnetic field display close correlation with variations in the Earth's gravity. They used magnetic field data from the CHAMP satellite operated by the Helmholtz Centre Potsdam - GFZ German Research Centre for Geosciences and highly accurate measurements of the Earth's gravitational field provided by the GRACE mission, which involves the GFZ in a leading role. The Earth's magnetic field protects us from cosmic radiation. Changes in the magnetic field are indicated also by tiny changes in the Earth's gravity, which are caused by shifts in its mass resulting from convection currents in the Earth's core.

ELISE Tests New Plasma Heating

The testing facility ELISE (Extraction from a Large Ion Source Experiment) now has been commissioned at the Max Planck Institute for Plasma Physics (IPP), associated within the Helmholtz Association. It is the world's largest facility of its kind. In the next two years, IPP researchers headed by Prof. Dr Ursel Fantz will use it to test whether a newly developed radiation source can heat hydrogen plasma to ignition temperature. In emulation of the Sun, a future fusion power plant is intended to generate energy from nuclear fusion. To this end, the fuel – a hydrogen plasma – needs to be heated to more than 100 million degree Celsius.

Smoking Affects Stem Cells

For the first time ever, a team from the Helmholtz Centre for Environmental Research was able to demonstrate that smoking influences the development of allergy-relevant stem cells. Stem cells are not specialised, can multiply without limits and can develop into the various types of cells and tissue comprising an organism. Various progenitor cells mark the steps between stem cells and fully developed cells, some types of which promote allergies. A study involving 60 children now has revealed that children with skin diseases feature increased amounts of such progenitor cells and that children already affected by dermatosis react particularly sensitively to their environment. Children from families living with ▶



This map served in determining the three-dimensional molecular structure of the enzyme. Image: Karol Nass, CFEL

Targeting Sleeping Sickness

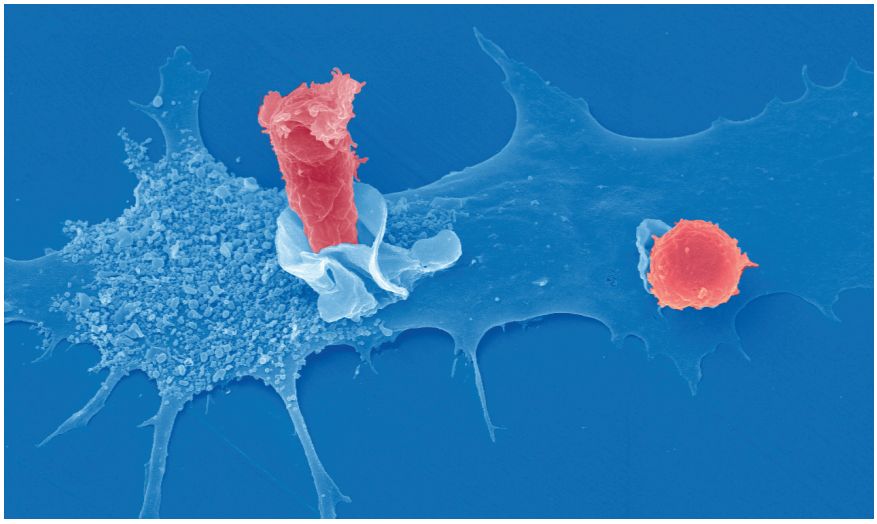
Using the world's most powerful X-ray laser, researchers from the Deutsches Elektronen-Synchrotron DESY and their colleagues have identified a potential Achilles' heel in the pathogen causing sleeping sickness. The detailed structural analysis of an enzyme of the pathogen now provides the blueprint for a potential drug. This was the first time that a new biological structure was analysed using a free-electron laser.

According to WHO estimates, more than 500,000 people in sub-Saharan Africa are affected by sleeping sickness and over 60 million live with the threat. The disease, called also human African trypanosomiasis (HAT), is caused by the *Trypanosoma brucei* parasite, which is transmitted by the tsetse fly. The sleeping sickness derives its name from the typical coma state the patient exhibits in the end phase due to severe deterioration of the central nervous system. Without medical treatment, the disease is usually lethal. Since the currently used drugs are not sufficiently reliable and the parasite increasingly develops resistance against them, the development of new active agents is of great importance.

The enzyme investigated by the researchers goes by the name of cathepsin B and has been previously known as a point of attack for drugs. However, since it occurs not only in the parasite, but also in the human body, medication must target only the pathogen's version of the enzyme, without affecting the human enzyme. To decode the three-dimensional structure of cathepsin B, the research team subjected small crystals from this biomolecule to intensive X-ray radiation from the Linac Coherent Light Source (LCLS) at the SLAC National Accelerator Laboratory in California, USA. The enzyme crystals under investigation were about one thousandth of a millimetre (one micrometre) thick and on average ten micrometres long. Crystals scatter X-rays in a characteristic manner, so that the resulting diffraction images allowed the researchers to calculate the position of the individual atoms within the crystal and thus within the enzyme. To determine the structure of cathepsin B, they needed to produce hundreds of thousands of diffraction images and subsequently assemble them, with each image providing only one part of the structure.

In doing so, they have identified distinct differences between pathogenic and human cathepsin B. Precisely these differences can be used as point of attack for a new, tailored active agent, which targets the pathogenic enzyme and thereby kills the pathogen. Now, the next step would be the production and testing of such an active agent. Yet a new form of medication is still a long way off, the scientists point out. To allow for more of this kind of basic investigation of biomolecules, the building of an even better X-ray laser facility is well under way: the European X-ray free electron laser (European XFEL) is currently being built in Hamburg, with the DESY being its chief shareholder.

The Unknown Enemy



T cells are immune cells that play a central role in combating viruses. The image shows two T cells (red) interacting with a dendritic cell, another type of immune cell. Photo: M. Rohde/HZI

About half of the adult population in Germany carries the cytomegalovirus (CMV) without this infection immediately impacting on their health. In old age, however, infection with CMV can negatively impact on the immune system's defensive forces, as was demonstrated by the work of Prof. Dr Luka Cicin-Sain at the Helmholtz Centre for Infection Research (HZI). For instance, CMV can weaken the immune defence against influenza viruses. In an ageing society such as ours, this long-term consequence is of particular significance.
Infection with CMV during pregnancy is the most common cause behind birth defects resulting from infection. Overall, only the genetically determined Down Syndrome is more frequent. Even so, society is largely ignorant of this danger. For comparison: Rubella, once very much feared, hardly figures in our society any more, since effective vaccination is available. As yet, however, there is no vaccination available for CMV.
Vaccine research focuses on CMV not only as a target, but also as a tool. Scientists attempt to use genetically engineered CM viruses as so-called vectors. The viruses' harmful characteristics are removed and, instead, genes from other pathogenic agents take their place. Because CMV can cause very strong immune cell reactions, research hopes to thereby enable vaccinations against the AIDS pathogen HIV or against the hepatitis C virus. The potential uses include also immunisation against cancer or improved vaccination against tuberculosis. *Jan Grabowski*

Europe's Queen of Computers

The high-performance computer JUQUEEN at the Forschungszentrum Jülich ranks fifth in the list of TOP 500 fastest supercomputers in the world, published in November. JUQUEEN is the first European supercomputer to achieve a processing power of more than 5 petaFLOPS; this corresponds to 5 trillion arithmetic operations per second or the performance of approximately 100,000 modern personal computers. In addition, due to direct water cooling, the new supercomputer is five times more energy efficient than its predecessor JUGENE. JUQUEEN provides ideal conditions to run elaborate climate and atmosphere simulations, to compile complex models of the brain or galaxies and to research new materials and particles. Moreover, JUQUEEN holds the promise of new opportunities for the Human Brain Project, the main goal of which is to simulate the human brain.

The new top-class computer JUQUEEN at Jülich. Photo: Forschungszentrum Jülich

high pollution rates of volatile organic compounds, such as those emitted by smoking, displayed significantly higher rates of allergy-relevant progenitor cells in their blood. It can be deducted that environmental and life-style factors are decisive in determining whether or not a genetic predisposition towards disease will manifest itself.

Lymphoma Switch

Scientists at the German Cancer Research Center have discovered a molecular switch involved in lymphoma development. When the PP4R1 protein is missing, immune cells can divide uncontrolled, migrate through the body and cause tumours in the skin. The cause for this can be a defect in a specific signal pathway: if certain "off switches" are missing, the signal pathway remains permanently active, resulting in tumours. PP4R1 is one of these central switches and seems to play a role also in other forms of cancer. The researchers now investigate the reason behind the failure to create PP4R1 and hope to derive from it new potential treatment methods.

Happiness Hormone Helps Memory

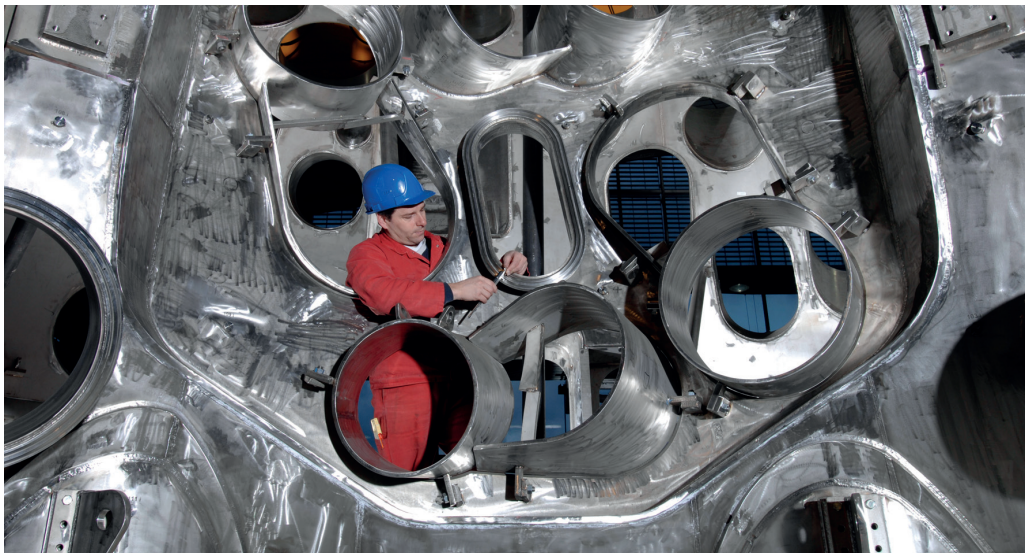
The happiness hormone dopamine strengthens long-term memory. This is the result of work by a team headed by Prof. Dr Emrah Düzel from the German Center for Neurodegenerative Diseases and the Otto-von-Guericke University Magdeburg. Test persons between 65 and 75 years of age were given a dopamine precursor substance. They proved to perform better in a memory test than did a comparison group that was given a placebo.

Crowd Funding for Research

With "Sciencestarter", the Science in Dialogue initiative now has established the first German language crowd funding platform for the scientific world. Researchers can use the platform to find sponsors for project ideas in the fields of science and science communication. To this end, within 30 days, they first need to find sufficient fans in favour of their project and then, during the ensuing crowd funding phase, need to win over sponsors for funding the project. If the target sum is achieved, the scientists receive the complete amount of funds collected.
www.sciencestarter.de

More Freedom for Science

The "Freedom of Science Act" minimises bureaucracy and strengthens international competitiveness in research. As of 2013, extramural research organisations in Germany will be given more autonomy and independent responsibility as regards their budgeting. After the Bundestag decision from 18 October 2012 and the positive statement from the Bundesrat, the "Gesetz zur Flexibilisierung von haushaltsrechtlichen Rahmenbedingungen außeruniversitärer Wissenschaftseinrichtungen" – in short, Freedom of Science Act – will come into effect on 31 December 2012. It gives the scientific organisations greater leeway with regards to budget and human resource decisions as well as participation and building projects. With this act, the federal government further extends flexibility in addition to the 2008 freedom of science initiative. The act affects the Helmholtz Association as well as the Leibniz Association, the Max Planck Society, the Fraunhofer Gesellschaft, the Deutsche Forschungsgemeinschaft - German Research Institution and other scientific institutions.



In future, third-party funds from non-public sources may also be used for paying salaries and salary components for science-relevant personnel. Photo: IPP

Global Budgets: Coverage, Transferability, Abolition of Staff Appointment Schemes
In future, the institutions can budget in a more flexible and demand-oriented manner. They now may allocate funds, which, due to unforeseeable changes, will become necessary for investment not until a later stage, also for operating equipment and vice versa. Very complex, innovative research projects in particular profit from this change, because often they are difficult to plan and require short-term decisions due to their technologically pioneering character. Now, unused budget funds may be fully transferred to the following year; so far, only 20 per cent could be carried forward. Up to now, the number of positions for executive staff was strictly limited. Discontinuation of the so-called W3 staff appointment schemes paves the way for organisational modernisation, that is, the institution of smaller, more powerful institutes, which can act faster, more efficiently and more flexibly.

Human Resources: Limitation of the "Besserstellungsverbot"
In future, the Freedom of Science Act allows the involved scientific organisations to use also third-party funds from non-public sources for salaries and salary components of scientific and science-relevant staff. This supports the institutions in winning over and keeping top-level staff from both at home and abroad with competitive work offers. This is of particular value for the Helmholtz Association. Due to its mission to create and operate complex research infrastructures, it is dependent on highly qualified executive personnel in the technical fields.

Participation: Faster Proceedings
Authorisation processes for involvement in enterprises with national and international partners will be streamlined and accelerated by the abolition of the right to reserve approval. Thereby, co-operation projects can be implemented faster and more flexibly – an important requirement in maintaining and further expanding international competitiveness.

Building Projects: Simplified Proceedings
Institutions with sufficient competence as regards building and controlling are given the opportunity to carry out building projects of a volume of up to five million Euro without having to involve governmental building authorities. Larger building projects benefit from simplified proceedings and the involvement of governmental building authorities is limited to the necessary minimum.

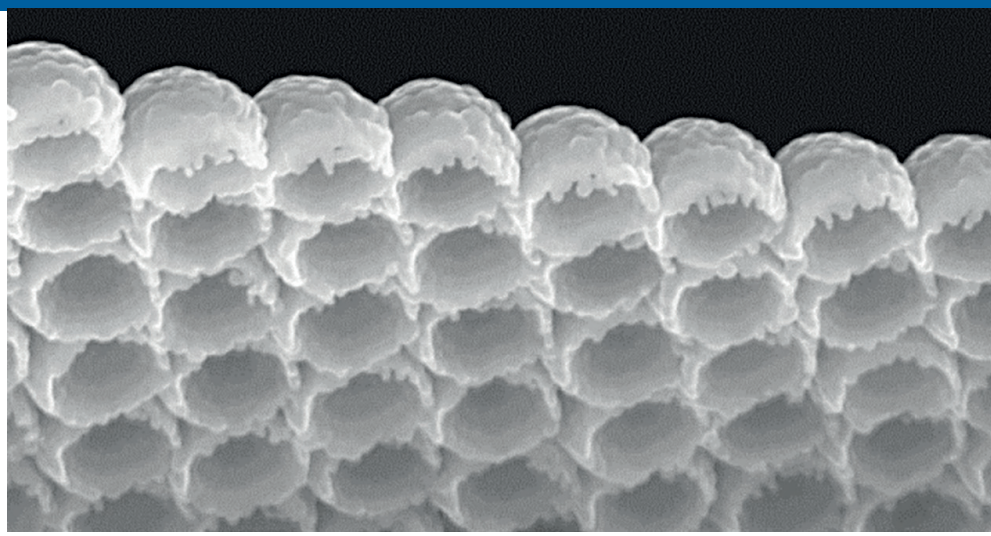
The Freedom of Science Act is an important step forward for German research, since legal framework conditions increasingly are a success factor in the context of international competition. The Helmholtz Association acknowledges its duty to use the newly granted freedom in a responsible and transparent manner. It assumes that these flexibilities now will be adopted also by the German federal states.

Rolf Zettl / Katrin Rehak

Corrosive: Building 3D Structures

A new etching technique creates three-dimensional micro structures in silicon, which can be used for processing light signals in telecommunication applications. Tailored optical materials control the fast transmission of light signals. Yet it is very laborious to imprint silicon with the required structure, because it has to be regular and precise in all directions. "Our new production process SPRIE uses established technology, such as etching, innovative processes, such as self-organisation, and combines these in a creative manner", says Prof. Dr Martin Wegener from the Karlsruhe Institute of Technology. First, a solution of tiny polystyrene spheres is applied to a silicon surface. As the solution dries, the spheres organise themselves to form a dense, single layer and thus serve in creating a honeycomb etching mask. The etchant is a reactive plasma gas. An electric field controls whether the gas particles etch in depth or consistently in all directions. Within a few minutes, a three-dimensional, photonic crystal is created that can be used as an optical material in telecommunications.

Light for Refuelling



At the HZB Institute for Solar Fuels, researchers now experiment with nano structures to efficiently use sunlight to produce hydrogen. Photo: HZB

At the "Solar Fuels" institute of the Helmholtz-Zentrum Berlin (HZB), Prof. Dr Roel van de Krol and his team develop new material systems, which transform as efficiently as possible energy from sunlight into hydrogen. Hydrogen is a chemical storage for solar energy and is versatile as regards its application: within a fuel cell, it can produce electricity or it can be further processed to methane, methanol, petrol or diesel.

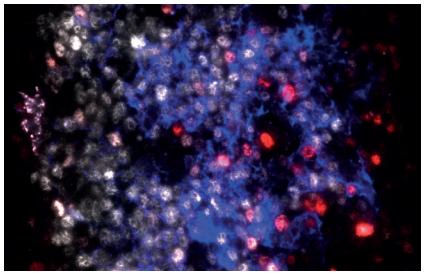
In an electrolytic process, water can be split into its components oxygen and hydrogen. In order for this to be achieved by sunlight, the light first needs to create voltage within the electrode, just as in a solar cell. In his work, van de Krol can draw from the HZB's vast experience in solar cell research. The electrode core consists of a multitude of differently doped semiconductor layers, which form several junctions. The researchers have demonstrated that one of these junctions can be replaced by a metal oxide layer. This would present one method of facilitating the production of these multilayered systems, of increasing their stability to resist corrosion and to improve their efficiency. Whereas semiconductor junctions predominantly use long-wave red light for charge separation, the metal oxide layer transforms light's blue components into voltage.

Van de Krol and his team already experiment with metal oxide nano structures. The reason for this is that the metal oxide layer needs to fulfil two contradictory requirements: On the one hand, it ought to be sufficiently thick to absorb enough light, whereas, on the other, it should be as thin as possible to allow easy discharge for charge carriers. Nano structures offer interesting solutions for this problem: A thin "carpet" of nanorods would provide short pathways for charge carriers and at the same time sufficient head way for light absorption. Or take the "hollow cup" structure made of iron oxide: the open hemispheres could capture almost all of the light. "We need solar energy storage solutions on a terawatt hour scale and chemical storage such as hydrogen could be part of the solution", says van de Krol with full conviction.

Antonia Rötger

Immune Cell Tumours

The most frequent form of adenoid tissue tumours, B-cell lymphomas, is characterised by a certain gene being overly active due to its misplaced position in the genetic material. Antibody producing B-cells propagate in the lymphoid organs' germinal centres. In doing so, they change also their genetic material to be able to combat new pathogens. Investigating those germinal centres, Dr Dinis Calado and Prof. Dr. Klaus Rajewsky from the Max Delbrück Center have identified two B-cell subgroups, in which said gene, called MYC, is active. Normally, MYC controls cell division processes and is of importance also for the germinal centres, however, its activity in B-cells was unknown so far. The now discovered B-cell groups with MYC activity carry an increased risk for tumour formation, because errors can easily occur due to their fast propagation rate and changing within the germinal centres.



In the immune system's germinal centres, immune cells learn to specifically target pathogens. Photo: Dinis Calado/ MDC

Internal Affairs: New HelmholtzNET

Some 3,000 colleagues use HelmholtzNET, in particular the group sections. Yet technically speaking, it by now has reached its limits. This is why we introduce a new HelmholtzNET based on MS Sharepoint 2010, the world-wide most used Intranet software. The already existing user profiles will be migrated to the new HelmholtzNET; users will receive an invitation for confirmation of their account when the new system goes online in early 2013. The main uses are:

1. Applications and Reports: Applications and technical reports can be submitted online. Report assessments are likewise submitted online.
2. Programme Evaluation: Assessors receive all required information and joint report compilation is possible including parallel editing.
3. Group Sections: Working teams, working groups and free project groups work in a member-only section featuring document exchange, email mailing lists, WIKI and calendar. In the new HelmholtzNET, external guests, too, can become members.
4. HelmholtzBox: This allows for simplified data exchange with internal and external persons. Every user can set up their own HelmholtzBox.
5. Intranet: This is a streamlined information section featuring useful information regarding the centres, hotels and booking of venues.

You will find the new HelmholtzNET as usual under:

www.helmholtznet.de

Oliver Seim

New Data Highway

A new data highway connects high-performance computers at various universities and research institutions. Photo: Michel Tronchetti, CC BY-NC 3.0

A part of a new data highway, the so-called "FAIR Tera Net" has been commissioned at the GSI Helmholtz Centre for Heavy Ion Research GmbH. It connects high-performance computers at various research institutions and universities in Hessen and, in particular, is to provide data transmission for the future accelerator centre FAIR, which is being built at the GSI. Since the FAIR experiments will yield huge amounts of data, the researchers need an extremely efficient IT infrastructure. "FAIR Tera Net" links the emerging accelerator centre with other high-performance computers in Hessen and thereby creates direct access to stored data. During the pilot phase, the transmission speed will be 120 gigabit per second; later, this will be increased to 1 terabit per second.

REXUS: Zero Gravity Student Research

Unfortunately, it will not be possible for some time to come for student teams from the Aachen University of Applied Sciences and the Technical University Dresden to be able to fly to the International Space Station. However, the German Aerospace Center (DLR) offers a different option of conducting zero gravity experiments. For this, though, the students had to travel to the secluded, wintry cold of North Sweden. On 16 November 2012, the REXUS 11 mission's research rocket brought the experiments to 79 kilometres altitude. During the subsequent two minutes free fall, the students' primed experiments proceed automatically.
For instance, the "CaRu" experiment by the TU Dresden's team applied a liquid to extremely absorbent paper within a pressure chamber. The questions: How does the liquid spread? Are there differences compared to its behaviour under gravity? A high-resolution camera recorded the experiment during the flight. After parachute-aided landing, the experiments were retrieved and returned to the rocket base, where the students immediately began with evaluating the data – one advantage compared to zero gravity experiments at the space station.

The German-Swedish early career researcher programme REXUS/BEXUS (Rocket/Balloon Experiments for University Students) allows students to gain practical experience in preparing and conducting aerospace projects. Each year, students can submit new suggestions for experiments at the DLR.

Start of the REXUS 10 research rocket at Kiruna (North Sweden). Photo: A. Lambert/ESA

Henning Krause

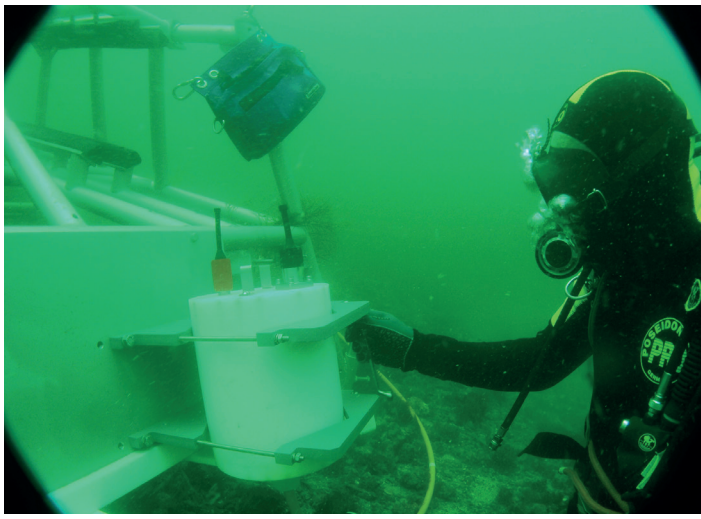
Stars, Jets and Batteries

Magnetic instabilities play a role in the genesis of black holes, yet they regulate also the rotation speed of collapsing stars and influence the behaviour of cosmic streams of matter, so-called jets. This year, at the Helmholtz-Zentrum Dresden-Rossendorf, such a magnetic instability – the Tayler instability – was verified for the first time ever in a laboratory. This phenomenon occurs when sufficiently strong electrical current flows through a conductive liquid. As of a certain magnitude, the interaction of the electrical current with its own magnetic field creates a stream. The HZDR researchers have found out that this phenomenon can occur not only in outer space but also on Earth, that is, in liquid metal batteries. These are a potential, cost-effective storage solution for renewable energies. However, the latest results now suggest that this form of application could prove rather complicated.

"We have calculated that as of a certain current density and battery size, the Tayler instability inevitably occurs, resulting in strong streams within the layers of metal. This will agitate the liquid layers and cause them to short-circuit", says Dr Frank Stefani.

North Sea Multiple Socket-Outlet

In September 2012, marine biologists from the Alfred Wegener Institute for Polar and Marine Research (AWI) have anchored the first data hub in the North Sea 700 metres north of Helgoland. The hub resembles a multiple socket-outlet, providing ports for up to ten measuring devices. The data hub was designed by scientists from the Helmholtz Centre Geesthacht (HZG) and developed in co-operation with the AWI. Embedded in a 600 kilogramme supporting frame, measuring data regarding current, salt content and oxygen as well as other parameters can be regularly collected independent of weather conditions and the seasons. For the first time, this enables uninterrupted data collection, which, in contrast to previous punctual measurements, allows for definite differentiation between natural and man-made changes. The Biologische Anstalt Helgoland, a part institute of the AWI, is responsible for on-site maintenance of the hub. To begin with, the hub was anchored in a depth of ten metres, however, it is designed for depths of up to 300 metres. A line from Helgoland provides the socket hub with power, whereas the connected devices are controlled via the internet. A fibre optic cable serves to transmit obtained measuring data back to Helgoland. The data hub is part of the COSYNA observation and analysis system for the observation of the North Sea's coastal regions and of the Arctic Sea. The data obtained by COSYNA are publicly accessible, so that researchers from all around the globe can participate in their evaluation.



A Helgoland research diver connects a cable at the data hub.
Photo: Philipp Fischer/AWI

Drilling Deep to Understand Earth

For two months, scientists from the GEOMAR Helmholtz Centre for Ocean Research Kiel travelled on the American drilling ship JOIDES Resolution off the west coast of Costa Rica. In this seismically highly active region, they researched the mechanisms triggering earthquakes and volcanism. A few days ago, they returned from their voyage. The drilling ship JOIDES Resolution, one of the world's largest research vessels, travels the oceans all around the globe in its quest of finding out more about the Earth's outer mantle and the processes within. The international expedition ran from 23 October to 11 December 2012 and included also three GEOMAR scientists. The researchers drilled along so-called subduction zones. These are areas where the oceanic crust of the Earth slides underneath the continental crust. The project, for which GEOMAR researchers Dr Steffen Kutterolf, Dr Michael Stipp and Dr Ken Heydolph collected samples during their trip, is called "Costa Rica Seismogenesis Project" or CRISP, for short. In 2002, the target area experienced a major earthquake. Because of the many preliminary investigations the Kiel-based scientists had previously conducted in the area, the researchers were able to assess the best drilling locations. Hence, the voyage proved successful: The borings and multi-disciplinary co-operation provided the researchers with new insights regarding the development of and changes to the subduction zone over time. Potentially, the results could contribute also to an improved understanding of earthquakes in other regions of the Earth. For instance, the devastating earthquake off the Japanese coast on 11 March 2011 occurred in a subduction zone with a structure similar to the one off Costa Rica.

"So far, other types of subduction zones were considered much more dangerous", says Stipp, "clearly, we need to correct some models describing the onset of earthquakes." The expedition involved 33 scientists from ten nations. It served in preparation of the CRISP project's highlight: drilling five kilometres deep into the seismogenic layer.

This research voyage ended under palm trees in Costa Rica. Yet prior to that, the scientists had worked at sea in shifts seven days a week for two months. Photo: S. Kutterolf, GEOMAR

Awards

For his research on optical imaging, Prof. Dr **Vasilis Ntziachristos**, Director of the Institute for Biological and Medical Imaging at the Helmholtz Zentrum München, receives the Leibniz Prize endowed with 2.5 million Euro. With the procedure developed by him, he has provided new impulses for basic research and for the treatment of patients. The Deutsche Forschungsgemeinschaft - German Research Foundation will award the prize on 19 March 2013 in Berlin.

This year's Karl Heinz Beckurts Award goes to Dr **Uwe Franke**, Dr **Stefan Gehrig** and Dr **Clemens Rabe**. The three Daimler AG researchers receive the award endowed with 30,000 Euro for their development of a "6D Vision" procedure supporting drivers in confusing traffic situations. Next year, Mercedes-Benz will for the first time offer the "6D Vision" system in serial production and, according to its own statements, intends to make it available also to other manufacturers. The Karl Heinz Beckurts Foundation was established by the Helmholtz Association in 1987 and strives to promote partnerships between science and industry.

Dr **Thomas Hofmann**, Head of a Young Investigators Group at the German Cancer Research Center, is the recipient of the Berlin-Brandenburg Academy of Sciences and Humanities award endowed with 10,000 Euro. The biologist has found out how cells determine their future fate after having suffered damage to their genetic material. His results contribute to understanding how cancer cells react to treatment methods that damage the genetic material.

For her outstanding work on the path to verifying the Higgs boson, DESY physicist Dr **Kerstin Tackmann** receives the Hertha Sponer Prize awarded by the Deutsche Physikalische Gesellschaft (DPG - German Physical Society). The prize endowed with 3,000 Euro will be awarded in March 2013 in the context of the DPG annual conference in Dresden. The Hertha Sponer Prize is to encourage young female scientists in particular and aims at winning over more women for a career in physics.

Pollutants in the marine environment – this is the topic **Roxana Sühring** has focused on in her diploma and subsequent doctoral thesis at the Helmholtz Centre Geesthacht's Institute of Coastal Research. The Possehl Foundation now awarded her with a sponsorship totalling 2,500 Euro for her research on the pollution of eels with flame retardants.

The **IONYS AG**, a spin-off company of the Karlsruhe Institute of Technology and the University of Karlsruhe, has made it to the top ten in the federal state competition for young enterprises. In the competition called by the Baden-Württemberg federal state government and the L-Bank, the enterprise has prevailed against more than 460 participants. The federal state award acknowledges the performance power and creativity as well as the social and ecological commitment of young enterprises in Baden-Württemberg.

Prof. Dr **Monika Koch-Müller** from the Helmholtz-Zentrum Potsdam – GFZ German Research Centre for Geosciences has been elected a Fellow of the "Mineralogical Society of America" (MSA). The requirement for a MSA Fellowship is a scientific paper that has significantly promoted mineralogy, crystallography, petrology, geochemistry or a related science.

New Appointments

As of 1 January 2013, Jan-Martin Wiarda will be the new head of the "Communication and Media" department at the Helmholtz head office. Previously, Wiarda was deputy head of the "Chances" department at the ZEIT newspaper. Parallel to studying politics, economics and sociology in Munich, he completed a vocational training course at the Deutsche Journalistenschule. In 2003, he completed his study course with a master's degree at the North Carolina University, USA. For many years now, Wiarda has been writing for various daily newspapers, including the Süddeutsche Zeitung, Tagesspiegel and Financial Times Deutschland. In 2004, he became an editor at the ZEIT newspaper. For his journalistic work, Wiarda has received, amongst other recognition, the KAUSA-Medienpreis. Moreover, he regularly works as a presenter for panel discussions and on congresses.

Calls for Applications

Each year, the Körber Foundation awards the **German Thesis Award**, including three main awards of 30,000 Euro each, in recognition of early career research contributions of outstanding social significance. The call for application addresses postdocs of all scientific disciplines, who have completed their doctorate with magna or summa cum laude. The cut-off date for the submission of applications is always the 1st of March. All those, who have completed their doctorate in 2012 with an excellent result, can thus apply for the German Thesis Award up until 1 March 2013.

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