

hermann

News from the Helmholtz Association



Aerial view of the science site Ny-Ålesund on the western coast of Spitsbergen. Photo: Joe Haschek, AWI

Anniversary in the Far North

Party time at the northernmost research site in the world: On 26 April, the Arctic station AWIPEV on Spitsbergen celebrated the ten-year anniversary of the German-French co-operation between the Alfred Wegener Institute Helmholtz Centre for Polar and Marine Research (AWI) and the Institut Polaire Paul Emile Victor (IPEV). The celebrations were topped off with the AWIPEV being the worldwide first station to receive the GRUAN seal of quality for standardised atmospheric measurements.

Established in 2003 as a symbol of joint European polar research, the AWIPEV is, in addition to marine biology, renowned in particular for the exact investigation of the atmosphere and the climate. For instance, the researchers use research balloons to send radiosondes to heights of up to 30 kilometres. These sondes measure temperature, atmospheric pressure and humidity by the second and transmit the data to ground control. Thus are compiled exact height profiles of these measured values, which are collected over years, always by the same method. These data allow the scientists to derive long-term climate trends and compare these with computer

model calculations. Yet the decisive factor in the compilation of global climate models is the fact that the collected data from all measuring stations is comparable. To this end, the international climate reference network GRUAN has developed a requirements catalogue stipulating standards for such measurements. The AWIPEV is the worldwide first meteorological institution to have received the GRUAN seal of quality. It is the first station implementing all these standards in its measurements.

As yet, the up to 150 German and French scientists working at the AWIPEV station each year are deployed across six research and living quarters in the research village of Ny-Ålesund. In co-operation with the Bremen-based "School of Architecture", plans for a centralised new building are currently being devised. However, the collaboration within the German-French team is excellent already in spite of the scattered workplaces: "The best proof of that is our joint winter team, which we put together since five years ago and jointly train for the task. On site, it is no longer an issue who comes from Germany and who from France", says AWI station co-ordinator Roland Neuber.

Dear Readers,



Research arises from curiosity. From time immemorial, human beings want to know about the meaning of the world around them and the laws governing it. Perhaps scientists are simply particularly curious humans. It is a pity that they sometimes struggle to tell others about what their work is about. Increasing numbers of science organisations agree that a central goal for the coming years will be to tear down the confines of understanding separating science from the society providing its funding. For us as the Helmholtz Association this means that we intend to be open and transparent in our communication with and to society. One element in this is the magazine you are about to read. As of the next issue in July, it will be presented in a new design. You may want to be curious.

Wishing you enjoyable reading,

Yours faithfully, Jürgen Mlynek, President

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In Brief

Helmholtz Open Access Workshop at DESY

Between 10 and 11 June, the central library of the Deutsches Elektronen-Synchrotron DESY and the Helmholtz Open Access Coordination Office offer a Helmholtz Open Access Workshop, hosted at DESY. The event provides a platform for information exchange and discussion regarding the open access to publications and research data. The focus is on the field of material science. Applications from Helmholtz employees will be accepted until 3 June.

Radiation Treatment Planning Model Licensed

The research group "Biological Modelling" at the GSI Helmholtz Centre for Heavy Ion Research, headed by Michael Scholz, has developed a model for calculating the optimal ion beam dose for radiation treatment of tumours. The GSI now has licensed the so-called Local Effect Model (LEM) to RaySearch Laboratories in Stockholm for further marketing. Ion beam treatment requires precise planning in order to kill as many cancer cells as possible while at the same time keeping healthy tissue intact. The newly developed model can calculate the optimal treatment dose for all kinds of ion beams and was already successfully used in carbon ion therapy at the GSI accelerator facility.

Nano Data Storage and Battery in One

The Jülich-Aachen Research Alliance (JARA) team around Rainer Waser has found out that so-called resistive memory cells (ReRAM) function also as a battery. So far, the tiny memory cells were considered to be purely passive elements. The discovery opens up new possibilities for optimised production and practical application. The innovative electronic data storage devices have the potential to be significantly more powerful yet requiring less energy than currently used types of memory. Instead of electrons they use ions for storing data, thus allowing for a more compact design.



Schematic illustration of a Cherenkov Telescope Array the construction of which will involve the DESY. Photo: G. Pérez, IAC (SMM)

New Large-scale Projects

Six Helmholtz Association centres are involved in planning the three large-scale research projects the implementation of which was rated as particularly urgent by the German Federal Ministry of Education and Research (BMBF) upon recommendation by the German Council of Science and Humanities. After their acceptance into the "Roadmap for Research Infrastructures" and the corresponding funding pledge, the realisation of the projects is within grasp. Yet what does this signify for the Helmholtz Association? "hermann" asked Managing Director Rolf Zettl:

Six Helmholtz centres as part of the most important research infrastructures. Typically Helmholtz?

One could say that. Co-ordinating large-scale research infrastructures is an important part of our mission. We have already planned, built and operated many large facilities of comparable size. Ultimately, it is our task to provide such facilities for science in order to be able to answer, with our partners, research issues of social relevance. This is a day of joy for the world of science in general. The selection of projects creates a diversity, which will

be highly attractive for researchers from all across the globe.

A day of joy also for the managing director of the Helmholtz association?

As yet my joy remains contained, since we currently are unable to assess the costs and the expectations of co-funding that may be directed at the Helmholtz Association. The basic principle is that operating costs must be borne by those organisations, which have made the request.

What are the responsibilities science enters into in consequence of such a (financial) gift?

The responsibilities are always the same: receiving tax-payers' money demands responsible use of these funds. The plans for these facilities must be implemented in a responsible manner, both as regards construction and operation. And then we hope that the insights gained in the experiments will be of considerable added value to society, thus justifying the costs.

The interview was conducted by Janine Tychsen.

The selected projects in detail:

The Cherenkov Telescope Array measures cosmic gamma radiation of the highest energy levels and is to consist of three different telescope types. The Deutsches Elektronen-Synchrotron DESY, a Helmholtz Association member, has taken over responsibility for building one of these three telescope types.

In the EU-Openscreen co-operation project, numerous European research institutions intend to jointly identify hundreds of thousands of biologically active substances, collecting these in a central database. The substances may serve as starting points for new medication development. On part of the Helmholtz Association, the project involves the Max Delbrück Center and the Helmholtz Centre for Infection Research.

IAGOS will use commercial aircraft to collect atmospheric data from the height of the air corridors. The new system thus allows for more detailed climate forecasts and it can identify the effects of air pollution. Helmholtz partners are the Forschungszentrum Jülich, the Karlsruhe Institute of Technology and the German Aerospace Center.

Raw Materials from Mobile Phones



Mobile phones contain many metalliferous raw materials. The German Ministry of Education and Research now funds their reclamation. Photo: Buero Quer

Rare metals are used in many hightech products such as mobile phones. Since only small amounts are required while at the same time being of particular importance, these are called also strategic metals. Their reclamation from discarded products is often quite difficult. They are well hidden and their extraction requires a lot of effort. The funding instrument "r³ - Innovative Technol-

ogies for Resource Efficiency" of the German Federal Ministry of Education and Research (BMBF) supports scientists in developing methods for the reclamation of strategic metals and minerals. The Helmholtz Institute Freiberg for Resource Technology has a co-ordinating function in a part-project within this instrument: extracting rare raw materials from mine dumps and slag heaps.

Our Blood Reveals the Right Treatment

These days, a given disease is usually treated with a standard method; for example, tumours are treated either with radiotherapy or chemotherapy. However, the same disease tends to manifest itself differently in each individual and everyone reacts differently to a given form of treatment. The reasons for this lie in the genetic material, the metabolic characteristics, the lifestyle and the age of the patient. This is where personalised medicine comes into play. By way of biomarkers it tries to assess even prior to treatment, which would be the best form of treatment for the individual patient. Biomarkers are substances providing information regarding the body and its individual characteristics: these include genes, proteins, metabolic products and cells. They can be examined in the blood or a tissue sample and indicate whether there is an increased risk for a specific disease, how far advanced an existing disease may be and the characteristics with which it manifests itself in the patient. On the basis of biomarker examination, medical practitioners allocate their patients

to groups with the same or similar characteristics and then apply the treatment holding the most promise for this group of patients. They thus minimise the risk of unsuccessful treatments and intolerances. Personalised medicine is well advanced in particular as regards to some cancer diseases – last but not least thanks to the pioneering contributions from the German Cancer Research Centre. As regards the treatment of cardiovascular, neurological, infection and metabolic diseases, such as diabetes, it is as yet in its infant stages. In spite of all promise of success, personalised medicine is not without controversy: Does it create too much hope in the patient? How is one to deal with information regarding other diseases revealed by the biomarker examination? Where and for how long should patient data be stored? When may psychological care become necessary? And who bears the costs? The Helmholtz Association will look into this issue during the next Fokus@Helmholtz on 12 June 2013 in Berlin.

Fewer Airport Vortices

The German Aerospace Center has developed panels to be set up alongside runways for minimising the air vortices caused by aircraft. Drawn out vortices in the wake of aircraft can throw smaller aeroplanes off course and therefore warrant a safety clearance of currently about 10 km. Since the new ground panels cause these long-lived air vortices to dissolve more quickly, aeroplanes could in future land in closer succession. The more efficient utilisation of runways would, for instance, eliminate the need for their expansion.

Marker Illustrates Disease Progress

The German Cancer Research Centre team headed by Jochen Hess has identified a chemical marking pattern in the genetic material of cancer cells in the oropharynx, which indicates a less strong progress of the disease. Patients displaying this marker could be eligible for a less intensive and therefore better tolerated treatment. Risk factors for cancer of the oropharynx are predominantly alcohol and nicotine, as well as infection with human papillomavirus. The chances of effecting a cure are often quite positive, yet there are also cases with complications. The newly discovered marker coincides with the easily curable cases and thus can help in choosing the best form of treatment.

Book Recommendation

"The Climate Trap"

The climate debate is gridlocked: the goal of limiting temperature increase to two degrees Celsius is scientifically controversial; the quarrel between sceptics and admonishers stifles the debate and renders political action difficult. The climate researcher Hans von Storch and the ethnologist Werner Krauß state: "We are stuck in a climate trap." In their book "Die Klimafalle" (The Climate Trap), the unusual team of authors casts a new glance at the essential stages of climate research and policy. The authors illustrate how in their view climate research has fallen into a "trap" and how it can get out of it again.

Awards

The marine scientists Judith Hauck from the Alfred Wegener Institute and Axel Moeller from the Helmholtz-Zentrum Geesthacht are awarded the Annette Barthelet Prize for their work on the Antarctic carbon cycle and on long-term pollutant distribution. They each receive a research scholarship to the amount of 3,000 Euro. The prize is in commemoration of four young marine scientists from the then-time Kiel Institute for Marine Science, today's GEOMAR Helmholtz Centre for Ocean Research Kiel, who lost their lives in a terrorist attack in Djibouti.

This year's Felix Burda Award in the category "Medicine and Science" went to Christian Stock, Michael Hoffmeister and Hermann Brenner from the German Cancer Research Centre (DKFZ). In the context of a study, they have proven the safety of colonoscopy. The first-time award in the category "Best Prevention Idea" went to Cornelia Ulrich, Ulrike Bussas and Clare Abbenhardt from the National Center for Tumor Diseases and from the DKFZ. They looked into the question on how to best identify and inform high risk groups. Both awards are endowed with 5,000 Euro.

Harald zur Hausen from the German Cancer Research Centre is the only German to have been elected an inaugural fellow of the newly established American Association for Cancer Research (AACR) Academy. The inaugural class of Fellows of the AACR Academy consists of 106 individuals, including 36 Nobel Prize awardees. The recipient of the 2008 Nobel Prize for Medicine hopes his membership will lead to intensive exchange with the internationally leading cancer researchers.

New Appointments



Emmanuelle Charpentier from the Helmholtz Centre for Infection Research (HZI) will be honoured with a Humboldt Professorship. Since December 2012, she contributes to the HZI's work with her research on "Regulation in Infection Biology". Charpentier has previously researched at the Institut Pasteur and

at the Rockefeller University. In the long term, Charpentier is to conduct translation research at Twincore, a centre jointly established by the Hannover Medical School and the HZI, where basic research scientists and medical practitioners closely work together. The Humboldt Professorship aims at making Germany as a site for science more attractive for foreign top-class researchers and, with up to five million Euro, it is Germany's highest endowed research award.

Harvard Professor Cristopher T. Walsh is to receive the Inhoffen Medal funded by the Friends of the Helmholtz Centre for Infection Research. Walsh is awarded the prize endowed with 5,000 Euro for his research in the field of natural compound chemistry. This includes his work on the questions of how do bacteria cope when exposed to toxic mercury, how are they able to outlast antibiotics, and how can they be killed using so-called "suicide inhibitors".

The biotechnology engineer and mathematician Anna Osberghaus and the physicist Susanne Mertens from the Karlsruhe Institute of Technology (KIT) were honoured with the Erna Scheffler Sponsorship Award. The dissertation award, each endowed with 2,500 Euro, commemorates the first female judge of the Federal Constitutional Court in Germany; she was an emphatic advocate for the equality of women. Every two years, the Soroptimist International Club Karlsruhe honours outstanding achievements of young female KIT scientists with this sponsorship award.

Calls for Applications

The Helmholtz Centre for Infection Research invites applications for the Jürgen Wehland Prize endowed with 5,000 Euro. It is addressed at excellent early career scientists with a research focus on infection biology. Their PhD graduation should be no longer than five years ago and applicants should be currently conducting their research in the German-speaking countries, preferably northern Germany. Applications on one's own behalf are as admissible as are nominations by a supervisor or superior. The cut-off date for applications is 01 August 2013.

The Hans and Ilse Breuer Foundation newly invites applications for the Alzheimer Research Award endowed with 100,000 Euro. Since 2006, this award is given each year to scientists contributing to decisive progress in Alzheimer's research or similar dementia related diseases. Applications must be electronically submitted in the German or English language to the Board of Trustees of the Foundation by 31 July 2013 under info@breuerstiftung.de.

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