AN INITIATIVE OF THE
Federal Ministry of Education and Research

Research in Germany
Land of Ideas

Newsletter "Research in Germany"

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Dear Readers,

German research institutes are among the highest ranked in Europe. The European Institute of Innovation and Technology (EIT) recently selected three "Knowledge and Innovation Communities" (KICs), all of which have German research institutes playing a decisive role. In fact, German researchers are even in charge of the KIC InnoEnergy that specialises in researching sustainable energy production.

The EIT funding programme is one of the most innovative of its kind in Europe. Its goal is to create a "triangle of knowledge" comprised of education, research and innovation. EIT sees itself as a bridge that links European research findings to international markets.

The overwhelming success of German research institutes at this first pan-European competition hosted by EIT is largely due to the Federal Government's Initiative for Excellence, Excellence Cluster Competition and High-Tech Strategy.

In this issue's interview, the Director of the Potsdam Institute for Climate Impact Research and Chairman of the German Advisory Council on Global Change, Prof. Dr. Hans Joachim Schellnhuber, talks about how the institute is contributing to the CLIMATE-KIC.

Prof. Dr. Annette Schavan, MdB
Federal Minister of Education and Research

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Interview

Addressing the European "innovation gap"

Prof. Dr. Hans Joachim Schellnhuber is the Director of the Potsdam Institute for Climate Impact Research (PIK) and Professor of Theoretical Physics at Potsdam University. He chairs the German Advisory Council on Global Change and advises the President of the European Commission on energy and climate change issues.

The Potsdam Institute for Climate Impact Research (PIK) has established itself as one of the world's most distinguished climate impact research institutions since its foundation in 1992. What key research priorities has PIK set?

The Potsdam Institute is one of the world's first scientific institutions to have been explicitly set up to address complex questions in a truly interdisciplinary approach. Climate change and its impact, the starting point for most projects at PIK, addresses various topics. PIK researchers investigate Earth system processes and how human activities interfere with them. There are the "typical" climate change issues, such as rising sea levels and the stability of the ice sheets. But we also focus on the regional impact, for example, on agriculture or biodiversity. Refining our models to be able to develop projections on a regional scale is one of the main perspectives of contemporary climate impact research. Another main perspective is to map out strategies for adapting to the unavoidable global warming and

Prof. Dr. Hans Joachim Schellnhuber

Potsdam Institute for Climate Impact Research – main building/Potsdam.
PIK addresses scientific questions in the fields of global change, climate impact and sustainable development. Researchers from the natural and social sciences generate interdisciplinary insights and provide society with information for decision-makers.

High-performance computer.

More information: http://eit.europa.eu, www.climate-kic-proposal.org, www.pik-potsdam.de
Contact: Potsdam Institute for Climate Impact Research e.V., Uta Pohlmann,
Email: presse@pik-potsdam.de

for mitigating dangerous climate change. This, especially, is where Earth system analysis and economics meet – also in person, if you like. PIK is one of only a few places where physicists and economists work on the same project and, in some cases, even share offices.

The 2009 United Nations Climate Change Conference showed us how difficult it is to agree on politically binding climate protection targets at the UN level. Can science and research contribute to making the follow-up conference in Mexico a success?

This is a difficult subject. Reading some German, British or American newspapers, you might get the idea that scientists are not only pulling the strings on climate policy, but are even about to overthrow governments worldwide! Reality, however, is very different, of course. Just look at what we got from the Copenhagen Conference, the assembly that was supposed to seal a just global deal on protecting the climate. The delegates merely agreed to "take note" of the Copenhagen Accord that, again, only "recognises the scientific view", namely that the increase in global temperature should be kept to below two degrees Celsius. I do think that recognising the two degree goal marks an important step forward, but it falls way short of the expectations the very same delegates raised with their many copious speeches on the urgency of climate protection. Now, science can evaluate this outcome, achieved with the participation of PIK researchers. The reduction targets submitted to the Copenhagen Accord leave the world heading for a mean temperature increase of three degrees Celsius or more by 2100. This is where many hundreds of peer-reviewed scientific studies indicating that we can probably manage climate impact of less than two degrees warming, but that we will probably fail to do so if we go above this, lose their meaning. Science can point out what action or inaction will probably lead to. But whether society does or does not take action remains a decision to be made by political leaders.

In December 2009, the European Union launched the Knowledge and Innovation Community CLIMATE-KIC with the European Institute of Innovation and Technology (EIT), a consortium of 16 top European universities, research institutes, companies and regions in total. What role will PIK play here and what other German partners are contributing?

PIK is one of five academic core partners of the CLIMATE-KIC. It will lead the German consortium consisting of three more partners: TU Berlin, TU Munich and the German Research Centre for Geosciences in Potsdam. The KlimaCampus Hamburg, an interdisciplinary research network of the University of Hamburg and independent institutes, and the Forschungszentrum Jülich also joined up prior to the initiative's implementation. But for the CLIMATE-KIC to deliver the required innovative step changes, it was especially important to join forces with partners from the corporate world. With these ten companies on board, our consortium brings world-class research to bear as well as expertise in the fields of implementation and commercialisation. For PIK researchers this provides an excellent opportunity to apply modelling skills to help bring about the crucial innovations required for protecting the climate. By so doing, we can contribute to the roadmaps needed for transforming the European infrastructure into a system that allows for low carbon energy, production and mobility, sustainable cities and sustainable land use.

What are the priorities of EIT?

EIT was set up to address Europe's innovation gap, to drive European sustainable growth and competitiveness by stimulating world-leading innovation. Besides the CLIMATE-KIC with its focus on climate change mitigation and adaptation, the KIC InnoEnergy concentrates on sustainable energy and the EIT ICT Labs on the future information and communication society. I, personally, attach most importance to EIT's young academics programme. We need to train people to cope with future challenges.

From where will the network operate? Will new structures be created to this end?

The network will operate at five locations, called Co-Location Centres: London, Zurich and the Berlin, Paris and Randstad metropolitan areas. Apart from these, we have managed to involve regions across Europe as laboratories, so to speak, for pilot projects. This is a crucial step in bridging the gap from theory to the ultimate test bed – everyday common practice. It also provides an example of the exciting prospects of the CLIMATE-KIC in really being able to hatch ideas from first thought all the way through to application.

Thank you very much for the information on PIK and its role in EIT.

For more information about EIT, please see our article in the "Current R&D policy" section.

Science and Research News

German scientists support relief workers in Haiti earthquake disaster

After earthquakes like the one in Haiti, relief organisations need rapid, reliable and meaningful information on the local situation, infrastructure and damage for their deployment in the disaster zone. Scientists from the German Aerospace Centre (DLR) provide important support and free access to satellite maps of the region. Dr. Tobias Schneiderhan from the DLR coordinates the work at the Centre for Satellite Based Crisis Information (ZKI), which is part of DLR and a signatory to the "International Charter on Space and Major Disasters," under which satellite data is made available. Just after the earthquake on 12 January 2010, the UN triggered a "Charter Call". The control centre in Germany immediately requested the appropriate satellite-based maps specially produced for such events and the data was given to relief organisations. This initial situation assessment also supported rescue teams and helped the search for suitable locations for water treatment plants and mobile hospitals.
"The Haiti earthquake was very complex with extensive damage and many affected people," says Schneiderhan. DLR scientists ensured relief organisations had an idea of the nature and extent of the damage. "The data is quickly processed so relief workers know which roads are passable, where buildings are standing, or where open areas can serve as car parks and stadiums could be used as emergency facilities." The DLR delivers maps from before and after the earthquake – for humanitarian relief activities and in the context of civil security. The maps can be downloaded from the ZKI website.

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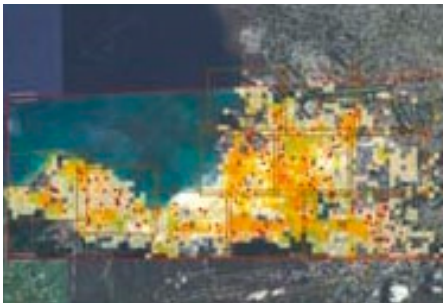

Damage evaluation map: Port-au-Prince following the earthquake on 12 January 2010.

Science and Research News

First commercial OLED panel for general lighting

SIEMENS

Osram Opto Semiconductors launched a new OLED (Organic Light Emitting Diodes) panel light for professional lighting applications, the first plastic light source to be commercially available. OLEDs have thin organic layers that illuminate under an electric current. They are attractive for several reasons: They are efficient, can be used to make extremely thin, lightweight lamps, deliver non-glare light and, as surface-emitting panels – unlike LEDs – do not need additional heat sinks. Today's OLEDs are mainly used as displays for electronic devices. Because their active layers are less than half a micrometre thick, OLEDs could also be used to make flexible lighting panels, if the glass substrate used today can be successfully replaced by flexible substrates. Researchers are also working on transparent OLEDs that could make it possible for windows to serve as lamps, too. Developed in cooperation with Siemens Corporate Technology, the round OLED panel "Orbeos" from Siemens' Osram subsidiary is eight centimetres in diameter, only 2.1 millimetres thick and weighs just 24 grams. Its brightness level is usually 1,000 candela per square meter and its efficiency of 25 lumen per watt already exceeds that of modern halogen lamps. Orbeos has a lifespan of roughly 5,000 hours, about five times that of incandescent lamps. The OLED panel light is intended for applications in the premium segment, such as designer lamps, architecture, or hotels and shops. This light source is currently priced at 250 euros per panel. But before OLEDs are ready for the mass market, processes for cost-effective mass production need to be developed and their service life has to be improved. Osram is part of the industry sector of Siemens and developed the technical basis for OLED panels as part of the "Organic Phosphorescent Lamps for Applications in the Lighting Market" project (OPAL).

More information: www.osram-os.com, www.siemens.com

OLED panel light for general lighting.

Recent Research Cooperation

Bridging the gap between R&D and private industry in Egypt – Models of cooperation

Participants at the closing question and answer session.

On 6 December 2009, the German Academic Exchange Service (DAAD), the Fraunhofer-Gesellschaft (FHG) and the Egyptian-German Development Cooperation Private Sector Development Programme by the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) hosted a conference on cooperation between R&D institutions and SMEs. Over 150 guests from various organisations within the Egyptian and German industrial and R&D community participated in the event. Representatives of the Ministry of Higher Education and Scientific Research, the Ministry of Trade and Industry and H.E. Michael Bock, German Ambassador to Egypt, opened the conference. It became apparent that cooperation between R&D and private industry is a crucial requirement for creating a knowledge-based society in Egypt.
Seven "Examples of German and Egyptian Success Stories" displayed best practice linkages between science and private industry. One of them is the "Natural Fiber Plastic Composites Innovation Network" created by the University of Alexandria and local industry. German project presentations focused on the field of renewable energy and models for the stimulation of close cooperation between science and industry as developed by Fraunhofer and major research universities such as FU Berlin and RWTH Aachen University. All participants agreed that this conference was only a first step. In order to achieve a breakthrough in R&D business and industrial relations, a more permanent forum of communication needs to be established.

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Recent Research Cooperation

MAX-PLANCK-GESELLSCHAFT

New Max Planck Society cooperation with India

After the discussion session, Germany's Federal President Horst Köhler and India's Research Minister Shri Prithviraj Chavan officially inaugurated the Indo-German Max Planck Center for Computer Science.

Germany's Federal President Horst Köhler and India's Minister of Research Pithviraj Chavan inaugurated the Indo-German Max Planck Center for Computer Science at the Indian Institute of Technology (ITT) in Delhi on 3 February with six new research groups, partnered by the Max Planck Institute for Computer Science.
The new research groups are the Algorithm Group at the IIT in Delhi, Graphics and Vision Group at the IIT in Delhi, Data Management Group at the IIT in Mumbai, Network Group at the IIT in Madras, Algorithms and Complexity Group at the IIT in Kanpur and Algorithm Group at the TATA Institute for Fundamental Research in Mumbai. "This broadens our cooperation with India in the computer sciences," says Peter Gruss, President of the Max Planck Society. Each group will get just over one million euros from the German Federal Ministry of Education and Research (BMBF) plus two million from the Indian Department of Science and Technology (DST) over five years. The Max Planck Society is contributing 900,000 euros for a budget of just under four million euros. The scientific programme aims to encourage the exchange of postdocs and to promote shared workshops and training activities, for example, at International Max Planck Research Schools. There are also plans to integrate scientists from other institutions as associate partners with mutual access to research institutes and equipment.
"India is a key priority for the Max Planck Society," explains Felix Kahle, Max Planck Society representative in Delhi. More than one in ten foreign doctoral students at MPIs now hail from the subcontinent. "The Max Planck Society is committed to helping foreign visiting scientists establish themselves scientifically in their home countries to create long-term ties. This benefits both sides," agree Prof. Mehlhorn and Naveen Garg, who will head the centre.

Contact: Felix Kahle, representative of the Max Planck Society at the German Embassy, New Delhi, Email: kahle@gv.mpg.de

Recent Research Cooperation

ARCHES Prize for German-Israeli research

In December 2009, the Federal Ministry of Education and Research (BMBF) presented the "Award for Research Cooperation and Highest Excellence" (ARCHES) to young German-Israeli research teams for the second time. The ARCHES Prize aims to promote scientific cooperation between the two countries. Following a call for proposals in the life sciences in 2009, the prize worth 400,000 euros was presented to two research teams from the biological and medical sciences, respectively. The award winners were Dr. Stephan Grill and Dr. Ohad Medalia for their work on cell research and Dr. Rotem Karni and Prof. Dr. Lars Zender for work on cancer research. Each team received 200,000 euros.
The annual prize honours young German-Israeli research teams, alternating between the natural sciences and engineering, the life sciences and humanities and cultural studies. It was first conferred in November 2008 to mark the occasion of the German-Israeli Year of Science and Technology. The first contacts had been made between German and Israeli scientists on 1 December 1959, after researchers from the Max Planck Society had taken up an invitation issued by the Israeli Weizmann Institute.
"This invitation – just 15 years after the Holocaust – was anything but self-evident," said Research Minister Prof. Dr. Annette Schavan, speaking in Berlin on the occasion of the Award Ceremony. "However, a spirit of diplomatic trust developed gradually between Germany and Israel. Furthermore, this first contact led to a strong and dynamic partnership in which science and research carried out many high-quality projects with great success."

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Federal Research Minister Prof. Dr. Annette Schavan with the winners of the ARCHES award 2009: (from left to right) Dr. Rotem Karni, Prof. Dr. Lars Zender, Dr. Stephan Grill, Dr. Ohad Medalia.

Latest R&D Funding Programmes and Activities

German-Russian Centre for terahertz research established at the University of Regensburg

Terahertz research is the focus of the "German-Russian Centre for Terahertz Research and Technology". The centre, which was recently established at the Institute of Applied and Experimental Physics at the University of Regensburg, is funded by the German Federal Ministry of Education and Research (BMBF). On the Russian side, three renowned institutions are involved in the partnership: the Ioffe Institute and the Polytechnic University in St. Petersburg as well as the Lomonosov University in Moscow. The activities on the German side are coordinated by Prof. Dr. Dieter Weiss and Prof. Dr. Sergey Ganichev, who is the appointed director of the new centre.
The terahertz research bridges the gap between the optical and microwave spectral range and promises new applications in solid state physics, medical imaging and security technology. The centre focuses on basic research in the field of spintronics, optics and optoelectronics as well as the development of THz semiconductor sources and detectors. A central aim of the centre is to foster closer collaboration between German and Russian scientists in this active and seminal research area. This will be primarily accomplished by funding guest researcher visits and by organising joint meetings between the participating institutions.

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More information: www.uni-regensburg.de/TerZ

Terahertz magneto-spectroscopy laboratory at the Terahertz Center Regensburg.

Latest R&D Funding Programmes and Activities

DAAD Deutscher Akademischer Austausch Dienst
German Academic Exchange Service

Comprehensive overview of doctoral research

The new DAAD brochure provides foreign scientists and aspiring doctoral candidates with useful information about doctoral research in Germany.

The new brochure "Doing a doctorate in Germany" offers young foreign scientists and aspiring doctoral candidates useful information about the German research landscape and doctoral research in Germany. This is accomplished by reports and interviews with experienced professors, students and representatives of science and industry.
The publication presents an overview of the different forms of doctoral research – from traditional individual supervision to the structured programmes offered at graduate schools, research training groups and the International Max Planck Research Schools. It provides valuable information on the formal requirements as well as various forms of funding. International students who have decided to do a doctorate in Germany report on their everyday routine and their experiences, as well as offer tips and words of encouragement for others thinking about taking up the challenge of doing doctoral research. Professors talk about their expectations of students, while experts from leading research institutions answer questions to help postgraduates decide which of the various paths to a doctorate suits them most and how they can best apply. They also address job prospects and give examples of how a doctorate can help a career.
A collection of links is provided for further information and individual searches. The brochure was published by the German Academic Exchange Service and funded by the German Federal Foreign Office. It is available in English and German and can be downloaded as a PDF file under www.research-in-germany.de/downloads.

More information about doctoral research in Germany: www.daad.de/promotion

Current R&D Policy

eit European Institute of Innovation & Technology

German institutes lead the way in European research

The European Institute of Innovation and Technology (EIT) recently selected three "Knowledge and Innovation Communities" (KICs) in the fields of Sustainable Energy (KIC InnoEnergy), Future Information and Communication Society (EIT ICT Labs) and Climate Change Mitigation and Adaptation (CLIMATE-KIC). Top scientists and researchers from Europe and around the world will collaborate closely in the KICs from now on. The goal is to establish regionally-embedded networks in pioneering, forward-looking technology fields for the knowledge triangle of education, research and innovation. Stakeholders from all three fields will work together to establish innovation clusters, thereby bridging the gap between research findings and profitable markets. The total budget available is 308 million euros up to the end of 2013.
German research institutions are contributing decisively to all three KICs. The Karlsruhe Institute of Technology (KIT) is to head KIC InnoEnergy, which aims to implement sustainable energy systems in industry and society. All in all, 35 partners from science and industry are involved. In Germany, these are companies and research institutions like the University of Stuttgart, energy utility EnBW plus SAP. With the Potsdam Institute for Climate Impact Research, Germany is contributing one of the five main academic partners to the CLIMATE-KIC (see this edition's interview with Prof. Dr. Schellnhuber). Further German companies participating in this project include Bayer, Beluga Shipping, SAP and Solar Valley as major partners, as well as the Hessen region. As far as the ICT Labs are concerned, the Fraunhofer-Gesellschaft, the German Research Center for Artificial Intelligence (DFKI), Siemens, SAP and Deutsche Telekom are taking part. The German Co-Location Centre will be established at the Technical University Berlin (TU). The partner countries of EIT are the United Kingdom, Switzerland, France, Netherlands, Belgium, Luxembourg, Spain, Poland and Sweden.

More information: http://eit.europa.eu

Current R&D Policy

Federal Ministry of Education and Research

Grants for small and medium-sized enterprises see strong growth

In launching its High-Tech Strategy, the Federal Government set priorities on funding innovative small and medium-sized enterprises (SMEs) so as to strengthen the potential that lies in these companies. In the key technologies alone, the Federal Ministry of Education and Research has increased its grants for SMEs by 40% to 120 million euros per annum to promote companies with a turnover of less than 100 million euros. In 2008, R&D funding for SMEs amounted to 194 million euros in total.
Federal Research Minister Prof. Dr. Annette Schavan stated that Germany's SME sector plays a decisive role as a motor of innovation. SMEs are the pioneers of technological progress in many fields of top-flight research. Hence, the funding initiative "KMU-innovativ" supports innovative SMEs in thematic fields of particular importance to Germany's future. These key fields include bio, ICT, nano, optical and production technologies as well as solutions aimed at raising resource and energy efficiency.
Security technology is the next field to be integrated into this initiative. Funding for other areas will continue to increase. SME-friendly funding criteria will, in particular, ensure that young companies are also able to turn their ideas into reality without too much red tape. "The response to this SME funding programme has been very favourable," said Schavan.

More information: www.bmbf.de/en

Last but not least

Universität Bremen

Intelligent containers

The University of Bremen has developed an intelligent container system that monitors the condition of perishables on board and immediately notifies the transport operator if the quality of the goods is in danger.
At the end of 2009, an experiment was carried out on two containers of bananas en route from Costa Rica to Hamburg. The intelligent containers were equipped with 20 wireless sensors which monitored the temperature and humidity of the pallets and transmitted the data via WLAN to the ship's control deck. A satellite link transmitted the data to the server at the University of Bremen. The data was graphically presented in various forms on a website which also included a notification function.
"This data will allow us to plan warehousing logistics better in the future," says Axel Moehrke, managing director and head of quality control at Dole, which cooperated with the University of Bremen on the test. "And most importantly, we can contact the plantation immediately if an error occurs. If we detect the problem after we've unloaded the goods in Europe, there are two or three more ships that have already left port with similar problems we can no longer prevent." In future, the data analysis will take place right on the container ship.
This pilot experiment demonstrated the basic feasibility of intelligent containers. It also showed that it wasn't sufficient to simply combine standard components. The system has to automatically respond to malfunctions by "fixing itself" so to speak. For example, when foodstuffs block the transmitters, the system has to be able to reboot the connection and look for alternative communication channels. One of the goals of the project is to create such a robust system. The University of Bremen hopes to develop a commercial system to automatically monitor foodstuffs within a couple of years.

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More information: www.intelligentcontainer.com, www.uni-bremen.de

Container Terminal/Vancarrier.

Events

1st International JARA Energy Conference (Aachen/Germany) 8 to 9 March 2010

As part of the Jülich-Aachen Research Alliance (JARA) between RWTH Aachen University and Forschungszentrum Jülich, JARA-ENERGY and its 50 member institutes provide an outstanding research platform and serve as an ideal contact point for all aspects of energy technology. In its first international conference, JARA-ENERGY will invite partners from science, industry and politics to discuss the core issues of tomorrow's energy technologies.
Experts will give an overview of new scientific and technical developments in energy technology. Roundtable discussions presented by high-ranking representatives of industry and science will highlight research approaches along the value-added chain as well as starting points for interdisciplinary cooperation.

More information:
www.jara-excellence.de

JARA Jülich Aachen Research Alliance

HANNOVER MESSE 2010 (Hannover/Germany) 19 to 23 April 2010

Established sixty years ago, the HANNOVER MESSE today ranks as the leading international showplace for industrial technologies, materials and product ideas. Under the new motto of "Efficiency – Innovation – Sustainability", the exhibition will showcase innovations, new developments and technologies, alongside new materials from the world of industry.
With its clear focus on energy, mobility and automation, as well as industrial subcontracting, the HANNOVER MESSE will again embrace the key trends that impact every branch of industry. The transfer of knowledge between science and business lies at the core of a varied programme of seminars, congresses and workshops.

More information:
www.hannovermesse.com

HANNOVER MESSE 19–23 APRIL 2010

PHOTON's – 6th Photovoltaic Technology Show 2010 Europe (Stuttgart/Germany) 27 to 29 April 2010

PHOTON's 6th Photovoltaic Technology Show will focus on production systems, software solutions, as well as raw materials and supplies. In addition, this year's conference aims to present findings from basic and applied research, testing and measurement equipment, product and process certification, as well as semi-finished products and balance-of-system (BOS) components.
It will be accompanied by PHOTON Academy's high-level conference series for top-ranking industry experts, as well as start-up companies with new and innovative product solutions and concepts.

More information:
www.photon-expo.de/en

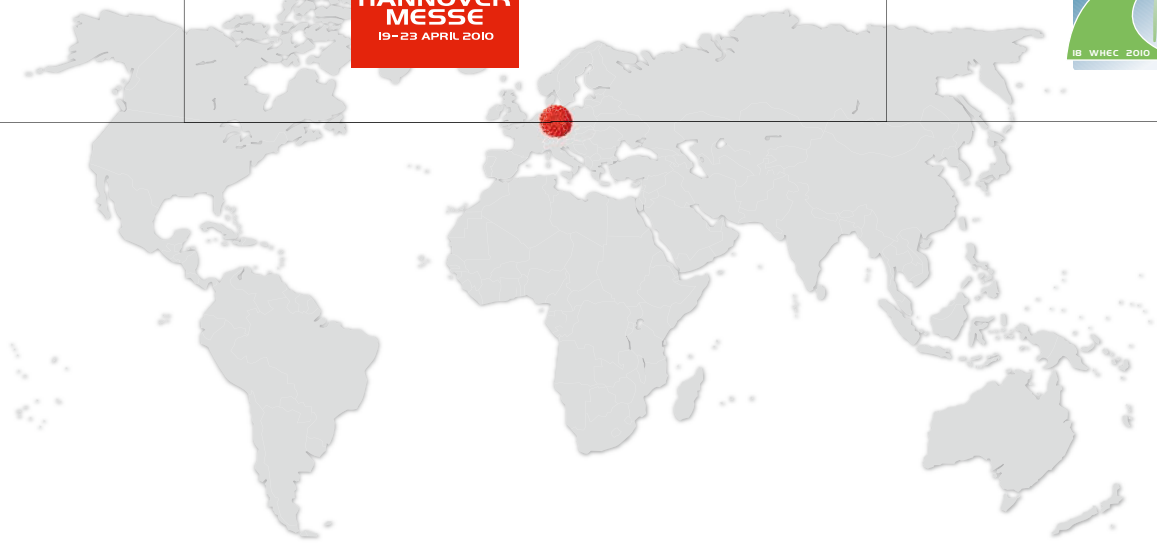
Photon EXPO

18th World Hydrogen Energy Conference 2010 (Essen/Germany) 16 to 21 May 2010

Under the auspices of the International Association for Hydrogen Energy (IAHE), the 18th World Hydrogen Energy Conference 2010 (WHEC2010) aims to promote the energy carrier hydrogen on the road to a sustainable and climate-friendly energy economy.
The WHEC will consider and discuss the scientific and technological status of hydrogen technologies as well as the political framework on a global scale. With its combination of scientific contributions, strategic discussions and educational programme highlights, WHEC2010 will give delegates from academia, research, politics and the private sector a unique forum for sharing information.

More information:
www.whec2010.com

Hydrogen Energy 18 WHEC 2010



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