

Newsletter Research in Germany

Issue 3, August 2009

www.research-in-germany.de

Dear Readers,

Did you know that printable batteries exist that are thinner than a millimetre and weigh less than a gram? The August issue of our Newsletter "Research in Germany" will tell you more about this new cutting-edge technology and other interesting developments in German science and research.

This issue includes an interview with Dr. Dirk-Meints Polter, Senior Vice President of Fraunhofer. He gives an insight into the internationalisation process of the Fraunhofer-Gesellschaft, Europe's largest applied research organisation. The newsletter also presents new collaborative agreements between German and international research institutions, as well as the latest R&D funding programmes and activities.

To receive our electronic newsletter regularly, please use the following link to subscribe: www.research-in-germany.de/newsletter. The website "Research in Germany" is the information platform of the Federal Ministry of Education and Research (BMBF) initiative to "Promote Germany as a Key Location for Research and Innovation". The portal provides more information on the German research landscape, everyday news about the latest research findings, practical tips about research in Germany and much more.

We hope you enjoy reading the articles and surfing our website. The next issue will appear in mid-October.

Your Editorial Team

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Interview with Dr. Dirk-Meints Polter, Senior Vice President of Fraunhofer



Dr. Dirk-Meints Polter
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The Fraunhofer-Gesellschaft celebrates its 60th anniversary in 2009. Within six decades Fraunhofer has not only become Europe's largest organisation of applied research but also an international player. The internationalisation is triggered by the globalisation of world industry. The interview was given by Dr. Dirk-Meints Polter Senior Vice President of Fraunhofer, who was responsible for internationalisation from 1989 to 2001. Under his aegis, the German research organisation became a global player.

Dr. Polter, when and how did Fraunhofer's internationalisation begin?

The organisation's internationalisation was a gradual development. Up until the beginning of the 1990s, Fraunhofer was a national research establishment. Anything that happened beyond Germany's borders at the time was mere coincidence. Individual institutes worked for customers abroad or cooperated with foreign research institutions, but there was no international strategy.

 Science and Research News

Printable batteries

Batteries were long bulky and heavy. Now, a new cutting-edge battery is revolutionising the field. It is thinner than a millimetre, weighs less than a gram, and can be produced cost-effectively through a printing process. The printable battery was developed by a research team led by Prof. Dr. Reinhard Baumann of the Fraunhofer Research Institution for Electronic Nano Systems ENAS in Chemnitz together with colleagues from the TU Chemnitz and Menippos GmbH. "Our goal is to mass produce the batteries at a price in the single figure cent range," says Dr. Andreas Willert, group manager at ENAS.

The characteristics of the battery differ significantly from those of conventional batteries. The battery contains no mercury and is in this respect environmentally friendly. Its voltage is 1.5 V, which lies within the normal range. By placing several batteries in a row, voltages of 3 V, 4.5 V and 6 V can also be achieved. The new type of battery is made of various layers: a zinc anode and a manganese cathode, among others. Zinc and manganese react with each another to produce electricity. However, the anode and the cathode layer dissipate gradually during this chemical process. Therefore, the battery is suitable for applications which have a limited life span or a limited power requirement, for instance greeting cards.

Further information: www.fraunhofer.de/en



Printable battery
©Fraunhofer/ENAS

 Science and Research News

Developing key technologies for the largest solar power station

 The solar-thermal power station Andasol 1, located in the Spanish province of Granada in Andalusia, was officially inaugurated at the beginning of July 2009. Andasol 1 is presently the world's largest solar power station. Researchers at the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) were heavily involved in the development of key technologies and identified the most suitable location with the help of various tools, including satellite data. They did this on behalf of Solar Millennium AG, a project development company. In addition, their measuring methods contributed to the precision design of the parabolic trough collectors.

Andasol 1 delivers climate-compatible power for 200,000 people. This makes it possible to cut annual CO₂ emissions by 150,000 tonnes. More than 600 parabolic trough collectors are distributed over a total surface area of about two square kilometres, each of them measuring 150 metres in length and 5.7 metres in width. These mirrors have a total surface area in excess of 500,000 square metres.

A heat accumulator is also located in the centre of this gigantic solar field. Here, two giant tanks, measuring 14 metres in height and 36 metres in diameter, are used to store surplus energy during the midday period with liquid salt. This salt is heated by solar power to temperatures of up to 390 degrees Celsius and this stored heat enables the power station to operate at full power (50 megawatts) for up to 7.5 hours after the Sun has set – a key requirement for the future use of solar power stations. More solar power stations are already in the planning stage.

Further information: www.dlr.de/en




**Deutsches Zentrum
für Luft- und Raumfahrt e.V.**
in der Helmholtz-Gemeinschaft



Andasol 1: 500 000 square metres of mirror surface capture the sunlight
©Solar Millennium AG



Research Cooperation with Taiwan: New DFG Funding Instrument

 The Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) would like to intensify cooperation between researchers from Taiwan and Germany. For this purpose, the funding instruments of the DFG and its Taiwanese partner organisation, the National Science Council (NSC), are to be even better coordinated with one another and their interactions optimised. The objective is to find simpler means by which the existing potential of both countries can, in the future, be transferred into excellent research and synergy effects more visibly utilised.


The DFG has cooperated closely with the Taiwanese NSC since 1987. As a result, the DFG now offers researchers from Germany the opportunity to collaborate with colleagues in Taiwan in all of its programmes. In doing so, it places high value on the early inclusion of young researchers in bilateral projects, especially through joint International Research Training Groups, which the DFG funds in collaboration with Taiwan.

To simplify the start of a German-Taiwanese cooperation project, the International Affairs Division of the DFG has, since the beginning of 2009, also offered a new funding mechanism for the initiation and intensification of bilateral cooperation. In this programme, applicants wishing to establish or strengthen scientific collaboration with international partners can be funded for a period of one year.

Further information: www.dfg.de/en



German-Egyptian Science Year: 19 German-Egyptian research projects launched

 The Egyptian Science and Technology Development Fund (STDF) and the German International Bureau (IB) of the Federal Ministry of Education and Research (BMBF) launched 19 joint applied research projects in May 2009. The projects will be financed by the "German-Egyptian Research Fund" (GERF) over two years.

At the end of the German Egyptian Year of Science and Technology in 2007, the Egyptian Minister of Higher Education and Scientific Research, Hany Helal, and the German Federal Minister of Education and Research, Prof. Dr. Annette Schavan, signed an agreement on the establishment of a joint research fund worth 600,000 euros per year. The initiative aims to strengthen bilateral research cooperation between the two countries. The fund is designed to support bilateral teams and so contribute towards ensuring that research results are translated into applications.

A total of 90 high-quality project proposals from various disciplines were submitted, and therefore both ministers agreed to increase the fund up to 2 million euros per year. Proposals in all fields of science, covering most of the priority areas of the Science Year, were encouraged, with a special interest expressed by the Egyptian side in the areas of wind energy, agriculture and biotechnology. GERF's second call for proposals will be announced in early 2010.

Further information: www.yearofscience.org

 Latest R&D Funding Programmes and Activities

New Form of Collaboration between University and Research Institution

German Federal Minister of Education and Research, Prof. Dr. Annette Schavan, and Baden-Württemberg Science Minister, Prof. Peter Frankenberg, signed the administrative agreement on the merger between the Forschungszentrum Karlsruhe and the Universität Karlsruhe to establish the "Karlsruhe Institute of Technology" (KIT) on 30 July 2009. KIT marks the creation of a completely new form of collaboration between university and research institution, with which it aims to head the world league of research institutions. It is the first time that a university and a research institution have merged to form a single institution. KIT has some 8,000 staff members and an annual budget of around 700 million euros, making it the largest research institution in Germany. KIT has set itself the goal of becoming the leading European centre for energy research.

KIT will be able to plan its scientific priorities in a joint procedure, will jointly appoint professors, and will establish an innovation-friendly administration. "A great opportunity lies in being internationally competitive in the race to recruit young scientists and researchers," said Frankenberg. Many young scientists look for their career paths at foreign centres of science which offer an outstanding working environment and in which they are free to pursue their research. With its thematic focus, its multidisciplinary approach, and its size, KIT offers them globally unique conditions.

Further information: www.kit.edu/english



Signing of the KIT-Administrative Agreement
©M.Breig

 Latest R&D Funding Programmes and Activities

Five million euros to establish the LMU Center of International Health

As one of the winners of the competition "Higher Education Excellence in Development Cooperation" run by the German Academic Exchange Service (DAAD) and the Federal Ministry for Economic Cooperation and Development (BMZ), the LMU Munich and its partner universities will have five million euros at their disposal over the next five years for building up the LMU Center of International Health. The new Center will promote healthcare in developing countries by reinforcing education and research in the health sector. It will focus on the UN Millennium Development Goals, in particular combating life-threatening diseases, reducing child mortality and improving maternal health.

The DAAD and the BMZ supported this competition to reinforce German higher education institutions and partner schools in developing countries in the fields of teaching, research and services as a means to achieving political goals, such as the UN Millennium Development Goals, and mastering other global challenges. Furthermore, the commitment by the German universities to solving global problems will be made visible and will become a driving force for German development cooperation. Alongside the LMU Munich, funding will now be given to another four universities (TU Braunschweig, Cologne University of Applied Sciences, Hohenheim University and Kassel University). These have proven skills in development cooperation in teaching and research and so will be able to produce a coherent future concept on this basis together with the involvement of their partners in the developing countries.

Further information: www.uni-muenchen.de



Prof. Dr. T. Löscher (LMU München) visiting the Jimma University Ethiopia
©T.Löscher

Research in Germany



Ms. Anandi Iyer, Representative of the BMBF campaign in India
©International Bureau of BMBF

Successful Presentation at Bangalore Bio 2009

As part of the Initiative "India and Germany – Strategic Partners for Innovation" by the Federal Ministry of Education and Research (BMBF), Germany presented itself as a centre of biotech science and industry at the Bangalore Bio Show from 18 to 20 June 2009. The exhibitors – BioRegionN, BIO Mitteldeutschland, Regenerative Medicine Initiative Germany, Verband der Biotechnologie Unternehmen (VBU), IBA GmbH, BIOBASE GmbH, Kompetenznetze Deutschland and the German Academic Exchange Service (DAAD) – presented a comprehensive range of products and developments, extending from infection biology, neurobiology and stem cell biology, via regenerative medicine, TAG-based protein purification technologies and biological databases, through to study opportunities in Germany.

Anandi Iyer, Representative of the BMBF campaign in India said, that "though India and Germany have been collaborating for a long time, the relationship lacked a proper framework. This initiative is intended primarily to intensify cooperation between the two countries. We would like to introduce German competence in the field of biotechnology and related fields to our Indian partners so as to encourage mutually beneficial partnerships. We would like the partnerships to be in business, academia and R&D".

In their numerous discussions and talks, the 18 members of the delegation were able to make many new contacts and consolidate existing collaborative agreements. In addition, the excellent stand and its presentation of Germany as a key location of innovation won the Exhibition Award for "Innovation and Design".

Further information: www.research-in-germany.de/india



Federal Minister Schavan: "Research needs strategic partners abroad"

Under the lead responsibility of the Federal Research Ministry, the German Government has published the first interim report on the Internationalisation Strategy for Science and Research that was adopted in 2008. Federal Research Minister, Prof. Dr. Annette Schavan, drew a positive conclusion of all the measures that had been undertaken so far by all the institutions involved – federal ministries, federal states, organisations from business and industry, science and research. The key points highlighted by Minister Schavan included the Alexander von Humboldt Professorships, which are financed by the Federal Ministry of Education and Research (BMBF) and serve to encourage outstanding international researchers to come to Germany, as well as the distinct increase in the grants and scholarships available to scientists plus the specifically targeted internationalisation of clusters and networks in research.

All the participating institutions saw the strategy as a necessary and appropriate response to globalisation and the challenges of our time, and want to continue to provide support for this. "Together with all the stakeholders and players, we have succeeded in initiating an ongoing and sustainable process, thereby providing the internationalisation of science and research in Germany with fresh impetus and dynamic force," said Schavan.

The Internationalisation Strategy has set four Key Priorities: Strengthening research cooperation with global leaders; International exploitation of innovation potentials; Intensifying cooperation with developing countries in education, research and development on a long-term basis; Assuming international responsibility and mastering global challenges.


Further information: www.bmbf.de/en

 Current R&D policy

German R&D networks and clusters to be internationalised

To support the internationalisation of German networks and clusters, the Federal Ministry of Education and Research (BMBF) has launched a new pilot scheme to initiate contacts between German industrial and scientific networks and relevant technical or scientific networks and clusters worldwide. This pilot measure is part of the Federal Government's Strategy for the Internationalisation of Science and Research and contributes towards one of the strategy's main goals: the exploitation of international innovation potentials. Twelve projects have been selected from the fields of environmental technologies/energy, medical technology, life sciences/biotechnology, transport, materials research, and information and communications technology (ICT). The target countries for network collaboration include France, above all, as well as the United States, Canada, Scandinavia, China and Morocco. At the kick-off event held in Bonn on 10 July 2009, the go-ahead was given for engaging in more intensive, international cluster collaboration. This measure not only opens up access to international markets for its members, including many Small and Medium-sized Enterprises (SMEs). German institutions and companies also profit much more easily from the knowledge created worldwide and can use this technological know-how to optimise their own innovative processes. Furthermore, the international networking and positioning of German networks and clusters will further raise Germany's appeal as a key location for international direct investment. The German Government's strategy to internationalise science and research has created the conditions for further consolidating Germany's position in the global knowledge society and for maintaining its international competitiveness. Besides expanding international research collaboration, the overriding goal is to open up further worldwide innovative potential to strengthen Germany as a centre of innovation and investment.

Further information: www.bmbf.de/en

 Last but not least

The smell of fear does exist

A research group headed by psychologist Prof. Dr. Bettina Pause from the Institute of Experimental Psychology, University of Düsseldorf, has proven that fear can be transmitted between two people via smell. It does not even have to be consciously perceived, proving that humans communicate chemically. Previous to this, such research was only known from the animal world. The smell of somebody else's fear molecules activates the cerebral regions that are responsible for empathy and for recognising states of fear. These regions are the insular cortex, the cingulum and the fusiform cortex. Psychologists took samples of cold sweat from students just before they sat an important university exam. Subjects had to wear cotton pads under their arms for around 15 minutes before the exam. Sweat samples were also taken from the same subjects while they were working up a sweat on gym equipment. These samples were processed and then presented to other subjects through an olfactometer, a device that delivers odour molecules at a constant temperature and flow rate. Subjects in the survey only perceived these odours very weakly. In fact, only half the subjects smelt the odour at all. The subject's brain activity was monitored by an MRI scanner during odour delivery. This highlighted those areas that are activated when subjects faced "fear". These areas handle emotional and social signals, are involved in the process of empathy and specialise in perceiving expressions of fear. By contrast, the presentation of sweat produced by doing sport failed to trigger any measurable responses.

Further information: www.psycho.uni-duesseldorf.de



Federal Ministry
of Education
and Research



Kick Off-Meeting, Bonn July 2009"
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Heinrich Heine
HEINRICH HEINE
UNIVERSITÄT
DÜSSELDORF



Proband attached to olfactometer
©Institute of Experimental Psychology,
Department of Biological and Social Psychology



fona - 6th BMBF Forum for Sustainability
(Hamburg / Germany)

9 to 10 September 2009

The 6th BMBF Forum for Sustainability will be held in Hamburg on 9 and 10 September 2009. Prof. Dr. Frieder Meyer-Krahmer, State Secretary to the Federal Ministry of Education and Research, will inaugurate the conference which aims to strengthen collaboration between politics, science and industry. This 6th BMBF Forum for Sustainability also marks the start of the new BMBF framework programme of Research for Sustainability. After five years of successful FONA research, the programme provides new thematic priorities, strengthens international collaboration and calls for the even closer interlinking of basic and applied research. The two-day scientific programme offers sessions on the following topics: Global Responsibility, Innovation for Climate and Resources, and Sustainable Forestry.

Further information: www.fona.de/en/index.php



Vision 2009 - 22nd International Trade Fair for Machine Vision and Identification Technologies
(Stuttgart/Germany)

3 to 5 November 2009

The automotive and electrical industry, mechanical engineering, technologies for the environment and renewable energies – as an industrial nation Germany thrives on home-grown innovation, on the quality of its products and the internationality of its economic relations. It thus comes as no surprise that the world's leading trade fair for the machine vision industry takes place in Germany. Companies from all over the world meet here annually in Stuttgart to exhibit at VISION, the International Trade Fair for Machine Vision and Identification Technologies, an event which will be taking place for the 22nd time this year already.

Further information: <http://cms.messe-stuttgart.de/cms/index.php?id=46073>



Visit to MIFI
(Moscow, Russia)

5 to 7 November 2009

Representatives of 20 German universities and research institutions will visit Moscow's prestigious Engineering and Physics Institute "MIFI" from 5 to 7 November this year. All the institutions represented share a common interest in the research fields of "physics, nanotechnology and materials science." In Moscow, delegates will have the opportunity to meet and engage with 40 renowned Russian scientists who teach and conduct research at "MIFI" or one of its associated universities. The goal of the visit is to increase the scientific exchange between Russian and German researchers and to explore opportunities for future collaboration. The event is held as part of the initiative "Research in Germany – Land of Ideas" and is sponsored by the Federal Ministry of Education and Research.

Further information: www.mephi.ru

"Research in Germany"
at the International
Conference on Advanced
Materials (ICAM)
(Rio de Janeiro, Brazil)

20 to 25 September 2009

The International Conference on Advanced Materials (ICAM) is one of the worldwide acknowledged conferences of the International Union of Materials Research Societies (IUMRS) and will be held in Rio de Janeiro from 20 to 25 September 2009. A range of topics at the frontiers of material research of contemporary importance for science, technology and engineering will be highlighted. The initiative "Research in Germany" will be present with a stand and will provide general information on Germany as a key research location, brochures on post-graduate and doctoral degree programmes as well as folders on exchange programmes and funding, including partnerships between research groups, postdocs and senior scientists. In the same context, the workshop "German material research and scholarship programmes for cooperation between Germany and Brazil" will provide information on study and research opportunities in Germany.

Further information: www.icam2009.com



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