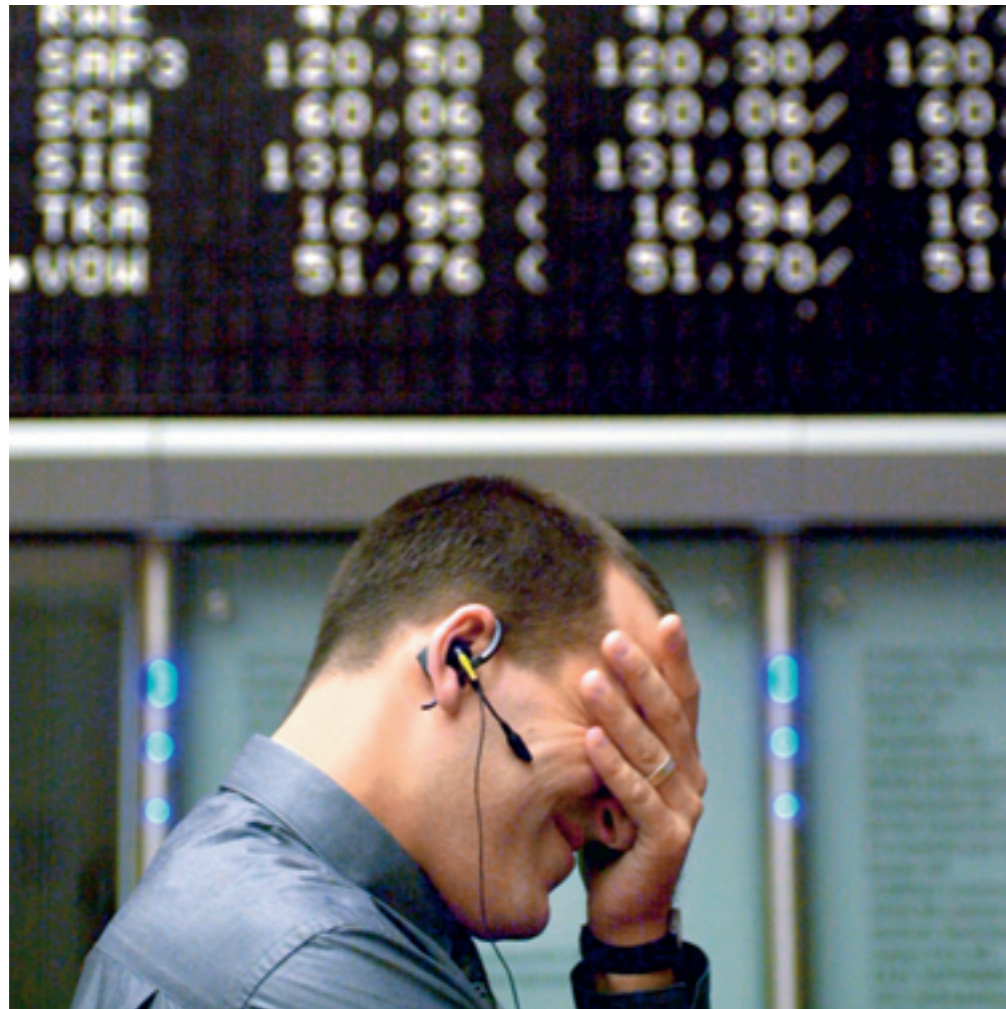




MAX PLANCK News



Who first came up with the idea of trading in derivatives? A trader on the Frankfurt stock exchange watches in dismay as prices tumble.

INTERVIEW WITH JOSEPH STRAUS ON THE GLOBALIZED ECONOMY

“Competition needs ethical standards”

Back in the summer of this year, the Max Planck Institute of Intellectual Property, Competition and Tax Law, in cooperation with the European Academy of Sciences and Arts and the Bavarian State Ministry of Economic Affairs, Infrastructure, Transport and Technology, organized a conference that attracted some high-profile experts on a current hot topic: the role of law and ethics in the globalized economy. We talked to the Director of the Munich-based institute, Joseph Straus, about the results of the conference.

MAXPLANCKRESEARCH: *The impact of the banking crisis in the US is being felt worldwide. After the glory years of globalization, are we now seeing the dark side? What are the likely consequences?*

JOSEPH STRAUS: The theme of our conference was certainly highly topical. It was the first time that the effects of the globalized economy had been questioned from the perspective of law and ethics. Certainly, as a result of the financial crisis in the US, we are currently experiencing the negative consequences – whether these be the seem-

ingly unstoppable rise in the price of oil, the increased cost of raw materials, or food shortages in poorer countries. On the other hand, the present crisis is also opportune insofar as it underscores the fact that we need more binding international regulatory structures – that the political community has an obligation, both ethically and morally, to mitigate the consequences of globalization.

MPR: *What were the objectives of the conference?*

STRAUS: The goal of the conference was to examine the causes and effects of the globalization process from various standpoints. Ultimately, the aim was to develop balanced proposals for future legislative action at the regional, national and international level. We need a variety of legal instruments and parameters that will enable us to set minimum standards to be observed in the necessarily competitive global environment, and to avoid calamities such as the current financial crisis. In the end, it is a question of preserving the peaceful co-existence of societies that is at risk if we do not succeed in offsetting the negative consequences of globalization.

MPR: *The TRIPS agreement has set some initial standards in the field of intellectual property. Where else do we need stricter regulation?*

STRAUS: The financial crisis is making it clear that the financial markets are unable to cope unaided. This is one area in which we need more transparent and more proactive guidance and legislation, for example to regulate the competition between tax systems at an international level. And then there is also the right to freedom of speech, employment law, climate and environmental protection – although I am aware that not all developing countries are in a position to adopt our standards straight away. The OECD and other organizations should use their influence to press more strongly for a common code of conduct.

MPR: *How did your institute come to organize the conference?*

STRAUS: It was a logical progression if you consider that one of the oldest examples of globalization in our modern world is patent law, or rather intellectual property law in general. As long ago as the end of the 19th century, the international community established principles that still apply to

this day. Without these and other international guidelines, it would have been impossible for this area of law to develop so dynamically. As experts in this field, we are well aware of the importance of balanced legislation to safeguard positive international development.

MPR: *Who attended the conference?*

STRAUS: Thanks to the excellent and extensive connections of the three organizers, we were able to attract some high-profile individuals who were notable for their expertise, as well as their political impact. We also felt it was important to take a balanced approach, in other words to consider the political, economic and social aspects of the globalization process. Among those who attended the conference were the President of the Republic of Slovenia, Danilo Türk, the Minister President of the Free State of Bavaria, the Bavarian Minister of Economic Affairs, Infrastructure, Transport and Technology, and former Max Planck Society President Hubert Markl. The former Polish Foreign Minister Andrzej Olechowski and Kenneth Dam, formerly Deputy Secretary at the US State Department, also made the journey to Munich, as did the Deputy Director Generals of the World Trade Organization and the World Intellectual Property Organization. That was a major success.



Joseph Straus

MPR: *Is globalization a new phenomenon?*

STRAUS: No, that was something that various speakers including Hubert Markl and Andreas Barner, chairman of the German Association of Research-based Pharmaceutical Companies, made very clear. Just take science for example, which, at least since the Middle Ages, can only be considered in an international context.

MPR: *What would you describe as the most important results of the conference?*

STRAUS: Globalization is a process that cannot be reversed, but it has also brought many benefits for developing countries. Today, it is a question of jointly defining the ground rules for globalization. This, in turn, means developing new and binding rules and guidelines at an international level in the areas that have already been highlighted. At the same time, the current negative consequences of globalization make it clear that, if we are to avoid a long-term threat to world peace, then competition must also be subject to certain basic ethical standards. ●

NEW INTERNET PORTAL STIMULATES ETHICAL DISCUSSION

Stem Cells for Schools

www.zellux.net – that’s the address of a new Web portal aimed squarely at school students and their teachers since late October. The site offers a broad range of educational material and information covering all aspects of stem cell research. The project was initiated by the Max Planck Institute for Molecular Biomedicine in Münster, together with various religious, ethical, educational and medical organizations, and is sponsored by the German Federal Ministry of Education and Research.

“An embryo in its earliest stage has neither nerves nor brain. It is incapable of feeling, let alone of conscious thought. Must we still protect it?” asks one female student. Another girl responds: “Every human being alive today was once an embryo. Don’t we owe every embryo the same opportunity to develop?” One of the features of the Web portal is that it responds to the thoughts that preoccupy young people, and provides short answers to their questions. An ethics test



also helps visitors to the site form their own personal opinion. Videos illustrate the variety of views right across the ideological spectrum. The “Information” section offers an explanation of both medical and current legal terminology, and also sheds light on a variety of ethical theories.

The complex issue of stem cell research is presented here in a balanced form, supported by detailed facts at a comprehensible level suitable for discussion in schools. “Many people take a relaxed view, while others reject stem cell research out of hand, without really having a proper understanding,” explains project leader Tobias Cantz of the Max Planck Institute for Molecular Biomedicine in Münster. This is where zellux.net can help, by providing reliable, detailed information on which to base an informed opinion. “Some might say that, as scientists, we simply want to use the Web site to talk up stem cell research. That’s not so. Every opinion has its place at zellux.net, says Max Planck Institute Director Hans Schöler. He would prefer to see society take a more active interest in debating the ethical aspects of stem cell research. “The controversies are not going to be put to rest just by passing a new law and shifting the cut-off date for qualifying cells.” On the contrary, it is essen-

tial that young adults growing up in our multicultural, pluralistic society are able to understand the differing ideological viewpoints that are involved here.

The Web site was designed and created by scientists who are themselves involved in the field of stem cell research. The success of the project is also due to the efforts of Johann Ach and Petra Michel-Fabian of the Bioethics Center, and Marcus Hammann and Manuel Ganser of the Biology Teaching Center at the University of Mün-

ster. Also involved were Gudrun Kordecki of the Institute of Church and Society of the Protestant Church of Westphalia, and Hartmut Schmidt in his capacity as transplant coordinator at the University Clinic in Münster.

The variety of information available at zellux.net is presented in an equal variety of formats. In addition to explanatory texts and visual illustrations, the site also includes interviews, video clips containing comments and speeches by a wide selection of personalities from Bishop Wolfgang Huber to politician Wolfgang Thierse, as well as a glossary of terms. As Gudrun Kordecki reports, however, the main focus is on the teaching units that have been tested at partner schools and that are designed for anything from individual lessons or a series of double lessons to three full days as part of a week-long project. “The exercise represents a Federal Commission of Inquiry tasked with putting forward a recommendation on how stem cell research should be managed in the future. By observing the representatives of society who contribute to the process and the interactions between those involved, students become familiar with the differing chains of argument and the basic values that underlie each party’s point of view.”

For and against stem cell research: The very first page of the new site welcomes visitors with some controversial film clips that focus on this issue.

Photo: MPS

HUBERT MARKL CELEBRATES 70

The Irresistible Lure of Debate

He is one of those individuals who don’t shun the difficult path, and who intervene with eloquence and esprit: In his role as President from 1996 to 2002, Hubert Markl left a lasting mark on the Max Planck Society.

Hubert Markl loves nature. When the conversation turns to ants or bees, to the subtle ways in which they communicate, orient themselves by their sense of smell, and perceive forms and shapes, Markl the zoologist is in his element. He is developing a similar passion for books, among them Bert Hölldobler’s new work THE SUPERORGANISM, Bernd Heinrich’s THE SNORING BIRD, Georg Forster’s A VOYAGE ROUND THE WORLD, and James Cook’s JOURNALS. He is reluctant to talk about his achievements at the Max Planck Society – they are something that “others must judge.”

Times were changing when Hubert Markl took the helm as President of the Max Planck Society in 1996: Six years had passed since German reunification, and the resurrection of the East was in full swing. And yet the Max Planck Society had nothing to spare to finance change for its own sake. Savings had to be made at existing institutes to allow investment in new ones. With huge effort, the new President streamlined and even closed departments and entire institutes. But at the same time, he set new trends in research with the appointment of 153 Directors.

His reputation for toughness was soon established. Those who were daunted by the acuity of his arguments kept out of his way. Others who dared to debate with him often became successful colleagues. “Certainly there were times when I was heavy handed and impatient,” Markl admits. But there was always a point to what he did. “I wanted to maintain the high standards and aspirations of the Max Planck Society.”

The difficult path he chose proved to “trigger an impressive renewal of the Max Planck Society,” as Peter Gruss put it in his speech marking the 70th birthday of his predecessor. Hubert Markl also succeeded in encouraging gifted young scientists: it was he who founded the International Max Planck Research Schools. Since 2000, the number of doctoral students researching at Max Planck Institutes has risen from 2,618 to 4,308,

Photo: BRAND SCHÜLLER



the majority of them from abroad. The decision to come to terms with the history of the Kaiser Wilhelm Society in the Third Reich proved to be a courageous move. Hubert Markl appointed an independent Presidential Committee to research and bring to public attention the errors that scientists had made. On June 7, 2001, he publicly acknowledged the guilt that scientists at the Kaiser Wilhelm Society had heaped upon themselves through their persecution of Jewish colleagues and their participation in Nazi crimes.

Whether in defense of stem cell research, the conservation of biodiversity or the sound teaching of biology, Hubert Markl always shone as a master of dispute, one who was not afraid of conflict and stood by his opinions. He raised a voice when capable scientists were abandoning Germany to work at universities in the US, when an Excellence Initiative was initiated at universities on his home soil, and when the lack of a new generation of engineers became acute.

Now, says Markl, he has time to read the things that interest him without the worry of day-to-day affairs. He is visibly enjoying his retirement, if one can call it that. “If I were still President of the Max Planck Society, I would be addressing the issue of whether science and industry are in correct proportion to one another. Now I say, that is no longer my concern. There are younger and better candidates to bear the torch.”

Guests toasted Hubert Markl at a celebration in Munich on October 13.

GUINNESS WORLD RECORDS HONORS GARCHING ATTOSECOND PHYSICISTS As Short as It Gets

Who can eat the most hamburgers, who played the longest table football match, who owns the deepest underwater mailbox – the Guinness World Records organization is well known for gathering the world's most unusual and bizarre achievements. Just recently, the Max Planck Institute of Quantum Optics in Garching proved that, even in this field, Max Planck scientists can hold their own. The team headed by Director Ferenc Krausz has a certificate to prove that it created the shortest-ever flash of light.

GUINNESS BOOK OF RECORDS, which has been an annual feature of British life since 1955.

The dimensions of an attosecond are unimaginably small. "An attosecond is the time it takes for light, which as everyone knows travels at a speed of almost 300,000 kilometers per second, to cover the length of three hydrogen atoms," explains Eleftherios Goulielmakis. While his Mediterranean origins may be unmistakable, his group is a model of scientific internationality. Its members come from as far afield as Russia, Canada, Germany and

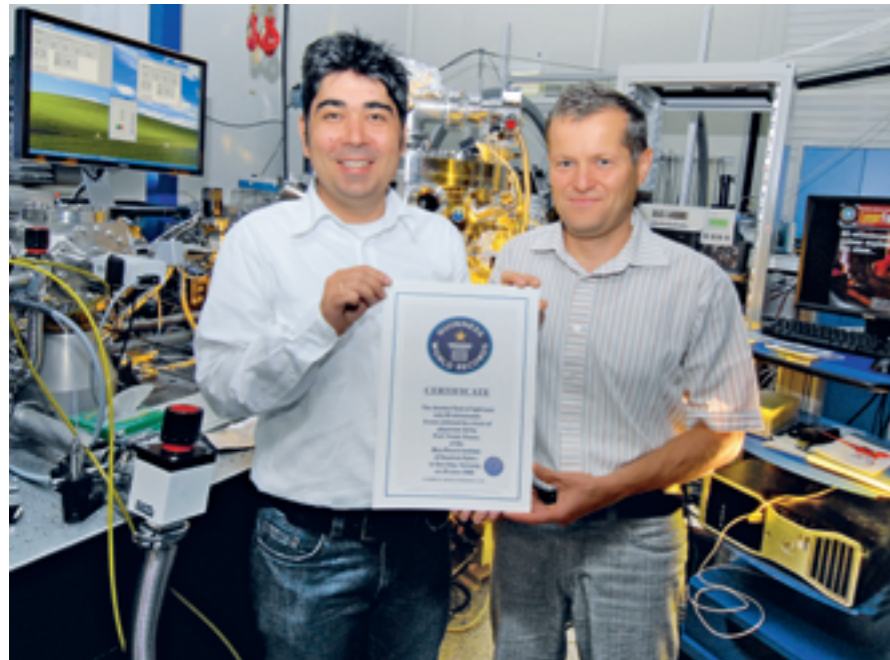
Austria. They communicate almost exclusively in English. Some of the researchers don't even work in Garching: "We keep in contact with them mainly via the Internet," adds Goulielmakis.

Our attosecond physicists use these ultra-short light pulses to explore the fastest processes nature has devised. Their interest is focused mainly on electrons in atoms and molecules. Electrons move from place to place in a matter of a few attoseconds. "We use the light pulses to make the high-speed electrons visible almost in real-time," says Ferenc Krausz. The shorter the flashes, the more detailed the images become. "It's a little like exposure times in photography," Krausz continues. "The same

applies here: the faster the shutter speed, the more detail we can see of these rapid movements."

But conventional photography is no match for the extremely rapid movements in the microcosm. Light is the only tool that can make atomic processes visible and controllable. "The sheer speeds fascinate me," says Eleftherios Goulielmakis. The purpose of these quantum optics experiments, which can last for months at a time, is to travel, rather than to arrive. "You never know where the journey will take you. That, to me, is what makes science so alluring."

Their success has been a tonic for the quantum optics experts in Garching. After all, the world record for the shortest flash of light is a fine endorsement of their work. Just which wall the Guinness certificate will be hung on has yet to be decided. What is certain is that 80 attoseconds is by no means the end. "We will continue to shorten the pulses of light to enable us to see even faster, as yet unknown atomic and molecular events," says Goulielmakis



World record for a flash of light: Eleftherios Goulielmakis (left) and Ferenc Krausz with the certificate presented by Guinness World Records.

Thirty-three-year-old Eleftherios Goulielmakis very nearly became an archaeologist – his homeland of Crete certainly offered plenty of opportunities. But in the end, he decided instead to study physics at the University in Heraklion. A few years later, he found himself in Garching, at the Max Planck Institute of Quantum Optics. Now this love of physics has earned the young Cretan and his colleagues under the leadership of Ferenc Krausz a special place in the record books: together they have created the world's shortest flashes of light. The pulses last for just 80 attoseconds (an attosecond is a billionth of a billionth of a second).

This record achievement by the Garching laser physicists has now been officially recognized by Guinness World Records in London. Hopefully the new record, corroborated by an honorary certificate, will find its way into the 2009 issue of the

PHOTO: THORSTEN NÄSSER

MAX PLANCK SCIENTISTS WIN INNOVATION PRIZE FOR MEDICAL TECHNOLOGY Keeping the Heart Beating

Around 100,000 people fall victim to sudden cardiac death in Germany each year. Frequently, death is caused by cardiac arrhythmia, such as ventricular fibrillation. To date, only implanted defibrillators have been able to offer long-term protection. But the electrical pulses they generate are painful, and the side effects can be substantial. Researchers at the Max Planck Institute for Dynamics and Self-Organization and the Göttingen School of Medicine are thus working on a new defibrillator that uses a much lower pulse energy. The project has been awarded the Innovation Prize for Medical Technology presented by the German Federal Ministry of Education and Research.

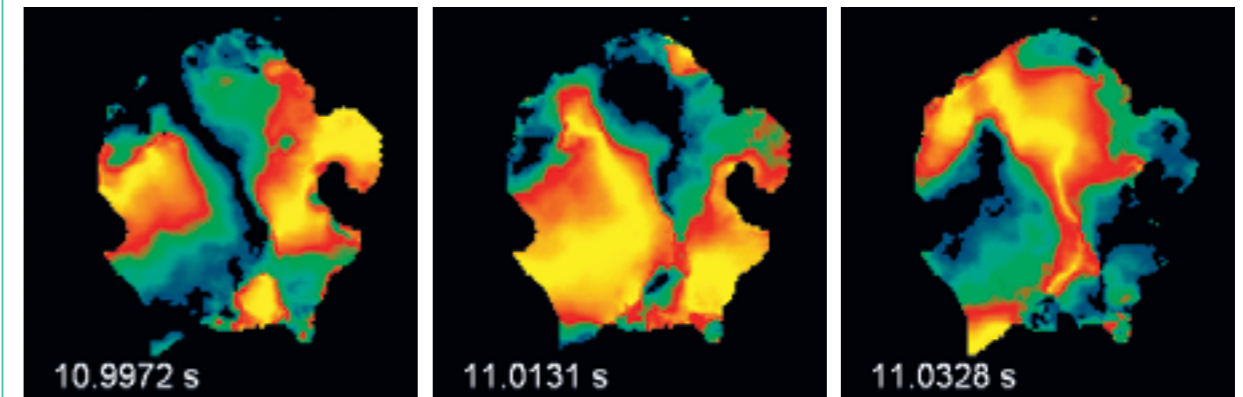
Electrical pulses spreading through the myocardial muscle control the movement of the organ, ensuring that the chambers of the heart contract and relax in even rhythm. In the case of individuals suffering from cardiac arrhythmia, this process is unreliable. The electrical signals controlling their hearts can be erratic, even chaotic. Consequently, the heart ceases to supply the body with blood. Sufferers can be dead within a matter of minutes.

weaker pulse could halt ventricular fibrillation if it were applied at several locations in the heart. But instead of implanting multiple electrodes, the researchers are making use of natural inhomogeneities in the heart.

"These are locations such as blood vessels and fatty tissue, where a weak electrical field can locally stimulate the heart tissue," explains Stefan Luther, project leader at the Max Planck Institute and Honorary Professor at the University of Göttingen. The inhomogeneities act as a kind of natural electrode.

These innovative defibrillators could be used not only in cases of ventricular fibrillation, but also as a preventive measure to guard against other types of cardiac arrhythmia. They would then benefit a greater proportion of patients than conventional devices, and reduce mortality rates resulting from sudden cardiac arrest. "If the technology proves viable, implantable defibrillators could be made significantly lighter and smaller without sacrificing reliability," explains cardiologist Markus Zabel, who heads the Clinical Electrophysiology department at the Göttingen School of Medicine Heart Center.

The new procedure has already proven itself in initial laboratory trials. The next stage now is



For patients who regularly suffer from arrhythmia, defibrillators are the only help doctors can offer. An electrical pulse briefly paralyzes all of the cells in the myocardium, preventing them from conducting any further signals. The heart then returns to its normal rhythm, rather like switching a computer off and on again to clear a fault. The energy required is considerable, however, and the procedure is very painful for the patient. It can also damage the surrounding tissue.

Under the leadership of the Max Planck Institute for Dynamics and Self-Organization, the scientists in Göttingen are thus looking to develop an alternative. The underlying idea is that a much

Patterns of excitement: The electrical wave generated by the defibrillators in current use spreads across the surface of the myocardium. The red areas are strongly excited, the black are barely affected.

to refine the process. The project was among those to be awarded the Innovation Prize for Medical Technology presented by the Federal Ministry of Education and Research on October 23. Out of a total of 91 applications, only 14 research groups managed to satisfy the jury. These teams will now receive financial support for up to three years.

PHOTO: MPIDS/CORNELL UNIVERSITY/FLAVIO FANTON, ROBERT GUMOUR

Pinboard

TWO NEURO-ONCOLOGISTS from the US won the Zülch Prize for 2008, presented for the 19th year in succession by the Gertrud Reemtsma Foundation, which is administered in trust by the Max Planck Society. David N. Louis (48), Head of Pathology at Massachusetts General Hospital in Boston and a professor at Harvard Medical School, and Darell D. Bigner (67), Professor of Pathology at Duke University Medical Center in Durham, North Carolina, will share the 50,000-euro prize money. Both of them are engaged in research into brain tumors. Louis receives the award for his seminal scientific contributions to the classification and molecular characterization of glioma tumors, which may possibly derive from glia precursor cells in the central nervous system – that is, from tissue cells that encase



Prize winners: David N. Louis (left) and Darell D. Bigner received the Zülch Prize for 2008 for their work on brain tumors.

and support the nervous system. Bigner was awarded the Zülch Prize for his fundamental investigations of the molecular mechanisms by which brain tumors originate and grow. Admiration was also expressed for his new treatment methods using monoclonal antibodies, which target specific cell molecules found only on malignant brain tumors.

WHO WOULDN'T APPRECIATE a shot in the arm on this scale? The new Drug Discovery and Development Center (DDC) developed by Max Planck Society technology transfer subsidiary Max Planck Innovation, in collaboration with London-based financial service provider Inventive Capital, is set to receive a 20 million euro capital injection. The German Federal Ministry of Research is putting up the money as an award in its promotional contest to develop the "Medicine of the Future." The contest, in turn, was part of the ongoing German Pharmaceutical Initiative that aims to close the gaps in the value chain and encourage the research and development of new drugs in Germany. Of the 37 projects entered for the contest, 10 made it to the final round, and just 3 received awards. The DDC comprises two independent enterprises: the Lead Discovery Center (LDC) and the Development

Company (DevCo). The LDC fosters innovative research projects that offer exceptional medical and commercial potential, but that are not yet mature enough to attract professional development partners in industry. The objective is to realize pharmaceutical agents that deliver proof of concept in animal models. Projects on which the LDC is currently working include agents to combat cancer and diabetes. The DevCo is expected to start work in 2009, when it will be tasked with promoting drug development and clinical studies with patients.

"CLOSED DUE TO OVERCROWDING" – the scene at the end of September at the Max Planck Institute for Physics in Munich resembled a common one at the city's famous Oktoberfest. Such was

the crowd that turned up for Big Bang Machine Day that the "Closed" sign that often appears outside the beer tents could well have been hung on the institute's doors. The Big Bang Machine refers, of course, to the world's largest particle accelerator, the Large Hadron Collider (LHC). Presentations were held in no fewer than six German cities on this special day. Institute Director and LHC scientist Siegfried Bethke presented the world's largest experiment in the field of basic research and explained how researchers will use the LHC to unlock the secrets of the Big Bang. The new particle accelera-

tor at CERN in Geneva is designed to help us improve our understanding of the universe. Particle physicists aim to use it to answer some fundamental questions, such as: Why is there more matter than anti-matter? Dark Matter and Dark Energy may account for 95 percent of our universe, but what are they made of? Why is it that matter has mass? The audience in Munich found themselves bombarded with superlatives: the LHC is arranged in a ring 27 kilometers in circumference, with 9,600 magnets operating at temperatures lower than those of the universe. A billion particle collisions per second occur in the Collider, and the project itself represents the combined efforts of 10,000 physicists, technicians and engineers from 85 countries. The LHC is tunneled 100 meters below the ground on the border between France and Switzerland. Inside its vacuum tubes, hadrons moving in opposite directions are accelerated almost to light speed and made to collide. At the moment, however, nothing is moving in the LHC: the Big Bang Machine had to be shut down, as helium escaping in the tunnel had damaged the system. ●