



Science-Switzerland, October - November 2011

News on Swiss science, technology, education and innovation

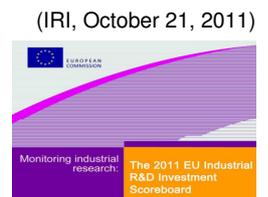
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Swiss Company World's Top R&D Investor

The 2011 "EU Industrial R&D Investment Scoreboard" collects information on the top 1000 EU companies and 1000 non-EU companies investing the largest sums in R&D in the last reporting year. Companies in other countries than EU, US and Japan continued to show the outstanding performance observed since 2005, increasing R&D and sales by 10.7% and 21.8% respectively. Switzerland remains the largest country by R&D, primarily because of the very large R&D investments of its two major pharmaceutical companies, Roche and Novartis. Roche is in first place followed by Pfizer from the US. The Swiss company Roche was in 2nd place last year and has risen 17 places in the R&D ranking since 2004 while Novartis (8th place) has risen 12 places since the same year.

<http://swissinnovation.org/news/web/2011/00-111021-ce.html>



1. Policy

Federal Councillor to Visit Azerbaijan on Energy Cooperation

(DETEC, November 14, 2011)

Federal Councillor Doris Leuthard was received by President Ilham Alijev during an official visit to Azerbaijan. Discussions focussed on the specific implementation of the Memorandum of Understanding signed by the two states in 2007 in the field of energy. The head of the Federal Department of the Environment, Transport, Energy and Communications held talks with President Ilham Alijev as well as with the Minister of Energy and Industry Natig Alijev. The two parties examined ways of further intensifying this cooperation in the shape of specific energy projects. The aim is to make it easier for private companies to cooperate and invest in the energy sectors of both countries. For Switzerland the issue of particular interest is that of improving the security of supply in natural gas and petroleum.

<http://swissinnovation.org/news/web/2011/01-111114-38.html>

Swiss Commitment for Climate Protection at UN Climate Change Conference

(FC, November 16, 2011)

The 17th UN Climate Change Conference will be held in Durban, South Africa. Discussions will focus on how to create a regime in which all major polluters make a legally binding commitment to reducing their greenhouse gas emissions. The Federal Council set out the mandate for the Swiss delegation in Durban. It continues to seek a comprehensive climate agreement to come into effect from 2020. The conference in Durban is another stage in this process and will build on the decisions reached at the conference in Cancún last year. The Federal Council has once again underlined Switzerland's commitment to climate protection measures, to implementing the national CO₂ Act and achieving climate goals. Switzerland will be making a bid for the Geneva-based Green Climate Fund.

<http://swissinnovation.org/news/web/2011/01-111116-39.html>



Participation in European Spallation Source

(SER, November 28, 2011)

The European Spallation Source (ESS) is a new large-scale infrastructure project to build and operate the world's leading facility for research using neutrons. The Federal Council has authorized the head of the State Secretariat for Education and Research (SER), Mauro Dell'Ambrogio, to sign a Memorandum of Understanding on Swiss participation in the Design Update Phase of the ESS project as well as a Declaration of Intent on construction and operation of the European Spallation Source (ESS). These two signatures will enable Switzerland to actively take part in the elaboration of this project. The ESS is the only major new project to be included in the Swiss roadmap for research infrastructure that the Federal Council adopted in March 2011 and lists the facilities to which Switzerland participates in the interests of its scientific community.



<http://swissinnovation.org/news/web/2011/01-111128-1d.html>

International Strategies for Importing Talent

(SER, November 28, 2011)

One of Switzerland's stated objectives is to encourage the exporting of education/training and the importing of talent ("brain circulation") as a means of strengthening its position as a location for science and research. This objective is part of Switzerland's international strategy for education, research and innovation, which was decided in 2010. Since Switzerland is exposed to international competition, knowing what strategies other countries have adopted is important for discussions here. The SER has charged its scientific counselors stationed in 19 countries around the world to gather information on the strategies used in their country of assignment. Switzerland's strategy to attract the best students, the best researchers and top specialists from around the world must fit into the context of similar efforts deployed by other nations.

<http://swissinnovation.org/news/web/2011/01-111128-be.html>

International Cooperation in Higher Education

(UZH, November 28, 2011)

International cooperation is becoming increasingly important for institutions like the University of Zurich. Switzerland's network of embassy-based scientific advisers as well as the network of swissnex outposts plays an important role in promoting the University of Zurich around the globe, especially in the USA, Europe, and Asia. For example, Professor Rolf Pfeifer recently presented at a biorobotics exhibition in India, which led to further cooperation with Indian universities. In Australia, the Swiss scientific adviser is organizing seminars and establishing an exchange program for students and researchers, while in South Africa exchanges are focused on medical research. Korea and Russia are other focal points of the internationalization effort.



<http://swissinnovation.org/news/web/2011/01-111128-82.html>

2. Education

New Bachelor of Science in Tourism Management

(HES-SO Valais, October 01, 2011)

The Swiss School in Tourism in Sierre has opened an English program for Swiss and international students. The program lasts for 6 semesters. The last semester is reserved for an internship and the bachelor thesis. The Swiss School of Tourism is part of the University of Applied Sciences of Western Switzerland HES-SO. The three-year course of studies leads to a "Bachelor of Science HES-SO in Tourism Management". The degree program is accredited by the Swiss Federal Government, and prepares graduates to take on positions of responsibility in the tourism industry.



<http://swissinnovation.org/news/web/2011/02-111001-68.html>

20'000th Doctoral Title

(ETH Zurich, October 17, 2011)

ETH Zurich recently conferred its 20,000th doctoral title since the school was founded in 1909. The honor fell to Kay Steinkamp, a doctoral student in the Department of Environmental Sciences who, for his dissertation, studied the global history of carbon dioxide levels. Kay received a special present from Professor Thomas Vogel, the Prorector for Doctoral Studies, in honor of this momentous occasion. Steinkamp previously studied in Karlsruhe and Frei-





burg im Breisgau before coming to Zurich. He will continue working at ETH Zurich until next March, but is looking for opportunities in academia and industry.

<http://swissinnovation.org/news/web/2011/02-111017-a4.html>

Innovative Project on Arts and Neuroscience

(UNIGE, November 09, 2011)

The Geneva State Council announced that the University of Geneva and the HES-SO Geneva have joined their skills to present a visionary and ambitious project involving the collaboration of three institutions. The key stone of this project, entitled "New Junction", is the meeting of arts and neurosciences around research and academic activities. The aim is to create a training, research and experience sharing space. The project is the result of a mandate from the State Councilor in charge of the Department of Education, Culture and Sports. It will allow Geneva to affirm its commitment towards a society of knowledge and culture, while we are witnessing a turning point in brain research.



<http://swissinnovation.org/news/web/2011/02-111109-b9.html>

Global Competitiveness in Education

(ETH Zurich, November 16, 2011)

The State Secretariat for Education and Research recently completed a study of the strategies used by twenty countries to remain globally competitive in the realm of higher education. The study found four main strategies in use. In English-speaking countries education is often run as a business to attract foreign students, with the danger of this strategy being that quantity can be valued higher than quality. Many European countries instead specifically target talented individuals in a "brain gain" strategy. Developing countries target their expatriates with good offers to attract them back to their home country. Finally, the last strategy is developing a global campus that makes students more competitive in the global market.



<http://swissinnovation.org/news/web/2011/02-111116-69.html>

3. Life Science / Health Care

Social Cooperation in Beetles

(University of Bern, October 04, 2011)

Scientists at the University of Bern have shown that beetles exhibit the same social behavior as other insects, such as bees, ants, and termites. They studied the small bark beetle, a type of beetle that builds a tunnel system in dead wood in which it grows a fungus and builds its nest. The mother's young divide up the work of looking after the fungus on which they feed, cleaning the nest, and taking care of the brood. Even the daughters, who can go on and start their own nest, stay to help for some time, most likely because inbreeding and slim chances of survival of a new nest drive them to pass on their genes through support of their family.



<http://swissinnovation.org/news/web/2011/03-111004-49.html>

Scientists to Chase Cholera in Haiti

(EPFL, October 05, 2011)

In January 2010, the earthquake – over 7.0 on the Richter scale – destroyed Haiti, devastating its capital, Port au Prince, causing the deaths of 230,000 people and injuring 300,000. Two EPFL laboratories have rallied round Terre des Hommes Lausanne. They have created a working group with the aim of developing tools capable of predicting how the cholera will spread, and organizing healthcare initiatives efficiently. In the Laboratory of Ecohydrology at EPFL, Andrea Rinaldo is undertaking research into the role of waterway networks – real ecological corridors – in the propagation of water-borne diseases. Soon after the outbreak of cholera at the end of 2010, he published a spatial model that enables the prediction of the distribution of pathogenic bacteria, taking into account the time, the place and the movement of populations in Haiti.



<http://swissinnovation.org/news/web/2011/03-111005-68.html>



Swiss Cancer Award 2011 on Drug Development and Diagnostics

(Debiopharm, October 05, 2011)

Debiopharm Group, a Swiss-based global biopharmaceutical group with a focus on drug development and companion diagnostics, presented the 'JCA-Mauvernay Award' to Dr. Hirofumi Arakawa from the National Cancer Center Research Institute in Tokyo, for his basic research on the 'identification and characterization of p53 target genes' and to Dr. Mineo Kurokawa from the University of Tokyo, for his applied research on 'the molecular pathogenesis and therapeutic targets of hematological malignancies'. This year the theme was 'Forward Strides for Cancer Research – Grounds for a Confident Future'. Professor Tetsuo Noda, President of the JCA and Dr. Rolland-Yves Mauvernay, Founder and President of Debiopharm presented both scientists with the 2011 Award for their outstanding and innovative research.

<http://swissinnovation.org/news/web/2011/03-111005-bf.html>

Formation of Vertebrae Explained

(EPFL, October 14, 2011)

EPFL scientists have discovered the mechanism that determines the shape that many animals take – including humans, blue whales, and insects. During the development of an embryo, segmentation and formation of vertebrae happens sequentially. Very specific genes, called "Hox" are involved in this process. They are situated one exactly after the other on the DNA strand. First, the Hox genes are dormant, packaged like a spool of wound yarn on the DNA. When the embryo begins to form the upper levels, the genes encoding the formation of cervical vertebrae come off the spool and become activated, then it is the thoracic vertebrae's turn, and so on. A new gene comes out of the DNA spool every ninety minutes, which corresponds to the time needed for a new segment of the embryo to be built.

<http://swissinnovation.org/news/web/2011/03-111014-71.html>



Wireless Body Sensor Network to Monitor Heart

(EPFL, October 19, 2011)

Researchers at EPFL have developed a new device that helps detect the onset of cardiac anomalies at a very early stage. High-precision body sensors applied to the skin, a radio module and a chip that's optimized for analyzing and processing biological signals form a wireless body sensor network (WBSN) that consumes very little electricity. Connected to a wireless network, it monitors users' heart rates remotely and in real time. By means of complex algorithms, anomalies can be detected and analyzed. When a problem is detected, information is sent to the user's smartphone, then by text message or e-mail to medical personnel, who can intervene if necessary. It has batteries that can last for 3-4 weeks.

<http://swissinnovation.org/news/web/2011/03-111019-5d.html>

Glassless 3D Visualization System for Surgery

(Geneva University Hospital, October 19, 2011)

The Geneva University Hospital have developed a 3D visualization prototype of the human body without the need of special glasses. This prototype is part of an innovative project resulting from a partnership between the A. de Rothschild Memorial and the Artères Foundation. It aims to produce a navigation system in 3D and 4D which may significantly alter surgery and neurosurgery. The "project 3D-4D" driven Prof. O. Ratib, K. Schaller and Dr. V. Mendes Pereira, reached a first brilliant result: the visualization of the human body in three dimensions on a screen. This is crucial in the context of operations as the wearing of traditional 3D glasses is hardly compatible with surgery. It is expected to reduce the duration of the interventions and their preparation, reduce post-operative complications and a better use of operating room.

<http://swissinnovation.org/news/web/2011/03-111019-75.html>

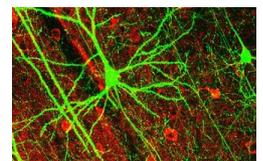


Joint Neuroscience Program

(EPFL, October 25, 2011)

EPFL and Harvard Medical School are combining efforts to study and cure deafness and paralysis in a new joint program. The program, which is funded by the Bertarelli Foundation, comprises six projects, five of which are focused on deafness, and one on paralysis. The projects will use the latest in gene therapy, flexible electronics, optical imaging, and human-machine interfaces to find cures. The several programs will look at modifying genes to cure genetic deafness, reconnecting nervous system pathways from the brain to the leg muscles, and using light to transmit signals from the middle ear directly to the central auditory pathways.

<http://swissinnovation.org/news/web/2011/03-111025-82.html>





Western HIV Treatment Also Effective in Asia and Africa

(SNF, October 25, 2011)

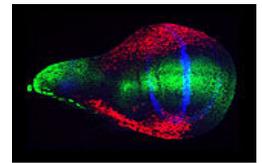
A number of types of the HIV virus exist and are more or less widespread in different parts of the world. Subtype B is the dominant form in the West, where most of the drugs are developed and tested. However, 90% of the HIV infected people carry other types of the virus that are common in Asia and Africa. Some experts feared that HIV therapies might be less effective against other viral types. However, these reservations have proven unfounded, as researchers of the Swiss HIV Cohort Study have shown in a recently published study. This does not necessarily mean that HIV therapies would be less successful in Africa and Asia than in Europe. Other circumstances also play a role, such as genetic factors or how closely the patient follows the doctor's recommendations. However, one can now at least rule out the possibility that existing therapies cannot contain virus subtypes that are predominant in Africa and Asia.

<http://swissinnovation.org/news/web/2011/03-111025-a2.html>

Proportional Organ Growth Regulation

(UNIBAS, October 25, 2011)

While it is well-known that animals grow to varying sizes based on their environment, the mechanism that maintains even proportions between organs despite other variations is less well-known. Researchers at the Universities of Basel and Lausanne have discovered the role of the morphogen Dpp and the associated target gene Pentagone in controlling proportional growth in the wings of the *Drosophila* fly. The two form a feedback loop where Dpp drives growth and Pentagone provides negative feedback to keep growth in control. The type of wing growth is controlled by the concentration of Dpp, which varies both spatially and in time. Further research will determine if this mechanism works in other animals as well.



<http://swissinnovation.org/news/web/2011/03-111025-c4.html>

Collaboration with Ireland in Therapeutic Products Sector

(FDHA, October 27, 2011)

Switzerland and Ireland wish to work more closely together in the therapeutic products sector. The Federal Council has approved a corresponding agreement, and Swissmedic and the Irish Medicine Board (IMB) have signed it today. The signed agreement is the first bilateral co-operation arrangement between Swissmedic and a national regulatory authority of an EU Member State. It was initiated by Ireland. The agreement is not legally binding, and is a so-called Memorandum of Understanding. This collaboration is of interest to both countries because the Swiss and Irish therapeutics products authorities are comparable. Among the objectives of this Memorandum of Understanding is the possibility of exchanging information and documents, and thus fostering understanding of the regulatory framework.

<http://swissinnovation.org/news/web/2011/03-111027-df.html>

Revolutionary Emergency Watch

(CSEM, October 27, 2011)

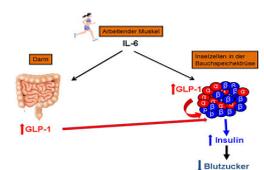
The Swiss start-up Limmex AG and CSEM SA jointly present a revolutionary emergency watch. It enables the wearer to request assistance at the push of a button, and to speak with pre-selected persons (e.g. family members, call center, physician). The watch works all over Switzerland and requires no installation. The watch aims to increase the safety of those working in dangerous environments or alone, the elderly, or people with illnesses such as epilepsy, cardiac problems or strong allergies, any of whom might find themselves in an emergency situation and need immediate assistance. In contrast to a mobile phone, a wrist-watch is instantly accessible at all times.

<http://swissinnovation.org/news/web/2011/03-111027-14.html>

Exercise Controls Insulin

(UNIBAS, October 31, 2011)

Diabetes affects hundreds of millions of people worldwide and is caused by reduced levels of insulin in the body. Recent research at the University and University Hospital of Basel has discovered the mechanism by which physical exercise controls insulin production. The hormone GLP-1, which is normally stimulated when food is consumed, drives the production of insulin. The new research shows that muscles, when exercised, produce Interleukin-6, which can also stimulate GLP-1 and thus insulin production. The discovery of this new mechanism confirms that physical exercise is an important way to prevent and treat diabetes, and it may lead to new methods to treat the disease.



<http://swissinnovation.org/news/web/2011/03-111031-25.html>



Cells Protection Mechanism Against Diabetes

(UNIGE, November 01, 2011)

At the Faculty of Medicine of the University of Geneva, researchers from the Department of Cell Physiology and Metabolism, Philippe Klee and Paolo Meda highlighted the role played by the beta cells that produce insulin in the pancreatic islets. The pancreatic beta cells no longer recognize glucose as a stimulus for insulin secretion and / or are no longer adequate numbers to ensure an adequate insulin secretion. With support from the Swiss National Science Foundation, the European Union and the Juvenile Diabetes Research Foundation, Meda's team sought to explain why, in patients suffering from long-term diabetes, often found in beta cells an ability to withstand attacks. Their findings highlight the role, previously neglected, and intercellular communication of connexins in controlling cell survival insulin, a phenomenon in determining the disease diabetes.

<http://swissinnovation.org/news/web/2011/03-111101-cc.html>

Future Medical Industry

(ETH Zurich, November 03, 2011)

A meeting of leaders from universities, industry, and politics in Switzerland was recently held to discuss the future of the Swiss medical industry. Switzerland stands at the forefront of this industry, but with the ever-increasing population of the world, more and more advances will be needed to address aging populations and increases in chronic diseases. ETH Zurich will be opening a new Department of Health Sciences and Technology in 2012, and EPFL already has many laboratories researching at the interface between medical science and engineering. Overall, special focus is being placed on personalized medicine, improved diagnostic tools, and improved nutrition systems. Additionally, close cooperation between academia and industry will ensure technology transfer.



<http://swissinnovation.org/news/web/2011/03-111103-64.html>

Decoding Ribosomal Subunit

(ETH Zurich, November 04, 2011)

Researchers at ETH Zurich recently decoded the crystalline structure of the larger of the two eukaryotic ribosomal subunits. Ribosomes are responsible for reading RNA and assembling proteins from the data. They are one of the most complex enzymes in living organisms. The same research group, led by Professor Nenad Ban, had previously decoded the structure of the smaller subunit. With this latest discovery, and by comparing eukaryotic ribosomes with bacterial ribosomes, researchers will be able to produce new antibiotics and fungicides that specifically target certain bacteria or fungi by binding to their ribosomes. Viruses could also be targeted because these bind to and manipulate the ribosomes of their host organism.



<http://swissinnovation.org/news/web/2011/03-111104-c4.html>

New Gene to Prevent Obesity

(UNIL, November 07, 2011)

The laboratory of Prof. Bernard Thorens, Center for Integrative Genomics, University of Lausanne, published the result of work highlighting a new gene essential for the activation of the genetic program of differentiation of brown adipose tissue. This gene, Plac8, had no well-defined function in mammals but was known in plants to control fruits size. In mice, the absence of this gene prevents the adipocytes of brown adipose tissue from acquiring their thermogenic property. The consequence is the gradual emergence of obesity with increased fat storage in white adipose tissue. This gene has a key role in energy balance and the balance between the two types of adipose tissue. Its Activation could be an effective way to increase the breakdown of fats to prevent obesity.

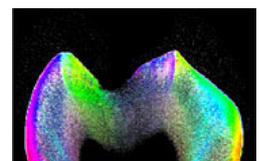


<http://swissinnovation.org/news/web/2011/03-111107-ec.html>

Nanomedicine for Cavities

(UNIBAS, November 08, 2011)

Dental cavities are one of the most common dental diseases. Current treatment methods involve drilling out the infected area and reconstructing it artificially. Researchers at the University of Basel and the Paul Scherrer Institute studied cavities at a nano scale and found that only the mineral structure of teeth is affected; the protein-based collagen part of the structure stays intact. Thus, the researchers believe that a new treatment method can be developed that builds up a new tooth around the existing collagen structure using nanomaterials, leaving more of the tooth intact.



<http://swissinnovation.org/news/web/2011/03-111108-98.html>



First Woman to Receive ERC Grant in Geneva

(UNIGE, November 10, 2011)

Stephanie Hughes, assistant professor in the Faculty of Medicine is the first woman from the University of Geneva to receive a subsidy from the European Research Council. The European Research Council (ERC) has encouraged the work of the team of Professor Stephanie Hughes. It focuses on the molecular and cellular mechanisms responsible for T cell tolerance in the development of autoimmune diseases and tumors. The funding rises EUR 1.5 million for five years. The University of Geneva participated successfully in several ERC grant scheme projects. Indeed, 15 researchers received a research grant to date, nine and six Advanced Grants Starting Grants in scientific fields ranging from life sciences, quantum physics to psychology. The financial support of each project varies between EUR 1 to 2.5 million.

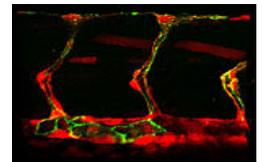


<http://swissinnovation.org/news/web/2011/03-111110-2e.html>

Blood Vessel Network Development

(UNIBAS, November 11, 2011)

Researchers at the University of Basel have discovered two mechanisms by which developing blood vessels join to form networks. They were able to conduct this research with zebrafish, which have a nearly transparent tail fin, and fluoresced proteins that play a key role in blood vessel development. One mechanism occurs in vessels already filled with blood. Blood pressure expands the vessel until it joins a neighboring vessel. A second mechanism occurs in dry vessels. The tip cells of neighboring vessels form a hollow chamber, which is then connected to each of the vessels. This research may lead to new ways of controlling blood vessel growth in tumors, a possible treatment method for cancer.



<http://swissinnovation.org/news/web/2011/03-111111-62.html>

Swiss Consume Too Much Salt

(FOPH, November 14, 2011)

The results of a national study commissioned by the Federal Office of Public Health confirm that people in Switzerland use too much salt. The study was carried out as part of the FOPH's Salt Strategy 2008 – 2012, the aim of which is to reduce salt consumption. Around 1,500 people were asked about their salt consumption and tested for hypertension. The results show that with 9.1g the daily salt intake of the Swiss population is well above the maximum daily level of 5 g per person recommended by the WHO. The study also showed that 25.6% of the individuals tested had high blood pressure.

<http://swissinnovation.org/news/web/2011/03-111114-f4.html>

Patient Self Reporting of Cancer Adverse Effects

(UNIBAS, November 15, 2011)

Cancer patients and survivors may face disturbing physical and psychological symptoms. For this reason, adverse event (AE) reporting is a critical component of cancer treatment and clinical trials. The National Cancer Institute's (NCI) Common Terminology Criteria for Adverse Events (CTCAE) is the primary system used by clinicians to describe the severity of AEs. Yet, there is growing awareness that symptoms are often underestimated by physicians and nurses and therefore collecting symptom data directly from patients using patient-reported outcome (PRO) tools can improve the accuracy of AE data collection. Therefore, the NCI developed a Patient-Reported Outcomes version of the CTCAE (PRO-CTCAE). The study PROVIVO, a collaboration between the NCI and the University of Basel, translated the English PRO-CTCAE into German by conducting cognitive interviews with stem cell transplant recipients and doing an expert survey in physicians and nurses.

<http://swissinnovation.org/news/web/2011/03-111115-27.html>

New Dual-Drug Targets Malaria Parasite

(Novartis, November 17, 2011)

A new class of antimalarial drug candidates inhibits malaria parasite liver- and blood-stages in malaria models. Novartis scientists have developed a novel assay to determine liver stage activity of candidate small molecules, then used the assay and other tools to identify and optimize a chemical scaffold with activity on both blood- and liver-stage parasites in malaria mouse models. Most current malaria treatments target blood infections but researchers believe both liver and blood infections need to be treated to eliminate malaria. The malaria parasite first infects the liver before moving to red blood cells and causing symptoms. However, after clearance in the blood, reservoirs of parasites can linger in the liver causing relapse and hampering efforts toward complete elimination of the disease.

<http://swissinnovation.org/news/web/2011/03-111117-6f.html>

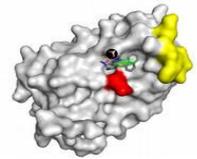


Immunosuppressant Developed with Computer Software

(ETH Zurich, November 18, 2011)

ETH Zurich scientists, using computer software they developed and in collaboration with German immunologists, have discovered a pharmaceutically active molecule that can halt the excessive production of an immune system messenger substance. A derivative of this molecule could one day help patients with an autoimmune disease. Interferons are important messenger substances in human and animal immune systems. For example, one class of interferons, known as Type I interferons, are produced by cells of the immune system as a response to infections by pathogenic viruses or bacteria. The researchers have discovered a pharmaceutically active candidate substance that specifically inhibits the secretion and activity of Type I interferons. In future this could help patients suffering from diseases such as systemic lupus erythematosus.

<http://swissinnovation.org/news/web/2011/03-111118-c8.html>



Neuronal Filters to Retrieve Information

(FMI, November 18, 2011)

Scientists from the Friedrich Miescher Institute for Biomedical Research (FMI) have discovered neuronal filters between the olfactory bulb and the cortex that can retrieve messages at the other end without confusing them. In a study they show that neuronal filtering in the cortex can extract information about specific odors from the plethora of information that is broadcast by the olfactory bulb. This filtering is likely to be important for the perception and memory of odors, and may also be implemented in other brain areas. The olfactory bulb is the first olfactory processing center in the brain. Upon stimulation of sensory neurons in the nose with an odor, nerve cells in the olfactory bulb produce complex patterns of activity that are transmitted to multiple higher brain regions.

<http://swissinnovation.org/news/web/2011/03-111118-73.html>



Damage from Worm Infections

(UNIBAS, November 23, 2011)

The Swiss Tropical and Public Health Institute recently conducted a study of the effects of trematodes on human health. Trematodes are parasitic worms that can affect humans through their food source, especially seafood. Light infections often go unnoticed, but more severe ones can lead to death. Originally concentrated in south-east Asia, cases of infection have spread to Europe and America due to the globalization of our food sources and increased travel. The study estimated that around 56 million people were affected worldwide with eight million suffering serious complications and 7000 dying. The disease was responsible for 665,000 disability-adjusted life years. Additionally, it caused harm to other animals, something which wasn't accounted for in the study.

<http://swissinnovation.org/news/web/2011/03-111123-91.html>

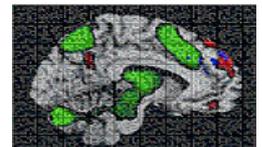


Memory Gene

(UNIBAS, November 24, 2011)

Researchers at the University of Basel are conducting a project to discover the neurobiological and molecular mechanisms responsible for proper human memory function. The project uses a range of methods from molecular-genetic surveys to neuroimaging and clinical studies. A recent result has discovered a gene that is central to memory function. The researchers studied the entire human genome and found that CTNBL1 is strongly correlated with good memory function. Using neuroimaging they were able to show that the gene controls brain activity in areas of the brain relevant to memory function. The project will next study how this gene affects information storage in the brain.

<http://swissinnovation.org/news/web/2011/03-111124-28.html>



Desert DNA Sequence Shapes Fingers

(EPFL, November 24, 2011)

Scientists from EPFL and the University of Geneva have discovered a genetic mechanism that defines the shape of our members in which, surprisingly, genes play only a secondary role. A DNA sequence that was thought to play no role actually codes seven enhancers which modulate the activity of the genes responsible for the formation of the fingers. When the fingers in the embryo begin to take shape, the string of DNA folds and the enhancers, located on different parts of the string, come into contact. They then bring together various proteins that stimulate the activity of the genes, and the fingers start to grow. Missing enhancers or mutations affect the way fingers are



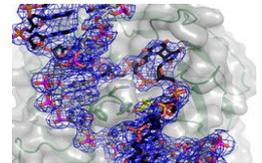
formed. The flexibility of this mechanism causes not only hereditary malformations, but also the many variations in the hands, legs and other appendages in nature.

<http://swissinnovation.org/news/web/2011/03-111124-10.html>

Internal Skin Cancer Prevention

Scientists at the Friedrich Miescher Institute for Biomedical Research (FMI) of the Novartis Research Foundation have elucidated the mechanisms underlying the repair of UV-induced damage in DNA, which frequently causes skin cancer. The protein structures additionally determined by these researchers will improve our understanding of how the body protects itself against skin cancer. These studies lay the foundations for the development of a new class of anti cancer agents. Reliable treatments can only be developed if the molecular mechanisms underlying skin cancer are better understood. Here, scientists at the FMI have made an important breakthrough. Group Leader Nicolas Thomä and his team at the FMI, working together with colleagues from Kobe and Osaka, have now identified the molecular machinery which allows the cell to recognize lesions not detected by the normal repair system.

(FMI, November 24, 2011)



<http://swissinnovation.org/news/web/2011/03-111124-08.html>

Personalized Medicine Program "Virtual Patient"

The flagship project ITFoM (IT for Future of Medicine) of the FET program (Future and Emerging Technologies) of the European Commission proposes a new and personalized medicine by creating a "virtual patient" through information and communications technologies implication. The University of Geneva (UNIGE) is heavily involved in the analytical phase of the project. ITFoM aims to put ICTs at the service of a new, individualized and data-rich medicine. The objective of ITFoM is to build "virtual patients" that would integrate all molecular, physiological and anatomical condition data of a patient. This new medicine, focusing on patient data, would allow doctors to provide personalized prevention programs and to virtually test treatments effectiveness in order to identify which one would offer the best chance of cure and to anticipate side effects.

(UNIGE, November 28, 2011)

<http://swissinnovation.org/news/web/2011/03-111128-8e.html>

Introns to Auto-Reproduce With Genome

ETH Zurich researchers led by Professor Bruce McDonald showed for the first time that non-coding parts of genes called introns can copy themselves and move around the genome. Nevertheless, these DNA sequences remain mysterious. The plant pathologists answered the question of why the same gene came in different lengths in different individuals. In some strains the gene, "ID-60105", which encodes for a cell wall-digesting enzyme, had an intron, in other strains the same gene did not have an intron. The researchers were able to identify whole families of closely related introns, and then determine the frequency with which a particular intron family was present in the genome. The researchers are convinced that their work will lead to a better understanding of intron evolution for all eukaryotes.

(ETH Zurich, November 30, 2011)



<http://swissinnovation.org/news/web/2011/03-111130-f1.html>

4. Nano / Micro Technology / Material Science

New Institute of Microtechnology

With the development of Microcity, EPFL is establishing its presence in the canton of Neuchâtel. The first stone of the building, which will house the Institute of Microtechnology. In 2007, the Institute of Microtechnology (IMT) in Neuchâtel became part of EPFL. For the first time, the school now had a campus outside of Lausanne. The goal was to foster innovation in the region renowned for its watchmaking and mechanical industries. The building will house all the activities of the Institute. The consolidation of the existing center of microtechnology around Microcity will also reinforce the interactions between the various institutions, and create a genuine knowledge network between EPFL, Neode, the Swiss Center for Electronics and Microtechnology (CSEM), the Haute Ecole ARC and the University of Neuchâtel.

(EPFL, October 11, 2011)



<http://swissinnovation.org/news/web/2011/04-111011-31.html>



Novel Nanocellulose Manufacturing Process

(Empa, October 24, 2011)

Researchers at Empa have created a new way to process nanocellulose that makes it easy to use and transport in powder form, rather than in a suspension. Nanocellulose is a fibrous material made of cellulose that is just a few nanometers in diameters and several micrometers long. It plays an important role in modifying the structural properties of polymers used in a wide range of industries. Until now, nanocellulose could not be dried into a powder because it would form clumps and lose its good properties. The new process developed at Empa allows the material to be dried and then later put back into solution, thereby reducing transportation costs and making it easier to work with.

<http://swissinnovation.org/news/web/2011/04-111024-db.html>

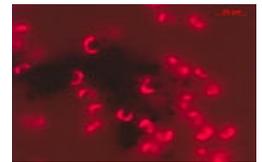


Carbon Nanotubes Effect on Environment

(EMPA, November 04, 2011)

Carbon nanotubes (CNTs) are used in ever-increasing quantities, but their effects on the environment are not fully understood yet. Researchers at Empa and the Argoscope Reckenholz-Taenikon Research Station recently studied the effects of CNTs on green algae. Contrary to previous beliefs, the study showed that CNTs are not toxic to green algae, but they do affect growth through two mechanisms. CNTs cause the algae to clump together around the CNTs, which reduces the space it has to grow, and increases shadowing. With less room and less sunlight, growth rates are reduced. Further tests are still needed to determine the other environmental effects of CNTs and other nanoparticles.

<http://swissinnovation.org/news/web/2011/04-111104-4d.html>

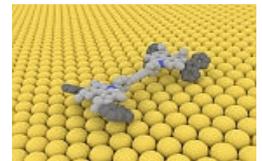


Nano Molecular Car

(EMPA, November 10, 2011)

The 4-wheel drive nano car, jointly developed by Empa researchers and their Dutch colleagues, represents lightweight construction at its most extreme. The nano car consists of just a single molecule and travels on four electrically-driven wheels in an almost straight line over a copper surface. Scientists at the University of Groningen and at Empa have successfully taken "a decisive step on the road to artificial nano-scale transport systems". They have synthesised a molecule from four rotating motor units. The small car, which measures approximately 4x2 nanometres needs to be refuelled with electricity after every half revolution of the wheels – via the tip of a scanning tunnelling microscope. Therefore, the researchers have been able to demonstrate that individual molecules can absorb external electrical energy and transform it into targeted motion.

<http://swissinnovation.org/news/web/2011/04-111110-be.html>



Novel Touchscreen With "Feeling" Texture

(EPFL, November 16, 2011)

EPFL researchers have developed a way to control the texture of a screen so that the "feeling" of specific areas can be modified underneath a user's fingertips. To obtain this relief effect, the scientists used a piezoelectric material that vibrates when a voltage is applied to it. The material expands and then returns to its original shape very rapidly, all at the nanometer scale. This movement generates micro-vibrations, whose intensity can be controlled mechanically. These vibrations, whose amplitude is only about a micron, are themselves imperceptible, but they create a very thin layer of air between the surface and a user's finger, giving the feeling that there's something raised underneath it. Users can feel actual raised keys under their fingers. The technology is being designed for smartphones, tablets, computers, and vending machines.

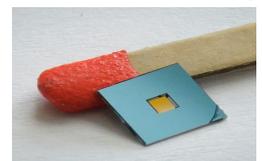
<http://swissinnovation.org/news/web/2011/04-111116-70.html>

Ultra- Cold Atoms

(UNIBAS, November 22, 2011)

Tiny mechanical oscillators are important tools for studying the boundary between classical and quantum physics. Researchers at the University of Basel were recently able to couple such an oscillator with ultra-cold atoms using laser light. Ultra-cold atoms exhibit behavior in the quantum realm, which makes this setup interesting. Laser light reflecting off the oscillator creates a standing wave that traps the atoms and couples the motion of the two. Swinging of the oscillator moves the standing wave, affecting the atoms through light pressure, and moving atoms affect the oscillator too. Due to the very high mechanical efficiency of the silicon-nitride oscillator, the researchers will be able to make highly accurate measurements of various quantum effects.

<http://swissinnovation.org/news/web/2011/04-111122-21.html>





5. Information & Communications Technology

Swiss Statistical Atlas for iPad

(OFS, October 04, 2011)

The Swiss Statistical Atlas for the iPad gives a rich and modern visualisation of numerous regional issues touching many themes of Switzerland's public statistics. Historical data clearly illustrate long term evolution and regional developments. The Atlas lets one visualize different themes at municipal, district and cantonal level. It contains over 1000 thematic interactive maps, letting one compare regions and time periods. The fully bilingual french and german app is, like the full version on the Swiss Statistics Portal, updated once a year.



<http://swissinnovation.org/news/web/2011/05-111004-62.html>

Future Predicting Supercomputer

(20 Minuten, October 18, 2011)

ETH Zürich's project called FuturICT is developing a supercomputer that will attempt to predict future events like financial crises, natural disasters, or wars by analysing so called domino effects in society. Actions lead to results in predictable patterns. Information concerning these patterns can be gleaned from social networks like Facebook and Twitter, and are uploaded into a supercomputer. An open and transparent platform would permit decision makers and ordinary citizens alike explore future scenarios and make more informed decisions.



<http://swissinnovation.org/news/web/2011/05-111018-ee.html>

Next-Generation Access Networks and Management of Frequencies

(OFCOM, October 20, 2011)

Switzerland has pledged its support for the European Ministerial Declaration on better use of the radio spectrum. This was adopted at the Conference on perspectives for the development of the electronic communications market in the European Union which was held in Warsaw. In response to the invitation of the Polish Presidency of the EU Council of Ministers, the Federal Council had decided to dispatch a Swiss delegation to participate in the discussions, which focused on the deployment of next-generation access networks and management of frequencies used for wireless communication. The European conference on the electronic communications market presented development guidelines in this area. The two central themes related to the coordination and management of the radio spectrum and to the deployment of next-generation access networks.

<http://swissinnovation.org/news/web/2011/05-111020-88.html>

Increase in Electronic Espionage and Skimming

(SG FDF, October 31, 2011)

In the first half of 2011, the Reporting and Analysis Centre for Information Assurance (MELANI) detected higher numbers of espionage attacks on the most diverse range of companies worldwide. The number of hacker attacks aimed at accessing sensitive data also increased. There was a massive increase in skimming cases in Switzerland during the first half of 2011. While 135 manipulated cash machines were found in the whole of 2010, 225 were discovered already in the first four months of this year. The attackers are increasingly trying to manipulate not only cash machines, but also payment devices in supermarkets and ticket machines. The perpetrators frequently have themselves locked in overnight in order to mount the necessary devices.

<http://swissinnovation.org/news/web/2011/05-111031-8d.html>

New Generic Top-Level Internet Domains

(OFCOM, November 14, 2011)

The Federal Office of Communications and the Swiss domain name registry SWITCH, along with representatives of the Swiss economy and civil society, are organising an event on the international programme for new generic internet domain names. At the same time, there will be an opportunity to interact in an informal setting and discuss the opportunities and risks that this development represents for businesses, government and the civil society in Switzerland. ICANN (Internet Corporation for Assigned Names and Numbers) decided to introduce new generic top-level internet domains. In addition to existing domain names such as .com, .org and .info, any other generic names such as .bank, .hotel, .berlin, .gmbh or even .cocacola, .nestle, etc. will be permitted.

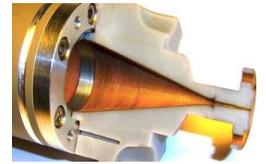
<http://swissinnovation.org/news/web/2011/05-111114-a6.html>



Terahertz to Enhance Detection System

(EPFL, November 15, 2011)

Swissto12 — an EPFL spin-off — could help boost the performance of detection systems and create new antennas for mobile telephony and on-board satellite systems thanks to an innovative transmission system that takes advantage of a previously under-utilized wavelength: the terahertz. These waves, whose frequency lies between the infrared band and the microwave band on the light spectrum, have the capability of characterizing surfaces or identifying the components of solids, liquids, even gases. So far considered harmless to human beings, terahertz waves have only been the subject of applied research for a few years. But Swissto12 is changing that. Swissto12's secret is hidden in a seemingly innocuous metal tube with thousands of micro-washers of a particular diameter and profile stacked inside.



<http://swissinnovation.org/news/web/2011/05-111115-f0.html>

Terahertz Passive Imaging Detection System

(CSEM, November 25, 2011)

Security inspection of airplane passengers without the use of radiation becomes reality thanks to the potential of terahertz passive imaging. A consortium of eight European industrial research groups and companies have started to develop a true on-chip integrated terahertz camera, a breakthrough which will allow widespread use of this safe technology. Called "TeraTOP", the project will focus on potential security applications and will demonstrate a camera for detecting hidden objects. Deployment of TeraTOP Imagers will greatly improve the surveillance and security of airports and other crowded places with no negative health-impact to individuals. The consortium plans to implement a completely new type of THz sensor based on thermally isolated nanotransistors directly integrated with CMOS-SOI readout circuitry.

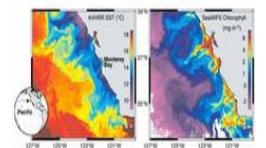
<http://swissinnovation.org/news/web/2011/05-111125-44.html>

6. Energy / Environment

Eddies in Ocean Reduce Biological Productivity

(ETH Zurich, October 11, 2011)

An international team of researchers led by ETH-Zurich wanted to find out which factors, besides the availability of nutrients, influence the strength of net primary production. They targeted eddies, which are coherent flow structures that vary in size between 20 and 200 km and are the oceanographic equivalents of the low and high-pressure systems in the atmosphere. Using high-resolution model simulations and statistical analyses, the scientists discovered that the more frequent and intense the eddies in the upwelling ocean systems are, the lower the biological productivity is. To understand the role of eddies is important since, with their limited size of less than 200 kilometres, they fall through the grid of nearly all current climate models. This could prove to be an essential gap in the modeling of the global carbon cycle.



<http://swissinnovation.org/news/web/2011/06-111011-73.html>

High Energy Standards for Buildings

(Tages-Anzeiger, October 15, 2011)

Energy efficient structures that meet the "Minergie" standards are becoming more and more common in Switzerland, but some new buildings are pushing the envelope and producing more energy than they consume. For example the new factory of the company Heizplan produces four-and-a-half times more energy than needed through solar cells and efficient construction techniques, such as triple-pane windows and LED lighting. However, the cost of such buildings is still high, and renovating old buildings to meet new standards does not gain enough efficiency to offset the costs. Nevertheless, government subsidies and regulations can change the equation and drive better overall building efficiency.



<http://swissinnovation.org/news/web/2011/06-111015-d8.html>

National Energy Research Program

(SER, October 20, 2011)

The State Secretariat for Education and Research is launching a new national research program to study various aspects of energy. In an initial information request phase, twenty-seven proposals for new research programs were received. Proposals were limited to the themes of efficiency technologies, electricity delivery and networks, energy



storage, energy creation, and economic and legal aspects of energy. Most of the proposals covered more than one of the themes, with three covering all five. The secretariat is reviewing proposals and hopes to launch new research programs early next year.

<http://swissinnovation.org/news/web/2011/06-111020-3c.html>

Sustainable Building Construction

(ETH Zurich, October 21, 2011)

Construction accounts for thirty percent of carbon dioxide emission worldwide. To help solve this issue, ETH Zurich is starting a new sustainable construction initiative. New positions for professors will be created that will be supported by ETH Zurich and industry partners. A range of technologies will be investigated, including building materials that arrange themselves to achieve the desired energetic and other properties. Additionally, research will be performed to improve the efficiency of construction sites. Sourcing local construction materials and minimizing waste are important steps in making construction more efficient. Lastly, the initiative will also focus on transferring technology from theory to practice through continued interaction with industry partners.

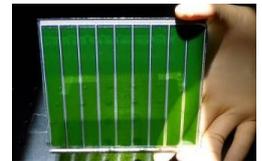


<http://swissinnovation.org/news/web/2011/06-111021-be.html>

New Efficiency Record of Dye-Sensitized Solar Cells

(EPFL, November 10, 2011)

Dye-sensitized Grätzel solar cells have just set a new efficiency benchmark. By changing the composition and color of the cells, a group of scientists in EPFL's Laboratory of Photonics and Interfaces, under the leadership of EPFL professor Michael Grätzel, has improved the efficiency of the famous Grätzel solar cells to 12.3%. This performance is now comparable to silicon-based solar panels that are on the market today. The challenge was to increase the efficiency of the dye-sensitized cells, in order to produce more electricity. To do this, the chemists replaced the standard dye components – ruthenium and iodine – with porphyrin and cobalt. This combination allows them to increase the absorption of sunlight and results in a more efficient electron exchange.



<http://swissinnovation.org/news/web/2011/06-111110-83.html>

Future of Energy in Switzerland

(ETH Zurich, November 15, 2011)

A new study from the Energy Science Center at ETH Zurich looks at the feasibility of Switzerland's planned exit from atomic energy. The study concludes that the planned timeline is feasible, but that it also presents some challenges. Energy costs will increase and technological advances in energy efficiency are needed. The balance of energy sources will rely heavily on hydroelectric power (fifty percent), but also on photovoltaic, biomass, geothermal, and wind power. Fossil fuel or imported electricity is estimated at twenty percent, which represents a reduction in comparison to the amount of electricity imported today. Electricity use will increase, partly due to a shift away from fossil fuels to meet greenhouse gas emissions targets.



<http://swissinnovation.org/news/web/2011/06-111115-f0.html>

7. Engineering / Robotics / Space

New Sensorless Controller for Electric Motors

(Celeroton, October 03, 2011)

Celeroton has launched the newest version of its electronic converter. This is the world's first converter that allows for sensorless control of permanent-magnet synchronous machines (PMSM) and brushless dc motors (BLDC) from standstill up to 1 million rpm. The integrated pulse-amplitude modulation (PAM) drives BLDC and PMSM, commonly used in dental- and medical tools and machining spindles, at higher rotational speeds with minimal losses in stator and rotor. Due to the sensorless speed control, hall sensors can be completely omitted, even for speeds below 10% of the nominal speed where standard converters would usually require a position feedback sensor. This results in a simplification in the motor design and less cables and connectors, with a resulting increase in reliability.



<http://swissinnovation.org/news/web/2011/07-111003-64.html>



Swiss Presence in Euclid Mission of ESA

(UNIGE, October 06, 2011)

Selected by the European Space Agency as part of its "Cosmic Vision" program, the «Euclid» mission aims to study the accelerating expansion of the Universe, one of the biggest question of cosmology and fundamental physics of the 21st century. Involving the estate for Outer Space Affairs of the Confederation, the University of Geneva, the Ecole Polytechnique Fédérale de Lausanne, the University of Zurich and the University of Applied Science of Northwestern Switzerland, the mission will likely be launched in 2019. The origin of the accelerating expansion of the Universe is one of the biggest questions of cosmology and fundamental physics of the 21st century. Astronomers and physicists are convinced that the study of the cause of this acceleration will fundamentally change the understanding of quantum physics, gravity and physics of the universe after the Big Bang.

<http://swissinnovation.org/news/web/2011/07-111006-52.html>

Self-Parking Electric Vehicle

(20 Minuten, October 12, 2011)

A new ETH Zurich research project called V-Charge is starting up and will develop an electric car that can autonomously find a charging station, plug itself in, and then find an empty parking spot. The vehicle will use GPS, ultrasound sensors, and cameras to find its way around the parking lot and park in its chosen spot. This technology will free up drivers to simply get out of their car at their destination and leave the nerve wracking tasks to the car. Another project at EPFL is partnering with Nissan to develop a car that can read its driver's mind.



<http://swissinnovation.org/news/web/2011/07-111012-c9.html>

First Soyuz Rocket Launched in Guiana With Swiss Participation

(SER, October 18, 2011)

For the first time, the legendary Russian Soyuz rocket will take off from Europe's Spaceport in French Guiana with on board the two first satellites of the future Galileo constellation, the European navigation system. This double "first" dedicates the culmination of the two programs of the European Space Agency to which Switzerland has fully participated. Ariane and Soyuz completes the Vega small launcher which together form the family of launchers operated from French Guiana to Europe to ensure access to space. Launchers sector and the ensuring access to space has always been a priority for Switzerland. Switzerland is part of the states active on the three launchers Ariane, Vega and Soyuz, and has positioned itself as a trusted partner.



<http://swissinnovation.org/news/web/2011/07-111018-4a.html>

Algorithms in the Search for Dark Energy

(EPFL, October 21, 2011)

The European Space Agency has selected the Euclid space mission to study the mysterious dark energy that permeates the Universe. Its goal is to map the sky and deduce from this how dark energy is distributed throughout the Universe. EPFL is developing algorithms that will help to analyze the images obtained by Euclid, and from there, to study dark energy in detail. With a diameter of 1.2 meters, Euclid's telescope will produce images with nearly the resolution of those taken by the Hubble, but over the entire observable sky. A launch date has been planned for 2019, and the mission will take seven years.



<http://swissinnovation.org/news/web/2011/07-111021-c5.html>

Fast Recharge of Compressed Air Vehicles

(EPFL, October 28, 2011)

As part of a partnership with a French company that develops compressed air vehicles, EPFL scientists have developed a prototype for a quick-stop recharge station that can fill up a tank in less than three minutes. The new recharge process is done in two stages: first the air is compressed in a high-performance compression station and transferred to an intermediate storage station. Because it's continually being refilled, the intermediate storage station is able to maintain quasi-constant pressure conditions. Then, the air is transferred very rapidly to the car's tank using a flow-limiting process in which very little energy is dissipated. A recirculation system cools the air during fill-up, to achieve denser air at constant pressure.



<http://swissinnovation.org/news/web/2011/07-111028-29.html>



New High-Energy Particle Astronomy Sensor

(ETH Zurich, November 02, 2011)

Earth is bombarded with high-energy particles that are accelerated by galactic and extra-galactic sources to energies much higher than can be produced by man-made facilities. Determining the location of these cosmic accelerators requires highly-sensitive sensors that take billions of pictures per second of the atmospheric light flashes caused by the high-energy particles. Until now, these Cherenkov telescopes could only operate on moonless nights in areas with very low light levels. A new semiconductor-based sensor developed at ETH Zurich, called a G-APD, is much more robust to light disturbance. The first sensor was just installed in a telescope in the Canary Islands, and started providing images on a full-moon night. The sensor will be optimized over the next several months.



<http://swissinnovation.org/news/web/2011/07-111102-64.html>

French Car Maker to Join Swiss Innovation Square

(EPFL, November 04, 2011)

PSA Peugeot Citroën is announcing its arrival on the campus of the EPFL. The French automaker will be the eleventh major company to move into business-oriented Innovation Square since the space opened. At a press conference in Paris, the French automaker publicly announced that it is setting up an innovation unit called StelLab@EPFL. The new unit will be located in Innovation Square, where it will join other multinationals such as Logitech, Nokia, Constellium, and Nestlé. The mission of this innovative structure is to foster a long-term vision for PSA Peugeot Citroën's products and services. EPFL conducts a great deal of research that is of interest to the auto industry, in a wide range of different fields.



<http://swissinnovation.org/news/web/2011/07-111104-ca.html>

Light-Sensitive Diode Camera to Observe Cherenkov Radiation

(EPFL, November 07, 2011)

EPFL researchers have developed a method to observe the flashes of light that are produced by gamma rays when they penetrate the Earth's atmosphere, called Cherenkov radiation. The observation of these brief flashes requires ultra-rapid, sensitive cameras that can record several thousand images per second. The FACT telescope detector is composed of light-sensitive diodes that produce an electric current when they record a flash of Cherenkov radiation. The semiconductors are advantageous: the camera is lightweight, and so a telescope equipped with it can also be lighter; it maintains good sensitivity in high ambient light conditions, and can thus make observations when the moon is full; the detector's performance is not compromised by exposure to light, as is the case with traditional cameras.



<http://swissinnovation.org/news/web/2011/07-111107-fa.html>

Innovative Tracking System

(EPFL, November 11, 2011)

International sports federations would like to be able to follow the movements of individual athletes more easily during televised matches, even when they're hidden from view. EPFL's Computer Vision Laboratory announces an innovative system that accomplishes this task—and the implications go far beyond sports. EPFL's Computer Vision Laboratory (CVLab), led by professor Pascal Fua, now has a new tool that makes it possible to follow multiple players at once on a field or court, even when they're buried under a pile of bodies in a rugby match or crouched behind another player. The system is made up of eight standard cameras - two on each side of the field or court, two that film from above and two that zoom – and three algorithms.

<http://swissinnovation.org/news/web/2011/07-111111-3c.html>

World's Fastest Robot

(EPFL, November 14, 2011)

The Delta robot made light work of hundreds of packets of Smarties at the Triennial Inter-pack Exhibition in Düsseldorf. The inventor of the concept, Reymond Clavel, was presenting in Germany the most recent version of the Delta robot, resulting of a collaboration with Bosch. The performance of "Delta Direct Drive" is impressive – the robot can achieve acceleration of over 15 g, and this represents an increase in performance of 50% compared to robots of the previous generation. The challenge in developing this new variant was daunting – it involved increasing the speed of the Delta robot, while maintaining its precision. Scientists have now been able to take advantage of the progress made in motorization – in both power and cost.



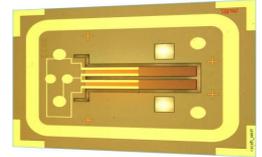
<http://swissinnovation.org/news/web/2011/07-111114-b1.html>



MEMS Packaging Ready for Space Missions

(CSEM, November 15, 2011)

The Heterogeneous Technology Alliance (HTA), a team of leading European technology institutes, is developing new methods for packaging and testing microelectromechanical systems (MEMS) devices to meet performance requirements of space missions. As part of the Wafer-Level Encapsulation in Microsystems (WALEs) project, HTA members are studying how wafer-level packaging (WLP) can be used to connect and protect MEMS devices in hermetically sealed structures to withstand radiation and extreme conditions encountered in space. The ESA-funded project will provide a fast standardized test to evaluate the suitability of MEMS for space missions. The CSEM-led project is developing procedures for testing MEMS WLP for piezo-electrically and capacitively actuated resonators.



<http://swissinnovation.org/news/web/2011/07-111115-99.html>

Educational Robot for Schools

(EPFL, November 28, 2011)

Creating an original pedagogical tool to get students interested in technology and robotics: this is the challenge that was undertaken by a group of the researchers led by Fancesco Mondada, in EPFL's Robotics Systems Laboratory. In collaboration with the University of Art and Design Lausanne (ECAL), they developed Thymio II, a little programmable white robot, jam-packed with sensors and LEDs, that can exhibit a wide range of behaviours. Each sensor is associated with a coloured LED, which allows the kids to visualize the activation of the sensors during a specific manoeuvre. The 11 cm x 11 cm robot is equipped with proximity sensors, ground-directed sensors, accelerometers, a microphone and a temperature sensor. It also has a memory card for recording sound.



<http://swissinnovation.org/news/web/2011/07-111128-1f.html>

8. Physics / Chemistry / Math

New Technology for Gamma-Ray Astronomy

(UNIGE, October 02, 2011)

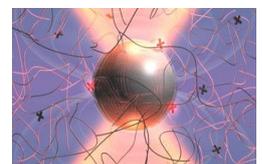
The camera of the telescope FACT, developed by a team of 45 physicists, engineers and technicians from the University of Geneva, EPFL, ETHZ and universities of Dortmund and Würzburg, use for the first time detectors based on semiconductors to observe flash of light produced by gamma rays in the atmosphere. The Universe contains particle accelerators much more powerful than CERN's LHC. The gamma-ray astronomy can reveal these cosmic accelerators, using light detection of very high energy. The technique relies on the use of telescopes, known as "Cherenkov". These telescopes are able to perceive the flash of light caused by the interaction of high energy photons with Earth's atmosphere. The observation of these particularly short flash requires sensitive cameras and high-speed capable of recording up to several billion frames per second.

<http://swissinnovation.org/news/web/2011/08-111002-36.html>

Tiny Vortices in Liquids

(EPFL, October 07, 2011)

By observing at very high speeds the shadow cast by a the particle on a detector, researchers in EPFL's Laboratory of Complex Matter Physics were able to show, and measure, the existence of eddies formed by a particle in motion in a liquid showing that Einstein's formula for describing this situation needs a little adjustment. These tiny vortices dissipate after just five microseconds. The challenge was to measure the characteristics of these vortices. To do this, the physicists used what they refer to as "optical tweezers." Using a laser, they are able to hold a particle in a liquid, as if the particle was attached to the end of a spring. By measuring the vibration of the particle against the spring, they can demonstrate that the vortex increases the particle's fluctuations.

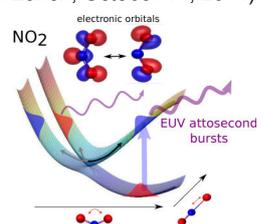


<http://swissinnovation.org/news/web/2011/08-111007-65.html>

Watching Electron in Molecules

(ETH Zurich, October 14, 2011)

For the first time, researchers at ETH Zurich have been able to measure and visualize the motion of electrons during a chemical reaction. They used very short ultraviolet pulses to excite nitrogen dioxide atoms followed by an infrared pulse. The ultraviolet pulse makes the molecules vibrate and then decompose into nitric oxide and an oxygen atom. The infrared pulse removes an electron and then accelerates it back to the molecule. This causes the molecule to emit a light pulse that contains information about the electron distribution. This





research is applicable to developing more efficient solar cells because a similar reaction occurs in photochemical processes.

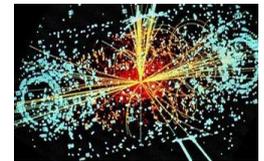
<http://swissinnovation.org/news/web/2011/08-111014-5a.html>

LHC@Home Lets Users Contribute to Science At CERN

With the SixTrack project developed by EPFL in the framework of the LHC@Home program, home computers can provide CERN with additional computing power. Predicting protons' motion in the LHC requires huge computing power. Scientists simulate collisions over and over again. In particular, they take into account the slightest flaw in any of the 1,232 magnets down to a fraction of a millimeter. The challenge has been successfully met so far. Stronger magnets are to be fitted in 2020 to reduce the beam size ever further, in order to increase the chance of particle collisions. Home users can help CERN scientists with the new simulations by contributing their CPU's idle cycles to the project.

<http://swissinnovation.org/news/web/2011/08-111024-62.html>

(EPFL, October 24, 2011)

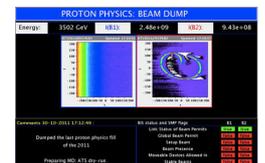


LHC's Proton Collisions for 2011 Successfully Conclude

After some 180 days of running and four hundred trillion (4×10^{14}) proton proton collisions, the LHC's 2011 proton run came to an end. For the second year running, the LHC team has largely surpassed its operational objectives, steadily increasing the rate at which the LHC has delivered data to the experiments. Physics highlights from this year's proton running include closing down the space available for the long sought Higgs and supersymmetric particles to hide in, putting the Standard Model of particle physics through increasingly gruelling tests, and advancing our understanding of the primordial universe.

<http://swissinnovation.org/news/web/2011/08-111031-bd.html>

(CERN, October 31, 2011)



Energy Saving Tunnel-FET Transistor

Consumer electronics could use 100 times less energy by 2017 thanks to a quantum phenomenon known as the tunnel effect, say researchers at EPFL. The technology used in today's transistors is called "field effect;" where voltage induces an electron channel that activates the transistor. Tunnel-FET technology is based on a fundamentally different principle. In the transistor, two chambers are separated by an energy barrier. In the first, electrons wait while the transistor is deactivated. When voltage is applied, they cross the energy barrier and move into the second chamber, activating the transistor. According to quantum theory, some electrons cross the barrier even if they apparently don't have enough energy to do so. By reducing the width of this barrier, it becomes possible to amplify and take advantage of the quantum effect – the energy needed for the electrons to cross the barrier is drastically reduced.

<http://swissinnovation.org/news/web/2011/08-111123-7c.html>

(EPFL, November 23, 2011)



9. Architecture / Design

Community Center in Sao Paulo

A new community center being built in the heart of the largest favela (shanty town) in Sao Paulo has been awarded the Holcim Award Gold for Sustainable Construction 2011. The center, designed by two Swiss professors of architecture at ETH Zurich, will attempt to further develop the social cohesiveness of the community. Its central theme is music, and will include music facilities and an event hall. Additionally, currently non-existent utilities such as running water, sewer connection, and public lighting will be built into the facility. A new bus stop will connect the community to the rest of the city.

<http://swissinnovation.org/news/web/2011/09-111019-32.html>

(ETH Zurich, October 19, 2011)





State-of-the-art Swiss Tech Convention Center

(EPFL, November 23, 2011)

The Swiss Tech Convention Center, under construction on EPFL's campus, will open its doors to rooms fully adjustable, equipped with the latest technologies by November 2013. With this project, conferences, seminars or business conventions will take place in ideal conditions. It will be able to pass from an auditorium of a capacity of 3000 seats to a banquet hall in minutes. The system allows the stands to retract on the push of a button. This landmark building will also serve as a demonstrator at one of the most innovative technologies invented at EPFL: the dye solar cells of Michael Graetzel. The glass walls of the convention center will indeed consist of this type of cells and thus, not only provide electricity, but also demonstrate a masterful architectural integration of new renewable energy sources.



<http://swissinnovation.org/news/web/2011/09-111123-b0.html>

10. Economy, Social Sciences & Humanities

Roadmap Towards Green Economy

(FOEN, November 03, 2011)

Switzerland submitted its contribution to the paper which will form the basis of negotiations at the UN Conference on Sustainable Development (UNCSD) in Rio de Janeiro in June 2012. The submission includes a proposal for the adoption of an international roadmap towards a green economy. The two main themes of the conference are the green economy in the context of sustainable development and poverty eradication and the institutional framework for sustainable development. Switzerland is also actively involved in this process. The Federal Council has appointed the Federal Office for the Environment FOEN to coordinate the work. With regard to the green economy, Switzerland proposes a Green Economy Roadmap which will help the international community towards developing a greener economy.

<http://swissinnovation.org/news/web/2011/10-111103-96.html>

11. Technology Transfer / IPR / Patents

Swiss Federal Institute of Intellectual Property

<https://www.ige.ch/en.html>

Swiss Technology Transfer Association

<http://www.switt.ch/html/home.php>

12. General Interest

Swiss Reputation

(20 Minuten, October 13, 2011)

A new study by the Reputation Institute ranks Switzerland highest in terms of giving people a positive feeling, and fourth overall in terms of reputation. Survey respondents ranked Switzerland's products and services as the highest-quality ones in the world. The Swiss flag serves as an ideal brand symbol that has strong historical roots in quality and precision. Current Swiss products continue to uphold this reputation, and this drives export and tourism. One noted area for improvement is friendliness towards guests. Nevertheless, Switzerland's high ranking puts its brand on very high footing.



<http://swissinnovation.org/news/web/2011/12-111013-45.html>



13. Calls for Grants/Awards

The 42nd St. Gallen Symposium

(St. Gallen Symposium, October 01, 2011)

The St. Gallen Symposium is the world's premier opportunity for intergenerational debate on issues of management, politics and civil society – completely run by students. From 3–4 May 2012, the 42nd St. Gallen Symposium will bring together Leaders of Tomorrow and Leaders of Today on the topic "Facing Risk" at the University of St. Gallen, Switzerland. The topic's wording calls for an awareness of the fact that risks are involved in any action taken and in any decision made and that these risks should neither be denied nor avoided. It should therefore convey a positive attitude towards risk and risk-taking, thus setting forth the potential that arises when risks are recognised as a prevailing reality. Students from all over the world can qualify for their participation through the renowned St. Gallen Wings of Excellence Award.

<http://swissinnovation.org/news/web/2011/13-111001-f3.html>

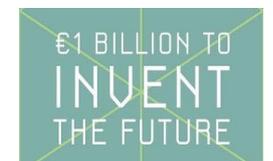


3 Swiss Megaprojects Competing for EU Funding

(EPFL, October 11, 2011)

A hundred million euros per year over ten years, for two projects: the Flagships Initiative launched by the European Union is absolutely unique in the research world. Six proposals are still in the running. Half of them come from Switzerland – incontestable proof of the excellence of science "made in Switzerland." The Human Brain Project, developed at EPFL, aims to simulate the human brain at the microscopic scale using a supercomputer in order to obtain an extremely realistic model of the brain. Guardian Angels – a joint project between the two Swiss Federal Institutes of Technology – focuses on manufacturing electronic components that use very little electricity. FuturICT, proposed by ETH Zurich and University College London, aims to analyze all available socioeconomic data, with the ultimate goal of simulating and preventing crises.

<http://swissinnovation.org/news/web/2011/13-111011-d0.html>



Excellent Research Thrives on Open Borders

(SER, October 20, 2011)

The European Research Council (ERC) has recently published the findings of its latest call for ERC Starting Grants, which are intended for young researchers. Over the next five years, 480 outstanding young researchers will receive a total of EUR 670 million. No fewer than 22 of the grant recipients work at a Swiss institution. Following the recent invitation to tender for "Starting Grants", the European Research Council has identified 670 projects on the 4000 that had been submitted. Research institutions in Switzerland are ranked as follows: EPFL (6), ETH (5), University of Bern (4), Geneva (2) Zürich (2) Basel (1) and Lausanne (1) and Novartis Research Foundation (1). The projects are in eleven cases within the physical and engineering sciences, ten within the life sciences and one within the social sciences.

<http://swissinnovation.org/news/web/2011/13-111020-3e.html>

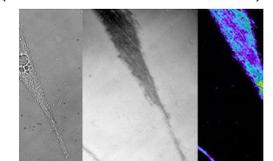


Fellowships for Prospective Researchers

(UNIL, November 03, 2011)

Fellowships for prospective researchers offer young scientists, who are at the point of starting their research career, the possibility to stay at a research institution abroad. These fellowships for a stay overseas are allocated in all disciplines supported by the Swiss National Science Foundation (SNSF). Funding includes personal maintenance, a fixed sum for travel expenses and may include a contribution towards research and conference expenses. The amount of the fellowship is based on family status, family obligations and cost of living in the host country. The duration is 12 to 36 months for postdoctoral fellowships and 6 to 24 months for doctoral fellowships. Submission deadline: March 2012.

<http://swissinnovation.org/news/web/2011/13-111103-00.html>



Calls for New Innovation Projects

(SNSF, November 21, 2011)

The Swiss National Science Foundation (SNSF) has issued a call for proposals for innovation projects within the scope of ongoing National Centres of Competence in Research (NCCRs). A total amount of 10 million Swiss francs has been made available for the projects. The deadline for the submission of project proposals is 15 February 2012. The Federal Council approved a package of measures for 2011 aimed at strengthening Switzerland as a business



centre in the short and medium term. The package includes investments in innovation and technology projects. The projects must contribute to the transfer of knowledge and technology from research to business and to society. An evaluation of the 28 projects currently underway has shown that researchers have been able to provide a variety of stimuli to the economy.

<http://swissinnovation.org/news/web/2011/13-111121-f1.html>

Upcoming Science and Technology Related Events

GRF One Health Summit 2012 One Health - One Planet - One Future Risks and Opportunities

February 19 – 23, 2012

http://www.grforum.org/pages_new.php/One-Health/1013/1/938/

Health risk management
Congress Center Davos, Davos

RE(ACT) CONGRESS 2012

February 29 – March 2, 2012

www.react-congress.org

Research of rare and orphan diseases
Gehry Building, Novartis Campus, Basel

Fascination of Plants Day 2012

May 18, 2012

<http://www.swissplantscienceweb.ch/plantday12>

Plant science
Various venues

Seminars in Information Security & Cryptography “Information Security and Cryptography - Fundamentals and Applications”

June 11 - 13, 2012

<http://www.infsec.ch/seminar1.html>

“Building Secure Software Systems”

June 14 - 15, 2012

<http://www.infsec.ch/seminar2.html>

IT
Courtyard Zurich North, Zurich

10th European SOFC Forum

June 26 – 29, 2012

<http://www.efcf.com/>

Fuel cell
KKL Lucerne, Lucerne

Seminars in Information Security and Cryptography “Wireless and Mobile Network Security”

July 3 - 4, 2012

<http://www.infsec.ch/seminar3.html>

IT
Courtyard Zurich North, Zurich

Seminars in Information Security and Cryptography “Applied Information Security, Hands-on!”

July 5 - 6, 2012

<http://www.infsec.ch/seminar4.html>

IT
Courtyard Zurich North, Zurich

4th International Disaster and Risk Conference IDRC Davos 2012 "Integrative Risk Management in a Changing World"

August 26 – 30, 2012

http://idrc.info/pages_new.php/IDRC-Davos-2012/831/1/

Disaster/risk management
Congress Center Davos, Davos

Science-Switzerland Back Numbers

<http://www.swissinnovation.org/Science-Switzerland>

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