



## Science-Switzerland, February – March 2011

News on Swiss science, technology, education and innovation

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### Swiss S&T-related Support Web-Platform for Japan

(ETH Zurich, March 31, 2011)

In response to the massive Tohoku earthquake and tsunami disaster, a new web-platform was established to support scientific research activities between Switzerland and Japan. As a single entry point, the site will provide a platform for coordinating relief efforts via scientific ties and lists open positions for visiting Japanese researchers and students, lab facilities available to Japanese partners as well as dedicated research initiatives and funding resources. ETH Zurich is already a contact point for cooperation of bilateral projects between Switzerland and Japan and is now hosting the new platform. – Website: <http://www.global.ethz.ch/stc/japan/support>

### Switzerland is European Leader in Innovation

(Federal Administration, February 01, 2011)

The Innovation Union Scoreboard (IUS) 2010 lists Switzerland as the top European country for innovation. The IUS is an initiative of the European Commission, started in 2001, that ranks the innovation of European countries according to 25 indicators. Switzerland's strengths lie in the large number of patent and trademark applications, its highly specialized high-tech workforce, its large amount of high-tech export, and the large number of small and medium sized businesses creating product and process innovations. According to the IUS indicators, Switzerland could further develop the cooperation between universities and industry, as well as increase the available capital for new ventures.

<http://tinyurl.com/00-110201>

## 1. Policy

### University Tuition Policy

(NZZ, March 25, 2011)

The issue of increasing tuition fees at universities and higher-education institutions is a complex and hotly debated topic. A new study published by the Swiss Graduate School of Public Administration examines the various effects of raising tuition by two to three thousand Swiss Francs per year. The study assumes a fee structure whereby lower income families would be aided by some form of financial aid and middle income families would only have to bear a reasonable amount of the cost. Overall, schools would have a greater income, but the cantons would be unequally affected due to varying demographics. Although the details of the models can still be debated, the study represents a good step towards analysis of the issue.

<http://tinyurl.com/01-110325>



## 2. Education

### Competitive Sport Education Entrance

(Der Bund, March 28, 2011)

Starting this year, entry into the sports education program at the University of Bern will be limited to 150 students, and a physical and intellectual test will be used as the deciding metric. Many students have been entering this program but failing out after the second semester because of the inability to pass certain tests. This new approach will already weed out incapable candidates at the beginning and increase the overall ability of the student body. Already, the effects of this new policy are being seen; the number of applicants has dropped from around 300 in previous years to just 200 this year. Other Swiss universities have also implemented such admissions criteria for their sports education programs.



<http://tinyurl.com/02-110328>

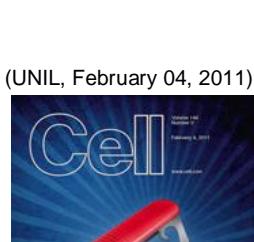
## 3. Life Science / Health Care

### High-Resolution Brain Activity Monitoring

(UZH, February 04, 2011)

Two neuroscientists at the University of Zurich, Fritjof Helmchen and Benjamin Grewe, received the Pfizer Foundation Award for their work developing a laser scanning method for high-resolution brain activity monitoring. Brain activity takes the form of electrical signals transmitted between neurons at an interval of a few hundredths of a second. To be useful, this brain activity needs to be measured at an even faster rate. Electrophysiological methods are capable of the required speed, but can only measure small number of neurons. This new method allows not only larger groups of neurons to be measured, but also allows the geometry of the neuron network to be determined, which in turn enables new, advanced research.

<http://tinyurl.com/03-110204>



### Enzyme Role Revealed

Researchers at the University of Lausanne have discovered an additional role of the enzyme OGT, which plays an important role in the human cellular cycle. In addition to its role in glycosylation, it also plays an important part in proteolysis, especially the protein HCF-1, an epigenetic regulator. Because of this research effort, the OGT enzyme is now known for both its constructive and destructive roles. Professor Herr, the project supervisor, notes that this multi-year effort was only possible because of the long-term support from the University of Lausanne and other sponsors, and that this project underscores the importance of such funding.

<http://tinyurl.com/03-110204d>



### Mechanism for Virus to Bind to Fat

(ETH Zurich, February 04, 2011)

Researchers at ETH Zurich have discovered the mechanism by which viruses can bind to fat molecules on the surface of the host cell, instead of to proteins, as is typical. When the virus binds to a fat molecule, the cell envelopes it and eventually pulls it into the cell. Although this entry method was discovered by the same research group many years ago, the researchers finally discovered the exact mechanism. The project took over six years, and certain questions still remain, such as which fat molecules are susceptible to this method, and what normal processes use this mechanism. For their research, Helge Ewers from ETH Zurich and Winfried Römer received the Pfizer Foundation Award for Infectiology.

<http://tinyurl.com/03-110204c>



### Health Research Partnership

(ETH Zurich, February 08, 2011)

Health research is a long and expensive undertaking. It benefits greatly from partnerships to spread the burden. The European Union is sponsoring a new partnership, called HealthTIES, which brings together five European regions, including Zurich with the participation of ETH Zurich and the University of Zurich. The partnership will study heart disease, neurodegenerative diseases, and cancer, among other current health issues. HealthTIES has a second goal as well, namely to get students interested in both medicine and the natural sciences.



The various international partners hope to profit from each other and to bridge the gap from basic research to marketable products.

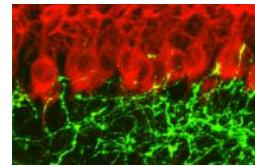
<http://tinyurl.com/03-110208>

## Neural Development Mechanism

(UNIBAS, February 09, 2011)

As the brain develops and learns, it is constantly making new neural connections and destroying incorrect ones. Researchers at the University of Basel have discovered the protein responsible for breaking connections between mossy fiber cells and Purkinje cells. Connections between these two types of neurons sometimes occur erroneously, but do not exist in a fully developed brain, where mossy fiber cells connect to granule cells. Surprisingly, the protein the researchers discovered is also responsible for bone development. Understanding brain development and its mechanisms is important for the understanding of diseases like autism, schizophrenia, and epilepsy.

<http://tinyurl.com/03-110209>



## Evolution in Bacteria

(UNIBAS, February 11, 2011)

Adaptive radiation is one of the key principles of evolution. It states that sub-species that are adapted to an ecological niche will quickly grow in number. Adaptive radiation occurs when an organism develops an evolutionary key innovation that allows it to adapt to a new niche, or when an organism happens upon a foreign environment to which it is already adapted. Until now, little was known about adaptive radiation in bacteria, but researchers at the University of Basel were recently able to describe adaptive radiation and its molecular basis, in the bacteria *Bartonella*. Each species adapts itself to its mammalian host by adapting its secretion system to that host. This research provides important new findings relevant to infectious bacteria research.

<http://tinyurl.com/03-110211>

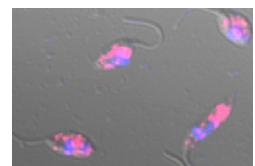


## Cause of Parasitic Disease Leishmaniasis

(Le Temps, February 11, 2011)

Leishmaniasis is the second most common parasitic disease in the world, and is particularly disfiguring because of the sores it creates. The disease is typically transmitted through sand flies, but the cause of one variant, mucocutaneous leishmaniasis, which affects the face, has not been well understood until now. Researchers at the University of Lausanne have discovered that this disease is caused by a virus carried by the parasite that the sand fly deposits during a bite. When the host's immune system destroys most of the parasites, the virus is freed to infect the host and inflame surrounding tissues in a way that allows the remaining parasites to migrate to the nose and mouth.

<http://tinyurl.com/03-110211d>



## Social Networks of Bats

(ETH Zurich, February 14, 2011)

Until now, scientists believed that only animals with high socio-cognitive ability could form complex relationships and interpersonal networks. However, recent research now shows that bats also form strong social networks despite their small brain size. Researchers at ETH Zurich studied many years worth of data to discover the relationships that bats form. They discovered that bats form the strongest relationships through female lineages, and that bats reform their groups each day, so relationships only become apparent by observing long-term data. This research casts new light on how scientists view complex social interactions, and their thinking about the connection between social complexity and brain development.

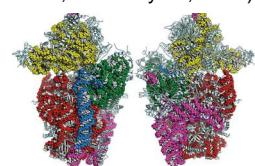
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## Ribosomal Subunit Structure

(ETH Zurich, February 15, 2011)

Proteins are the building block of life. They are produced through a process where DNA is first translated to messenger RNA (m-RNA) by enzymes, and then amino acids are assembled into proteins by ribosomes according to the instructions in the m-RNA. Ribosomes of eukaryotic cells consist of two subunits, the larger 60S subunit and the smaller 40S subunit, the latter of which plays an important role in finding the correct starting place on the m-RNA chain. A research team at ETH Zurich recently was able to analyze the structure of the 40S





subunit by creating a crystal from it and measuring it with x-rays. This research may give new insights into the fight against viruses, which can alter ribosomes.

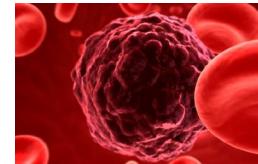
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### Prostate Cancer Detection Method

(ETH Zurich, February 18, 2011)

Researchers at ETH Zurich are developing a new method by which to detect prostate cancer. Current methods detect tumor antigens in the blood, which is not a reliable method, and which requires patients to undergo painful biopsies. The new method detects biomarkers in the blood. The idea is to detect those proteins created by bodies with cancerous prostates but not by healthy bodies. Initial trials were performed on mice by deactivating a gene that generally gets turned off by prostate cancer. This approach led to a highly reliable model on which to test the detection method. Subsequently, human testing was used to show that the same method was applicable to humans. Further development is being undertaken by ETH spin-off Proteomedix.

<http://tinyurl.com/03-110218>



### Bionic Wheelchair and Prosthetics

(pressetext schweiz, February 21, 2011)

New research in bionics has the potential to give disabled people newfound ability. EPFL recently demonstrated a wheelchair and robot that are steered by thoughts. Previously, other researchers had developed a prosthetic that could be moved by thoughts, as well. The next challenge will be to provide sensory feedback, such as surface temperature, from the prosthetic to the user. This information would be transmitted through available nerves.

<http://tinyurl.com/03-110221>



### Study About The Placebo Effect

(myScience, February 21, 2011)

A recent survey of Swiss doctors and patients gathered information on the views these two groups have about medical treatment and healing that works without any pharmacological or physical basis, also known as the "placebo effect". The study found that 87 percent of patients and 95 percent of doctors believed in the placebo effect, but that patients were generally more open-minded about placebo treatment than doctors. The biggest difference between the two groups was in the opinion on how much information about the treatment is desired. Seventy-two percent of patients said they wanted to be informed if a certain treatment was a placebo treatment, whereas doctors estimated that only 33 percent of patients would want this information.

<http://tinyurl.com/03-110221b>



### Smart Bandages for Chronic Wounds

(Le Temps, February 22, 2011)

A Swiss research collaboration is developing an intelligent bandage for chronic wounds. Using embedded optical fibers, it is able to measure certain properties about the wound, such as pH or enzymatic activity. Until now there was no way to obtain continuous measurements of a wound. This new technology uses a layer of silica deposited on the optical fibers that changes color according to the measured property. The color change is measured through the optical fibers and some measurement electronics, thereby providing the desired quantity. The researchers are in discussions with doctors in Switzerland and France to test the usefulness of this technology.

<http://tinyurl.com/03-110222a>



### New Tuberculosis Test

(Tribune de Geneve, February 22, 2011)

One third of the world's population is infected with the tuberculosis bacillus, and testing for this infection is a long and difficult process. However, doctors at the University Hospital of Vaud (CHUV) have developed a new test that is more rapid and that can distinguish between active and latent infections. The test is based on the immune system response against tuberculosis, and can be used to track patients during treatment and verify the success of the treatment. Currently, the test still requires a complete laboratory setup, but the researchers are currently working on making it more accessible.

<http://tinyurl.com/03-110222b>



## Link Between Air Pollution and Heart Attacks

(UNIBAS, February 24, 2011)

Heart attacks are one of the most common causes of death in Western countries. Researchers at the University of Basel recently completed a study on the causes of heart attacks and concluded that automobile traffic and the resulting air pollution is a major factor in causing heart attacks. This risk factor ranks approximately equally with acute excessive physical stress and overeating. The study underlines the importance of controlling air pollution, especially in developing countries where the increased in development corresponds to increases in heart attacks.

<http://tinyurl.com/03-110224>

## New Neural Experimentation Techniques

(EPFL, February 24, 2011)



Researchers at EPFL have invented two new methods for experimenting with synapses in the brain. A synapse is a junction that allows neurons to communicate with each other, and a key part of the synaptic mechanism involves calcium ion channels, which were the target of the researchers' methods. Their first new technique deactivates a certain protein responsible for increasing the density of calcium ion channels. With their second technique they genetically modify mice so that they don't produce a certain calcium ion sensing protein, synaptotagmin, but then selectively reintroduce the protein through a virus. Through their research they discovered that synaptotagmin not only initiates neurotransmitter release, but also enhances the signal by inhibiting other calcium ion sensing proteins.

<http://tinyurl.com/03-110224b>

## Malaria in Swiss Bats

(UNIL, February 24, 2011)



Malaria has previously been thought to exist only in tropical climates. However, researchers at the University of Lausanne have recently discovered that malaria can also exist in temperate climates, such as Switzerland. They discovered that Swiss bats are infected with malaria, up to fifty percent of animals in some species. In bats, the infection is transmitted by a wingless fly that lives permanently on bats. The same research group is studying what factors affect malaria transmission in wild birds. This different study provides valuable data from a population subject to natural selection. They hope to help cure malaria in humans by first studying affected animals.

<http://tinyurl.com/03-110224c>

## Microbes Reduce Asthma Risk

(UNIBAS, February 25, 2011)

Several studies have shown that children growing up on farms are at a lower risk of asthma than other children. A new study, in which the University of Basel is taking part, builds on this work and shows that this risk reduction is due mostly to the increased number of microbes that farm children are exposed to. Children living on farms have an increased microbial exposure level even inside the farmhouse. However, the exact mechanism by which microbes decrease the risk of developing asthma is still unclear. The researchers have two hypotheses. First, it is possible that the increased exposure strengthens the immune system. Second, it is possible that the microbes further the growth of asthma-inhibiting microbes.

<http://tinyurl.com/03-110225>

## Medical Micro-Robot



Researchers at ETH Zurich funded by the Swiss National Science Foundation are developing micro-robots for medical applications. These robots have a length on the order of one-third of a millimeter, which, for comparison, would be small enough to operate on a fly. It is envisioned that they could carry substances directly to the required tissue location or even perform high-precision surgery from within the body.

<http://tinyurl.com/03-110302>

## New Material for Alzheimer Research

(ETH Zurich, March 01, 2011)

Researchers at ETH Zurich have developed a new method by which to produce amyloid beta peptides. This has previously been difficult to do with high enough purity, and typical impurity levels inhibited amyloid fibril formation, which in turn led to difficulties in obtaining reproducible *in vivo* and *in vitro* experiments. The new technique produces human A $\beta$ 1-42 as fusion protein, which allows authentic recombinant A $\beta$ 1-42 to be cleaved with a protease.



$\text{A}\beta 1\text{-}42$  is suspected to be the agent that causes Alzheimer's disease. These peptides are applicable to Alzheimer disease research, characterization of amyloid fibril formation, and the generation of human antibodies against amyloid beta fibrils for drug development.

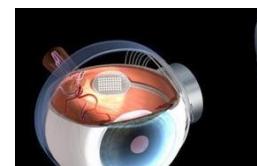
<http://tinyurl.com/03-110301>

## Artificial Retina

Researchers at Second Sight, a company whose European branch is located in EPFL's Science Park, have developed a prosthetic retina for patients with the disease retinitis pigmentosa. The system uses a camera attached to a pair of glasses to transmit a signal to a receiver on the retina, which subsequently sends impulses to neurons, effectively bypassing the defective retinal cells. The system does not completely replace normal eyesight, but gives patients the ability to identify their surroundings. The company is now marketing the product in Europe and working with researchers at EPFL to improve it.

<http://tinyurl.com/03-110303>

(EPFL, March 03, 2011)

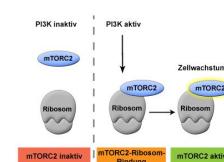


## Cell Growth Mechanism

The main function of ribosomes is the production of proteins needed for cell growth. However, researchers at the University of Basel have discovered that they also play a role in regulating cell growth. One central element that controls cell growth in all eukaryotes is TOR (Target of Rapamycin), which is composed of two protein complexes, TORC1 and TORC2 (respectively mTORC1 and mTORC2 in mammals). Until now the regulation of mTORC2 was not well understood, but the researchers were able to show that it is activated by a high concentration of ribosomes. This way, cell growth is not activated until the required proteins are made available by ribosomes. This result opens new avenues in cancer research.

<http://tinyurl.com/03-110304>

(UNIBAS, March 04, 2011)



## Embryonic Organ Development

The development and organization of organs in a growing embryo are strictly controlled by morphogen signaling molecules. This molecule is created at a localized source and diffused across the developing organ. Cells then sense the chemical gradient and use it as a signal to determine their specialization. Until recently, the exact mechanism remained a mystery, but researchers at the University of Geneva recently made some key discoveries. First, they discovered that tissue structures itself according to the gradient itself. Second, they discovered that cells perceive the change in morphogen over time, and use this as a signal too. The researchers now want to find out how this discovery links to tumor growth mechanisms.

<http://tinyurl.com/03-110304b>

(UNIGE, March 04, 2011)

(ETH Zurich, March 04, 2011)



## Medicine Dosage Through Breath Analysis

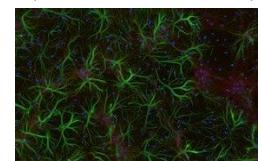
Researchers at ETH Zurich have developed a new application for mass spectrometry: the measurement of medicine dosage. Specifically, they measured the concentration of the epilepsy medicine valproic acid (VPA). Normally, VPA dosage is adjusted according to its concentration in the blood, but this requires regular blood samples. This new technique only requires a breath sample from the patient, from which it can measure the concentration of VPA and its byproducts. Initial trials were very successful and showed a close correlation between blood concentrations and breath concentrations. Additionally, the researchers were able to determine how fast the concentration of VPA dropped, as well as additional byproducts that were previously unknown. This is an important step towards personalized medicine.

<http://tinyurl.com/03-110304c>

## Long-Term Memory Creation

Researchers at EPFL along with colleagues in the US have shown that lactate, a byproduct of glucose, plays an important role in forming long-term memories. Lactate is an energy source for neurons, and is supplied to the brain by astrocyte cells. The researchers experimented on rats and showed that if lactate production or transport in the brain is stopped, then the rats have trouble memorizing where a certain negative stimulus (an electric shock) is located. If lactate is artificially introduced, then the rats are again able to form long-term

(EPFL, March 07, 2011)





memories, but the same is not true if glucose is introduced. This result opens up new avenues in the research of neurological diseases where memory is affected.

<http://tinyurl.com/03-110307>

### Electrified Dental Implants

(ETH Zurich, March 08, 2011)

Dental implants are becoming more and more common, but in about ten percent of implants problems occur, often due to infection of the tissue surrounding the implant. When this happens, the implant may not properly heal into the jawbone or the bone may atrophy and recede. Scientists at ETH Zurich are developing a non-intrusive method to kill bacteria with an electrical current on the implant. The current changes the pH level near the implant and creates powerful oxidizers such as chlorine, which are good at killing bacteria. A fifteen-minute treatment at less than ten millamps has been shown to kill 99 percent of bacteria in a laboratory model.

<http://tinyurl.com/03-110308>

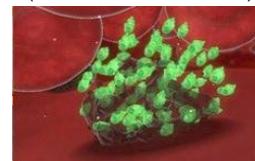


### New Malaria Drug

(EPFL, March 09, 2011)

Malaria kills millions of people per year and the parasite that spreads it quickly develops a drug resistance and hides from the immune system in blood and liver cells. Researchers at EPFL recently discovered that the parasite proliferates inside these cells by hijacking a signaling pathway from the host cell, which it cannot produce itself. The researchers also discovered, by surprise, that a drug being evaluated for cancer treatment is designed to block these hijacked signaling pathways and thus could be used in the treatment of malaria as well. The scientists have shown this treatment method to work in laboratory experiments and they are hoping to further develop this research.

<http://tinyurl.com/03-110309>



### Identifying Cancerous Cells

(Le Temps, March 09, 2011)

Researchers from the Swiss Institute for Experimental Cancer Research (ISREC) and the Massachusetts Institute of Technology have published two papers, one in 2000 and one this year, that identify the characteristics that define cancer. The first paper identified six characteristics: the support of positive growth signals, indefinite replication, evasion of growth inhibitors, resistance to cell death, angiogenesis induction, and the ability to spread and metastasize. The new paper adds two emergent hallmarks: the deregulation of energy management for better proliferation, and the ability to evade the immune system. Additionally, they identify genomic instability and tumor inflammation as additional characteristics of cancer. They hope their research will help with the development of more general cancer treatments.

<http://tinyurl.com/03-110309c>



### Personalized Cancer Treatment

(ETH Zurich, March 15, 2011)

Ovarian cancer is an insidious form of cancer that is difficult to detect and treat before it begins spreading. However, researchers at ETH Zurich and the University of Zurich have discovered one of the oncogenes responsible for ovarian cancer, URI. Cancer can be caused by the overexpression of an oncogene, and in the case of ovarian cancer, the URI oncogene even counters chemotherapy treatments. With this new discovery, researchers will be able to suppress the responsible oncogene and thereby kill off the cancer. Research into lung cancer is following a similar treatment path. So far, this method has been shown to work on mice.

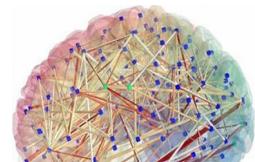
<http://tinyurl.com/03-110315>



### Understand Neural Connections

(UNIL, March 21, 2011)

Researchers at EPFL, the University of Lausanne, and the University Hospital of Lausanne developed a new software tool, called Connectome Mapping ToolKit, to help map connections in the brain. It can potentially be used to better understand how the brain is organized, research neurological diseases, such as neurodegeneration, epilepsy, and schizophrenia, and help with rehabilitation therapy after an accident. The tool uses an MRI scan to determine the diffusion capacity of water molecules in the brain's white matter. From this





information, a macroscopic view of the regional connections can be generated and compared with the mapping of other people.

<http://tinyurl.com/03-110321>

### Maca Improving Sperm Quality in Bulls

(ETH Zurich, March 22, 2011)

Researchers are studying the effectiveness of a traditional Peruvian-Andean virility medicine. The so-called Maca plant is supposed to increase the libido and prowess of animals such as breeding bulls. The researchers found that these claims were not true, but they did find that semen quality increased. More semen was active, and there were fewer DNA defects. However, not all Maca plants are created equal. Researchers also found that only Maca grown at a certain altitude and in specific soil contains high quantities of the active ingredients. Synthetic development of these ingredients has the potential to help breeders, but may negatively impact the additional income Peruvian farmers get from selling Maca plants.



<http://tinyurl.com/03-110322>

### Effect of LED Screens on Sleep Cycles

(UNIBAS, March 25, 2011)

Researchers at the University of Basel have discovered that computer screens with LED backlight have a greater effect on a person's sleepiness and concentration, as compared to other types of backlight. LEDs output light at a wavelength of around 464 nanometers, which has a strong effect on the sleep hormone melatonin as well as on concentration. Tests showed that people who sat in front of an LED backlit screen for five hours in the evening had a 20% faster reaction time and had better cognitive abilities according to other tests as well. The researchers suggest creating variable wavelength backlights so that sleep cycles are not interrupted.

<http://tinyurl.com/03-110325>

### Stress Hormones and Phobias

(UNIBAS, March 29, 2011)

Researchers at the University of Basel have shown that the stress hormone cortisol helps support the elimination of the fear of heights through psychotherapy. Psychotherapy is a common method with which to treat phobias. The patient is exposed to the phobia in a controlled situation and shown that it isn't harmful. The researchers conducted a study with forty patients undergoing treatment for the fear of heights. Half the group received cortisol, the other half a placebo. The group that received the cortisol demonstrated a much stronger reduction in their phobia. The researchers now plan on studying the effect of cortisol on other phobias.

<http://tinyurl.com/03-110329>

### Natural Ultraviolet Light Detectors

(UNIGE, March 31, 2011)

Ultraviolet rays are a part of natural sunlight, but UV-B rays can be harmful to organisms. Plants, which are dependent on sunlight and sedentary, have developed natural tools to guard against these harmful effects. This mechanism was recently discovered by an international collaboration involving the University of Geneva. Plants are able to create their own molecular "sunscreen" that absorbs UV rays, as well as enzymes that repair DNA damaged by UV rays. Finally, certain receptors triggered by UV rays play a central regulatory function in plants and may have shaped the course of evolution.

<http://tinyurl.com/03-110331>

## 4. Nano / Micro Technology / Material Science

### Novel Bi-Component Fiber for Artificial Turf

(Empa, February 10, 2011)

Artificial turf needs to be both resistant to constant use and soft enough to not cause abrasion to falling players. Researchers at Empa – Swiss Federal Laboratories for Materials Science and Technology and TISCA TIARA, an artificial turf manufacturer, have developed a bi-component fiber that contains a polyamide core and a polyethylene sheath. The core is resilient and will always return to upright even under heavy use, while the sheath is soft so as to not cause abrasion. Additionally, unlike previous types, this new turf is mostly maintenance free. It has already been laid down on two fields in Switzerland, and users are satisfied with its qualities.

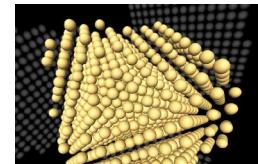




## Atomic Structure of Nanoparticles

(ETH Zurich, February 17, 2011)

Because nanoparticles have different properties than larger versions of the same material, they can be subject to quantum effects that change their material properties. Researchers at ETH Zurich and Empa were recently able to determine the atomic structure of silver nanoparticles using an electron microscope. They prepared the nanoparticles in an aluminum matrix to make measurement easier, and they set up the microscope to use a lower accelerating voltage to protect the nanoparticles from the electron beam. Also, they needed to use a microscope with a resolution of less than fifty picometers. Using image reconstruction and sharpening techniques, they were able to count and reconstruct the atomic structure of the nanoparticles.

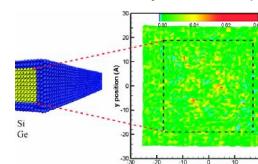


<http://tinyurl.com/04-110217>

## Increasing the Efficiency of Thermoelectric Processes

(ETH Zurich, February 28, 2011)

Due to the Seebeck effect, thermal differences can be converted directly into electricity. If the temperatures at the two ends of a conductor are different, a current flows along the conductor. However, for this process to be efficient, the thermal conductivity needs to be as low as possible, while the electrical conductivity needs to be as high as possible. Researchers at ETH Zurich have discovered that adding a coating of germanium to silicon nanowires reduces their thermal conductivity by 75 percent at room temperature. Currently this technology only exists in simulation, but it is a promising development for energy scavenging.



<http://tinyurl.com/04-110228>

## Thin Flexible Solar Cells

(myScience, March 24, 2011)

Traditional silicon-based solar cells are not amenable to flexible construction. However, a new polymer fabric based electrode developed by Swiss researchers has produced promising results. An important component of solar cells and many other electronic components is a transparent and flexible electrode sheet. Traditionally, this has been created with the rare metal indium, which is expensive and in limited supply. The new technology embeds thin metal fibers into a woven polymer fabric, which is then embedded into a plastic layer. The resulting electrode is transparent, stable, and flexible.



<http://tinyurl.com/04-110324>

## 5. Information & Communications Technology

### Sound Pollution Absorbing Loudspeaker

(Le Temps, February 08, 2011)

Researchers at EPFL have developed an active noise reduction loudspeaker that can absorb low frequencies in the range of 20 to 600 hertz. This speaker can be used to reduce noise pollution or control the acoustics in concert halls, cathedrals, or other large venues. A venue will be able to be used for a purpose for which it wasn't originally designed. Because of their low-frequency response, they are better than passive systems, such as sound-absorbing panels. The system uses an optimally designed electrical circuit that modifies the speaker's response to absorb incoming frequencies. Although the loudspeaker is still in the prototype stage, the researchers expect that it could be on the market in two to five years.



<http://tinyurl.com/05-110208z>

### Energy-Efficient Supercomputers

(IBM, March 01, 2011)

Researchers at the IBM Research Center in Zurich are developing advanced computer chip cooling technologies for increasingly powerful computers that produce increasing amounts of heat. The new system cools chips with hot water flowing through microchannels. Additionally, the waste heat in the water is used to heat the ETH Zurich campus, where IBM built its first supercomputer based on this new technology. IBM hopes to enable 3D chips, which are vertical stacks of chips that shorten communication paths between chips. One major challenge is effectively cooling the stack, which water-based technologies should be able to achieve. Because the density of inter-chip connections would be similar to those in a brain, cooling channels would need to be especially small.

<http://tinyurl.com/05-110301>



## Micro-Insurance via Mobile Phones

(ETH Zurich, March 10, 2011)

The research lab "I-Lab", a joint effort between ETH Zurich, the University of St. Gallen, and several insurance companies, is investigating how insurance policies can be sold directly to people over their mobile phones. In many developing countries the mobile phone is of central importance for many activities such as paying bills and performing banking transactions. Fixed infrastructure is simply not available in many areas. Now, insurance companies want to be able to sell micro insurances directly to consumers. These insurances are affordable to the poor in developing countries but cover the very basic necessities, such as immunizations and emergency hospital stays.

<http://tinyurl.com/05-110310>

## Gender Differences in ICT

(EPFL, March 11, 2011)

At Swiss universities information and communication technologies (ICT) programs are made up of only about fifteen percent women. According to Professor Ailamaki of EPFL, the field may suffer from an image problem and may not seem attractive; it may seem boring to many people. EPFL is working to make the challenging and reward aspects of the field more known to students in order to attract them to this exciting field. Professor Ailamaki has been working in ICT for over 25 years and is still discovering new ideas every day. She hopes to attract more women to the field because she feels they have an advantage over men, in some ways.

<http://tinyurl.com/05-110311>

## Network Robustness

(ETH Zurich, March 17, 2011)

Researchers at ETH Zurich have developed new methods for analyzing the robustness of networks. They specifically concentrate on the networks that our society fundamentally relies on, such as the electrical grid and the Internet. The latest research shows that current networks are not especially robust to attacks on key components, but that small changes in network structures can lead to large improvements in robustness. However, even small changes can translate to very high implementation costs. Instead, their tools could be used to guide new infrastructure development, rather than to modify existing infrastructure.

<http://tinyurl.com/05-110317>



## 6. Energy / Environment

### Fire Ant Genome Sequenced

(UNIL, February 02, 2011)

The fire ant, which originated in South America, has been accidentally introduced in various other areas, including the southern United States of America, as well as Australia and China. In the US alone, the fire ant is estimated to cause five billion dollars worth of damage per year. Fighting these pests requires new, unconventional methods. Researchers at the University of Lausanne and the Swiss Institute for Bioinformatics have recently sequenced the entire fire ant DNA sequence and identified approximately 15,000 genes, the largest genome ever sequenced in Switzerland. The researchers hope that this information will be useful for fighting the fire ant, perhaps by disrupting its strong sense of smell.

<http://tinyurl.com/06-110202b>



### Solar-Powered Water Purification Using Reverse Osmosis

(Le Temps, February 08, 2011)

The startup SwissINSO, based in Lausanne, is developing a solar-powered water desalination and purification system, dubbed Krystall, that it hopes will help solve water shortage problems in developing countries. The system uses a reverse osmosis process, is completely independent of an electrical grid, and is designed to supply close to 5000 people with safe water. It also fits in two standard twelve-meter long containers, which simplifies deployment. The company, in business since 2006, has its first contracts in Algeria and Malaysia, where it hopes to have the systems operational by springtime. Because the current price for the system is high, SwissINSO is looking to lease the system to local partners so that it can become widely used.

<http://tinyurl.com/06-110208c>



## Efficient Hybrid Automobile System

The efficiency of automobiles depends strongly on the system architecture used. Electric vehicles are not necessarily the best choice; they use more precious metals than gasoline-powered cars, and their electricity may still come from a fossil fuel source. Researchers at Empa – Swiss Federal Laboratories for Materials Science and Technology performed a study to determine the best automobile system architecture for typical Swiss use. Their findings show that a plug-in hybrid is the best choice because for short trips, which are typical, efficient electric-only propulsion can be used, but the batteries can still be small because an engine can charge them for longer trips. The design saves on both battery size and use of gasoline.

<http://tinyurl.com/06-110209>

(Empa, February 09, 2011)



## The Future of Hydrogen Fuel

Hydrogen is the most abundant element and it burns cleanly without any greenhouse gas emissions. However, storage of the substance remains one of the big challenges. Because the hydrogen molecule is so small, it escapes easily from tanks, and storing it as a liquid is energy intensive. Chemical storage methods are also possible, but further research still needs to be conducted to make them energy and cost efficient. Researchers at the University of Zurich are developing catalysts for hydrogen production and usage that use low-cost materials instead of expensive rare metals like current technologies do. This research will increase the viability of hydrogen as the fuel of the future.

<http://tinyurl.com/06-110210>

(UZH, February 10, 2011)



## Alpine Plants in Danger

Because of global warming, alpine plants are in danger of losing ground to plants from lower altitudes. Researchers at the University of Lausanne recently published a report on alpine plants in twelve zones ranging from the Pyrenees to the Scottish Highlands. This is the first trans-European study that confirms the sensitivity of alpine plants to climatic change. They found that although alpine plants are able to grow at lower altitudes, they are usually displaced by more competitive plants. The study also shows that, depending on the exact climate change, between 36 and 55 percent of European alpine plants could lose up to 80 percent of their habitat.

<http://tinyurl.com/06-110211>

(UNIL, February 11, 2011)



## Renewable Energy Study

Changing our energy production over to renewable resources is becoming a critical issue as fossil fuels begin to run out, according to a new report released by the Swiss Academy of Engineering Sciences. The conversion will likely take until the end of the century, but the higher our energy usage goes, the more important it is to speed along the process. Renewable resources are a viable source of energy, but innovations are needed to drive the cost down. There also needs to be a good way to store the energy, since the sun doesn't always shine and the wind doesn't always blow. Lastly, because of the large investment required, public participation will be needed to realize the changeover.

<http://tinyurl.com/06-110212>

(SATW, February 17, 2011)

## Climate Change's Effect on Water Supplies

The canton of Valais is joining an international research project that is studying the effects global climate change has on water supplies, especially in relationship to glaciers and snowfall. For the Valais, this is an important issue because water and winter tourism is an important part of its economy, and the canton has been subject to several large flash floods in the past 25 years. In fact, Switzerland holds six percent of Europe's freshwater supply, making this an important national issue. Melting glaciers and reduced snowfall are reducing this supply. For once, though, science and politics are working together; having the cantonal authorities participate in this project strengthens it greatly.

<http://tinyurl.com/06-110220>

(swissinfo, February 20, 2011)





## Soot Affects Himalayan Glacier

Researchers from the Paul Scherer Institute recently showed that global warming alone is not completely responsible for the melting of glaciers in the Himalayas. They discovered that soot particles being deposited on the glacier's surface reduces its albedo and increased the solar energy it absorbs. The researchers took an ice core sample from the north face of Everest and saw that the amount of soot deposited on the glacier increased significantly over the last few decades. A 108-meter long core was taken, and the amount of soot was measured with a new laser-based tool that allowed it to be accurately measured in one single pass. Further research on the exact sources of the soot is still needed.

<http://tinyurl.com/06-110221>

(PSI, February 21, 2011)

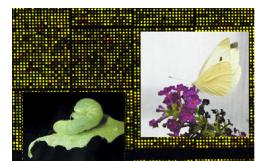


## Discovering Plant Communication

Researchers at the University of Lausanne are taking part in a pan-European research project to better understand how plants communicate with the insects and fungi around them. Plants emit considerable quantities of volatile organic compounds that play an important role in communicating with other organisms. These signals are emitted in response to various stresses on the plant, and allow it to defend itself. For example, if a herbivorous insect attacks a plant, it can attract wasps to attack the insects. When a plant experiences multiple stresses, this signaling dynamic becomes much more complex, and it is this dynamic that the researchers are trying to uncover.

<http://tinyurl.com/06-110221c>

(UNIL, February 21, 2011)



## Solar-Powered Water Purification Using Heat

A team at the Technical University of Rapperswil is testing a solar-powered water purification system it invented. The SwissWaterKiosk uses solar energy to heat water to 80 degrees Celsius for five minutes, which has been shown to kill off all pathogens and make water safe to drink. The system costs 500 dollars and can clean 500 liters of water per day. It is currently being tested in Bangladesh, Mozambique, and Tanzania. So far, tests have shown that the unit is more useful in rural and semi-rural settings than in urban settings, where a water supply infrastructure is already in place. The system's performance also suffers when there is insufficient sunlight.

<http://tinyurl.com/06-110222>

(swissinfo, February 22, 2011)



## Improving the Waters of Lake Geneva

The International Commission for the Protection of Lake Geneva (CIPEL) is putting in place a second ten-year plan to further improve the waters of Lake Geneva. In the previous decade, CIPEL focused on reducing the amount of phosphorus to help reduce algae growth. They achieved this through regulation of phosphorus in detergent. In the coming decade they want to further reduce phosphorus, renew the lakeshore, and reduce micropollutants. Previously, these micropollutants were difficult to detect and only four were known to be in Lake Geneva, but with new detection technology eighty are now known about. Micropollutants are dangerous even in small doses and can enter the food chain, which is why they are a focal point of CIPEL.

<http://tinyurl.com/06-110225z>

(Le Temps, February 25, 2011)



## Reproduction of Wasps

One big unanswered question in biology is why sex exists. Asexual reproduction is more efficient because all members of a species reproduce instead of just the females. Researchers at ETH Zurich and the University of Zurich are trying to answer this question by studying a certain type of wasp that can produce both sexually and asexually. The first important step was to show that asexual members of the species were identical to sexual members, except for that difference. The researchers were able to do this with crossbreeding experiment, and, in fact, showed that just one gene is responsible for the sexual difference. Although more work is needed, they hope to help improve biological pest control, something for which these wasps are used.

<http://tinyurl.com/06-110225b>

(ETH Zurich, February 25, 2011)





## Surveying Lake Geneva

An international research team that includes EPFL and several other Swiss institutions will use Russian Mir submersibles to study Lake Geneva. The overall goal of the program is to understand and protect the lake. The waters and lakebed of Lake Geneva form a complex environment and questions about what and how pollutants circulate, how sediments settle, and how bacteria are distributed still exist. The Mir submersibles will be valuable tools for studying the layers of water and the deepest parts of the lake, up to 300 meters deep. The team will also study the mouth of the Rhone, where sediments form 30-meter deep canyons, the environment of which is not well known.

<http://tinyurl.com/06-110301>

(EPFL, March 01, 2011)



## Faster Fruit Breeding

(Federal Administration, March 08, 2011)

Developing a new breed of fruit that has specific disease resistance and taste characteristics can take decades when performed traditionally. A new research effort, dubbed "Breedomics", is attempting to sequence the DNA of fruits to determine which genes affect which characteristics. Given this information, crossbreeding can be performed in a more informed manner, thus leading to new breeds in less time. The first fruit that is being studied is the apple. ETH Zurich and Agroscope Changins-Wädenswil (ACW) are participating in the large international team. A focus of the team will be to transfer research to actual application with fruit producers.

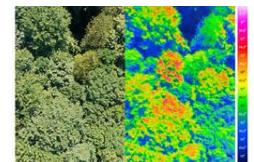
<http://tinyurl.com/06-110308>

## Tree Growth in Dry Climates

(SNSF, March 16, 2011)

As the Swiss climate becomes warmer and drier during the summer months, different trees will survive according to how they can adapt to the changing environment. Researchers at the University of Basel have determined that oak and ash trees will best be able to cope with water shortages, while sycamore maples and broad-leaved limes will find dry spells the toughest to overcome. Copper beeches and wild cherry trees fall in the middle of this range.

<http://tinyurl.com/06-110316>



## Measuring the Natural CO<sub>2</sub> Cycle

(ETH Zurich, March 21, 2011)

The basic carbon dioxide cycle, although simple in concept is not completely understood in detail. Thus, researchers from ETH Zurich have, for the past two summers, attempted to carefully measure it in a patch of forest in Switzerland. They installed a dense network of sensors that measured CO<sub>2</sub> and water vapor into and out of plants, tree, and other organisms. Additionally, they made detailed measurements of the different isotopes of carbon and oxygen present, which allowed them to determine the path carbon takes within a plant, as well as how the presence of different isotopes is an indication of the climate during a growing season. Now, the researchers need to analyze the millions of data points to extract useful information.

<http://tinyurl.com/06-110321>



## Protection of Peat Bogs

(EPFL, March 31, 2011)

Peat bogs represent an important soil-based store of carbon dioxide. However, their existence is being threatened by changing atmospheric conditions, especially increasing levels of nitrogen. Sphagnum moss in peat bogs decomposes slowly, which allows it to retain carbon better than vascular plants. On the other hand, increased nitrogen levels threaten the growth of the moss. Also, sphagnum moss cannot regulate its water content, so it relies on sufficient rainfall to survive. If peat bogs diminish, large amounts of carbon dioxide could be released into the atmosphere and further intensify the amount of carbon dioxide in the atmosphere.

<http://tinyurl.com/06-110331>





## 7. Engineering / Robotics / Space

### Change in Martian Dunes

Contrary to previous theories, a new study, in which the University of Bern took part, shows that in as little as one Martian year dunes on Mars undergo significant change. The study is based on images from the HiRISE camera on the Mars Reconnaissance Orbiter. The dunes in the northern polar region cover a large area, and each winter they are covered by a layer of frozen carbon dioxide (dry ice). When this ice sublimates in the spring, it destabilizes the dunes, setting sand avalanches in motion, thus effecting change in the dune structure. More surprisingly, traces of these sand avalanches disappear within a month, which may mean polar winds are stronger than previously surmised.

<http://tinyurl.com/07-110203>

(UNIBE, February 03, 2011)

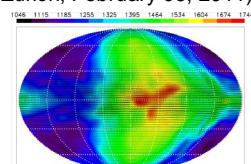


### Storms on Exoplanets

Since 1992, several hundred exoplanets have been discovered outside our solar system. However, because they are far away and weak compared to their star, it is difficult to observe the conditions on these planets. Nevertheless, some hypotheses about the atmospheric conditions of certain planets have been formulated. One researcher at ETH Zurich created a model of atmospheric circulation on exoplanets. The model closely predicts the measurements that have been made so far. For example, the model predicts very strong winds on one of the largest exoplanets discovered so far. This explains the temperature distributions that have been observed on that planet. This area of research is still in its infancy and many new discoveries are waiting to be made.

<http://tinyurl.com/07-110209>

(ETH Zurich, February 09, 2011)



### People-Friendly Robots

Although robots currently only play a small part in our daily lives, as new technology develops, they will become more and more important. One area where robots may play an important role is in the care of the elderly. Robots could help the elderly remain independent longer, retain mobility, and act as neuro-prosthetics. The National Centre of Competence in Research "Robotics" at EPFL is working towards this vision by pursuing research in various areas, including micromechanics, high-precision manufacturing, and people-friendly technologies. This part of the robotics industry is still in its infancy, so there is a large potential for growth.

<http://tinyurl.com/07-110209b>

(SNSF, February 09, 2011)

### Swiss Participation in Space Exploration

Swiss company Ruag Space is participating in two European Space Agency programs, the ExoMars rover and the Automated Transfer Vehicle (ATV), a resupply ship for the International Space Station (ISS). For the rover, the company is helping to develop the drivetrain, including the wheels, motors, and steering system. The rover will be able to turn and move in all directions, as well as climb over big rocks. It is being tested in a simulated Mars environment. For the ATV, Ruag Space is supplying certain structural components, sensors for the automated docking system, and parts for the solar panel deployment.

<http://tinyurl.com/07-110210>

(Der Bund, February 10, 2011)



### The Search for Exoplanets

The University of Geneva is taking part in a project, called HARPS-N, to detect exoplanets, or planets outside our solar system. HARPS-N, which stands for High Accuracy Radial velocity Planet Searcher-North, is based on a similar instrument based in the southern hemisphere. Together, the two instruments will be able to search for exoplanets in all directions. HARPS-N will be installed on the Telescopio Nazionale Galileo in the Canary Islands. The HARPS-N instrument is a high-precision spectrograph instrument designed to detect Earth-like planets by their mass and structure, and even make asteroseismological measurements. Finally, HARPS-N will cooperate with the Kepler telescope to make the best possible long-term measurements of exoplanets.

<http://tinyurl.com/07-110214>

(UNIGE, February 14, 2011)



## Electromagnetic Waves Used to Detonate Landmines

(swissinfo, February 19, 2011)

Improvised explosive devices (IED's) pose a hazard in many conflict zones around the world. They kill and mutilate hundreds of thousands of people per year. Researchers at EPFL and the National University of Colombia are developing a system based on electromagnetic waves to detonate IED's remotely. These IED's often use plastic so as to avoid conventional detection, but their detonators still use pairs of wires that can be set off if made to resonate at the appropriate frequency. The researchers found that despite the variety of detonators, all work at approximately the same frequency. Their prototype was able to detonate test devices at an average of twenty meters. Next, the researchers will build a more robust unit for further testing.



<http://tinyurl.com/07-110219>

## Measurement of Ski Jumpers

(EPFL, February 25, 2011)

Researchers at EPFL developed a system to accurately measure ski jumpers during their jump. Previously, coaches simply filmed the skiers but had no accurate measurement of the jump parameters. This new system improves the performance of athletes by helping them optimize their jumps. The system consists of accelerometers and gyroscopes on the suit that measure the jump data, a biomechanical model, and signal processing tools that automate the data extraction process. Next, the researchers want to use similar technology to help prevent injuries to downhill skiers. The idea of using a measurement tool on skiers came from a doctor at the University Hospital of Vaud (CHUV).



<http://tinyurl.com/07-110225>

## Cosmic Particle Accelerators

(UNIGE, March 08, 2011)

Cosmic rays are streams of high-energy particles formed in our galaxy and elsewhere in the universe that play an important role in the thermodynamics of the universe. However, the source of these cosmic rays is not well known. Researchers at the University of Geneva have made progress in this direction based on measurements from the INTEGRAL and Fermi satellites. They discovered that in the Eta Carinae stellar system protons are accelerated to energies rivaling the CERN Large Hadron Collider (LHC). They also discovered a source of high-energy electron beams in the Crab nebula with energies 1000 times greater than produced in the LHC. Both of these discoveries are important steps towards understanding the source of cosmic rays.

<http://tinyurl.com/07-110308>

## Swiss Satellite In Operation

(EPFL, March 25, 2011)



The first Swiss satellite, SwissCube, recently began sending back its first pictures from space. The satellite was a collaborative design with the participation of many Swiss universities, and its mission was to return images of airglow. Airglow is a luminous effect in the upper atmosphere caused by the formation of oxygen molecules after they are separated by solar radiation. The satellite suffered from some big problems after launch and deployment. It was spinning at a high rate, and operators could do little except wait. Eventually, two students improvised solutions to reset the onboard computer and finalize the stabilization of the satellite, allowing it complete its mission.

<http://tinyurl.com/07-110325>

## 8. Physics / Chemistry / Maths

### International Year of Chemistry 2011

(SCNAT, February 15, 2011)

The UN International Year of Chemistry 2011 was launched in Bern with a celebration. Nobel Prize in Chemistry winner Richard Ernst called upon scientists to build bridges between the various scientific disciplines. The celebration was rounded off with a chemistry show and a lecture on odors. The Swiss postal service released special commemorative stamps, too.

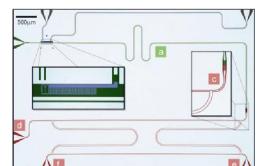
<http://tinyurl.com/08-110215>



## Breakthrough in Photon Production

(ETH Zurich, February 21, 2011)

Researchers at ETH Zurich recently made advances in emitting and detecting single photons in the microwave frequency range. These photons have a very low intensity, and thus traditional technology is unable to detect them. The researchers integrated a single photon light source and two detectors onto a microchip. A half-mirrored beam splitter splits the photon beam and either lets a photon pass through to one detector, or reflects the photon to the second detector. Since the photon must go either to one detector or the other, it can be confirmed that only one photon at a time is emitted. This research is promising and may help enable quantum information processing.



<http://tinyurl.com/08-110221>

## Quantum Computing Research Effort

(SNSF, February 24, 2011)

Earlier this year, the National Centre of Competence in Research – Quantum Science and Technology was created to study quantum physics and information theory. Quantum computing takes advantage of quantum mechanical properties to store information and perform computations. Quantum computing has important implications in many aspects of technology.

<http://tinyurl.com/08-110224>

## Improved Particle Physics Model

(EPFL, March 02, 2011)



Physicists at EPFL are attempting to improve the model of B-mesons, a type of subatomic particle that is important to understanding fundamental properties of the universe. In the Big Bang, matter and anti-matter were not created in equal parts, which is a violation of CP symmetry. The experiments that EPFL is conducting are trying to find a new mechanism for this violation. The experiments are being conducted in Japan as part of the BELLE experiment particle collider. The collider is tuned at a lower energy than the CERN collider, but this produces a large number of B-mesons without many other particles to distort measurement results. The scientists won the Nobel Prize for Physics in 2008.

<http://tinyurl.com/08-110302>

## Helium Nanodroplets

(EPFL, March 23, 2011)



Scientists at EPFL are conducting basic research into the properties and behavior of helium nanodroplets, which are droplets consisting of just a few thousand atoms. Helium nanodroplets are created by injecting helium near absolute zero into a vacuum. The researchers then associate the droplets with sodium and excite the resulting combination with a laser, which can result in a stable or unstable configuration. This research is still in its very beginning stages, but it will further our understanding of physics, and may have application to quantum computers.

<http://tinyurl.com/08-110323>

## 9. Architecture / Design

### Art and Science

(UNIFR, February 10, 2011)



Belgian artist Edith Dekyndt has a new art exhibit in Fribourg that explores the boundary between art and science and the difference in scale between the very large and the very small. Helping her is Olivier Pravaz, a doctoral candidate at the University of Fribourg who studies nanotechnology. For the exhibit, he took the constituents of an apple and a wooden table and mixed them at a micro and nanoscopic level. The result, laid out on a sheet of Plexiglas, looks homogeneous. Only under the microscope can the individual parts be seen. This work tries to examine the unseen scale differences in our world.

<http://tinyurl.com/09-110210>



## Recycled Building Materials

(UNIZH, February 11, 2011)

The Canton of Zurich is increasingly using recycled building materials in its buildings, mainly in the form of recycled concrete. Recycled concrete replaces traditional gravel aggregate in concrete with recycled building materials such as from demolished buildings. This approach makes financial sense in Zurich because new building materials are expensive, and there is sufficient recycled material available from the large number of old buildings in the Canton that are being either renovated or demolished. Recycling construction material also alleviates the burden on landfills and other storage sites to store all the renovation and demolition debris. One recent example of a building that uses recycled concrete is the University of Zurich's small animal clinic.



<http://tinyurl.com/09-110211>

## Architecture as a Marketing Tool

(ETH Zurich, February 23, 2011)

Marketing is often seen as a short-term discipline, and yet the long-term implications of marketing, especially the building of a brand, are important. The recent "Award for Marketing + Architecture" was created to begin a dialog between marketing professionals and architects. The idea is that a company's buildings should reflect its brand. In other words, the architecture of a company's buildings is an important marketing tool. One winner of the award was the youth hostel of Scuol. The design of the building reflects the hostel's not-for-profit mission while still attracting tourists. The building takes many cues from traditional building styles of the region and fits into the surroundings.



<http://tinyurl.com/09-110223>

## Sustainable Architecture Award

(ETH Zurich, March 04, 2011)

Several new Swiss buildings, including the Benedictine Abbey in Disentis and the expansion of the International Union for Conservation of Nature (IUCN) building in Gland, were recently distinguished for their sustainable architecture. Often, sustainable architecture is difficult to achieve because of conflicting economic, environmental, bureaucratic, and political goals. However, the winning constructions demonstrated the ability to overcome these challenges, act as pioneers, and make use of multi-disciplinary design. The Abbey in Disentis was built out of native lumber and created a community space for all its users. The IUCN building combined simple construction with high-tech building technologies to reduce its carbon footprint. Federal councilor Doris Leuthard attended the ceremony and spoke about the importance of proper space planning.



<http://tinyurl.com/09-110304>

## Wind Tunnel for City Engineering

(ETH Zurich, March 17, 2011)

ETH Zurich recently opened a new wind tunnel at the Empa research center. This wind tunnel is specially designed for use with models of cities and it can induce realistic turbulence as found in nature. It also has an advanced measurement system that uses cameras and a laser for high-resolution wind measurement. The researchers want to use the wind tunnel to better understand the interaction between buildings and the local climate. They can, for example, show that winds along an "urban canyon" can cool down buildings, and that winds can help ventilate cities and remove dangerous exhaust fumes. An additional goal the researchers have is to use wind tunnel data to improve their simulation models.



<http://tinyurl.com/09-110317>

## 10. Economy, Social Sciences & Humanities

### Adolescent Use of Media

(UNIGE, February 28, 2011)

The University of Geneva, the University of Lugano, and the Zurich University of Applied Sciences recently published a study that looks at how adolescents in Switzerland use media. They interviewed approximately 1000 people between the ages of 12 and 19 for the study. They discovered that the mobile phone is the most important device used for communicating and keeping up to date. The Internet is also important, but traditional media, such as television less so. With the mobile phone, they discovered that text messages are preferred over calls. Social net-



works also play an important role in distributing information. Lastly, the researchers discovered regional differences in their statistics, showing that a unified, nationwide approach is not necessarily ideal.

<http://tinyurl.com/10-110228>

## Religion in Switzerland

(March 29, 2011)

A new study looks at how Swiss perceive religion and reveals several interesting results. Most Swiss feel distant from religion, though not all of these consider themselves completely secular, meaning they may not be an active part of a church, but they still have spiritual beliefs. Furthermore, the percentage of people seeing themselves as distant from religion or secular has increased strongly at the expense of regular churchgoers. The study also revealed gender differences, namely that men are more likely to be distant from religion or secular than women, and that women are more likely to practice an alternative form of religion. Lastly, most people saw the established churches as being very helpful to the socially disadvantaged.

<http://tinyurl.com/10-110329>

## 11. Technology Transfer / IPR / Patents

### Spin-offs Winners of ACES Awards

(ETH Zurich, February 04, 2011)

Two spin-offs founded at ETH Zurich, Mirasense and Dybuster, won an Academic Enterprise Award as the top European startups in their respective categories: "Fast Start" and "ICT". Mirasense developed a barcode reader for cellphones that pulls up additional information about a product within seconds, and works even with low-resolution cameras on non-smartphones. The program allows shoppers to compare prices and check ingredients, among other things. Dybuster invented a software program to help dyslexics overcome their disability. The technology originated as an ETH Zurich research project and is being deployed in Swiss schools. Additional ETH Zurich spin-offs made it to the final round of the contest.



<http://tinyurl.com/11-110204>

### Venture Capital Funding Initiative

(ETH Zurich, February 11, 2011)

The initiative "venture kick" was started in 2007 to give new Swiss startups the necessary funding to get off to a successful start. Since its launch, the initiative has given out 5.8 million Swiss Francs to 161 spin-offs. The new companies have been quite successful, raising 103.5 million Swiss Francs of additional funding and creating 940 new jobs. This performance shows the enormous potential that Swiss startups have for innovation. Zurich and Lausanne are the two regions that are leaders in hosting successful startups.



<http://tinyurl.com/11-110211>

### 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

### Einstein's Correspondences

(ETH Zurich, March 03, 2011)

The ETH Zurich library holds over one hundred letters written by Albert Einstein, most of which were acquired from private collections, and is about to make an additional six public. The six new letters are personal ones to his friend Jakob Ehrat and Ehrat's mother. Einstein graduated from ETH Zurich (then the Federal Polytechnical School) around 1900, after which he worked in Schaffhausen and then at the patent office in Bern. From 1914 to 1933 he worked in Berlin, but then moved to Princeton University when the Nazis came to power in Germany.

<http://tinyurl.com/12-110303>





## 13. Calls for Grants/Awards

### Spreading Science

The Swiss National Science Foundation (SNSF) is starting a new program, named "Agora", to fund communications projects that bring science to the general public. Funding is available to any discipline as long as projects do more than just disseminate science but try to build a dialogue with the public. The choice of media is not limited; in fact anything that brings science to life is encouraged.

<http://tinyurl.com/13-110303>

(SNSF, March 03, 2011)



### SNSF Development Professorships

The Swiss National Science Foundation, in its 12<sup>th</sup> round of awards for this program, has selected forty-one outstanding individuals for its development professorships, five of whom will be at the University of Basel. The program funds academics with strong research credentials and future professorship potential for four years. The winners receive an assistant professorship and sufficient funding to support their own research project. Since the program started in 1999, 443 individuals have been given this award. The application deadline for the next round is on May 02, 2011.

<http://tinyurl.com/13-110303b>

(UNIBAS, March 03, 2011)

## Upcoming Science and Technology Related Events

### Mobility Without Emission?

April 1, 2011

<http://tinyurl.com/psi-mobility>

Open visit

Paul Scherrer Institute, Villigen

### Energissima

April 13-16, 2011

<http://energissima.ch>

National meeting on renewable energies

Forum Fribourg, Fribourg

### 12th Swiss Global Change Day

April 19, 2011

<http://tinyurl.com/global-change-day>

Science community interaction platform

Berne

### MicroNanoFabrication Annual Review Meeting

May 10, 2011

<http://cmi.epfl.ch>

Networking Forum

EPFL, Lausanne

### Swiss NanoConvention 2011

#### How Nanotechnology Will be Shaping our Future

May 18-19, 2011

<http://tinyurl.com/nanoconvention>

Conference on nanotechnology

TRAFO Center, Baden

### Information Security and Cryptography

June 20-24, 2011

<http://www.infsec.ch>

Computer science seminars

Marriott Hotel, Zurich

### International Workshop on Radiation Imaging Detectors

July 3-7, 2011

<http://tinyurl.com/radiation-imaging>

International forum on radiation imaging

ETH Zurich, Zurich

### International Conference on the Evaluation of Inter- and Transdisciplinary Research

September 14-16, 2011

<http://tinyurl.com/transdisciplinary>

Experiences and reflections on best practice

Bern

### World Resources Forum 2011

September 19-21, 2011

<http://www.worldresourcesforum.org>

Platform on sustainability

Davos



## Science-Switzerland Back Numbers

[http://www.swissinnovation.org/Science-Switzerland\\_DecJan\\_2010-2011.pdf](http://www.swissinnovation.org/Science-Switzerland_DecJan_2010-2011.pdf)  
[http://www.swissinnovation.org/Science-Switzerland\\_OctNov\\_2010.pdf](http://www.swissinnovation.org/Science-Switzerland_OctNov_2010.pdf)  
[http://www.swissinnovation.org/Science-Switzerland\\_AugSep\\_2010.pdf](http://www.swissinnovation.org/Science-Switzerland_AugSep_2010.pdf)  
[http://www.swissinnovation.org/Science-Switzerland\\_JunJul\\_2010.pdf](http://www.swissinnovation.org/Science-Switzerland_JunJul_2010.pdf)  
[http://www.swissinnovation.org/Science-Switzerland\\_AprMay\\_2010.pdf](http://www.swissinnovation.org/Science-Switzerland_AprMay_2010.pdf)  
[http://www.swissinnovation.org/Science-Switzerland\\_FebMar\\_2010.pdf](http://www.swissinnovation.org/Science-Switzerland_FebMar_2010.pdf)  
[http://www.swissinnovation.org/Science-Switzerland\\_DecJan\\_2009-2010.pdf](http://www.swissinnovation.org/Science-Switzerland_DecJan_2009-2010.pdf)  
[http://www.swissinnovation.org/Science-Switzerland\\_OctNov\\_2009.pdf](http://www.swissinnovation.org/Science-Switzerland_OctNov_2009.pdf)

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