Science-Switzerland, December 2013 – January 2014

News on Swiss science, technology, education and innovation

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7% R&D Expenditures Increase in 2012

(Swiss Federal Statistical Office, December 19, 2013)

The Federal Statistical Office (FSO) has recently published a survey indicating that Swiss enterprises have been spending more money in research and development (R&D) in 2012. The total investment amounts to CHF 12.8 billion and represents an increase of 7% compared to 2008. This ranks Switzerland among one of the countries with enterprises having a highly active R&D.
http://swissinnovation.org/news/web/2013/00-131219-81

Outstanding Performance by Swiss Students in PISA 2012

(SERI, December 03, 2013)

Over 11,000 15-year-olds in Switzerland participated in the 2012 Program for International Student Assessment (PISA), a triennial survey conducted worldwide by the Organization for Economic Co-operation and Development, achieving results higher than the averages of similar countries such as Finland and Belgium. Designed to assess the ability of students to apply their knowledge to real-life situations, PISA 2012's focus was on mathematics, in which Switzerland came up top of Europe. Switzerland also scored significantly above the OECD average in reading and science, the latter for the third time since 2006. Switzerland's gender performance gap however remained around the OECD average, with boys achieving a higher average score than girls in mathematics, girls scoring better than boys in reading, but both boys and girls achieving comparable averages in science.
http://swissinnovation.org/news/web/2013/00-131203-3d

Highest Longevity in Switzerland

(WSJ Live, January 03, 2014)

With 82.7 years in average Swiss people live longer than any other member of the OECD. The recent study also found that Switzerland has the lowest mortality rate caused by strokes or cancer. However, it also has the 3rd highest per capita health care expenditure in the OECD. Switzerland is followed by Italy (82.7 years), Japan (82.7 years), Iceland (82.4 years) and Spain (82.4 years). The USA only ranks as 26th in the rating with an average life expectancy of 78.7 years, while having the highest per capita health care expenditure in the OECD.
http://swissinnovation.org/news/web/2014/00-140103-6c

Swiss Exoplanet Hunter in Nature's Top Ten

(Nature, December 18, 2013)

Michel Mayor was selected by the prestigious journal Nature to be one of the most important scientists in 2013. Mayor is an emeritus astronomer at the University of Geneva in Switzerland who is still active in research, and has found hundreds of exoplanets together with his team during the past two decades. His presence in Nature's Top Ten List is due to the extraordinary discovery of the planet Kepler-78b. This planet is considered the closest analogue of Earth identified so far, concerning density and size. However, the close orbit of this planet to its parent star

causes its surface to be molten. Nevertheless, Mayer is convinced that finding a true Earth twin is only a matter of time and hopes he will be able to celebrate this discovery.
http://swissinnovation.org/news/web/2013/00-131218-17

Switzerland is #1 Partner for S&T Collaborations with the United States

(The Washington Post, December 04, 2013)

The U.S.-Israel Science and Technology Foundation recently released an index measuring the science and technology collaboration between the United States and other leading countries. The report compared American ties by looking at 20 different indicators in four categories: government, private sector and industry, human capital and research and development. Switzerland tops the ranking with 131 points, before Canada with 101 and Israel with 100 points. The top three are followed by Singapore, Germany, South Korea and Sweden. According to the study, Switzerland is particularly important for collaborations in the R&D and Private Sector fields.
http://swissinnovation.org/news/web/2013/00-131204-a9

Energy Award Watt d'Or 2014

(Federal Administration, January 09, 2014)

The Swiss Federal Office of Energy announced the winners of the 2014 Watt d'Or, a prize given to people and organizations who make advancements in the energy sector by bridging theory and practice. This year's winners made dry cleaning and laundry more energy efficient, upgraded a pumped storage power generation station to run more efficiently, industrialized Grätzel solar cells, developed a gas-diesel hybrid engine for vehicles, and built a highly efficient apartment building in central Switzerland.
http://swissinnovation.org/news/web/2014/00-140109-e9

1. Policy

Horizon 2020 Launched

(HES-SO, December 24, 2013)

Horizon 2020, the European Union's 8th Framework Program for Research, has a budget of EUR 80 billion for the period 2014-2020. Its Swiss launch took place during a national conference held from 14-17 January at the national football stadium in Bern. The conference, organized by the State Secretariat for Education, Research and Innovation (SEFRI) and Euresearch, addressed different themes on different days: day 1 covered issues of interest to managers of research, policy and economics; day 2 addressed societal challenges; day 3 industrial primacy; day 4 scientific excellence. Horizon 2020 should help give new impetus to the knowledge economy in Europe and address key issues affecting citizens' lives.
http://swissinnovation.org/news/web/2013/01-131224-2e

Federal Council to Boost Biomedical Research and Technology

(Federal Administration, January 18, 2014)

Biomedical research and technology have been known to drive economic growth, and though Switzerland is already known for its strength in this area thanks to its excellent education system, tax and labor laws, and political stability, the Federal Council anticipates steep competition over the next ten to fifteen years. Therefore, improving the framework for research, access to markets, and intellectual property are among some of the strategies the Council plans to focus on as part of its 2011-2015 legislature planning in the name of staying competitive. Measures such as implementing the Human Research Act and stamping out counterfeit and illegal medicines are expected to take place in early 2014 and by 2016 respectively.
http://swissinnovation.org/news/web/2014/01-140118-9e

Switzerland as Open Center for Research and Innovation

(ETH Zurich, January 21, 2014)

Representatives of Switzerland's university and research organizations have published a "Manifesto for Switzerland as an open center for research and education". With national referenda on immigration policy planned in 2014 and 2015, they are calling for Swiss borders to remain open for research and education. They consider openness and internationalism crucial if the country is to retain its lead in global research, and free movement of persons a

pillar stone of this. Free movement brings highly skilled scientists into the country, and gives Swiss researchers and students opportunities to study and work elsewhere in Europe without any administrative barriers. Moreover, it underpins the successful bilateral agreements on education and research concluded with the EU. Ultimately it is helping build a successful, knowledge-based society and economy.
http://swissinnovation.org/news/web/2014/01-140121-fe

Four New Energy Competence Centers

(Federal Administration, December 16, 2013)

The SCCER Steering Committee, made up of representatives from the Commission for Technology and Innovation (CTI) and the Swiss National Science Foundation, has approved funding during 2014-2016 for four further Swiss Competence Centers for Energy Research (SCCERs). Applications were approved in the action areas 'Grids and their components' (EPFL), 'Efficient concepts, processes and components in mobility' (ETH Zurich), 'Biomass' (Paul Scherrer Institute) and 'Economy-environment-law-behavior' (University of Basel). Previously approved applications were in 'Storage' (PSI) and 'Power supply' (ETH Zurich). With six of the seven action areas defined in the Coordinated Energy Research in Switzerland Action Plan now covered, a call has been relaunched for bids in the remaining area, Efficiency (application deadline 17 March 2014). Funding of CHF 39 million is available to SCCERs to develop energy research capacities.
http://swissinnovation.org/news/web/2013/01-131216-2f

One Fifth of Swiss Population in Formal Education

(Federal Administration, December 19, 2013)

More than 1,5 million students and apprentices were counted for the school year 2011/12. Therewith, almost a fifth of the Swiss population was attending a formal education. This statistic encloses all forms of education from preschool to university. The Swiss education system is well-known for its permeability between different education levels, which is enabled by a wide range of transition formations and permits everybody to obtain continuing education. Only 18% of people obtaining education were in tertiary education, which comprises universities, advanced technical colleges and other superior education levels. The trend over the last years indicates that the percentage of people in tertiary education is continuously rising.
http://swissinnovation.org/news/web/2013/01-131219-f7

Harmonization of Training for Healthcare Professionals

(SERI, December 13, 2013)

As the number of elderly and chronically ill people increases in Switzerland, more well-qualified healthcare professionals are needed to ensure ongoing high-quality medical care. The Federal Council has included in its healthcare program "Gesundheit 2020" the goal of training more healthcare professionals. The new Health Professions Act (GesBG), currently under consultation, establishes uniform requirements for the training of nurses, physiotherapists, occupational therapists, midwives and nutritionists at undergraduate level at universities of applied sciences. It also regulates independent professional practice. Healthcare professionals are currently trained mainly at higher vocational schools and technical colleges. Although nursing courses are equivalent, the content of courses at colleges conferring a bachelor's degree differs by canton. The new law will unify these training courses.
http://swissinnovation.org/news/web/2013/01-131213-95

Financing the Global Climate Policy: North & South

(ETH Zurich, January 07, 2014)

As with other global governance projects, for instance the protection of the stratospheric ozone, there is a big contrast between North and South. Usually, developing countries have three different types of demands for the industrialized nations. Firstly, they demand financial aids for the adaptation to the climate change. Secondly they want to bind agreements for the mitigation of greenhouse gases to financial and technological transfers. And third, they ask for "Loss and Damage" compensation for the damages to the climate mainly caused by industrialized nations. The north obviously desists from making strong commitments with regards to such a compensation as it would prove difficult to estimate the financial damages actually caused by climate change. Even in the less controversial financing of direct projects for adaptation and mitigation, only small commitments are made. Overall, the negotiations with respect to climate change are not going to become easier, and a further exacerbation of the differences between North and South are to be expected.
http://swissinnovation.org/news/web/2014/01-140107-10

2. Education

Ranking: HSG in Top Ten

(University of Geneva, December 02, 2013)

For the second year consecutively, the international business newspaper The Financial Times has placed the University of St. Gallen (HSG) 7th in its 2013 European Business Schools Ranking, making it Switzerland's top business school. It also comes top among German-speaking business universities. The HSG and four other top ten schools on the FT list are members of the CEMS Global Alliance – an alliance of academic and corporate institutions dedicated to educating and preparing future generations of global business through the CEMS Master's in International Management. Founded in 1898, HSG has over 7,500 students and offers a truly international education, with degrees in Business Administration, Economics, Law, Social Sciences and International Affairs, as well as MBA and EMBA executive education programs.
http://swissinnovation.org/news/web/2013/02-131202-01

Erasmus+ launched in January 2014

(EAIE, December 02, 2013)

On 1 January 2014 the European Commission launched Erasmus+, which has a set runtime of seven years and a budget of $ 19.9 billion. This means an increase of 40% compared to the current spending, which clearly underlines the high degree of commitment by the EU to Education, Training, Sport and Youth institutions. Furthermore, one of the program aims is to increase the current level of mobility and opening up Europe to partner countries. In addition, it will focus in enhancing participation and commitment between higher education institutions and industry partners. Strong university-business cooperation can furthermore enhance entrepreneurship and entrepreneurial competences of students.
http://swissinnovation.org/news/web/2013/02-131202-fd

Recruiting the Best Minds for Future Global Network

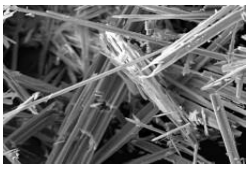
(ETH Zurich, January 23, 2014)

Scholarships for talented international students enable Switzerland to attract the best minds. According to a joint study by ETH Zurich and the University of Zurich, this is not "brain drain" but a networking opportunity that benefits everyone involved, as a new survey by the ETH Zurich and the University of Zurich shows. About half the alumni who were awarded scholarships had not returned to their home country at the time of the survey. However, she would not speak of a "brain drain" effect, says Emma Lindberg, lead author and, at the time of the study, working at ETH Global. Many alumni who remained abroad still maintained close contact with their countries of origin, collaborating with researchers there or researching areas of importance to these countries. "A physical presence is not necessary in order to exchange ideas and knowledge," says Lindberg.
http://swissinnovation.org/news/web/2014/02-140123-65

3. Life Science / Health Care

Blood Test to Detect Lung Cancer

(ETH Zurich, December 20, 2013)



Mesothelioma is a serious form of lung cancer that is usually fatal and manifests in people that have been exposed to asbestos. Current methods only allow for detection in its late stages, by which time the prognosis is often poor. Now thanks to an international team of researchers led by Bernd Wollscheid at ETH Zurich's Institute of Molecular Systems Biology, a new and non-invasive way to diagnose mesothelioma is on the horizon in the form a simple blood test. Besides testing for the mesothelin protein, which is not completely specific to mesothelioma, the researchers have also identified six other glycoproteins which are biomarkers for the disease. Their findings could result in a method with higher diagnostic power, but in the mean time, many more measurements in thousands more patients will be necessary to confirm their biomarker panel's efficacy.
http://swissinnovation.org/news/web/2013/03-131220-45

Genome Replication Pathway Differs in Cancer

(University of Geneva, December 03, 2013)

During cell division, double-stranded DNA opens like a zipper, revealing a "replication fork" equipped with enzymes. These forks gradually move along the separated DNA strands, creating two copies of the genome. Cell pro-

liferation is controlled by proto-oncogenes, whose overexpression or mutation triggers unruly proliferation and promotes the onset of cancer. In tumor cells, oncogenes damage replication forks, causing DNA strands to break. An international study led by the University of Geneva, reported in Science, has discovered how cancer cells repair damaged replication forks to complete their division. The intracellular biochemical pathway called “break-induced replication" (BIR) is common in cancer cells, but unusual in healthy cells. The next goal is to identify players along this pathway that may become promising therapeutic targets.
http://swissinnovation.org/news/web/2013/03-131203-15

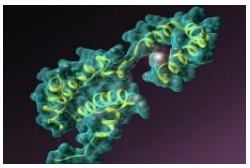
Natural Dual-action Antibiotic Effective against TB

(EPFL, December 04, 2013)

Scientists at EPFL’s Global Health Institute with colleagues at ETH Zurich have discovered a potent natural antibiotic. Pyridomycin, a substance produced by non-pathogenic soil bacteria, is effective against a related strain of bacteria that cause tuberculosis. The molecule’s complex three-dimensional structure allows it to act simultaneously on two parts of a key enzyme in the tuberculosis bacillus. This unexpected dual action dramatically reduces the probability of TB bacteria developing multiple resistances. The results, published in Nature Chemical Biology, show that by binding simultaneously onto these two elements and neutralizing them, pyridomycin prevents the bacterium from generating its membrane, and it ends up bursting like a balloon. The challenge is to develop a more robust, longer-lasting version of the molecule.
http://swissinnovation.org/news/web/2013/03-131204-b2

Driver of Chronic Viral Disease Discovered

(ETH Zurich, December 16, 2013)



The immune-suppressive cytokine “interleukin-10” (IL-10) is crucial for keeping the body’s immune system in check by reducing inflammation and controlling the activity of certain killer cells produced in response to infection. However, it is also a major factor in the body’s inability to clear chronic viral infections such as Hepatitis B and C, and HIV that plague over 500 million people worldwide. Previously, dendritic cells were thought to be responsible for producing the relevant immune-suppressive IL-10, but new research led by Professor of Immunology Annette Oxenius at ETH Zurich has shown that instead, only the IL-10 produced by non-specific phagocytes and helper cells achieves the regulatory effect on killer cells. These revelatory findings are vital for further studies on IL-10 receptors and ultimately, developing effective therapies in the form of IL-10 blockers.
http://swissinnovation.org/news/web/2013/03-131216-7e

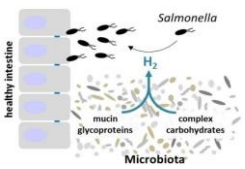
Exploring Ways of Preventing Brain Damage

(University of Lausanne, December 12, 2013)

Researchers at UNIL have advanced the understanding of cell death, opening the door to new therapeutic strategies in diseases like cancer, cerebral asphyxia or neurodegenerative diseases that involve the deregulation of autophagy in cell death. By digesting intracellular components, autophagy is essential for maintaining vital cell functions. In normal healthy cells, the process degrades certain defective proteins and organelles for recycling. An initial UNIL study in 2009 showed that activating autophagy in affected neurons might slow neuronal death. In a new study, conducted with the University of Texas and published in PNAS, excessive autophagy was induced, demonstrating that overactivation can kill cells by autosis, independently from other known types of cell death (apoptosis and necrosis). Cardiac glycosides were found to inhibit autosis and significantly reduce brain damage.
http://swissinnovation.org/news/web/2013/03-131212-87

Hydrogen-Powered Salmonella Attack

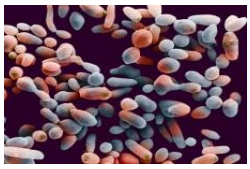
(ETH Zurich, December 11, 2013)



Recent studies of the procedural method of intestinal colonization by the pathogen Salmonella Typhimurium, which is known for causing diarrhea, suggest the use of hydrogen as a source of energy during the early stage of the Salmonella attack. Hydrogen, which is created by the intestinal flora as a chemical intermediate, can be converted into energy by the hydrogenase enzyme of Salmonella. Normally, the intestine is colonized so densely by a vast array of harmless microorganisms that pathogens are unable to multiply. However, in the case of Salmonella and probably other hydrogen-powered pathogens the protective intestinal flora can facilitate infections by serving as an unintentional energy provider through its own metabolism.
http://swissinnovation.org/news/web/2013/03-131211-5c

Protein Clumps as Memory

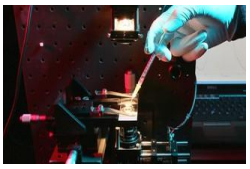
(ETH Zurich, December 05, 2013)



In the first demonstration of a form of non-hereditary memory in a single-celled organism, observations by ETH Zürich scientists show that yeast cells store memories in the form of protein aggregates. The particular "memories" in this case are souvenirs of failed mating attempts. When two yeast cells attempt but fail to fuse, their Whi3 proteins are modified and deactivated. The proteins form aggregates, with the result that mating in the future will require a much stronger pheromone signal between the cells. Alternatively, yeast cells can reproduce asexually, in which case the protein aggregates are not passed on to the daughter cells. Protein aggregates have also been shown to function as memory in multicellular organisms.
http://swissinnovation.org/news/web/2013/03-131205-17

Assessing Toxicity of Nanomaterials in Cells

(EPFL, December 09, 2013)



Researchers from EPFL have developed a novel optical technique to precisely assess the toxicity of nanomaterials. Nanomaterials can be found everywhere nowadays, although their effects on humans and the potential toxicity has not been completely unraveled. The new analytical tool enables the measurement of the concentration of oxidizing substances in cells. Such substances are usually produced by damaged cells and therefore provide researchers with valuable insight into the process of oxidative stress. The new test is currently the most reliable and continuous way of assessing oxidative stress in cells without damaging them.
http://swissinnovation.org/news/web/2013/03-131209-f0

OGT Protein's Role in Cell Division

(University of Lausanne, December 06, 2013)

A study conducted at UNIL and published in Science demonstrates an unknown mechanism ensuring that cell division functions properly. The OGT enzyme is versatile, able not only to fix a sugar onto certain proteins enabling the cell to divide (i.e., glycosylation) but also to cleave a protein (i.e. it is a protease). Proteolysis is crucial in ensuring that the cell divides into two cells each with a healthy core, instead of producing a single cancerous cell with two nuclei. The study has delivered visual evidence of the OGT enzyme attaching itself onto the HCF-1 protein and cutting it in half. OGT thus fulfils two different functions with the same structure. This finding is a significant step forward in understanding how cancer develops.
http://swissinnovation.org/news/web/2013/03-131206-d7

Young Killer Cells Protect Against Infectious Mononucleosis

(University of Zurich, December 19, 2013)

Currently, more than 90 percent of the adults are carriers of the Epstein-Barr Virus, which is responsible for triggering infectious mononucleosis. Immunologists from the University of Zurich have now shown that the abundant number of killer cells in children are able to fight off infectious mononucleosis and additionally provide a life-long protection from its cancer-causing effect. By contrast, the reduced number of killer cells in adults make them more susceptible to an outburst of the illness. The researchers are currently examining vaccinations that could protect non-carrier adolescents against an Epstein-Barr Virus infection. This could prevent the outbreak of infectious mononucleosis and reduce the related risk of developing Hodgkin lymphoma, a cancerous tumor of the lymphatic system.
http://swissinnovation.org/news/web/2013/03-131219-53

Weight-regulating Gene Discovered

(University of Lausanne, December 19, 2013)

A UNIL study published in PLOS ONE opens up a new way to treat obesity. The research team investigated metabolic exchanges between neurons and astrocytes - star-shaped glial cells in the central nervous system (CNS). They found three genes, called MCT1, MCT2 and MCT4, that control the export and import of lactate, used by neurons for energy. When fed on a fat and sugar-rich diet, transgenic mice partially deficient in MCT1 were found to have less adipose tissue than wild-type mice. Transgenic mice had lower MCT1 expression in the CNS and showed resistance to weight gain, with fewer signs of hepatic steatosis, insulin resistance or other indications of type 2 diabetes than their wild counterparts. In tackling obesity, the MCT1 carrier could therefore represent a new therapeutic target.
http://swissinnovation.org/news/web/2013/03-131219-2d

Clinical Trials of Alzheimer's Vaccine

(startupticker, January 09, 2014)

Swiss biopharmaceutical company AC Immune SA, based at EPFL, has completed a new round of financing for CHF 20 million from existing investors. AC Immune is focused on developing treatment and preventive medicines against Alzheimer's disease. They have begun the world's first trial of a vaccine against the phospho-Tau (phosphorylated Tau protein) target for the disease. Phospho-Tau forms twisted proteins inside neuronal cells and builds tangles that disrupt the cells' functioning. The vaccine, code-named ACI-35, stimulates the patient's immune system to produce conformation-specific antibodies against phospho-Tau protein. Another pipeline compound for AC Immune is the monoclonal antibody cerezumab, now in phase II clinical trials, partnered with Genentech.
http://swissinnovation.org/news/web/2014/03-140109-ee

Negative Social Effects of Cocaine

(University of Zurich, December 18, 2013)

Cocaine is the second-most used illicit drug in Switzerland, and a new study from the University of Zurich shows the negative social effects that it has. The study found that cocaine users show reduced empathy, which breaks down their social circles, possibly leading to higher cocaine use. The drug can also lead to a variety of mental problems and it is a highly addictive drug. On the positive side, some of these negative effects are reversible when drug use is stopped. However, this is not necessarily true with children, who may have more permanent changes to their brain, as a result.
http://swissinnovation.org/news/web/2013/03-131218-47

Dietary Fiber Can Protect Against Asthma

(swissinfo, January 06, 2014)

Results of a study conducted by researchers at the Lausanne University Hospital and funded by the Swiss National Science Foundation have revealed that dietary fiber is not just important for maintaining a healthy gut; it can also affect the development of immune cells responsible for defending against allergies and inflammation in the lungs. Experiments involving mice showed that those that were fed a fiber-enriched diet had milder allergic reactions when exposed to dust mites compared to those on low-fiber diets. These findings potentially link the rising incidence of asthma in humans over the past fifty years to the changing Western diet that now comprises less fruits and vegetables. The research team plans to conduct clinical studies to further investigate the impact of high-fiber diets on allergies and inflammation.
http://swissinnovation.org/news/web/2014/03-140106-74

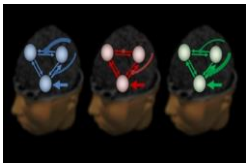
Monoclonal Antibody in Schizophrenia Clinical Study

(startupticker, December 20, 2013)

GeNeuro SA has been awarded US$ 700,000 (approximately CHF 631,000) by the Stanley Medical Research Institute to fund its clinical program in schizophrenia. The private biotech company based in Geneva specializes in developing therapies for neurological disorders, and plans to use this funding to support a clinical trial that will test a monoclonal antibody's ability to target a protein called Env. Env is expressed in 40-50% of patients with schizophrenia and has been shown to have neurotoxic and inflammatory implications. Being able to neutralize this protein using the specific monoclonal antibody will represent a pioneering form of treating psychotic disorders. GeNeuro SA plans to launch its first clinical trial next year.
http://swissinnovation.org/news/web/2013/03-131220-78

Diagnosing Schizophrenia Using Mathematic Models

(ETH Zurich, January 07, 2014)



Psychiatric diagnosis is tricky. Using only standardized questionnaires to identify and diagnose diseases is common practice, and it is therefore unsurprising that various subtypes of a given disease can go undetermined. Professor Klaas Enno Stephan at ETH Zurich's Institute of Biomedical Engineering however may have a solution. Using a "simple mathematical model", functional magnetic resonance imaging (fMRI) images of brain activity are analyzed and the coupling strength amongst three brain regions is calculated. According to their model, different brain activity patterns correspond to different degrees of the disease's severity. This was confirmed by the patients' clinical symptoms in their study. The model represents a stepping-stone towards better psychiatric diagnosis and will be subject to further tests and modifications before it can be used in clinical practice.
http://swissinnovation.org/news/web/2014/03-140107-85

Breakthrough Prize in Life Sciences Awarded to Swiss Scientist

(University of Basel, December 13, 2013)

Michael Hall, Professor of Biochemistry at the University of Basel, became the first Swiss scientist to be awarded the Breakthrough Prize in Life Sciences for his 1991 discovery of a protein called target of rapamycin (TOR), a central regulator of cell growth and metabolism. The discovery of TOR has contributed towards a deeper understanding of vital processes like cell growth, division, and death, and has had implications for the development of therapies for various diseases such as cancer and diabetes. The prize comes with a US$ 3 million endowment and is sponsored by various internet entrepreneurs including Mark Zuckerberg of Facebook and Sergey Brin of Google.
http://swissinnovation.org/news/web/2013/03-131213-a8

Salt is Good for Pregnant Women

(20min, December 20, 2013)

For most people a high consume of salt leads to an increased blood pressure. Not so for pregnant women. Researchers from the Insel hospital in Bern have found that a high salt consume is able to reduce the blood pressure of pregnant women. They were therefore able to reject the commonly accepted opinion to eat as little salt as possible during pregnancy. The study even confirms an increased risk for circulatory complications by doing so. The researchers assume a hormonal change to be the reason for the inverse effect of salt on pregnant women.
http://swissinnovation.org/news/web/2013/03-131220-29

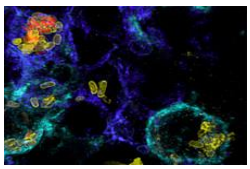
Neurofeedback Enable Control Over Own Brain Activity and Thoughts

(University of Zurich, December 12, 2013)

Interpersonal relationships as well as daily life highly depend on the ability to regulate and controlling negative feelings. A team of researchers from the Psychiatric University Hospital Zurich and ETH Zurich have successfully enabled participants to control and manipulate their brain activities through cognitive techniques. The participants brain activity was monitored by magnetic resonance imaging and real time neurofeedback was given to them in order to actively influence the activity in specific regions of the brain. Such methods could in future be used as in psychotherapy for patients who have difficulties in controlling their emotions.
http://swissinnovation.org/news/web/2013/10-131212-58

How the Typhoid Pathogen Evades the Immune System

(University of Basel, January 15, 2014)



The life-threatening disease typhoid fever results from the ongoing battle between the bacterial pathogen Salmonella and the body's immune cells. Each year, more than 20 million people are infected with this disease, which is transmitted by ingesting contaminated food or water. Growing antibiotic resistance makes this insidious illness increasingly difficult to cure. Scientists at the University of Basel have discovered how Salmonella repeatedly manages to evade the host's immune system. It has developed a range of defense strategies to resist macrophage attacks, survive and even replicate in macrophages. The team's findings are published Cell Host & Microbe. Understanding which factors enable Salmonella to survive encounters with host cells might provide new strategies in the treatment of typhoid fever and many other infectious diseases.
http://swissinnovation.org/news/web/2014/03-140115-1d

Better Results with Robot Therapy for Stroke Patients

(20min, January 16, 2014)

Researchers at ETH Zurich's Sensory-Motor Systems Lab have shown that robot-assisted therapy leads to slightly better results on average than conventional therapy with a physiotherapist amongst stroke survivors with paresis. In a study of 77 test subjects, robot therapy was revealed to produce better sensory-motor function amongst patients, but conventional therapy is still better in terms of building strength. Approximately 16,000 people suffer from strokes in Switzerland annually, making restoring mobility using therapy robots a viable option since patients would be able to train independently and be motivated by game-like elements and computer simulations. Additionally, robots can be adjusted to individual patients, making training at home a possibility. Further studies to assess the potential of this therapy will be conducted.
http://swissinnovation.org/news/web/2014/03-140116-eb

Influence of Dopamine on Sleep

(University of Zurich, January 08, 2014)

The regulation of the sleeping cycle in human beings is individual and largely determined by genetic factors. Scientists from the University of Zurich were now able to demonstrate that a Gene regulating the signal transmission effects of Dopamine in the brain also has a large effect on sleeping habits. Sleep is still not completely understood by

modern science and is an area, where cutting edge neurosciences is conducted. In an transdiscliplinary collaboration, researchers from the Institute of Pharmacology and Toxicology and the Institute of Medical Molecular Genetics demonstrate that Dopamine also plays a role in regulating the physiological sleep cycle.
http://swissinnovation.org/news/web/2014/03-140108-58

Intensive Use of Grasslands Reduces Biodiversity

(University of Bern, December 24, 2013)

A team of researchers from Germany and Switzerland, including ones from the University of Bern have established a biodiversity index and have shown that the intensity of land use greatly affects biodiversity. More intense use reduces their index. However, the biodiversity index can be strongly increased by varying the intensity of use from year to year. For farmers, this can mean varying the number of cows on a specific pasture or the frequency of mowing. The biodiversity index takes into account a range of species, from soil bacteria to birds.
http://swissinnovation.org/news/web/2013/03-131224-ab

Nestle Expands Health Science Activities

(Reuters, January 08, 2014)

Nestle is expanding its activity in its Health Science unit, where it researches medical foods that are nutritionally enhanced for specific medical conditions. Foods are developed for conditions that include diabetic peripheral neuropathy, dementia, depression, high-risk pregnancy, and Alzheimer's. Nestle made two recent acquisitions of Pamlab and Accera, US firms developing health foods. It also recently partnered with Cellular Dynamics International to provide stem cells for further medical foods research and development.
http://swissinnovation.org/news/web/2014/03-140108-37

How New Roots Grow

(University of Lausanne, January 10, 2014)

A UNIL team has revealed the complex process by which new roots grow inside the parent root and cross different cell layers before emerging. The researchers discovered Casparian strips, micronets that selectively seal the endodermis (deep cell layer) and provide protection against pathogens. Despite this solid structure, the cells of the parent root are able to flex and contract, allowing young roots to emerge. This expands the root system to access more nutrients. The study, published in Science, described for the first time the dramatic rearrangements in the endodermis that allow a lateral root to grow, thereby ensuring plant survival. This research opens new perspectives for botany and agriculture, e.g. cultivating plants in poor or dry environments, by controlling the root development.
http://swissinnovation.org/news/web/2014/03-140110-44

Importance of Non-coding RNA Identified

(EPFL, January 20, 2014)

Biologists have studied the functionality of a poorly understood category of genes, which produce long non-coding RNA molecules rather than proteins. Some of these genes have been conserved throughout evolution, and are present in 11 species ranging from man to frog. The research was lead at UNIL, in partnership with EPFL and the Swiss Institute of Bioinformatics (SIB), and the findings have been published in Nature. UNIL's Center for Integrative Genomics (CIG) compiled an authentic catalog of long non-coding RNAs in 11 species. The study suggests that some of our genomes' "dark matter" may play a role in the development and functioning of the most vital organs of our bodies. Future experimental studies will further clarify the role of these genes.
http://swissinnovation.org/news/web/2014/03-140120-65

Biodiversity of Tropical Forests Investigated

(University of Fribourg, January 21, 2014)

The University of Fribourg has collaborated in an international study showing that forest biodiversity is more complex than previously thought. The study, published in PLOS ONE, involved researchers in Belgium, Spain, Cameroon and the United Kingdom. It compared the distribution of the genetic diversity of fourteen tropical tree taxa in Central Africa. The seasonal inversion at the equator was found to strongly influence the structure of Central African rainforests. The study demonstrates how urgent it is to study the evolution and functioning of tropical forest biodiversity, since global climate change could cause the disappearance of tree species that have not yet been scientifically described. This would result in a serious loss of resources for ecosystem services, including the discovery of medicinal substances.
http://swissinnovation.org/news/web/2014/03-140121-7b

Motor Threshold and Working Memory Connected

(University of Basel, December 23, 2013)

Using transcranial magnetic stimulation (TMS), scientists at the University of Basel have discovered a positive correlation between motor threshold and working memory. Having a low motor threshold means only a small electromagnetic pulse is required to trigger a visible muscle twitch, and in the study of 188 human subjects, pulses of ascending strength were administered while the subjects were given behavioural tasks and questionnaires. These results may suggest that humans with low motor thresholds may be better suited to memory tasks. The scientists plan to continue pursuing further neurobiogical and molecular mechanisms of human memory.
http://swissinnovation.org/news/web/2013/03-131223-34

Fighting Malaria more Efficiently

(20min, January 17, 2014)

Fighting Malaria becomes increasingly difficult, owing to the growing resistance of the pathogens against many active components. In the fight against resistant Malaria, researchers from the Swiss Tropical and Public Health Institute have now developed a novel genetic test to identify if the pathogen is resistant to Artemisinin, which is the most reliable active component currently on the market. In a first step they will examine blood samples from patients in the most common Malaria regions. With this procedure the scientist aim at tracing and monitoring the expansion of resistant Malaria over the world.
http://swissinnovation.org/news/web/2014/03-140117-d1

European Honey Bees: Males are the Weaker Sex

(University of Bern, January 18, 2014)

Honey bees are crucial to the economy and ecosystem, and the failure of colonies is therefore a matter of great concern. Publishing in the open-access journal "PLOS ONE", scientists from the University of Bern's Vetsuisse Faculty have shown that male honey bees are more susceptible to the fungal parasite "Nosema ceranae" compared to their female counterparts. The parasite has been spreading and detected in bees outside of Asia, where it originates from, and understanding its pathogenic mechanisms has become a major priority since honey bees help sustain a wide range of agricultural crops valued at approximately CHF 5 billion through pollination, as well as produce 130,000 tons of honey annually in Europe. Vulnerability in males has been attributed to the fact that they are haploid, or have only one copy of each chromosome, unlike females which are diploid (they have two copies).
http://swissinnovation.org/news/web/2014/03-140118-f7

Mechanism to Control the Fine Motor Behaviour

(University of Basel, January 31, 2014)

Only recently the group of Prof. Silvia Arber at the University of Basel has found that motor commands to the arm musculature take two different routes. The instructions which are issued by the brain, reach the spinal cord, where they are sent to motor neurons innervating muscles in the hands and arms. However, in addition to this route, a copy of the information is simultaneously sent back to the brain. There it is segregated by functionality and space within a brainstem nucleus. This dual information stream provides the extremely precise execution of complex arm and hand movements. In a further study the researchers will focus on what happens if the copy to the brain is intercepted.
http://swissinnovation.org/news/web/2014/03-140131-e2

Enhancing Aminoglycoside Antibiotics

(https://www.ethz.ch/de/news-und-veranstaltungen/eth-news/news/20, January 29, 2014)

An international research team led by scientists at the University of Zurich and ETH Zurich has succeeded in improving a class of early-generation antibiotics: they have been able to suppress their once serious side effects. The improved antibiotics belong to the group of aminoglycosides which fight bacteria in a sensitive spot: their ribosomes. These are likewise constructors of the attacked pathogens as they produce proteins, important building blocks of the cells. However, human cells are also equipped with ribosomes, which is why the aminoglycosides also sometimes latch onto them, leading to damage.These side effects may cause loss of hearing or deafness. Now, the research team was able to successfully synthesize the antibiotics of these group in a way that they can better distinguish between human and pathogenic ribosomes.
http://swissinnovation.org/news/web/2014/03-140129-6b

Novartis Strengthening Pharmaceuticals Business

(genevalunch.com, January 21, 2014)

Novartis will cut 500 jobs, mostly in the Basel area, in 2014, while creating about the same number of jobs to push new pharmaceutical products. It put the emphasis on status quo for staffing numbers this year, following five years

of consecutive growth in jobs, noting that in 2013, 750 new jobs were created, bringing to 15,000 the total. Of the 4,000 new jobs created in the past eight years, the firm says, most have been in the Basel area. The Nyon site will see jobs added, with a third over-the-counter production area added. Most of the jobs lost will be in head office support for the pharmaceuticals division. The new jobs will be in the areas of brand and generic medicines for respiratory ailments, pulmonary cancer, dermatology and heart disease.
http://swissinnovation.org/news/web/2014/03-140121-a6

Pioneering Skin Grafts with Functional Blood and Lymphatic Capillaries

(University of Zurich, January 30, 2014)

For the first time, skin grafts of almost full skin thickness containing blood and lymphatic capillaries have been successfully engineered in the laboratory thanks to researchers at the University Children's Hospital Zurich and the University of Zurich. This is good news for severe burn victims, of which there are approximately 11 million every year. Engineering skin grafts in the lab using patients' cells in this way may prove to be better than conventional methods that require removing a small piece of skin from the patient, especially now that the functional engineered capillaries can provide efficient blood circulation and tissue fluid drainage. The first clinical application of these complex grafts is expected to take place in 2014, but without the engineered capillaries (which are in the process of getting approved).
http://swissinnovation.org/news/web/2014/03-140130-02

4. Nano / Micro Technology / Material Science

Pioneering Nanoscale Friction Research

(University of Basel, December 16, 2013)

In collaboration with the University of Basel, an international team of researchers has observed a strong energy loss caused by frictional effects in the vicinity of charge density waves. This may have practical significance in the control of nanoscale friction. In the experiment led by Prof. Dr. Ernst Meyer, Professor of Experimental Physics at the University of Basel, the team vibrated the nanometer-sized tip of an atomic force microscope above the surface of a layered structure of niobium and selenium atoms. They selected this combination due to its unique electronic properties, and in particular the charge density waves formed at extremely low temperatures. The electrons are no longer evenly distributed as in a metal, but instead form areas where the electron density fluctuates between a high and low range. The researchers registered very high energy losses in the vicinity of these charge density waves between the surface and the tip of the atomic force microscope, even at relatively large distances of several atomic diameters.
http://swissinnovation.org/news/web/2013/04-131216-c9

Ultra-Thin and Flexible Electronics

(ETH Zurich, January 07, 2014)

Researchers at ETH Zurich are developing electronics that are fifty times thinner than a human hair and flexible enough to bend around one. A substrate of parylene film is created, and then traditional semiconductor and conductor materials are used to build sensors and transistors on the film. The component can be transparent, if desired, leading to many possible applications. One that has been demonstrated on artificial eyes is a contact lens that measures intraocular pressure, which is used in diagnosing glaucoma disease.
http://swissinnovation.org/news/web/2014/04-140107-fc

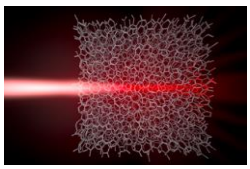
Guardian Angels to Produce First Prototype

(swissinfo, January 05, 2014)

Guardian Angels achieved the status of "flagship project" but were pipped at the post one year ago. Now, the backers are going ahead with plans to produce their first prototype. Like all major scientific projects, Guardian Angels is a joint venture. Led by the two Swiss Federal Institutes of Technology, (EPFL and ETH Zurich), it had 66 partners across Europe. Despite its failure to secure the subsidy, 58 of those research partners decided to continue with the work nonetheless. They include such prestigious institutions as France's CNRS, Imperial College London, Cambridge University and the Catholic University of Leuven in Belgium, along with industry heavyweights like IBM, Intel, Siemens, Sanofi and Nestlé. The way the project initiators see it, the Guardian Angels are the electronic systems of the future.
http://swissinnovation.org/news/web/2014/04-140105-58

New Materials Create Color and Opacity

(University of Fribourg, December 19, 2013)



Microscopic or nanoscopic structures can make an object appear to have color, without use of pigment. Examples in nature include butterfly wings and bird feathers, but these are ordered, crystalline structures. Using a high definition 3D printer, a research group at the University of Fribourg has produced a new amorphous (non-crystalline) material with interesting capabilities in this field. The material is an irregular network of microscopic plastic cylinders. It selectively reflects light in the infrared range, and also dramatically reduces transparency. The new class of material has a wide range of potential applications, from packaging, automobile paint, and cosmetics to the processing and transmission of optical signals.
http://swissinnovation.org/news/web/2013/04-131219-0b

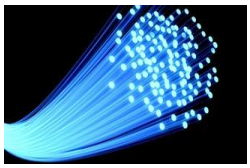
Forgery-proof Luxury Watches

(20min, December 20, 2013)

Luxury products like precious watches have always been victims of counterfeiting. However, this might soon be a thing of the past. The company DNAwatch, which was founded at ETH Lausanne, has developed a novel identification mark technique which is applied to the glass and is as unique as a finger print. The mark consists of minuscule pieces of electronic semiconductor metals on the glass and is invisible to the naked eye. Only under UV light it becomes visible. The prodcution procedure requires specific expert knowledge and is rather expensive, hindering the forgery of such watches for most counterfeiters. Additionally, DNAwatch has been nominated for the pioneering price of the cantonal bank of Zürich and hope to find a producer of forgery-proof watches.
http://swissinnovation.org/news/web/2013/04-131220-86

New Method for Designing Metamaterials

(EPFL, January 10, 2014)



An EPFL-led team has found a way to create computational models for the design of a wide range of metamaterials. Metamaterials, engineered to have properties that are not found in nature, are getting increasing attention in various technological fields. Designing a new material to meet technological demands requires using computer models to predict the full spectrum of the material's properties. Metamaterial modeling involves a set of differential equations known as Maxwell's equations. The EPFL team found a way to translate Maxwell's equations from continuous into discrete functions, thus enabling computational models suitable for efficient, accurate design of customized metamaterials.
http://swissinnovation.org/news/web/2014/04-140110-32

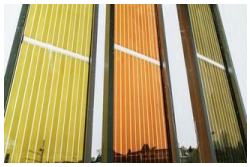
No Health Risk from Nano-Dust from Façade Paint

(Empa, January 13, 2014)

After 42 months the EU research project «NanoHouse» has ended, and the verdict is a cautious "all clear" – nanoparticles in the paint used on building façades do not represent a particular health risk. Five Empa laboratories were involved in the EU «NanoHouse» project, along with four other European research institutes and four industrial partners. The aim of the project was to investigate the opportunities and risks presented by the nanomaterials used in the surface coatings applied to building façades.
http://swissinnovation.org/news/web/2014/04-140113-ad

New Revolutionary Solar Cell

(EPFL, January 30, 2014)



EPFL scientists have discovered how novel, revolutionary solar cells, based on lead iodide perovskite light-absorbing semiconductors, transfer electrons along their surface. Photovoltaic energy conversion holds high promise for the future of renewable energy worldwide. The efficiency of solar cells depends upon the light-absorbing materials they use. Solar cells based on lead halide perovskites are arousing immense interest, as these semiconductors demonstrate very high conversion efficiencies (over 16%) and unsurpassed cell voltage (more than 1 Volt). However, it is not entirely clear how they work. The EPFL study, published in Nature Photonics, shows how the generated electrical charge travels across the perovskite surface of solar cells built with various architectures. This new type of solar cell may enable more efficient photovoltaic converters to be designed.
http://swissinnovation.org/news/web/2014/04-140130-d5

5. Information & Communications Technology

Success Story: Online Meeting Scheduling Tool Doodle

(startupticker, January 07, 2014)

Doodle, the online meeting scheduling tool has been a success story in Switzerland and on the Web. Doodle has grown a large user base and become profitable. In 2011, the media group Tamedia took a 49% stake in the company, and starting this year, it will take over complete ownership. Doodle's two founders will also transition their roles to new managers, who also have a successful track record. Michael Brecht will take over as CEO, bringing with him twenty years of experience with several different online companies.
http://swissinnovation.org/news/web/2014/05-140107-29

Smartphone Camera as 3D Scanner

(ETH Zurich, December 04, 2013)

Scientists from the Computer Vision and Geometry Lab of ETH Zurich developed an app that turns an ordinary smartphone into a mobile 3D scanner. Instead of taking a normal photograph, a user simply moves the phone around the object of interest and after a few motions, a 3D model appears on the screen. 3D scanning aims to capture the geometry of the 3D world. However, most existing solutions require a complicated setup, are often hard to use and might not always work outdoors. Marc Pollefeys, professor at the Institute for Visual Computing and his group found a way to develop a software that works with existing smartphone technology that allows the user to scan a 3D model almost as easy as taking a photograph.
http://swissinnovation.org/news/web/2013/05-131204-2c

Measuring UV Exposure with your Smartphone

(ETH Zurich, January 28, 2014)

The young ETH Zurich spin-off Bitsplitters has developed a innovative awareness system for sunlight exposure. The systems composed of a sensor and a smartphone application is able to measure the UV exposure in real-time and helps assessing correctly the required protective arrangements, by warning you whenever the UV uptake of the body will reach a certain threshold. Furthermore, precautionary measures like applying sunscreen and protective cloths can be entered into the app and will be accounted for when assessing the remaining time for sunlight exposure. The lightweight and water resistant sensor is currently being developed further to make it even smaller and easier to wear.
http://swissinnovation.org/news/web/2014/12-140128-a4

Failsafe Navigation Algorithm for Quadrocopters

(ETH Zurich, December 04, 2013)

Researchers at ETH Zurich have developed a novel control algorithm that allows quadrocopters to continue to fly in spite of multiple motor or propeller failures. This algorithm makes these vehicles safer and may allow them to be used for instance in delivery services. Drones like quadrocopters have become very popular with hobbyists due to their simplicity and agility. But they are also increasingly being used for commercial applications such as aerial photography and cinematography, inspection and transportation of cargo. One of the primary concerns currently limiting the widespread use of quadrocopters is safety. If a quadrocopter loses a propeller, it can no longer control its flight with the normal control software, and may crash in a public area. ETH researchers have now developed a failsafe technology that makes quadrocopters safer and may thus pave the way for these vehicles to be used in safety-critical applications.
http://swissinnovation.org/news/web/2013/05-131204-a9

Fast and Green Supercomputer

(ETH Zurich, December 02, 2013)

ETH Zurich's Piz Daint supercomputer set records for both speed and energy efficiency. It is the fastest supercomputer in Europe (and 6th worldwide) at 7.7 petaflops, and it runs at an efficiency of 4.5 gigaflops per watt. This efficiency puts in at number four on the Green500 list of most energy efficient supercomputers, but it is the only one in the top ten with petaflop-magnitude speed. Piz Daint recently underwent several upgrades, more than doubling its size and adding graphics processors. The computer is also twenty times faster than its predecessor, Monte Rosa, while only increasing energy usage by ten.
http://swissinnovation.org/news/web/2013/05-131202-58

World's First Quantum Multi-Link Encryptor

(startupticker.ch, December 13, 2013)

ID Quantique SA announced the launch of the world's first large-scale, high-speed encryptor utilising quantum random number generation. The new Centauris has been uniquely developed to cost-effectively protect traffic on largescale multilink data networks. With the performance capabilities of ten 10Gbps high-speed multilink encryptors, the CN8000 will protect up to 100Gbps of multiprotocol network traffic. IDQ's CEO, Gregoire Ribordy, stated that, "We are excited to launch the world's first encryptor whose keys are based on the security of a quantum random number generator and which supports quantum key distribution for long-term data protection". The Swiss designed and manufactured encryptor offers unparalleled cost efficiency, performance and security benefits for organizations with large scale network traffic and multiple high-speed links.
http://swissinnovation.org/news/web/2013/05-131213-f0

Swiss Chocolate Greetings App

(startupticker, December 09, 2013)

mySwissChocolate AG's newest app has been receiving rave reviews for its unique chocolate greeting service, already available in 46 countries and counting. Users can download the app for free and use it to send a photo, greeting, and Swiss chocolate of their choice via post for as little as €5.50. The app had over 200,000 downloads within the first four months of its launch, and its development was made possible by various long-time investors in mySwissChocolate AG as well as the Zurich Cantonal Bank.
http://swissinnovation.org/news/web/2013/05-131209-87

Cutting Edge HTML5 Video Technology Goes to Hugely Popular Website

(AlpICT, December 12, 2013)

Dailymotion announced the acquisition of Jilion, the Lausanne based development team behind cutting edge HTML5 video technology, SublimeVideo. This technology and talent acquisition will help Dailymotion take the lead in video experience across multiple platforms. Dailymotion.com is one of the most popular websites worldwide. Dailymotion has 120 million unique visitors generating over 2.5 billion video views every month. It is ranked the 35th most visited website in the world. Dailymotion hopes that the acquisition will help to offer the best video playing experience on offered the market.
http://swissinnovation.org/news/web/2013/05-131212-7b

Paradox Engineering Expands with Strategic Partner

(startupticker, December 20, 2013)

Minebea Co. Ltd., a leading producer of high-precision machinery components and electronics from Japan, is set to become a major strategic partner of Paradox Engineering SA (PE SA) and acquire approximately 35% of its outstanding shares as of January 2014. As part of its growth strategy, Minebea will take advantage of PE SA's innovative communication platforms and social infrastructure technologies such as M2M (Machine to Machine) and Smart City/Smart Grid. The Japanese corporation will also be integrating and promoting the sale of such products for use in wireless street lights and other urban and industrial wireless sensor networks.
http://swissinnovation.org/news/web/2013/05-131220-eb

Google Buys ETH Zurich Spin-off

(startupticker, January 05, 2014)

In 2013, a small team of developers, who had studied computer science at ETH Zurich, founded a start-up called Bitspin. By summer 2013, Bitspin had developed a innovative and simple app by combining an alarm clock, a stopwatch and a timer, which they called "Timely". One highlight of this app consists of the synced alarms on several devices, which allows the alarm to go off on all the devices and to snooze or dismiss the alarm on one single device. Google has only recently acquired Bitspin and the developers reassure that this will not hamper Timely in any way.
http://swissinnovation.org/news/web/2014/05-140105-1b

Managing Rail Disruptions Effectively

(ETH Zurich, January 27, 2014)

Several Swiss Federal Railways (SBB) trains were delayed in 2013. With its tight schedules, dense network, and heavy traffic on certain routes, the smooth operation of the railway system is susceptible to even the smallest of disruptions such as jammed doors. However, thanks to ETH Zurich's Steffen Schranil at the Institute for Transport Planning and Systems, a precise method to predict the durations of disruptions has been developed as part of his

doctoral thesis. Using statistical analyses of data provided by SBB, Deutsche Bahn, and other urban rail operators, Schranil is hoping to provide passengers and rail operators information on delays and timetable changes quickly and reliably in the long-term through making precise predictions and improving existing rail management tools.
http://swissinnovation.org/news/web/2014/05-140127-34

6. Energy / Environment

Swiss Environmental Prize: Two First-Place Prizes Awarded

(EMPA, January 23, 2014)

For the first time in history, First Place under the "Innovation" category of the Swiss Environmental Prize was awarded jointly to two participants. Fixit AG and the Swiss Federal Laboratories for Materials Science and Technology (EMPA) received CHF 50,000 as prize money for the development of a high performance insulating plaster as part of the Sustainable Renovation of Historical Buildings research project. The plaster is made of nanoporous aerogel and is consequently lightweight and has excellent insulating properties. Kies und Beton AG Pizol also received equal prize money in recognition of an environmentally friendly binder they developed that makes use of recycled wood ash and waste gravel slurry. The Swiss Environmental Prize is awarded every two years by the foundation "pro Aqua – pro Vita".
http://swissinnovation.org/news/web/2014/06-140123-d2

Atmospheric CO2 for Making Clean Fuel

(startupticker, January 07, 2014)

Zürich-based Climeworks, spun out of ETH Zurich in 2009, has created the first manmade system to capture carbon dioxide from ambient air. German car manufacturer Audi, seeing the potential of the technology, has decided to expand their cooperation with Climeworks. Audi makes synthetic methane as fuel for certain new car models. The components needed to make this fuel are hydrogen and CO2. The hydrogen is extracted from water using electrolysis, and the CO2 currently comes from a biogas producer near Audi's e-gas facility in Werite, Germany. Using the Climeworks technology, Audi could produce the CO2 itself. They estimate that with one large Climeworks facility, they could make about 1500 cars CO2-free.
http://swissinnovation.org/news/web/2014/06-140107-68

25% Greater Temperature Increase

(ETH Zurich, December 01, 2013)

Many scientists believe that global warming will come to an end if, some day, human succeeds in stopping the release of greenhouse gas emissions into the atmosphere. It would, indeed, be hotter on Earth than before industrialisation, but nonetheless it would not get even hotter. Climate physicist Thomas Frölicher questions this notion by using model calculations and creates a more pessimistic picture. According to his model calculations, it is very possible that the Earth's atmosphere could continue to warm for hundreds of years even after a complete stop of CO2 emissions, and that temperature levels stabilise at an even higher level at a later stage. "In the long term, the temperature increase could be 25% greater than assumed today," says the scientist.
http://swissinnovation.org/news/web/2013/06-131201-a3

Thermochronology Data Show Glaciation Promotes Erosion

(University of Lausanne, December 19, 2013)

For more than 20 years scientists have debated whether glacial climate periods are responsible for increased erosion rates during the last few million years. Researchers at the UNIL and EPFZ have spent the last four years compiling 18,000 data points to answer this question in the affirmative. Their study relied on a tool called thermochronology, based on the principle that the temperature of rock decreases as the process of erosion brings the rock closer to the surface. Rock carries evidence of its thermal history as certain minerals in the rock cristallize at particular temperatures. The study results will also improve understanding of the link between erosion and the carbon dioxide cycle.
http://swissinnovation.org/news/web/2013/06-131219-eb

NEST: Testing Novel Buildings under Real-World Conditions

(EmpaNews 43, December 19, 2013)

The construction industry is a traditional industry, most of the time unable and unwilling to take any risk, owing to the enormous costs of new projects which need to be amortized over long periods and the extensive and strict leg-

islation. Recently, the need for a research facility for universities and construction industry where projects could be tested under real-world conditions was getting more and more pronounced. This is where the Empa research platform Next Evolution in Sustainable Building Technologies (NEST) is trying to tie in with the current problems. NEST aims at developing and testing novel buildings under real-world conditions and monitoring energy flows and supply technologies.
http://swissinnovation.org/news/web/2013/06-131219-6c

European Bumblebees Invade South America

(ETH Zurich, December 09, 2013)

Soon after the introduction of European bumblebees as pollinators for fruit and vegetable crops in a few Chilean greenhouses in 1998, wild colonies of this foreign species started to emerge. Since then the European bumblebee has been gaining ground in the southern part of South America and prejudicing native species. The astonishingly rapid spread of the bumblebees has been monitored by Paul Schmid-Hempel, retired Professor of Experimental Ecology at ETH Zurich, who indicates that this is one of the most spectacular examples of the invasion of an entire continent by a foreign species introduced by man. Furthermore, there are no signs for this unparalleled victory tour of the bumblebees to stop anytime soon.
http://swissinnovation.org/news/web/2013/06-131209-f8

Fish Migration and Downstream Turbines

(EAWAG, December 12, 2013)

Fish that migrate downstream, unlike their counterparts going upstream, typically end up in turbines because they follow the flow of water. The challenge: how can we divert these fish away from the turbines without compromising electricity production? In a joint project by the Association of Aare and Rhine Power Stations, ETH Zurich, and the Swiss Federal Institute of Aquatic Science and Technology (EAWAG), test models of special rakes have produced promising initial results with real fish. Similar full-size solutions are already in place in the US, but they must be adapted for use in Switzerland to address issues like gravel, driftwood, and the wide variety of fish species that exist in Swiss waters.
http://swissinnovation.org/news/web/2013/06-131212-ae

Effect of Sooth on Global Warming

(PSI, December 17, 2013)

The research team of PSI-researcher Martin Gysel has been granted the prestigious Consolidator Grant of the European Research Council for the examination of the effect of sooth on cloud formation and global warming. This novel project, which is funded with 2 million euros, will investigate, amongst others, how strongly sooth particles influence the properties of various cloud types. The research will characterize the properties of real clouds on the Jungfraujoch, a mountain pass in the Bernese Alps, which is wrapped in clouds 40% of the time. The results will be used to improve the current computer simulations, which are used to predict the evolution of clouds in the atmosphere. Accurate models are essential for assessing effective measurements against global warming.
http://swissinnovation.org/news/web/2013/06-131217-39

Super Vulcano Eruptions are Triggered by Lift Force

(ETH Zurich, January 06, 2014)

It is unclear what might activate the approximately 20 known super volcanoes on Earth. Instead of erupting like normal volcanoes, they explode, leaving a caldera or huge hole in the earth's crust whose diameter can be up to one hundred kilometers. An example is the Yellowstone Caldera in the U.S.. On average, super volcanoes are active less than once in 100,000 years and, with insufficient historical data available, researchers can only speculate about such events from traditional ash and rock strata. ETH Zurich researchers have now discovered that the pressure generated by density differences between magma and the surrounding rock may suffice to trigger eruptions. Their findings could help better assess dormant super volcanoes and how fast their magma can penetrate the Earth's crust and reach the surface.
http://swissinnovation.org/news/web/2014/06-140106-41

Monitoring Harmful Drosophila Pest Flies

(Federal Administration, January 06, 2014)

The spotted-wing drosophila, scientifically *Drosophila suzukii*, first appeared in Switzerland in 2011 and poses a threat to berries and other fruits. Agroscope, the research institute of the Federal Office for Agriculture assembled a working group to monitor and fight this pest. Traps were set across the country to monitor the pest's spread, and

farmers were advised of protective measures. These include the setting of traps, timely harvesting of crops, and cleaning of crops to minimize spoiled fruit that attracts flies. In more extreme cases, chemical spraying may be necessary. More generally, a multi-pronged approach that includes research, production, and distributor stakeholders is being used to fight the pest.
http://swissinnovation.org/news/web/2014/06-140106-96

Exploiting Short-term Excess Electricity to Produce Synthetic Natural Gas

(EMPA, January 06, 2014)

Short-term excess electricity from alternative energy sources could be used to produce hydrogen, which combined with CO2 can be used to produce methane. The power to gas concept could therefore provide a solution to the excess energy of renewable energy sources at peak times and produce "quasi-fossil" fuels, which can be easily and cost-effectively distributed in the natural gas network. Empa researchers have been able to improve the efficiency of the methane production process significantly by using a nickel catalyst on a zeolite. The zeolite plays a crucial role in the novel catalyst, as it is able to shift the chemical equilibrium by absorbing the side product water. In a next step the Empa researchers are planning to build a pilot plant for methanation.
http://swissinnovation.org/news/web/2014/06-140106-3f

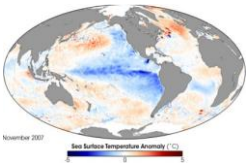
Low-Cost Solar Energy Storage

(EPFL, January 08, 2014)

Because sunlight is not a constantly available form of energy, solar energy systems need a way to store energy. This is commonly accomplished by using photoelectrochemical water-splitting. Solar energy is used to split water molecules into hydrogen and oxygen, storing energy in the form of hydrogen. This "hydrogen evolution reaction" requires a catalyst, which is typically platinum deposited on the surface of the solar panel's photocathode. An EPFL research team has demonstrated that a molybdenum sulfide catalyst deposited on a copper(I) oxide photocathode is equally efficient. This innovation should enable significant reduction in cost of photoelectrochemical water-splitting devices, as well as greater technical accessibility of complete solar energy systems.
http://swissinnovation.org/news/web/2014/06-140108-53

Explaining the Adjourned Global Warming

(ETH Zurich, January 21, 2014)



Scientist have long been puzzled by rising greenhouse gas concentrations, but stagnating global warming and critics skeptics have interpreted it as proof for the non-existence of such climate changes. One of the explanations for this odd behavior includes the climate phenomena El Niño and La Niña. These two periodically occurring sea currents in the east Pacific Ocean have a strong influence on temperature and precipitation world wide. Depending on which of those phenomena dominate the earth atmosphere is heated up or cooled down and can therefore enhance or counteract global warming. Owing to some very strong La Niña events combined with the non-occurrence of the El Niño phenomenon in the recent years, the global warming was counteracted and the temperature increase reduced.
http://swissinnovation.org/news/web/2014/06-140121-b9

Network for Measuring Aerosols

(PSI, January 20, 2014)

Aerosols, tiny particles in our atmosphere, have a significant effect on global climate change. Directly, they absorb or reflect sunlight, and indirectly they act as nuclei for the formation of clouds and rain droplets. However, the exact effect aerosols have is not precisely known. The Paul Scherrer Institute, together with the Swiss Agency for Development and Cooperation, is installing a network of aerosol monitoring stations in developing countries where local practices introduce high levels of aerosols, such as through the burning of wood. The monitoring stations are made robust, and local technicians and scientists are trained to operate the stations. The stations not only monitor aerosol levels but also important particle characteristics.
http://swissinnovation.org/news/web/2014/06-140120-9d

Traces of Nuclear Tests Remain in Atmosphere

(20min.ch, January 07, 2014)

Swiss researchers from the Federal Office for Civil Protection have discovered that the stratosphere still contains radioactive particles from nuclear tests performed in the 1950s and 60s. Particles in the troposphere have been brought down by rain, but the ones in the stratosphere remain mostly untouched in aerosols. However, volcanic

eruptions send ash to the troposphere, where it can bring down the radioactive particles, as was the case with the Eyjafjallajökull eruption in 2010. In all cases, the radioactivity levels are not a cause for health concerns, but they do help us better understand the transport patterns in the upper atmosphere.
http://swissinnovation.org/news/web/2014/06-140107-74

Saving Money with Foldable Solar Panels

(20min, January 10, 2014)

Solar panels are usually fastened to the roof by steel or concrete constructions in order to withstand any kind of weather. However, exactly these safety measures correspond to a third of the arising costs. Two graduates of the Advanced Technical College of Zurich (ZHAW) have know deigned a novel solar panel, which is foldable and is retrieved automatically into a cabinet as stormy weather approaches. The signal is given by a coupled weather station continuously monitoring air pressure and moisture. With an imminent storm approaching the solar panels can be drawn in within a few seconds.
http://swissinnovation.org/news/web/2014/06-140110-3f

Controlling Spreading of Common Ragweed

(University of Fribourg, January 30, 2014)

The abatement of the fast spreading and harmful common ragweed has made a huge progress, by the discovery of an efficient biological weapon in form of a gluttonous beetle. Prof. Heinz Müller-Schärer from the University of Fribourg has spotted the small insect, which seems to be present in 80 percent of the 150 monitored spots. Furthermore, the small beetle appears to be able to eradicate the common ragweed almost completely, therefore representing the most promising weapon against the harmful plant. It remains to be verified if the beetle ophraella communa will selectively attack common ragweed and if the presence of the beetle has already affected the number of ragweed allergies.
http://swissinnovation.org/news/web/2014/06-140130-89

Plate Tectonics Affected by Continent Size

(ETH Zurich, January 28, 2014)

New research from ETH Zurich in the field of plate tectonics examines the relationship between oceanic and continental crust. Simulations on high-performance computers show that as continents grow in size, the adjacent oceanic plates can grow much more quickly. Thus, the scientists calculated that oceanic crust is at most 200 million years old while continental crust is up to 2.5 billion years old. The oceanic crust cools quickly and sinks underneath the continental crust, where it becomes magma again.
http://swissinnovation.org/news/web/2014/06-140128-07

Network for Measuring Aerosols

(PSI, January 20, 2014)

Aerosols, tiny particles in our atmosphere, have a significant effect on global climate change. Directly, they absorb or reflect sunlight, and indirectly they act as nuclei for the formation of clouds and rain droplets. However, the exact effect aerosols have is not precisely known. The Paul Scherrer Institute, together with the Swiss Agency for Development and Cooperation, is installing a network of aerosol monitoring stations in developing countries where local practices introduce high levels of aerosols, such as through the burning of wood. The monitoring stations are made robust, and local technicians and scientists are trained to operate the stations. The stations not only monitor aerosol levels but also important particle characteristics.
http://swissinnovation.org/news/web/2014/06-140120-9d

Solar Energy Production Nearly Doubled in 2013

(swissinfo, January 13, 2014)

The Swiss trade association Swissolar has confirmed that the solar energy production in Switzerland has nearly doubled in 2013. Currently, 1% of the national energy requirements are met by solar power. However, the installation growth rate of solar panels has experienced a leveling off and only amounted to an increase of 30% compared to the previous year. It is believed that the reason for this trends are the governments changed policy, which newly only involves providing financial support for 15 instead of 25 years, and the skepticism of investors whether solar panels can be maintained in a cost-efficient way. The Swiss government is planning on having 2% of the national energy requirements covered by solar energy by 2050.
http://swissinnovation.org/news/web/2014/06-140113-9c

How to Predict Volcanic Eruptions

(University of Geneva, January 03, 2014)

Using Monte Carlo simulations and statistical analysis, a team of researchers from three universities including the University of Geneva has identified the factors that determine the timing of volcanic eruptions. They discovered that the factors differ according to the volcano's size. Small volcanoes erupt more frequently, as a consequence of the accumulation of magma in the magma chamber. For large volcanoes, increased magma volume is not by itself sufficient to increase the chamber pressure to the point where an eruption will occur. Here, the magma's buoyancy becomes the primary determinant of less frequent but more voluminous eruptions. The researchers could also predict that the largest possible eruption would release 35,000 cubic kilometers of magma.
http://swissinnovation.org/news/web/2014/06-140103-7e

Monitoring the Air Quality on Zurich's Tram Rooftop

(ETH Zurich, January 13, 2014)

Researchers from ETH Zurich have been monitoring the air quality in Zurich for over two years by placing gauging station on top of the trams. They have now disclosed the detailed maps, which clearly indicate when and where air pollution is highest. The project has monitored the entire city in an unprecedented way concerning spacial and temporal resolution, while examining ozone, carbon monoxide and fine dust concentration. By doing so, they are now able to show the strong pollution along the main transport axes. The boxes will be riding the tram for two more years and the gathered data will soon be available over a mobile app.
http://swissinnovation.org/news/web/2014/06-140113-59

A Solution to the Honey Bee Crisis

(ETH Zurich, January 16, 2014)

Worldwide, honey bees have been dying off in record numbers. This is leading to a crisis for farmers, who have relied on honey bees to pollinate their crops. Imported bees have been used, but this poses a danger to local biodiversity. A spin-off from ETH Zurich, "Wildbiene + Partner", has a local solution, mason bees. Mason bees are extremely good pollinators that are two orders of magnitude better than honey bees, and they can be raised in Switzerland. They also work on cloudy days and tend not to spread plant diseases. The spin-off wants to work with the Swiss population to cultivate the bees for agricultural use.
http://swissinnovation.org/news/web/2014/06-140116-1b

Long-lasting Effects from the Deepwater Horizon Incident

(EPFL, January 21, 2014)

EPFL and the Woods Hole Oceanographic Institution (WHOI) in the United States have collaborated during the last 4 years, in order to examine and asses the composition of eight oil-soaked sand patties that were collected within a year after the Deepwater Horizon incident in the Gulf of Mexico. The results that were recently published in the journal Environmental Science & Technology, clearly indicate that the oil-soaked sand patties contain harmful compounds, whose ecotoxic impact to marine wildlife and humans is difficult to assess. This is due to the limited knowledge about the broader toxicity of some of those long-lived oil residues and their long-term toxicological impact.
http://swissinnovation.org/news/web/2014/06-140121-65

7. Engineering / Robotics / Space

Balancing Cube Robot

(wired.com, December 20, 2013)

Cubli is a robotic cube developed at ETH Zurich. Using momentum wheels and advanced algorithms, the cube can jump up from its rest position to an edge or corner, and then stably balance there. It can also spin on a corner or walk across a surface by sequentially jumping up and falling back down. A more advanced Cubli that is being developed, will learn to adapt dynamically to changes in its weight, inertia, or the surface it is on.
http://swissinnovation.org/news/web/2013/07-131220-e2

Ten Times More Throughput on Optic Fibers

(EPFL, December 05, 2013)

As demand for communication bandwidth continues to increase, fiber optic networks are reaching their maximum capacity. Scientists at EPFL have demonstrated a new light pulse that allows ten times more data to be sent over existing fiber optic networks. The pulses, called Nyquist sinc pulses, have a special shape that allow the pulses to be closer together. The pulses are generated using a laser, modulator and frequency comb, such that the output is not just a single frequency, but a range of frequencies, producing a square spectrum without a peak. Most importantly, the technology required is mature and could be easily implemented in existing equipment.
http://swissinnovation.org/news/web/2013/07-131205-44

Wearable Human-Robotic Exoskeleton

(20min, January 29, 2014)

A common health risk for workers are musculoskeletal disorders. In the future, a robot exoskeleton aims to prevent these issues by supporting the workers. A new international project to develop such a robot has begun under the lead of the Zurich University of Applied Sciences in Switzerland. The goal of the project named “Robo-Mate” is to develop a user-friendly intelligent cooperative light weight wearable human-robotic exoskeleton for manual handling work. Robo-Mate aims to increase both efficiency and safety of manual production processes in industrial environments. This would increase the productivity at the same time as it would lower the currently high costs induced by musculoskeletal disorders.
http://swissinnovation.org/news/web/2014/07-140129-7a

Infection Tool with a Metallic Core

(PSI, December 03, 2013)

Thanks to the analysis of protein samples at PSI, EPFL researchers have managed to demonstrate which instrument bacteria use to transmit diseases. Researchers have described how a particular strain of bacteria transmits diseases with unprecedented precision. The team of scientists headed by Petr Leiman, an assistant professor at the EPFL’s Laboratory of Structural Biology and Biophysics, demonstrated that the tip of a bacterial infection tool consists of a PAAR protein, which envelops a metal atom and tapers off to a sharp point. The findings are based on measurements carried out at the Swiss Light Source (SLS), one of the three large-scale research facilities at the PSI.
http://swissinnovation.org/news/web/2013/07-131203-c8

Utilizing Interactive Video Games for Rehabilitation

(EPFL, December 13, 2013)

Rehabilitation is a tiresome and time consuming procedure, that many people require. A EPFL spin-off developed a fun and still effective way for patients to exercise alone. The Mindmaze platform helps stroke patients to perform the required excessive, which can be selected by the caregiver and adapted in difficulty according to the patients needs. The exercises consist of a wide variety of entertaining tasks and stimulating video games. Furthermore, the doctors can monitor the progress of the patient and adapt the training to their needs. This device is now being validated by the University Hospital of Lausanne and soon by the Stanford Stroke Center (United States).
http://swissinnovation.org/news/web/2013/07-131213-a2

Rocking Beds for Better Sleep

(20min.ch, December 20, 2013)

Engineer Robert Riener from ETH Zurich and the University of Zurich is examining in collaboration with Peter Achermann from the University of Zurich why a softly joggling bed can enhance one's night sleep so considerably. The idea arose while observing commuters falling asleep in the train and waking up at the stations, where the train stands still. The aim of his research is to develop a bed that can monitor one's sleep and identifies when the person is about to wake up, in order to softly joggle it back into deep sleep.
http://swissinnovation.org/news/web/2013/07-131220-5a

Rosetta Space Probe Awakens After Hibernation

(20min, January 20, 2014)

The European Space Agency space probe Rosetta was launched in 2004 to investigate the comet Churyumov–Gerasimenko. Since its launch it performed several orbits of the inner planets and the sun to gain momentum, followed by an energy-saving hibernation of over two years. This January it reawakened in preparation for rendez-

vous with the comet. Onboard the probe is the Rosina mass spectrometer, developed at the University of Bern. This instrument will help to determine the composition of material in the comet's tail. One hypothesis is that comets contain the molecular building blocks needed for life, and the probe hopes to help answer this.
http://swissinnovation.org/news/web/2014/07-140120-f1

Giants Composed of Dust and Gas

(University of Zurich, January 06, 2014)

With novel, and highly complex models, a group of astrophysicists at the University of Zurich investigates the genesis gas planets and black holes in the universe. This research has implications for the very basics of physics. The project led by Lucio Mayer is concerned with the fundamental powers in the universe and in order to understand these, the scientists require the assistance of supercomputers who can solve the complex models simulating these effects. The implications generated by these models can influence the very fabric of physics, as in the case of new simulations of colliding galaxies and supermassive black holes. In a recent study, the scientists investigated the effects such collisions had on the gravitational field in order to inform efforts in measuring these effects in practice.
http://swissinnovation.org/news/web/2014/07-140106-a1

Scientific Partnership Between Animals & Robots

(EPFL, December 11, 2013)

Collaborations between robotics specialists and biologists have never been so successful. The former draw their ideas from animal morphology while the latter have found in technology a useful tool for studying nature. The EPFL is hosting several interdisciplinary research projects between engineers and biologists. For instance, the design of robotic cockroaches.This work leads to new knowledge and to new ideas for designing the robots' mechanisms and for developing new types of applications. On the other hand, the use of robots can be useful in situations where you cannot directly employ real animals. In one project, EPFL biologists only work with robots. The aim is to study the evolution of cooperation among individuals, specifically to see the conditions under which they become more or less altruistic according to their degrees of relationship and the benefits they receive. The advantage with robots is that they can observe such evolution on a number of generations, while it would take years with real animals
http://swissinnovation.org/news/web/2013/07-131211-4f

8. Physics / Chemistry / Math

Superconductivity Created By Magnetic Fields

(PSI, December 22, 2013)

Strong magnetic fields typically interfere with superconductivity. However, researchers at the Paul Scherrer Institute have discovered a material, CeCoIn5, where a magnetic field creates superconductivity. The superconducting state is in addition to, and simultaneous with, a first superconducting state that appears at low temperatures. Furthermore, an additional antiferromagnetic order was observed, and it was discovered with the SINQ neutron source. This discovery ultimately demonstrates the direct control of quantum states, an important discovery for future quantum computers.
http://swissinnovation.org/news/web/2013/08-131222-5a

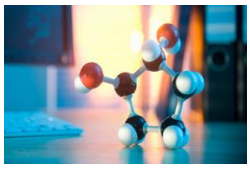
Hyperfine Study of Antimatter

(CERN, January 21, 2014)

To learn more about antimatter, scientists at the European Center for Nuclear Research (CERN) are comparing the hyperfine structure of hydrogen and antihydrogen. The hyperfine spectra of both (anti)atoms are expected to be identical, so small differences might lead to new knowledge about physics. The scientists were, for the first time, able to create a beam of antihydrogen away from the strong magnetic fields needed to trap and direct the antihydrogen. Strong magnetic fields generally distort spectroscopy measurements, so this is an important development towards a full characterization.
http://swissinnovation.org/news/web/2014/08-140121-e6

New Theory of Formic Acid Fission

(University of Fribourg, December 11, 2013)



Scientists from the University of Fribourg have solved the mystery surrounding the fission of the formic acid molecule (HCOOH) by electrons, which has long opposed two groups of American chemists. The first at Lincoln University in Nebraska had proposed that the weakest link always breaks, whereas the second at the University of California, Berkeley had suggested a completely different mechanism, having found that the weakest link only splits after deformation of the molecular structure. The Fribourg research team tested experimentally which mechanism is correct and proposes a new theoretical approach. On the molecular level, a chemical reaction involves restructuring of atoms within the molecules. It is important to understand how the atoms move during chemical reactions, particularly in biological systems where such molecular fission is provoked by radiotherapy.
http://swissinnovation.org/news/web/2013/08-131211-0b

Testing Mercury Content in Lamps

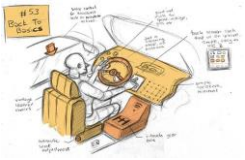
(Empa, January 27, 2014)

Swiss regulations limit the amount of mercury allowed in fluorescent light bulbs, but products have never been fully tested against this limit. The most difficult measurement has been the quantity of gaseous mercury in a bulb, but the Swiss Federal Laboratories for Materials Sciences and Technology - Empa have developed a method to perform this measurement. A bulb is submerged in a potassium permanganate solution and then broken, so that the gaseous mercury goes into solution. Subsequently, spectrometry is used to measure the amount of mercury. Other methods are used to measure the mercury bound to the bulb in other forms. Of the fifteen types of bulbs tested, all met the legal quantity limit.
http://swissinnovation.org/news/web/2014/08-140127-42

9. Architecture / Design

Car Interior Design Challenge

(EPFL, December 06, 2013)



Fusebox is an open design platform that was used to run a car interior design challenge by EPFL and PSA Peugeot Citroën. Participants designed what they thought the future of the car would look like. Ideas ranged from a "Back to Basics" design that simplified the interior, to customizable interiors for individual or shared cars. Other proposals called for cars to be connected for group travel in a mobile social network, and for cars to integrate a personal gym so that travelers could work out while traveling.
http://swissinnovation.org/news/web/2013/09-131206-91

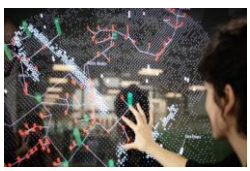
'Topping up' Buildings in City Lifting Project

(Empa, December 19, 2013)

For small countries like Switzerland with limited amount of space for agriculture and urban areas, an intensive use of already developed areas is becoming increasingly important. The idea of adding roof extensions and therefore increasing urban aggregation has great potential as a solution to urban sprawl. The City Lifting project developed plans for sustainable lightweight construction systems combined with timber and composite elements. Such systems need to be highly flexible and robust in order to bridge the large differences between the existing buildings and the roof extensions, while also distributing the load equally over the facade.
http://swissinnovation.org/news/web/2013/09-131219-49

Simulations for Future Sustainable Cities

(ETH Zurich, January 28, 2014)



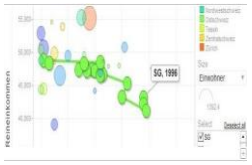
The Future Cities Lab (FCL) program, launched in 2010, is a research program of the Singapore-ETH Centre for Global Environmental Sustainability (SEC). Employing around 150 research scientists, doctoral students and administrative staff from over 30 countries, SEC works in close partnership with Singaporean universities, government agencies and industry. FCL comprises ten research modules led by professors at ETH Zurich, and three assistant professorships. It aims to improve the sustainability of cities, and individual FCL projects cover such topics as new building materials, digital fabrication, mobility and transportation planning, urban design, urban sociology and territorial planning. The simulation platform research module acts like 'glue' holding all

the projects together. FCL's superb facilities enable 3-D data to be captured and presented, and research translated into simulation tools for practitioners.
http://swissinnovation.org/news/web/2014/09-140128-74

10. Economy, Social Sciences & Humanities

Switzerland: a Statistical Laboratory

(University of St.Gallen, December 06, 2013)



No other country has such diverse institutions and politics as Switzerland. This diversity is particularly pronounced in public finance. The Swiss fiscal system is highly federalist, with around 2,500 municipalities in 26 cantons being free to set their taxes and decide how to use their fiscal revenue. Since Switzerland has changed little over many years, it offers long observation horizons, and applied researchers have access to many long statistical series and many observation units. This makes the country an ideal statistical laboratory. The Sinergia project, supported by the Swiss National Science Foundation (SNSF), will enable statistical data to be collected systematically and made widely available for scientific use and comparative purposes. Research results will be published and new data posted on a new website: fiscalfederalism.ch.
http://swissinnovation.org/news/web/2013/10-131206-e4

First Bitcoin ATM in Switzerland

(20min, January 20, 2014)

Switzerland's first Bitcoin ATM has been installed in Zurich's Viaduct Markethall as part of a one-week pilot project by the World Bitcoin Association to test its viability. Currently only able to deal in Euros, the machine is on loan thanks to a private owner from Slovakia since the ATM manufacturer has been inundated with orders. Swiss Bitcoin fans can expect new machines to be ready in March at the earliest. However the question of where it will be permanently installed in Switzerland remains open, especially in view of various regulatory issues.
http://swissinnovation.org/news/web/2014/10-140120-10

Arguing is Learnt Through Conflicts with Parents

(20min, December 06, 2013)

Every parent knows the nerve-wracking situation: the child is sitting at the dinner table and refuses to eat the vegetables. What most people do not know: exactly over such discussions the child is learning how to argue. Researchers from the University of Neuenburg and the University of Utrecht (Netherlands) have monitored and evaluated the discussions held by 30 families over dinner. The most common arguments of parents to persuade their children into eating the food comprised the quality of the food and references to an external authority. Children simply inverted the statements, for example claiming vegetables are not healthy.
http://swissinnovation.org/news/web/2013/10-131206-85

Mobile Phones Affecting Adolescents Social Behaviour

(University of Zurich, December 11, 2013)

Almost every teenager uses a smartphone in everyday life. An innovative ethnographic research project investigates how Swiss youth uses mobile phone cameras in order to produce their environment and stage their identity. In Switzerland, 98.5 percent of the teenagers in Switzerland posses a smartphone - with huge implications for their social behaviour. The research project lead by Thomas Hengartner from the Institute of Popular Culture Studies investigates how smartphones affects the lives of teenagers. In the project, trends, such as "Handy Slapping" are analysed.
http://swissinnovation.org/news/web/2013/10-131211-a7

Harvard Microeconomics of Competiveness Award goes to Fribourg

(University of Freiburg, January 09, 2014)

Students from the University of Fribourg have received the first prize in the Harvard Business School's Microeconomics of Competiveness (MOC) Awards. The award was presented to students of Prof. Philippe Gugler by world-renowned expert Professor Michael Porter at Harvard Business School. The winning students, who are studying for a Master's degree in European Studies at the University of Fribourg, are: Valeria Andrade, Sean Malden, Desislava

Naseva, Maria de Los Angeles Solis Amodio and Matteo Sudan. They received the award before an audience of 150 specialists on competitiveness issues from more than 50 countries. The award-winning study focused on the clean-tech cluster in Ireland and was conducted as part of the Master's course on "Microeconomics of Competitiveness" at the University of Fribourg.
http://swissinnovation.org/news/web/2014/10-140109-38

Gigantic Games are Unsustainable

(University of Zurich, December 12, 2013)

Unused stadiums, oversized airports and national debt: the Olympic Games and other major events often leave unsightly scars. Studies are underway at the University of Zurich on how to make such "mega-events" more sustainable. The Winter Games in Sochi, Russia, will probably be the most expensive Olympics ever held, with 14 sports venues built from scratch and the event costing around CHF 45 billion. Despite intentions to be greener that the previously "greenest Games" in Vancouver 2010, Sochi will leave behind environmental destruction, misappropriated funds and barely profitable plans for reusing new infrastructure. Ideas to reduce the environmental impact of future events include selecting suitable venues with existing infrastructure, using modular buildings that degrade or are reusable, and distributing games among multiple adjacent cities.
http://swissinnovation.org/news/web/2013/10-131212-24

Stressed by Flood of Emails

(20min, January 23, 2014)

A recent study has revealed that two third of the employees feel stressed out and overloaded by the daily flood of business related emails. However, only a few employers take measures to arrest this alarming trend. The professional association Commercial Organization Switzerland has been monitoring the questionable procedure of continuously checking one's emails and found that this permanent stress often sickens the employees. In addition, the repetitive appearance of mail alerts and the associated sound effects, disturb the workers concentration and lead to inefficiency. It is assumed that one requires up to 8 minutes after each email in order to be again fully focused on the task.
http://swissinnovation.org/news/web/2014/10-140123-af

11. Technology Transfer / IPR / Patents

Record 40,829 Registered Start-ups

(20min, January 03, 2014)

A record 40,829 start-ups were registered with the Swiss Commercial Register in 2013 – a 3.7% increase from 2012. Zurich and Tessin were amongst the cantons with the highest increases (6.7% and 14.7% respectively), while Appenzell Innerrhoden, Zug, and Schwyz experienced decreases due to their loss of tax-haven status. Every two out of three firms were founded by Swiss nationals, with Germans making up the largest group of foreign entrepreneurs. Notably, women were found to have an edge over their male counterparts. According to startups.ch CEO Michele Blasucci, women are more meticulous in their preparations and better informed of the relevant risks compared to men. Unsurprisingly, a quarter of all start-up founders are now women compared to 5% twenty years ago. However, traditional gender roles are still reflected in the fact that female entrepreneurs are two years older than males on average because of childcare responsibilities. Start-ups by women also tended to be in the areas of Beauty, Wellness, Communications, and Marketing, while men would typically deal in high-tech start-ups.
http://swissinnovation.org/news/web/2014/04-140103-5d

Excellent Track Record of ETH Zurich's Spin-offs

(ETH Zurich, January 06, 2014)

2013 has been an excellent year for ETH Zurich spin-offs with a total of 24 new founded companies and equalizing the number of the record year 2009. The start-up companies are active in diverse sectors and have usually relatively young founders. In total the ETH Zurich spin-offs were able to raise investments of approximately $ 89 millions over the entire year. Roland Siegwart, Vice President Research and Corporate Relations, believes that the success of the spin-offs lies in the support provided by ETH Zurich through their two programs: the Pioneer Fellowships Program and the Innovation and Entrepreneurship Lab.
http://swissinnovation.org/news/web/2014/00-140106-5d

Successful Entrepreneurship Portal

(startupticker, December 20, 2013)

SECO's entrepreneurship portal, StartBiz.ch, enables to easily start a business online. The latest version of StartBiz further simplifies company founding procedures, e.g. allowing individual company applications to the commercial register to be transmitted electronically using SuisseID. The portal enables individual companies, limited liability companies, joint stock companies, and general and limited partnerships to be founded and register for, i.a., pension schemes, VAT, accident insurance (all types), and the commercial register (for sole proprietorships, general and limited partnerships). The portal's Info Center provides technical information on applications and other topics, like self-employment. Company founders are guided through input screens, with useful explanations and examples. Users can check all their data before transmitting them electronically or printing a signature-ready form. Approximately 3,600 applications are processed annually.
http://swissinnovation.org/news/web/2013/01-131220-0d

Expanded Lab Network for Startup Companies

(startupticker, December 12, 2013)

In collaboration with Quinel AG, the canton Zug has expanded its allocation of budget-friendly laboratories for start-up entrepreneurs. This laboratory network, which has been founded some months ago, aims at helping technical start-up companies to gain ground in the region of Zug and to boost innovation by providing private laboratory facilities on preferential terms. Newly, Quinel AG in Rotkreuz will incorporate into the network, which currently consists of the Helmut Fischer group and the Lapp Engineering group, and provide diverse laboratory facilities for the electrical industry.
http://swissinnovation.org/news/web/2013/01-131212-45

Ten Winners in "Venture 2014" Startup Competition

(venture, January 16, 2014)

»venture» 2014 is an initiative of the ETH Zurich, Knecht Holding, the innovation promotion agency CTI and McKinsey & Company, Switzerland. The Swiss-wide business plan competition supports young entrepreneurs in founding a company. »venture» 2014 offers total prize money of over CHF 150,000 for the winning business ideas and business plans. January 15th marked the culminating point of the first phase of the »venture» startup competition. More than 300 people attended the award ceremony at ETH to celebrate the ten winning teams. The ten winners, in alphabetical order, are: Alerion Technologies, Bright Sensors, Caustics, CellSpring, G-Therapeutics, Lunaphore, Play! By Uberchord Engineering, Qloudlab, ReHaptix, Versantis.
http://swissinnovation.org/news/web/2014/03-140116-fb

Entrepreneurs are the World's Happiest People

(startupticker, January 23, 2014)

Entrepreneurs are among the happiest individuals worldwide, measured on individual well-being and satisfaction with their work conditions, according to the Global Entrepreneurship Monitor 2013 Global Report. This 15th annual survey of entrepreneurship worldwide is the largest single study of its kind. More than 197,000 individuals were surveyed and approximately 3,800 national experts on entrepreneurship participated in the study across 70 economies, collectively representing all regions of the world and varied economic development levels. It was found that, in all regions, entrepreneurs exhibit relatively higher rates of subjective well-being compared to individuals are not involved in starting a business or owning-managing one. Female entrepreneurs in innovation-driven economies showed on average a higher degree of subjective well-being than males. The report can be downloaded for free from the GEM website.
http://swissinnovation.org/news/web/2014/11-140123-cd

Crowdfunding Platform Successful

(University of St. Gallen, December 13, 2013)

Thanks to the University of St. Gallen's innovative crowdfunding platform "HSG inSite", as many as five projects have received the necessary funding to continue, amongst them, sponsoring for the equipment of the university's women's lacrosse team and helping an undergraduate finance her tuition fees. Crowdfunding is a transparent process that is open to anyone willing to contribute. All donations are listed on the website and donors can be named if desired. Donors also have access to detailed reports on the impact of their contributions. The University plans to continue exploiting the power of the internet in this way and intends to publish information on future successful projects.
http://swissinnovation.org/news/web/2013/11-131213-c2

Changing Venture Capital Landscape

(startupticker, December 23, 2013)

Investors are beginning to change their investment habits, becoming more cautious of today's 'hot' sectors, such as consumer Internet apps, and moving towards neglected ones, such as medtech, software, drug development, and semiconductors. This may be the sign of an Internet bubble forming, but not one as severe as in the late 90's, because the Web infrastructure is stronger now, and investors are more aware of the dangers. Another development is that recent investment activity was focused on early-stage startups and late-stage companies, with series B and C funding suffering. This is partially driven by European investors following Silicon Valley practices.
http://swissinnovation.org/news/web/2013/11-131223-7d

12. General Interest

Documentary: "The Swiss Miracle"

(startupolic, January 20, 2014)

Why is Switzerland flourishing despite the current economic climate, but countries like France are not? In a 93-minute documentary aired on the French television channel “France 2”, Switzerland's economic strength is deconstructed and analyzed in terms of its exports, low unemployment, democratic government, and border employment conditions. Stereotypes of Switzerland held by the French are also discussed as well other possible explanations for Switzerland’s success. The documentary is available online.
http://swissinnovation.org/news/web/2014/00-140120-6c

Swiss Pharma Amongst Top 100 Sustainable Companies

(Novartis, January 22, 2014)

Novartis has been named among the 2014 Corporate Knights Global 100. Corporate Knights announced the results of its 2014 Global 100 Most Sustainable Corporations in the World (Global 100) index at the World Economic Forum in Davos on January 22. Recent recognition for Novartis corporate responsibility activities include being listed in the STOXX Global ESG Leaders Index for the third consecutive year; being recognized among the 25 best multinational employers by Great Place to Work® Institute; and being ranked top pharmaceutical company in Fortune’s World's Most Admired Companies for the third year in a row.
http://swissinnovation.org/news/web/2014/12-140122-49

The Best Hotel of the World Locates in Switzerland

(Tages Anzeiger, January 24, 2014)

The Grand Hotel Kronenhof in the Swiss Alps has been selected as the best hotel in the world by the world's largest travel site TripAdvisor. Furthermore, a total of 114 Swiss hotels and worldwide over 7000 accommodations were awarded the international traveler's choice award. Travelers highly estimate the Swiss hospitality and have therefore voted for Swiss hotels, enabling many of them to enter the European and World rankings.
http://swissinnovation.org/news/web/2014/12-140124-cf

13. Calls for Grants/Awards

Call: Apply to World's Largest Startup Accelerator

(MassChallenge Startup Accelerator, January 31, 2014)

MassChallenge connects entrepreneurs with the resources they need to launch & succeed immediately. It's the world's largest startup accelerator and is looking for the 125 highest-impact startups from any industry for its 2013 program. Benefits include world-class mentorship & training, a driven community of fellow entrepreneurs, $10M+ in in-kind deals and $1M+ in grants with no equity taken. Deadline: April 3.
http://swissinnovation.org/news/web/2014/13-140131-f7

Call: SNSF professorship

(SNSF, January 31, 2014)

The SNSF professorships address young and promising researchers who aim to pursue an academic career and start their own research team. An SNSF professorship includes the researcher's salary, a research grant, salaries

of employees as well as a contribution to infrastructure costs. The funding period is 4 years and may be extended by no more than 2 years. The selection procedure includes two stages and will start in August.
http://swissinnovation.org/news/web/2014/13-140131-b1

Call: Competition for Student Entrepreneur Projects

(startupticker, January 24, 2014)

BearingPoint, a multinational management and technology consulting firm headquartered in Amsterdam, is calling for proposals in its Be.Project competition. The competition is open to students from universities and business schools in Switzerland, Germany, and Austria with a focus on business or IT. Pre-selected finalist teams will be coached by a BearingPoint consultant to prepare for a jury presentation. First Prize will be 8000 Euro plus a year of consulting support; Second Prize 3000 Euro, and Third Prize 1000 Euro. More information at www.beproject-europe.com. Participants must register their teams and innovative projects by submitting a written application before 31 March 2014.
http://swissinnovation.org/news/web/2014/13-140124-04

IMD's Executive MBA Program

(IMD, January 31, 2014)

The world's most stimulating, most challenging and most rewarding Executive MBA program has now two Master stage sessions per year. Participants of the IMD EMBA program can now graduate in June and November. The new session launched will kick-off in April 2014 and will run in addition to the current November session.
http://swissinnovation.org/news/web/2014/13-140131-4d

Invitation: swissnexDay 2014, Olten, March 26

(swissnex, January 28, 2014)

The relationship between level of innovation and GDP continues to drive national policies around the world. While countries like the US and Switzerland continue to commercialize their research results with much success other regions of the world are evolving fast and building their own innovation systems. The swissnexDay'14 will offer you a unique opportunity to discover a few examples of new projects and innovative ideas in three Asian countries (India, China, Singapore) – hence the title "Different Faces of Innovation in Asia". Asia is a dynamic continent with a mix of mature and emerging economies featuring growing markets and strong scientific potential. Besides technological innovation, there is a lot be learnt about current developments in social innovation or frugal innovation as entrepreneurs and executives work hard to use local resources to their benefit. After a morning of presentations, the afternoon part will be dedicated to workshops with the active participation of the audience. Academic and professional experts will debate the status and future of innovation in India and China followed by a discussion on Singapore as a hub for entrepreneurs.
http://swissinnovation.org/news/web/2014/12-140128-80

Upcoming Science and Technology Related Events

8th Swiss Scandinavian Bio-Business Seminar
February 12, 2014
http://www.swissbiotech.org/events#event:670
Biotech / Pharma
Zurich

Startupticker Bruch Lausanne
February 20, 2014
http://www.startupticker.ch/en/events
Startups
Lausanne

Early Stage Drug Discovery Partnering with CROs
February 25, 2014
http://www.swissbiotech.org/events#event:714
Drug Discovery
Geneva

7th Annual European Life Science CEO Forum
March 4-5, 2014
http://www.swissbiotech.org/events#event:522
Clinical Drug Development
Opfikon-Glattbrugg

Negotiating International Deals
March 4-5, 2014
http://www.swissbiotech.org/events
Business Development
Bern

Spark Award 2014
March 6, 2014
www.ethz.ch/sparkaward
Patent Applications / Award
with Hansjoerg Wyss
ETH Zurich

RE(ACT) 2014: International Congress on Research of Rare Diseases
March 5-8, 2014
www.react-congress.org
Rare and Orphan Diseases
Novartis Campus, Basel

Winning Through Innovation
March 11, 2014
http://www.swissbiotech.org/events#event:698
Clinical Drug Development
Belgian Embassy in Basel

7th SwAPP Exchange Expertise Meeting
Mach 18, 2014
http://www.swissbiotech.org/events#event:720
Legal & Regulatory Affairs
Bern

4th European Lung Cancer Conference
March 26-29, 2014
www.esmo.org/Conferences/ELCC-2014-Lung-Cancer
Oncology
Geneva

Innovative Smart Systems Networking Conference
April 1, 2014
www.swii.org/index.php/events/systems-event
R&D / Innovation
CSEM, Neuchâtel

ORPHEUS 2014
April 3-5, 2014
http://www3.unil.ch/wpmu/orpheus2014/
PhD Education
Lausanne

Life Science Career Day 2014
April 5, 2014
http://www3.unil.ch/wpmu/lifesciencecareerday/
Career Opportunities / Life Sciences
Lausanne

Swiss Biotech Day 2014
April 8, 2014
www.swissbiotech.org/events#event:616
Life Sciences
Zurich

Geneva Health Forum 2014: Global Health – Interconnected Challenges, Integrated Solutions
April 15-17, 2014
http://ghf.globalhealthforum.net
Global Health
Geneva

Human Genome Meeting 2014
April 27-30, 2014
www.hgm2014-geneva.org
Life and Health Sciences
Geneva

EPFL - MicroNanoFabrication Annual Review Meeting
May 6, 2014
http://blogs.epfl.ch/article/36925
Micro & Nano Fabrication Techniques
EPFL, Rolex Learning Center