



# Science-Switzerland, June – July 2015

News on Swiss science, technology, education and innovation

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## 1. Policy

### Federal Expenses for R&D dropped 7% in 2014

(BFS, July 23, 2015)

The Swiss Federal expenses for research and development dropped for the first time since 2006. Due to the decrease the Federal Government spend less than CHF 2 billions for R&D. The reason is the reduction in expenses for activities in foreign countries, which is the result of the federal popular initiative "against mass immigration". The cooperation between the European Commission and Switzerland were suspended and the amounts intended for the Framework Programme For Research were blocked (> CHF 500 millions). The most money goes now into the Swiss National Science Foundation (SNSF).

<http://swissinnovation.org/news/web/2015/01-150723-95>

## 2. Education

### Alumni UZH Washington D.C. Chapter Inaugurated

(University of Zurich, July 27, 2015)

The University of Zurich has a new alumni group in Washington, D.C. The chapter was inaugurated in a ceremony attended by Ambassador and UZH alumnus Martin Dahinden and UZH president Michael Hengartner.

<http://swissinnovation.org/news/web/2015/02-150727-b7>



### Zurich Insurance Exporting Swiss Vocational Training to U.S.

(zurich.com, June 26, 2015)

In an effort to improve skills development programs in the U.S., the Swiss-owned Zurich Insurance Group is launching a novel apprenticeship program for high school graduates. The structure of the announced program is based on the model of the Swiss national apprenticeship, which combines work experience with higher education in a way that allows apprentices starting with entry-level skills to develop full job competency. In Switzerland, where two-thirds of high-school level graduates enroll in vocational training, a large percentage of apprentices find employment with the company providing the education. Zurich teams up with William Rainey Harper College to begin the program in 2016 with the goal of enrolling 100 apprentices by 2020.

<http://swissinnovation.org/news/web/2015/02-150626-fb>



### 3. Life Science

#### Promising Malaria Agent

(20 Minuten, June 19, 2015)

An international research team has discovered an agent that effectively combats malaria pathogens, including those resistant to other malaria medications. In a laboratory test on mice, the agent killed ninety percent of pathogens. It promises to improve malaria medication, possibly treating the disease in one dose, as well as helping prevent infection and spreading. The Swiss Tropical and Public Health Institute participated in the research team.

<http://swissinnovation.org/news/web/2015/03-150619-bc>

#### Ebola Vaccine Tested Successfully For the First Time

(University of Bern, July 31, 2015)

The Ebola virus disease epidemic in West Africa has not been defeated yet, although the number of cases has dropped substantially since the start of the year. People who had come into close contact with someone recently infected, and who are therefore at particularly high risk, were vaccinated. One of the vaccines, «rVSV-ZEBOV», has now been tested in the first large field trial of efficacy and effectiveness in Guinea, West Africa. Prof. Dr. Matthias Egger from the Institute of Social and Preventive Medicine at the University of Bern was involved in this «Ebola ça suffit» trial, together with PD Dr. Sven Trelle and other staff from the Clinical Trials Unit CTU Bern at the University's clinical study centre and Bern University Hospital. The initial results of the study show that the vaccine can effectively contain the further spread of the Ebola virus.

<http://swissinnovation.org/news/web/2015/03-150731-4a>

#### US Biotech Giant Biogen Invests \$1 Billion in Switzerland

(Boston Globe, July 02, 2015)

The Cambridge biotechnology giant Biogen Inc. plans to invest \$1 billion in a new manufacturing plant in northern Switzerland that would triple the company's global capacity to produce large protein-based drugs known as biologics. The plan, which is subject to zoning approval by the Swiss government, could help reduce Biogen's corporate tax rate to 23 percent from 26 percent, according to a note to investors by Robyn Karnauskas, a biotech analyst at Deutsche Bank. The proposed site in Luterbach, Switzerland, near Zurich, would be Biogen's fourth manufacturing plant. Among the benefits of Switzerland, a European biopharma hub, is a skilled workforce and advanced infrastructure.



<http://swissinnovation.org/news/web/2015/03-150702-d7>

#### Advances in Parkinson's Disease Research

(EPFL, July 09, 2015)

In Parkinson's disease, the protein alpha-synuclein fills neurons that regulate movement, and either exists within neurons as monomers (single molecules) or as aggregates such as oligomers or fibrils. At some point alpha-synuclein begins to destroy the neurons, but when exactly this occurs is unknown. Now, owing to their specialist expertise in synthesizing custom protein aggregates to facilitate experiments, researchers at EPF Lausanne have discovered that the protein's ability to encourage the formation of new fibrils is linked to neuron death. New avenues for drug development and targeting, particularly even at later stages of the disease, may now be possible.



<http://swissinnovation.org/news/web/2015/03-150709-7c>

#### Fructose has Troubling Side Effects

(ETH Zurich, June 19, 2015)

In recent decades fructose spread throughout the food market, due to a reputation as being less harmful than glucose. In addition, fructose is sweeter to the taste. But there is a downside: the liver converts fructose very efficiently into fat. People who consume too much high-fructose food can in time become overweight and develop high blood pressure, dyslipidaemia with fatty liver and insulin resistance, symptoms that doctors group together under the name metabolic syndrome. ETH researchers have recently described a further, more troubling side effect of fructose, namely uncontrolled growth of the heart muscle, a condition that can lead to fatal heart failure. Their study was published in Nature.

<http://swissinnovation.org/news/web/2015/03-150619-de>



## Understanding How Speech Is Decoded in the Brain

(University of Geneva, June 26, 2015)

To understand how speech is processed in the brain is one of many major questions in neuroscience. Speech processing is believed to be associated with so called gamma and theta waves, electrical oscillations of certain wavelengths. Professor Anne-Lise Giraud and her group researching auditory language at the Neuroscience Center of the University of Geneva have been studying the role of these neuronal oscillations in speech processing using a computerized model of neuronal microcircuits. The researchers were able to show that the synchronization of theta and gamma waves is central for the deciphering of speech in the brain. Further observations in people with dyslexia and autism revealed defects in the synchronization process, hinting at explanations for difficulty in sensory information processing. In a next step the scientists will attempt to correct abnormal oscillations hoping to observe responses in patients.

<http://swissinnovation.org/news/web/2015/03-150626-a2>

## Broken Heart Syndrome Differs from Heart Attack

(University of Zurich, June 09, 2015)

University Hospital Zurich (UHZ) and University of Zurich (UZH) cardiologists are researching the mysterious, dangerous “broken heart syndrome”, known in Japan as “takotsubo cardiomyopathy”. Patients, 90% of whom are women aged 60-75 who have recently suffered severe emotional stress, present with symptoms resembling a coronary. However, cardiac catheterization tests undertaken at UHZ show that, unlike in heart attacks, these patients’ coronary vessels remain open. Instead, the left ventricle is deformed, resembling a Japanese octopus trap (“takotsubo”), so the heart no longer pumps properly. Since 2011 UHZ has run the world’s biggest database containing information on patients suffering from this condition. Research conducted with UZH has revealed massive anatomical abnormalities in parts of the brain involved in controlling emotions, which disrupt stress impulses to the heart.

<http://swissinnovation.org/news/web/2015/03-150609-02>

## Numerical Superiority in Niches Drives Genetic Diversity in Bacteria

(ETH Zurich, June 10, 2015)

Theoretically predicted and now demonstrated experimentally at ETH Zurich using soil bacteria: weaker organisms can prevail against stronger ones if they are superior in number. This acts as a driving mechanism in maintaining genetic diversity. The bacterium *Myxococcus xanthus* lives worldwide in soils and interacts socially, e.g., individuals go hunting together for other bacteria and fungi, or form fruiting bodies with spores that ensure long-term survival. Some highly competitive genetic variants and strains of *M. xanthus* could likely destroy weaker ones, meaning that strain diversity would disappear. However, reality differs, since numerous genetically different strains of *M. xanthus* remain present in the soil. Published in *Current Biology*, the study shows that less competitive strains survive if they occupy a niche that dominant bacteria cannot colonize.



<http://swissinnovation.org/news/web/2015/03-150610-9e>

## How Animals Keep Cool in the Desert

(20 Minuten, June 26, 2015)

Desert animals could perfectly adapt to their environment. A Namib desert beetle for instance holds its back in the wind thus gaining humidity. Humidity is then condensed and transported to the head. The sandfish is able to swim in the sand thanks to its special skin surface. Desert foxes are able to cool themselves thanks to their long ears which enlarge the surface of their skin. Bees make sure to have sufficient air circulation in the beehive by ventilating and leaving it from time to time. All these techniques are copied and used in contemporary science and technology.

<http://swissinnovation.org/news/web/2015/03-150626-66>

## Clinical Research Priority Program on Rare Diseases

(University of Zurich, June 30, 2015)

A disease is deemed to be rare if it affects fewer than five in 10,000 people, causes a lasting disability or is life-threatening. Rare diseases are generally due to a genetic defect, so symptoms often emerge as early as infancy or childhood. Many people with rare diseases spend years going from one doctor to another until someone finally makes the right diagnosis. In general, however, funding for research into rare diseases tends to be scarce.





The pharmaceuticals industry shows only sporadic interest. Added to this is a lack of model organisms, diagnostic standards, and effective treatment options, plus the fact that case histories are available on only a fragmentary basis. The Swiss Federal Office of Public Health has recognized these shortcomings, and in September 2014 approved a national initiative on rare diseases.

<http://swissinnovation.org/news/web/2015/03-150630-fe>

## How Cries Affect Our Brains and Behavior

(Université de Genève, July 14, 2015)

Cries are among the most innate and widespread communication signals among human beings. They are particularly effective in ensuring our survival. Unlike speech, cries alert us immediately to danger. To find out why they are unique signals and how they are processed by the brain, neuroscientists at the University of Geneva (UNIGE) and New York University undertook a series of experiments combining behavioral studies and neuroimaging. They isolated the acoustic frequencies that give cries their alarming power and investigated their effect on the human brain. Surprisingly, they also discovered that sirens used worldwide use the same frequency range as natural cries, which explains why they put us on the alert. Industrial applications of these discoveries, published in *Current Biology*, could improve our everyday auditory experiences.

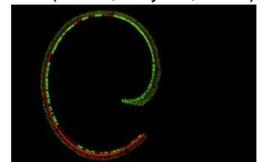
<http://swissinnovation.org/news/web/2015/03-150714-e2>

## Gene Therapy Could Combat Deafness

(EPFL, July 08, 2015)

Using gene therapy, researchers at Boston Children's Hospital, Harvard Medical School and EPFL have restored hearing in mice with a genetic form of deafness. Their work, published online in *Science Translational Medicine*, could pave the way for gene therapy in people with hearing loss caused by genetic mutations. More than 70 different genes are known to cause deafness when mutated. The study focused on the TMC1 gene, because it is a common cause of genetic deafness (4-8% of cases), and encodes a protein essential for hearing, helping convert sound into electrical signals that travel to the brain. Profound hearing loss is currently treated using hearing aids and cochlear implants. Clinical trials of TMC1 gene therapy within 5-10 years could lead to better alternative treatment.

<http://swissinnovation.org/news/web/2015/03-150708-b6>

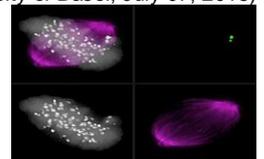


## Another Checkpoint Enzyme for Flawless Cell Division

(University of Basel, July 07, 2015)

The error-free distribution of genetic material during cell division is important for preventing the development of tumor cells. A research group at the Biozentrum, University of Basel, has uncovered a new important function of the human enzyme Plk1. It plays a significant role in monitoring chromosome segregation. Just like the enzyme Mps1, Plk1 also ensures the assembly of the MCC and finally the inhibition of cell division. Plk1 thus also has a checkpoint function and consequently safeguards chromosome segregation. The results published in the journal "Cell Reports" may provide important clues for the treatment of cancer.

<http://swissinnovation.org/news/web/2015/03-150707-66>

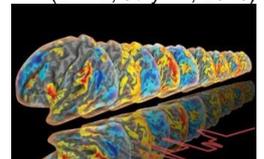


## Observing Brain Network Dynamics to Diagnose Alzheimer's

(EPFL, July 17, 2015)

By analyzing blood flow in the brain, researchers from EPFL and the University of Geneva were able to observe the moment-to-moment interactions between different regions in the brain. They applied an imaging technique called functional magnetic resonance imaging (fMRI) completed by a complex computational method to determine which brain regions work together. They identified thirteen main networks. On average, four of these networks were active at the same time. Until now, researchers thought that regions took turns activating, and that they did so with little coordination. These new findings could help with the early detection of neurological disorders, such as Alzheimer's disease.

<http://swissinnovation.org/news/web/2015/03-150717-55>



## Tracking down Viruses

(University of Zurich, July 21, 2015)

The aim of the Viral Infectious Diseases Clinical Research Priority Program is to track down dormant human immunodeficiency viruses, and find unidentified pathogens that plague people with weak immune systems. The Viral Metagenome Project aims to create a basis for optimizing the treatment of patients with immune deficiencies.



Under the leadership of Trkola and her fellow co-director Nicolas Müller, scientists at the Institute of Medical Virology are using techniques such as next generation sequencing (NGS) to fish for unidentified pathogens in blood, stool and lung mucus samples. They've already notched up their first success by identifying a specific virus as the trigger of lung infection following heart transplant surgery – one that routine diagnostic methods had failed to detect.

<http://swissinnovation.org/news/web/2015/03-150721-2b>

### The Light of Fireflies for Medical Diagnostics

(EPFL, July 23, 2015)

EPFL scientists have exploited the light of fireflies in a new method that detects biological molecules without the need for complex devices and high costs. The lab of Kai Johnsson at EPFL, led by Alberto Schena and Rudolf Griss, were able to add a small chemical tag on the enzyme luciferase, which produces the light of fireflies. The tag detects a target protein, and the luciferase gives out a light signal that can be seen with a naked eye. The tag acts as a switch: it blocks luciferase, preventing it from producing light. When the tag detects its target protein, it attaches to that instead, removing the block from luciferase. As a result, luciferase is free to turn on the lights, which is the signal that the target has been found. In short, the scientists have created a chemical solution for a biological problem.

<http://swissinnovation.org/news/web/2015/03-150723-00>

### Neural Efficiency Hypothesis Confirmed

(ETH Zurich, July 27, 2015)

One of the big questions intelligence researchers grapple with is just how differences in intelligence are reflected in the human brain. Researchers at ETH Zurich have succeeded in studying further details relating to suspected functional differences in the brains of intelligent people. The brains of more intelligent people are capable of solving tasks more efficiently, which is why these people have superior cognitive faculties. Scientists refer to this as the neural efficiency hypothesis, although it ceased being a hypothesis quite some time ago and is now accepted by experts as an undisputed fact, with ample evidence to support it.



<http://swissinnovation.org/news/web/2015/03-150727-ac>

### Individual Aggregations That Cause Alzheimer's Made Visible

(EPFL, July 28, 2015)

Diseases like Alzheimer's are caused when proteins aggregate and clump together. These protein aggregates are the focus of medical research in neurodegenerative diseases. The focus is on distinguishing between the individual aggregation form of the proteins, in order to identify which ones can be targeted more effectively to treat the diseases. However, current imaging techniques have not been able to distinguish between a protein's intermediate species and the final fibrils. The lab of Giovanni Dietler at EPFL addressed the problem by combining Atomic Force Microscopy and Infrared Spectroscopy. In that way they are able to distinguish the disease-causing aggregation forms of proteins. The finding can help change pharmaceutical treatment of neurodegenerative diseases.

<http://swissinnovation.org/news/web/2015/03-150728-95>

### Stress Hormone Cortisol Reduces Addictive Cravings

(University of Basel, July 28, 2015)

Every addiction is characterized by a strong desire for a certain addictive substance, be it nicotine, alcohol or other drug. Researchers at the University of Basel recently conducted a study on heroin addiction and demonstrated that the stress hormone cortisol can reduce addictive cravings. Heroin is a drug with an extremely high dependency potential that stimulates severe cravings in addicts. The researchers in Basel discovered that cortisol diminishes the ability to retrieve memories; intake of the hormone reduced the brain's ability to remember. This can be used, for example, to relieve symptoms in patients suffering from anxiety disorders by inhibiting the patients' ability to recall anxious episodes. Cortisol also has an inhibitory effect on addiction-related memory and thus on the craving for the addictive substance.

<http://swissinnovation.org/news/web/2015/03-150728-b5>

### Gene Clusters Influence Gut Immunity

(EPFL, July 29, 2015)

When it comes to fighting gut infections, we are not equal. EPFL scientists studied gene clusters in fruit flies and revealed that even minor genetic variation can lead to important differences in the susceptibility of the gut to infections. They identified several new influencers of gut immunity. One cluster they discovered involved genes



linked to the production of the highly reactive molecules that neutralize infectious microorganisms. This group of genes helps flies resist infections by lowering the activity of reactive oxygen species. This cluster also helps with faster clearance of infectious pathogens and higher stem cell activity for tissue healing. The study, challenging simplistic views of gut disease, was published in Nature Communications.

<http://swissinnovation.org/news/web/2015/03-150729-bc>

## 4. Nano / Micro Technology / Material Science

### Paving the Way for New Electronic Devices by Moving Sector Walls on the Nanoscale

(ETH Zurich, June 05, 2015)

Scientists at ETH Zurich are able to visualize and selectively modify the internal order of an intensively researched class of materials known as multiferroics. This opens the door to promising applications in electronics. For example, it may be possible to produce electronic components in which the nanoscale domains act as tiny capacitors that could be electrically charged separately. Essentially, the team showed that the electrical conductivity of the domain walls differs from that of the material as a whole. In one material, strontium manganite, they showed that the domain walls suppress the flow of electric current. This could be used to create a new charge-based storage medium, where it would take only a voltage pulse to alter the charge in a domain. A storage medium of this type would be more energy-efficient than those available today.

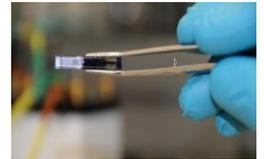


<http://swissinnovation.org/news/web/2015/04-150605-e0>

### Polyionic Liquids in CO<sub>2</sub> Sensor

(ETH Zurich, June 08, 2015)

A new material changes its conductivity depending on the concentration of carbon dioxide (CO<sub>2</sub>) in the environment. Scientists worldwide are currently investigating these polyionic liquids (PIL) for use in different applications, such as batteries and CO<sub>2</sub> storage. Material scientists at ETH Zurich and the Max Planck Institute of Colloids and Interfaces in Potsdam have used this material to develop a miniature, simply constructed, new type of CO<sub>2</sub> sensor. Researchers believe that with the new material, other miniature portable devices are now conceivable. These devices could be used to measure breathing air for scuba diving, extreme altitude mountaineering or for medical applications.

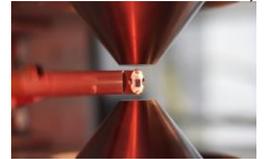


<http://swissinnovation.org/news/web/2015/04-150608-01>

### New, Game-changing Magnetoresistance Discovered

(ETH Zurich, June 12, 2015)

More than 150 years ago, William Thomson, later Lord Kelvin, discovered the magnetoresistive effect. This discovery led to the field of research called spintronics. Today, this finding enables sensors to measure the rotational speed of a car wheel, and is also used in compass navigation and robot control systems. ETH Zurich material scientists have now found a new kind of magnetoresistance that promises further insight into basic research and could one day be used for practical applications. This results are published in Nature Physics. Customised materials may eventually be produced in which the new magnetoresistance could be used. Examples include semiconductors or topological insulators in which the electrons are confined at the interface of different material components and may present amplified magnetoresistances.

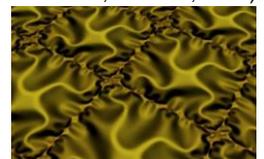


<http://swissinnovation.org/news/web/2015/04-150612-8c>

### Faster Ionic Conduction to Drive New Product Development

(ETH Zurich, June 15, 2015)

ETH Zurich material engineers produce ceramic materials that conduct charged atoms, such as oxygen or lithium ions, very quickly. These materials are used in lambda sensors of automotive catalytic converters and solid oxide fuel cells. Since they will likely increase in industrial importance, the key challenge is how to optimize them. ETH Zurich researchers have discovered that the performance of ion-conducting ceramic membranes depends largely on their strain and buckling profiles. For the first time, scientists can now selectively manipulate the buckling profile, and thus the physical properties, allowing new technical applications of these membranes. This supports





the development of future gas sensors, ion-based data storage and micro energy converters, such as fuel cells – and potentially other applications in the promising field of ionics.

<http://swissinnovation.org/news/web/2015/04-150615-c6>

### Sound Waves to Control Micro Droplets

(ETH Zurich, June 21, 2015)

Just as the size of transistors continues to decrease, laboratories are also expected to shrink until they eventually fit on a chip. Researchers at the Institute of Mechanical Systems of ETH Zurich have developed a system of using sound waves to move, merge or sort minuscule droplets with reagents or cells in a controlled manner. Previous methods in which researchers manipulated individual cells on a tiny scale resulted in cases of cells being damaged. This method however can be used for cells as well as for DNA, reagents and chemicals. Researchers hope that this technology will become a valuable part of laboratory equipment, allowing for experiments in high throughput with minimal consumption.

<http://swissinnovation.org/news/web/2015/04-150621-51>

### Soundproofing Using Quantum Physics

(ETH Zurich, July 03, 2015)

ETH Zurich physicists have shrunk the gap between abstract theory and tangible applications. Working with so-called topological insulators – i.e. with materials whose ability to conduct electricity is of a topological origin – they have investigated how to transfer the principle of a topological insulator to mechanical systems. Their mechanical implementation of a quantum mechanical phenomenon could be useful in sound and vibration insulation. Moreover, materials could be produced that transmit sound in only one direction or focus sound like a lens. To make their mechanical model more compact, the engineers are now building a smaller device that works without pendulums and that will measure just a few centimeters.



<http://swissinnovation.org/news/web/2015/04-150703-cc>

### How to Make Better Water Filters with Nanotubes

(Université de Genève, July 06, 2015)

Until now, simulations of water flow in carbon nanotubes could only be performed under unrealistically high flow-rate conditions. In a recent international project, including the University of Geneva and CERN, simulations at working conditions of real nanotube-based filters could be carried out. The research project Computing for Clean Water, was accomplished with the support of over 150,000 volunteers worldwide, contributing their own computing power to the research. This low flow rate enabled researchers to show exactly how, under the right conditions, vibrations result in oscillating friction, leading to enhancements of the rate of water diffusion through the nanotubes of more than 300%.

<http://swissinnovation.org/news/web/2015/04-150706-f7>

### Stretchable Nanocomposite with Tunable Electrical Strain Response

(ETH Zurich, July 16, 2015)

Conventional strain sensors are made out of rigid materials limiting the maximal deformation to a few percent before mechanical and/or electrical failure. The emerging new class of stretchable electronics are either complex in design and fabrication or have an intrinsic material property with little room to tune it. Especially challenging is combining high conductivity with high stretchability and high sensitivity while having a reliable reversibility of the composite material. Stretchable conductive composite can be designed with arbitrary resistance responses to strain. Researchers at ETH Zurich found a novel, simple, and versatile methods can be used for producing composite materials that are tunable by the means of conductivity (up to 6000 S/cm), stretchability (> 100%) and sensitivity ( $K = 0.01 - 10000$  and more) with a low hysteresis.

### Graphene Biosensor for Nanoscale Measurements

(EPFL, July 20, 2015)

Graphene a material made of one layer of carbon atoms combining robustness, lightweight and excellent thermal and electrical conductivity has become somewhat of a buzzword in recent years. Scientists from the EPFL's Bionanophotonic Systems Laboratory have now developed a novel graphene-based sensor to detect molecules.



The sensor's technology is based on infrared absorption spectroscopy, but improves on the established technique by using graphene's properties to focus light with nanoscale precision. While regular infrared spectroscopy cannot easily resolve in the nanometer range, the novel graphene biosensor was shown to allow researchers to gain a detailed picture of biomolecules without stressing the sample. The technique could have many applications as it allows complex analysis of a wide range of molecules using a single device.

<http://swissinnovation.org/news/web/2015/04-150720-91>

### Perovskites Drive Solar-cell Cost Down and Efficiency Up

(EPFL, July 22, 2015)

Solar panels sensitized with the lead-containing perovskites are among the best options for market-suitable solar panels. However, the selective extraction of positive and negative charges limits the light-to-electricity conversion efficiency of perovskites, which is why they must be combined with prohibitively expensive hole transport materials. EPFL and Kaunas University scientists have overcome the problem of cost by synthesizing a small molecule that is both cheap to integrate with perovskites, and raises the efficiency of solar panels to 16.9%, their highest value yet using new hole transporting materials.

<http://swissinnovation.org/news/web/2015/04-150722-db>

### New Research Program to Develop Heat Pump Powered by Waste Heat

(news.admin.ch, July 27, 2015)

As part of the National Research Program "Energy Turnaround" NRP 70 the Swiss National Science Foundation (SNSF) is supporting the interdisciplinary research project "THRIVE". With IBM Research – Zurich and the Hochschule für Technik Rapperswil as leading houses, scientists from Empa, ETH Zurich, HEIG-VD and PSI will be teaming up with industrial partners until 2017 to develop a heat pump that is powered by waste heat. Compared to today's compression heat pumps, this technology only requires very little electricity and can also use waste heat efficiently to air-condition buildings. The project is part of the SNSF initiative to support the Swiss government's "Energy Strategy 2050" and is open to further industrial partners interested in collaborating.

<http://swissinnovation.org/news/web/2015/04-150727-48>

### New Modulator Converting Light into Surface-Plasmon-Polaritons

(ETH Zurich, July 28, 2015)

Transmitting large amounts of data, such as those needed to keep the internet running, requires high-performance modulators that turn electric signals into light signals. Researchers at ETH Zurich have now developed a modulator that is a hundred times smaller than conventional models. In order to beat the law of optics that restricts the smallest possible modulator to the wavelength of light itself, the light is first turned into so-called surface-plasmon-polaritons. Plasmon-polaritons are a combination of electromagnetic fields and electrons that propagate along a surface of a metal strip.



<http://swissinnovation.org/news/web/2015/04-150728-95>

### Yarn from Slaughterhouse Waste

(ETH Zurich, July 29, 2015)

ETH researchers have developed a yarn from ordinary gelatine that has good qualities similar to those of merino wool fibers. Man-made fibers manufactured from products of petroleum or natural gas account for almost two-thirds of the worldwide traded fibers. Over the past few years, there has been increased demand for natural fibers produced from renewable resources using environmentally friendly methods. Now Philipp Stössel, PhD student of the Functional Materials Laboratory at ETH Zurich, is presenting a new method for obtaining high-quality fibers from gelatine. Gelatine consists chiefly of collagen, a main component of skin, bone and tendons. Large quantities of collagen are found in slaughterhouse waste and can be easily made into gelatine.



<http://swissinnovation.org/news/web/2015/04-150729-e2>



## 5. Energy / Environment

### Cheap, Scalable Method to Produce Solar-to-Hydrogen Conversion Films

(EPFL, July 01, 2015)

Solar panels that efficiently split water molecules into oxygen and hydrogen, thus allowing the storage of solar energy as hydrogen, are as of today rather inefficient and expensive to produce. Professor Kevin Sivula and his team from the Molecular Engineering of Optoelectronic Nanomaterials lab at the EPFL have now developed a novel method to produce high quality thin films capable of this feat. The films made of tungsten-diselenide, a so called 2D-material forming a single layer with exceptional electronic properties, are produced by injecting 2D flakes into the boundary between two non-mixing liquids. While still in the proof of concept stage the novel method is already showing higher efficiencies in solar-to-hydrogen conversion than any previous film. Furthermore the production method developed in the study is easily scalable and could therefore have potential for commercial application.

<http://swissinnovation.org/news/web/2015/06-150701-97>

### Ozone to Treat Wastewater Micropollution

(EPFL, July 31, 2015)

The use of pharmaceuticals and pesticides has led to the release of persistent micropollutants into the environment via wastewater. Ozone treatment is a technology that is both easy to implement and highly efficient. There are, however, certain compounds that can become more toxic when treated with ozone. In a study published in the journal *Water Research*, a team of researchers from EPFL, ETH Zurich, and Eawag presents a test to evaluate the suitability of ozone treatment for urban wastewater taking into account potential contributions from industrial sources. Upgrading wastewater treatment plants with ozone treatment to eliminate micropollutants is one way to curb their release into the environment. But, says von Gunten, joint professor at EPFL and Eawag, legislating the use of particularly persistent, harmful compounds and replacing them with less harmful alternatives could contribute to solving the problem at the source.

<http://swissinnovation.org/news/web/2015/06-150731-8f>

### Environmental Impacts of Fuel Cell Cars

(Empa, July 15, 2015)

A study conducted by an international team of scientists led by EMPA has found that for fuel cell cars to be truly environmentally friendly, they must be powered by hydrogen from renewable energy resources. Currently, industrial hydrogen is produced from natural gas and many fuel cell cars rely on electricity from the European grid which produces hydrogen by the electrolysis of water. However, the carbon dioxide emissions for this current method are far too high. The researchers hope that future fuel cell cars will run on solar-generated hydrogen, or at least use excess wind power and solar energy captured in the form of hydrogen that would otherwise be lost because the turbines are switched off at off-peak times.

<http://swissinnovation.org/news/web/2015/06-150715-fb>

### Global Water Management Needs Local Strategies

(Eawag, July 31, 2015)

Traditionally, water resource management has been in the hands of local authorities. In order to alleviate urgent worldwide water problems, scientists and politicians are increasingly calling for global approaches. But Eawag Director Janet Hering advocates local strategies. Whilst it is certainly the case that a global perspective enables the identification of international fields of action and the mobilisation of international financial resources, the challenges of sustainable water management are nevertheless specific to the particular locality. For these reasons, effective solutions can only be worked out and implemented by the people on the ground, as they are acquainted with the local needs and constraints and therefore have greater credibility. A global perspective harbours the danger that power and resources will be transferred from local to international institutions, claim the authors.



<http://swissinnovation.org/news/web/2015/06-150731-f8>

### Reducing Solar Heating in Automobiles

(20 Minuten, June 26, 2015)

The Touring Club of Switzerland tested various methods of reducing solar heating in automobiles. Methods included leaving windows open, choosing a light-colored paint, and using reflective foil. Cars were illuminated with UV lamps in a laboratory, and the interior temperature was measured. An unprotected car reached 40 degrees



Celsius in half an hour. Leaving the windows open reduced that temperature by two degrees, while paint color had an effect on interior temperature. A foil in the windscreen reduced the temperature by ten degrees.

<http://swissinnovation.org/news/web/2015/06-150626-eb>

## North Atlantic Atmospheric Blocking Pattern Makes Europe Sweat

(ETH Zurich, July 21, 2015)

Stable high-pressure systems can lead to summer heatwaves – such as the one Europe is currently experiencing. Researchers have termed these special high-pressure conditions ‘blocking’, since they deflect low-pressure systems and, as a result, may lead to warm weather patterns. These patterns are around 2000 kilometers in diameter and can span across large swathes of Europe. They interrupt the typical westerly flow from the North Atlantic, which would otherwise determine the weather conditions in our region. The Atmospheric Dynamics research team at ETH Zurich is now shedding new light on the formation of these blocking patterns.



<http://swissinnovation.org/news/web/2015/06-150721-9c>

## High-resolution Mapping Produces Ecological Data

(EPFL, July 24, 2015)

Beyond simple topographic data, high-resolution digital elevation models can provide estimates for a diverse range of ecological variables. But in a recent publication in the journal *Methods in Ecology and Evolution*, researchers from the EPFL and the University of Neuchâtel show that higher resolution models do not always guarantee accuracy. “What we highlight is that scale is important. Not all variables are estimated better using higher resolution digital elevation models,” says Leempoel, who works at the Landscape Genetics Group, which is part of EPFL’s Laboratory of Geographic Information Systems. In general, soil characteristics were best described using variables at the highest spatial resolution, whereas hydrological parameters were best inferred from intermediate resolution models.

<http://swissinnovation.org/news/web/2015/06-150724-fa>

## Better Accuracy of Snow Cover Estimated Using Mathematical Model

(EPFL, July 28, 2015)

Knowing how much water is stored as snow on mountain slopes is crucial for water resource managers to predicting floods. Laser and radar-based technologies are two ways to remotely measure snow depth at discrete points, but using these measurements to estimate total snow mass is inherently prone to errors. But because the physical properties of snow vary strongly from place to place, especially in complex terrains or in forests, errors creep in when these point measurements are used to estimate total snow cover. To improve the accuracy of snow cover estimates, Ernesto Trujillo, a researcher from ENAC’s Laboratory for Cryospheric Science, developed a mathematical model that is capable of reproducing the expected error for a given terrain. Using this model, he explains, snow cover estimates can be improved.

<http://swissinnovation.org/news/web/2015/06-150728-e4>

## 6. Information & Communications Technology

### Expansion of Information Security

(ETH Zurich, June 17, 2015)

Information security is a strategically important area of research at ETH Zurich; the Department of Computer Science in particular has been focusing intensively on this field for years. A donation of five million Swiss francs has been made by Zürcher Kantonalbank to the ETH Zurich Foundation specifically for expanding its Zurich Information Security and Privacy Center (ZISC). The plan is to develop both basic and applied research, which will revolve around issues stimulated by industry partners. Open innovation for all to see will remain the overarching principle throughout. ZISC's existing subject areas will be broadened. In future, researchers will focus on issues relating to the security of networks, systems, software and applications, the cloud and mobile computing. Researchers at ETH-ZISC will also continue to work on next-generation networks, cyber-physical systems and cryptography.



<http://swissinnovation.org/news/web/2015/05-150617-d4>



## 7. Engineering / Robotics / Space

### New Concept for Artificial Vision

(The economist, July 25, 2015)

Most attempts to give sight to robots use cameras that produce the sort of image a human being is used to, and then apply computing power to simplify it. Dario Floreano of EPFL, has, however, taken a different approach. The result is an artificial version of an insect's compound eye. Such eyes do not have the resolving power of single-lens vertebrate eyes, but they are far better in detecting motion. Dr. Floreano's artificial ommatidia use a concept called 'optical flow'. This is the pattern of apparent motion of objects in the visual field they are looking at, caused by the actual movement of the insect they are attached to. An object, that moves at an angle to most other things in the field, is easy to notice.

<http://swissinnovation.org/news/web/2015/07-150725-bb>

### Material of Comet Churyumov-Gerasimenko is Far Harder than Expected

(University of Bern, July 30, 2015)

Hard like frozen firn snow instead of loose and soft like dust: Apparently, the material under the surface of Comet Churyumov-Gerasimenko is far harder than many experts had expected – this was the result from measurements by the «Philae» comet lander at least. Up to now, many researchers had assumed that it has remained in virtually the same state since its formation about 4.5 billion years ago. Now the scientists say it is particularly important to understand these changes as the ESA Rosetta space probe seems to be orbiting a comet, which has undergone at least some degree of modification compared to its initial state.

<http://swissinnovation.org/news/web/2015/07-150730-2d>

### Pioneering Hybrid-Electric Powertrain for Road Sweepers

(Empa, June 04, 2015)

Empa, ETH Zürich and the road sweeper manufacturer Bucher Municipal have jointly developed a pioneering hybrid-electric powertrain for road sweepers in a CTI project. The concept is based on a gas-driven engine, which provides power to the electric motors. The contribution of such working vehicles, e.g. road sweepers, municipal vehicles, etc., to the energy consumption of all road traffic is as high as 15 percent, despite the actual number of such vehicles being relatively small. Compared to conventional sweepers, the energy consumption has been halved and CO2 emissions reduced by more than 60 percent. Bucher Municipal is currently working on a concept study to investigate possible commercialisation of the new technologies.



<http://swissinnovation.org/news/web/2015/07-150604-e5>

### New Satellite Maps World's Vegetation Every Five Days

(University of Zurich, June 23, 2015)

A Vega rocket was launched from French Guiana carrying Sentinel-2A, a satellite a team of Michael Schaepman, Professor of Remote Sensing at the UZH Department of Geography helped to develop. Sentinel-2A is a multispectral imager (MSI) that maps vegetation at a high resolution from an altitude of 800 kilometers. The instrument delivers multi-spectral data with 13 bands in the visible, near infrared, and short-wave infrared part. The imager on board the satellite can supply data that reliably map changes in vegetation. The entire surface of the earth will be mapped every five days. It will be possible to monitor even short-term changes, allowing to map the development of plant health or the growth of forests. This will enable countless potential uses and practical applications.



<http://swissinnovation.org/news/web/2015/07-150623-02>

### Restoring the Natural Sense of Touch for Prostheses

(20 Minuten, June 26, 2015)

Swiss researchers are aiming to develop a prosthesis that provides amputees with the natural sense of touch. Recent research resulted in hand and leg prostheses enabling users to differentiate between various surfaces. These prostheses are however far from giving the natural feeling of touch. Researchers from the Swiss Center for Electronics and Microtechnology (CSEM) together with a number of Swiss Universities are developing an artificial skin embedded with tactility sensors. This net of sensors is designed like a glove that can be put on a prosthesis. People who are interested in testing the prototypes are welcome to contact the researchers.

<http://swissinnovation.org/news/web/2015/07-150626-84>



## Overview of Current Heat Pump Research

(BFE, June 30, 2015)

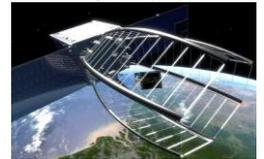
The use of heat pumps to provide heat and hot water is standard practice in Switzerland today. The number of heat pumps sold annually in Switzerland since the early 1990s has grown almost tenfold to currently 18 500 pieces (2014). Around 70 to 80% of newly built single-family homes are now equipped with such systems. Not only can equipment design itself be optimized, but also control of heat pumps in combination with other energy-producing equipment. Big gains can come from the clever integration of the heat pump with the power grid. An overview of the current heat pump research in Switzerland is provided by the Swiss Federal Institute of Energy.

<http://swissinnovation.org/news/web/2015/07-150630-e8>

## Giant 'Pac-Man' Satellite to Gobble up Space Junk in 2018

(<http://spectrum.ieee.org/>, July 09, 2015)

Space debris runs the gamut from broken down satellites to spent rocket stages. At a speed of 7 km/second, these pieces of space trash become powerful projectiles and constitute a serious threat to the devices and people working in space. In order to reduce these risks to a minimum, NASA carefully monitors every item larger than 10 cm. Many actors, including CleanSpace One, are currently working on long-term solutions for recuperating and eliminating space debris. The Swiss team is pitching in with the so-called "Pac-Man" solution: the prototype resembles a net in the form of a cone that unfolds and then closes back down once it has captured the small satellite. This system is more reliable and offers a larger margin for maneuvering than a claw or an articulated hand. CleanSpace One could be launched as early as 2018 in collaboration with the company S3, headquartered in Payerne.



<http://swissinnovation.org/news/web/2015/07-150709-89>

## New Digital Fabrication Lab for Researching Robotic Construction

(<http://spectrum.ieee.org/>, July 16, 2015)

At ETH Zurich, the Swiss National Science Foundation has opened a Digital Fabrication lab that's exploring the limits of what is currently possible with construction autonomy. The flagship project is the In-situ Fabricator, an autonomous construction robot. It's an industrial arm on a mobile base that can lay bricks, but with the added perk that the robot does not require any external localization systems. The robot has a 2D laser rangefinder on it, and once it gets to the construction site, it can build up a 3D map that gets registered to existing localized structural plans. A second project is the "robotic aggregations of materials with unpredictable geometry," which is developing a system that can build things out of irregular materials, such as raw quarry stones or recycled concrete rubble.



<http://swissinnovation.org/news/web/2015/07-150716-c9>

## ABB Wins \$90 Million in Train Equipment Orders to Meet Rail Demands in Europe and US

(ABB, July 16, 2015)

ABB has won orders worth around \$90 million from Swiss train manufacturer Stadler Rail to enable sustainable high-speed, suburban and urban transit in Europe and in the United States. ABB has a long history of providing innovative and energy-efficient technologies to the rail sector, manufacturing and servicing all components and sub-systems. The ABB-equipped Stadler trains destined to run between Zurich and Milan, and later between Frankfurt and Milan, will be the world's first single-decker, low-floor electric high-speed trains on a line that runs on both alternating and direct current electrification systems. ABB's propulsion system, located beneath the floor of the train, takes up less space and adds more comfort for the passengers.

<http://swissinnovation.org/news/web/2015/07-150716-d9>

## Unmanned Solar Airplane Breaks World Record

(<http://www.atlantiksolar.ethz.ch/>, July 20, 2015)

Researchers of ETH Zurich set a new endurance record: 6.8kg "Atlantik-Solar" unmanned aerial vehicle flew continuously during 81.5 hours (4 days and 3 nights) and has broken the flight endurance world record in its class. The flight was the fifth longest flight ever demonstrated by any aircraft (both manned and unmanned). Atlantik-Solar is optimized for low power consumption and flight efficiency, it combines efficient solar-technology with state-of-the-art Li-Ion batteries. In the future such technology will be used after natural disasters.



<http://swissinnovation.org/news/web/2015/07-150720-e4>



## New Phase for Unmanned Urban Transport

(EPFL, July 30, 2015)

The driverless minibuses that have been making their way around the EPFL campus since April now show up on demand. Users can use a free app, BestMile, to order a ride and track the location of the vehicles in real time. The app uses GPS to find your position and direct you to the closest shuttle stop. Usage statistics will be carefully collected and analyzed and subsequently used as the basis for the development of driverless public transport systems serving an entire neighborhood or even a city. This clearly marks a new phase in the development of urban transport.

<http://swissinnovation.org/news/web/2015/06-150730-ed>

## 8. Physics / Chemistry / Math

### Birth and Intense Observation of a New Planet

(ETH Zurich, July 01, 2015)

Publishing their findings in *Astrophysical Journal*, scientists at ETH Zurich have characterized the ongoing birth of a new planet within the gas and dust disk of the relatively young star HD 100546. This confirms an earlier hypothesis made by the same researchers led by Sascha Quanz two years ago that was only just proven thanks to valuable data collected using the Very Large Telescope at the European Southern Observatory in Chile. Until now, scientists could typically only use theory or computer simulations to investigate how planets form in the disks surrounding young stars. However, Quanz is excited about the prospect of now having a 'laboratory' from which empirical data about how planets are born can be collected.

<http://swissinnovation.org/news/web/2015/08-150701-48>

### Precocious Black Hole

(ETH Zurich, July 11, 2015)

Black holes can be found at the centers of most galaxies. Most have little mass compared with their host galaxy. ETH researchers, however, have discovered a particularly massive black hole, using the Keck telescope in Hawaii. This black hole clearly grew so quickly that the host galaxy was not able to keep pace. This calls into question previous thinking on the co-evolution of galaxies and their central black holes. The findings were presented in the journal *Science*. Researchers hope to gain further insight into the links between the black hole and the host galaxy, through observations with the Alma radio telescope in Chile.



<http://swissinnovation.org/news/web/2015/08-150711-7a>

### Solving the Astronomical Mystery of Buckminster Fullerene

(University of Basel, July 16, 2015)

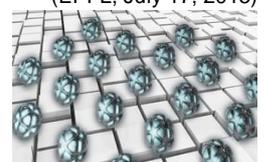
For almost a century, astronomers have been investigating what gives rise to the diffuse interstellar bands (DIB) that are observed on Earth; matter of some kind must be absorbing the starlight at certain wavelengths to give these absorption bands with dark gaps. In the mid-eighties buckminster fullerene, also known as the 'football molecule' was discovered to consist of 60 carbon atoms, and already by the early-nineties, Prof. Maier of the University of Basel had studied the electronic absorption of its ion. Now, gas phase spectroscopy of the buckminster fullerene ion has proved beyond reasonable doubt that these molecules absorb certain wavelengths of starlight to create the DIB. His team's measurements also prove that ionised buckminster fullerenes exist in gaseous states in the universe, a surprising finding given the complexity of its structure. The work of Prof. Maier and his research group have been published in *Nature*.

<http://swissinnovation.org/news/web/2015/08-150716-40>

### New Nanoscale Effect Caused by Adsorbed Molecules

(EPFL, July 17, 2015)

Scientists from Max Planck and EPFL have discovered a new nanoscale effect in the interplay between a quantized metallic system and adsorbed molecules. The study uses STM conductance spectroscopy and mapping to analyze the impact of molecular adsorption on the quantized electronic structure of individual metal nanoparticles. The researchers adsorbed isophorone and CO<sub>2</sub> onto monolayer gold islands grown on MgO thin-films. Isophorone and CO<sub>2</sub> acted as prototypes for physisorptive and chemisorptive binding, respectively on the metal-





oxide boundary. The study found that CO<sub>2</sub> binding causes the gold quantum well states to increase their mutual energy spacing. On the other hand, they move together for isophorone physisorption. In effect, the experiment reveals how molecular adsorption affects individual quantum systems, which is “of utmost relevance for heterogeneous catalysis.”

<http://swissinnovation.org/news/web/2015/08-150717-63>

### Study with Time Resolution in Ultraviolet Domain

(EPFL, July 22, 2015)

EPFL scientists have shown that electrons can jump through spins much faster than previously thought. They also demonstrated that there are no intermediate steps between spin jumps. For their measurements, they used ultrafast spectroscopy, where a laser shines on the material sample under investigation, causing its electrons to move. Another laser measures the spin changes over time in the ultraviolet light range. This is the first study ever to push time resolution to this limit in the ultraviolet domain. Aside from its enormous implications for fundamental physics, this finding can also propel the field of spintronics forward.

<http://swissinnovation.org/news/web/2015/08-150722-55>

## 9. Architecture / Design

### New Research Laboratory for Sustainable Construction

(ETH Zurich, June 02, 2015)

After 18 months of construction, ETH Zurich's newest building, the House of Natural Resources (HoNR) has been inaugurated on the Hoenggerberg campus. ETH President Lino Guzzella has hailed it as 'a good example of on-site interdisciplinarity' and has praised the sustainable and technically innovative use of Swiss beech wood in its structure. The research groups of six professors from the Institutes of Structural Engineering, Building Materials, and Technology in Architecture were involved in the construction of the HoNR, and are now looking forward to testing their technologies over time such as the building's adaptive solar modules and new surface coatings for the wood facades. The HoNR will house ETH Zurich's research laboratory for sustainable construction, which has been identified as a key strategic area by the university.



<http://swissinnovation.org/news/web/2015/09-150602-5a>

## 10. Economy, Social Sciences & Humanities

### Game Theory Experiments Shows When Defector is most likely to Be Punished

(ETH Zurich, June 30, 2015)

When a person in a group violates a norm, he or she is often punished by the others. In a game theory experiment, ETH sociologist Andreas Diekmann shows that this defector is most likely to be punished if those injured by the violation have differing levels of strength. Among equals, in contrast, the defector tends to get away with it. The strong player in a heterogeneous group tends to carry out the punishment. Groups in which all members have to pay an equally high price for taking punitive action behave more cautiously. If all group members face equal, symmetrical conditions, then without communication it is almost impossible to coordinate an intervention – everyone assumes someone else will do it.

<http://swissinnovation.org/news/web/2015/10-150630-94>

### Insights into the Lives of Global Nomads

(University of Zurich, July 08, 2015)

Globalization is challenging the tradition of nationally demarcated societies with sedentary citizens, and transnational lifestyles are becoming more common as the world gets more mobile and globally connected. A University of Zurich (UZH) sociologist has interviewed people on the move who feel at home in many different countries. The study explored how this nomadic way of life affects people's identity, and their attitudes foreignness and home. Being cosmopolitan takes various forms: moral, cultural, and political. Some transnational mobiles display great interest in other cultures, or stress their belief that all people are equal; others develop a global political perspective,





while still feeling they belong to a particular nation. While crossing borders broadens people's horizons and provides varied experiences, it may also bring uncertainty and insecurity.

<http://swissinnovation.org/news/web/2015/10-150708-97>

### 100 Psychological Mind Traps Resulting from Our Heuristics Failing

(University of Zurich, July 14, 2015)

Since the world is far too complex to understand in all its details humans have evolved to use heuristics to reach conclusions and make decisions. This works fine in most cases but every once in a while these shortcuts fail, resulting in wrong conclusions. Some of these mind traps concern stereotyping, be it with respect to genders or political ideologies, others arise in situations that at first glance seem straightforward like eating habits in cafeterias. Marie Hennecke and Jana Nikitin, psychologists from the University of Zurich, have published a book collecting 100 psychological mind traps resulting from failures in our heuristics. The book is an effort to bring together recent research results from developmental psychology in an accessible way.



<http://swissinnovation.org/news/web/2015/10-150714-70>

### Unemployment Penalizes Seniors, but Social Networks may Compensate

(UNIL, July 15, 2015)

Two theses completed at the University of Lausanne as part of a LIVES project provide interesting insights into the Swiss labor market. The first, "Labor market experience and well-being after firm closure: Survey evidence on displaced manufacturing workers in Switzerland", by Isabel Baumann shows that people aged over 55 have fewer job prospects than young people, and are less likely to find employment after losing it, which has a negative impact on well-being and sociability. The second, "Social networks: a rehabilitation tool for disadvantaged unemployed", by Nicolas Turtschi reveals the impact of social networks on prospects for professional reinsertion. While personal relationships help decrease the age handicap, they cannot limit the impact of other types of inequality. Better support and training are recommended to improve seniors' reinsertion.

<http://swissinnovation.org/news/web/2015/10-150715-88>

### New Patterns of Historical Interpretation for the Period between 1980 and 2010

(ETH Zurich, July 15, 2015)

The decades between 1980 and 2010 were an elusive time of change. Sociologists, political scientists and historians have attempted to describe it in different ways. Their interpretations include the "End of History" (Fukuyama), "Clash of Civilizations" (Huntington) and "Age of Fracture" (Rodgers). More than 50 historians travelled to Monte Verità in Ascona, at the end of June. It was here that they tried to make it easier to explore the recent past from a historical-scientific point of view. "The Good Years! An International Conference on Recent History 1980-2010" is the title of the conference. David Gugerli, Jakob Tanner, Monika Dommann, Gisela Hürlimann, Magaly Tornay and Roman Wild prepared and organised the conference.

<http://swissinnovation.org/news/web/2015/10-150715-78>

## 11. Technology Transfer / IPR / Patents

### Business Clusters are best to Share Knowledge

(ETH Zurich, July 22, 2015)

A study conducted by the Chair of Strategic Management and Innovation at ETH Zurich found that the best way to keep up with the competition is sharing knowledge within a business cluster. Von Krogh, Professor for Strategic Management and Innovation at ETH Zurich, said, 'Expertise from a limited field of knowledge is often insufficient to develop a new product in technology-intensive sectors. A business cluster facilitates rapid and direct knowledge exchange.' Nina Geilinger, a PhD student at ETH Zurich, acknowledged, 'In Canton of Zurich, universities and firms are also in close proximity, and the business clusters are well connected to the academic world.'

<http://swissinnovation.org/news/web/2015/11-150722-fe>

### Interview with Fritz Schiesser, President of the ETH Board

(Handelszeitung, July 24, 2015)

"If you believe the construction of an innovation park leads straightforward to innovation, you are mistaken", Fritz Schiesser, President of the ETH Board since 2008, said in an interview with the weekly newspaper Handelszeitung. The government can only create the right





boundary conditions to enhance creativity and innovation. Good examples are the Technopark in Zurich and the Parc de l'innovation in Lausanne, acknowledged Schiesser. Switzerland is well on track: The absolute number of ETH spin offs last year was higher than the one of MIT.

<http://swissinnovation.org/news/web/2015/11-150724-4d>

## 12. Calls for Grants/Awards

### Call: Seed money projects with selected Asian countries

(ETH Zurich, July 31, 2015)

Mandated by the Swiss State Secretariat for Education, Research and Innovation (SERI), ETH Zurich is in charge of exploring and promoting scientific cooperation with key institutions in the Asia-Pacific region. This call offers seed money projects with scientific partner institutions of the following Asian countries: Afghanistan, Bangladesh, Bhutan, Cambodia, Indonesia, Laos, Malaysia, Mongolia, Myanmar, Nepal, North Korea, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Timor-Leste, Vietnam Available Instruments Seed Funding for initiating larger joint activities. *Submission deadline is September 11, 2015.*

<http://swissinnovation.org/newsUS/web/2015/13-150731-f7>

### Call for Proposals: Tech4Dev 2016 -- From Innovation to Social Impact

(EPFL, July 29, 2015)

Tech4Dev 2016 is a unique international Conference for researchers and students, entrepreneurs and innovators, field practitioners, policy makers, and private sector professionals. Attendees will learn and share ideas across disciplines and fields of technology to promote the development of innovative and cost effective solutions for the Global South. In harnessing cutting edge research and connecting knowledgeable professionals, Tech4Dev 2016 offers a critical platform to energize science and technology solutions for development. *Submission deadline is September 11, 2015*

<http://swissinnovation.org/news/web/2015/13-150729-44>

### 3rd Call: Application for 'EPFL Fellows' postdoctoral fellowships

(EPFL, July 31, 2015)

EPFL Fellows is a Marie Skłodowska-Curie COFUND project (under Horizon 2020). The programme aims to attract talented postdoctoral researchers from all over the world to the EPFL and to provide them with excellent conditions for research at our School, to develop their leadership potential and to position them for future success as research leaders. *Submission deadline is October 1, 2015.*

<http://swissinnovation.org/newsUS/web/2015/13-150731-14>

### Call: ERC Starting Grants

(European Commission, July 29, 2015)

ERC Starting Grants are designed to support excellent Principal Investigators at the career stage at which they are starting their own independent research team or programme. Applicant Principal Investigators must demonstrate the ground-breaking nature, ambition and feasibility of their scientific proposal. Starting Grants may be awarded up to a maximum of EUR 1'500'000 for a period of 5 years. *Submission deadline is November 17, 2015.*

<http://swissinnovation.org/news/web/2015/13-150729-3e>



## Upcoming Science and Technology Related Events

### Swiss-US Energy Innovation Days 2015

August 19-21, 2015

<http://bit.ly/1fab9to>

Energy

Zurich

### ScienceComm'15

September 24-25, 2015

<http://www.sciencecomm.ch/index.php/en/sciencecomm-15>

Life Science

Solothurn

### 2015 NTN Swiss Biotech Innovation Day

August 19, 2015

<http://www.swissbiotech.org/events#event:1261>

Biotech

Zug

### 15th Annual Biotech in Europe Forum

September 29-30, 2015

<http://www.sachsforum.com/basel15/index.html>

Biotech

Basel

### Industry Day 2015

August 25, 2015

<https://goo.gl/XkOCWX>

Engineering, Biotech, Medicine

Zürich

### Swiss Biotech Fall Day 2015

October 15, 2015

<http://goo.gl/ryKKMp>

Biotech

Monthey

### 9th European Congress on Tropical Medicine & Intl. Health

September 6-10, 2015

<http://www.ectmihbasel2015.ch/ectmih2015/home.html>

Biotech

Basel

### World Resources Forum 2015

October 11 -14, 2015

<http://www.wrforum.org/>

Innovation, business and finance

Davos

### Changing Paradigms in Drug Development: Product Strategy

September 15, 2015

<http://goo.gl/OOBqIE>

Biotech

Bern

### Changing Paradigms in Drug Development: Company Strategy

November 17, 2015

<http://goo.gl/qjohkC>

Biotech

Bern

### International Dual Career Network

#### IDCN Event at Zurich Insurance

September 17, 2015

<http://goo.gl/jlci6o>

Business and Academia

Zurich

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