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Science-Switzerland, February-March 2018

News on Swiss science, technology, education and innovation

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1. Policy

Swiss President Berset in South Korea for Bilateral Talks

(admin.ch, February 08, 2018)

In February President Alain Berset was received by President Moon Jae-in in Seoul. Both sides commended the excellent relations between the two countries. Contacts in the field of science are particularly important as South Korea is one of Switzerland's eight priority countries. Mr. Berset reiterated Switzerland's interest in updating the free trade agreement between the EFTA states and South Korea which has now been in place for twelve years. The two delegations also discussed the security situation on the Korean peninsula. Mr. Berset stated that Switzerland very much welcomed the resumption of dialogue between North and South Korea and hoped that the talks would continue beyond the Olympic Games. At an event at the Swiss-Korean Innovation Week, Mr. Berset and the South Korean health minister, Park Neunghoo, discussed how costs in healthcare could be reduced through innovation.
http://swissinnovation.org/news/web/2018/01-180208-68

Science and Technology Cooperation Strengthened Between Switzerland and Japan

(admin.ch, March 05, 2018)

Eleven years after the signing of the agreement on scientific and technological cooperation between Switzerland and Japan the balance is extremely positive: the efforts undertaken and the funding instruments made available have resulted in a significant strengthening and facilitation of cooperation. At the fourth meeting of the joint committee for scientific and technological cooperation in Tokyo, the already well-established direct cooperation between the various research funding agencies was strengthened: the Swiss SNSF and its Japanese counterpart signed a Memorandum of Cooperation intended to further extend and facilitate their direct cooperation. The ground was also prepared for launching the research projects funded by the SNSF and the Japan Science and Technology Agency in the framework of a joint project call. The members of the Swiss delegation were also able to sound out further possibilities for cooperation.
http://swissinnovation.org/news/web/2018/01-180305-34

Switzerland and Afghanistan Collaborate on Development Cooperation and Humanitarian Aid

(admin.ch, March 06, 2018)

The Swiss Ambassador and Afghanistan's Minister of Finance signed a framework agreement on technical and financial cooperation and humanitarian aid. This enhances the legal basis for cooperation between the two countries. The Swiss Agency for Development and Cooperation (SDC) programme in Afghanistan is fighting the causes of fragility and crises and working to reduce the negative consequences, particularly for women and vulnerable population groups. Moreover, the SDC's programmes contribute to building trust in Afghanistan's state institutions such as the police and the judicial system. Switzerland works on the ground in close cooperation with local authorities, other donor countries and international organizations.
http://swissinnovation.org/news/web/2018/01-180306-01

European Funding Initiative ECSEL

(admin.ch, March 09, 2018)

The Joint Technology Initiative Electronic Components and Systems for European Leadership (JTI ECSEL) is a European funding initiative. It supports transboundary research and development projects in digitalization, developing marketable products in the fields of micro- and nanoelectronics, system integration and intelligent systems. The project costs are met by both the EU and Switzerland. In signing the agreement to participate in this European funding initiative, Switzerland commits to contribute project funding according to the ECSEL programme statutes drawn up jointly with the other participating states. To this end, it must provide a funding budget for the Swiss project partners. The 2018 ECSEL call for projects is open to Swiss applicants.
http://swissinnovation.org/news/web/2018/01-180309-65

Participation in the UN Commission on Narcotic Drugs

(admin.ch, March 14, 2018)

Switzerland was re-elected to the United Nations Commission on Narcotic Drugs for another four-year term. The commission sets out recommendations on drug policy for UN member states, steers the programs of the United Nations Office on Drugs and Crime, and decides about the control and classification for narcotic drugs, psychotropic substances and precursors. Switzerland is presenting a resolution promoting the full implementation of the online platform I2ES (International Import Export Authorization System). The I2ES system allows states to issue import and export authorizations for the legal trade in narcotic drugs and psychotropic substances, to electronically exchange this information between trading countries in real time, and to rapidly verify the legitimacy of a transaction in relation to international drug control conventions. This enables the global trade in controlled substances to be monitored more effectively and helps to prevent their diversion.
http://swissinnovation.org/news/web/2018/01-180314-06

Environmental Aspects in Financial Market Policy

(admin.ch, March 16, 2018)

The State Secretariat for International Financial Matters and the Federal Office for the Environment regularly exchange views with the industry on the progress of incorporating sustainability criteria into financing and investment decisions. A recent meeting clearly showed the financial sector is willing to move forward in this area. The focus is on the recommendations of the industry-led Task Force on Climate-related Financial Disclosures (TCFD) on the voluntary disclosure of climate-related risks and opportunities. 79 pension funds and insurance companies, covering around two thirds of the total market in terms of assets under management, accepted the invitation to have their portfolios tested for climate compatibility. The tests showed that today's investments support global warming of 4-6 degrees Celsius, while the Paris Convention on Climate Change wants to limit global warming to well below 2 degrees Celsius.
http://swissinnovation.org/news/web/2018/01-180316-15

2. Education

Gifted High School Students to Experience University Life

(UZH, February 01, 2018)

In the Fall Semester of 2018, the University of Zurich will launch a two-year pilot project enabling talented high school students to study at the University. For one to four semesters, school students in the final two years of high school in the Canton of Zurich can attend selected course modules from the Faculty of Science, the Faculty of Law, the Faculty of Theology, and the Faculty of Arts and Social Sciences. The students will thus have the opportunity to find out where their interests lie, deepen their subject knowledge, or branch out into new areas to help them choose their future paths and prepare them for the world of academia. Similar programs at the universities of Basel, Bern and Lucerne have proved successful.
http://swissinnovation.org/news/web/2018/02-180201-5a

Inequality of the Swiss Educational System

(UZH, March 01, 2018)

In Switzerland, the number of young people from families with a lower level of education managing to get a university degree is pretty low. According to sociologists, the Swiss school system is problematic from both the parents' and the teachers' point of view. Parents want their children to maintain the same standard of living that they themselves reached. As for the teachers, they often unconsciously give less generous grades to children from families with lower levels of education. According to the experts, the focus of the educational

system should be placed more on learning processes and less on selection. The system could be modeled on the school system in Scandinavia, where school pathways do not diverge until after nine years of schooling.
http://swissinnovation.org/news/web/2018/02-180301-77

Teachers Struggle to Understand Pupils' Comprehension of Intuitive Problems

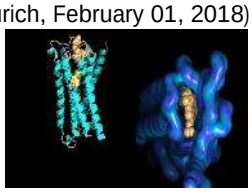
(UNIGE, March 06, 2018)

When a task calls for intuitive knowledge – as in "subtracting means taking something away" – its complexity often goes unnoticed. However, when intuitions are not mobilized – having to grasp, for instance, that subtracting means "finding the difference" – the task is considered difficult, and seemingly requires the use of specific educational strategies. Researchers at the University of Geneva have demonstrated that teachers sometimes struggle to understand the difficulties encountered by pupils when attempting to solve apparently intuitive problems that are in fact very difficult. The findings suggest teachers only use their pedagogical skills when a problem seems to mobilize counter-intuitive strategies. The results stress the importance of training teachers to avoid the pitfalls of intuition so that the seemingly obvious does not get in the way of understanding the difficulties faced by students.
http://swissinnovation.org/news/web/2018/02-180306-08

3. Life Sciences / Health Care

1,400 Unknown Molecular Interactions

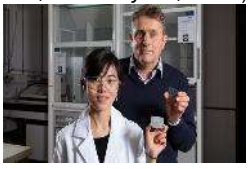
(ETH Zurich, February 01, 2018)



Compared to what was known about interactions between proteins, knowledge about interactions between proteins and small metabolic molecules, so-called metabolites, was very limited until recently. By studying how metabolites alter a protein's original structure, a team from ETH has now discovered 1,400 previously unknown protein-metabolite interactions. The results, published in the journal Cell, suggest that a cell can regulate its protein activity in two different ways. Either the cell actually changes its protein concentrations, or it (de)-activates the existing protein via metabolite binding – the second method often being the quicker and more efficient one. The team around lead author Paola Picotti is convinced that the technique will help identify new regulatory mechanisms and metabolic reactions in the cell. It can also be used for drug testing, an application already carried out by ETH spin-off Biognosys, which is the only company currently holding a license.
http://swissinnovation.org/news/web/2018/03-180201-6c

Electrochemistry Flushes Out Antibiotic-Resistant Proteins

(EPFL, February 01, 2018)



EPFL scientists and their colleagues in Shanghai set out to develop a new method to detect antibiotic resistance that is capable of identifying larger proteins. They used steel plates that had been imprinted with titanium dioxide nanoparticles. "Titanium dioxide is a white powder that absorbs light. When hit with UV rays, the powder triggers an electrochemical reaction that enhances the laser's effects by literally exploding open the bacteria membranes," says Hubert Girault, head of LEPA. This method opens up the bacteria much more than existing ones, releasing an array of biological molecules including protein, DNA, RNA, and lipids. Horst Pick, a biologist who helped develop the method, says: "We also found that we could use the same mass spectrometry technique to analyze all the other types of molecules released and obtain the bacteria's 'fingerprint.' That can help doctors identify the specific type of bacteria."
http://swissinnovation.org/news/web/2018/03-180201-f0

Reciprocal Trading Observed in Norwegian Rats

(UNIBE, February 01, 2018)

Humans cooperate with each other on a daily basis and on different scales, e.g. by opening doors for others, playing symphonies, or building space shuttles. Although a high level of cooperation is considered cognitively demanding and a human core competence, cooperation is not uniquely human. Many animals help each other too – like bees managing their hive. Researchers at the University of Bern have demonstrated for the first time that non-human animals also exchange different commodities. Norwegian rats were observed exchanging different kinds of favor, following the decision rules of direct reciprocity, or "tit for tat", even when paying with different currencies – like grooming or food provisioning. Reciprocal trading is thus more widespread than assumed, and not limited to large-brained species with advanced cognitive abilities.
http://swissinnovation.org/news/web/2018/03-180201-81

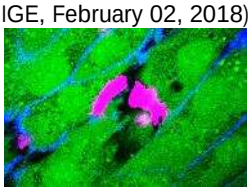
Award-Winning Swiss Medical Research

(UZH, February 01, 2018)

This year's winners of the prestigious Pfizer Research Awards, worth a total of CHF 165,000, include seven researchers from the University of Zurich and its hospitals. Eighteen researchers were chosen by The Pfizer Research Award Foundation for their excellent scientific work at Swiss research institutions or hospitals. Their research projects cover: how vessels develop in the brain – useful for research into diseases such as brain tumors, vascular malformations, and strokes; softening traumatic memories – showing that doxycycline may be suitable for treating post-traumatic stress disorder; improving cancer therapy –to treat metastasizing tumors of the skin and kidney; new form of chemotherapy – to treat acute lymphoblastic leukemia (ALL); varying risk of allergies – to gain insights into the development of atopic dermatitis in children.
http://swissinnovation.org/news/web/2018/03-180201-f1

Combining Therapies to Cut Off Tumor Supplies

(UNIGE, February 02, 2018)



For tumors to grow, they need to develop blood vessels that supply nutrients and oxygen. Preventing tumor vascularization has therefore been explored as a promising anti-tumor therapy over the last decade. The challenge now is to improve the therapy's effectiveness. Researchers at the University of Geneva have identified two key cytokines (TNF-alpha and VEGF) – enabling the recruitment of blood cells essential for forming new blood vessels – and deciphered how they interact simultaneously with blood vessels. The study highlights the need to target the right cytokines at the right time, and use the mechanisms discovered, to define new lines of anticancer treatment. The findings, published in Nature Communications, suggest that combining existing drugs or drugs under development, instead of using them separately, could significantly increase their efficacy.
http://swissinnovation.org/news/web/2018/03-180202-82

Bio-Engineered Viruses to Fight Bacteria

(ETH Zurich, February 05, 2018)

Bacteriophages are viruses that can attack and kill specific bacteria. They occur everywhere in the natural world. Precisely because they are matched to just one specific type of bacteria, researchers and medics hope that phages can be engineered to combat certain bacterial infections. By using synthetic biology methods and other methods, ETH researchers have now developed a technology platform that allows them to systematically modify and customize bacteriophages. It allows the scientists to create almost any bacteriophages for different purposes, with a great variety of functions. "In the past we had to screen millions

of phages and select those with the desired characteristics. Now we are able to create these viruses from scratch," says Martin Loessner from ETH. The researchers have now applied for a patent.
http://swissinnovation.org/news/web/2018/03-180205-d4

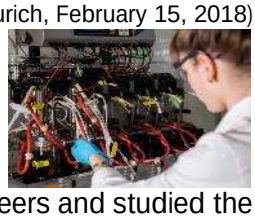
3D Structure of the Enzyme that Attaches Sugar Chains to Proteins Determined

(ETH Zurich, February 08, 2018)

ETH researchers determined the three-dimensional structure of oligosaccharyltransferase (OST), which is the enzyme that connects proteins to sugar trees, in yeast. To start with they modified the yeast cells so that the enzyme could be targeted and purified. They had to extract the enzyme from large quantities of these yeast cells and then purify it. The OST molecules were applied to a small grid, flash-frozen as individual, separate particles and imaged using a high-resolution cryo-electron microscope. From the thousands of images made, the researchers generated the three-dimensional structure of OST. The result was an electron density map which shows the enzyme as an “electron cloud”. To interpret the electron microscopy data, the researchers had to fit the amino acid sequence of OST “manually” into the small clouds. Thus, they were able to depict the 3D structure of OST in full detail.
http://swissinnovation.org/news/web/2018/03-180208-3c

Healing Intestinal Diseases with a Bacterial Mix

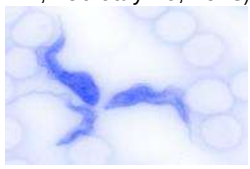
(ETH Zurich, February 15, 2018)



When the bacterial ecosystem in the intestine is out of balance, there often is no other remedy than a faecal microbiota transplant. Due to the risks of this procedure, researchers from the ETH spin-off PharmaBiome have set out to develop a bacterial mix consisting of less than a dozen bacterial strains that represent a basic framework of this ecosystem. The mix may one day help people whose intestinal ecosystem is imbalanced and causes disease. They isolated bacteria from stool samples taken from healthy volunteers and studied the conditions under which they can be cultivated and which individual biochemical roles they play in the intestinal network. They also succeeded in cultivating strains that could not previously be cultivated.
http://swissinnovation.org/news/web/2018/03-180215-28

New Weakness in the Sleeping Sickness Pathogen

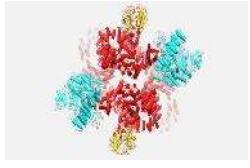
(UNIBE, February 16, 2018)



Trypanosomes can cause devastating diseases in people: the sleeping sickness in Africa, Chagas disease in South America and recently also in Europe. There are still no suitable therapies for these diseases. Researchers led by Prof. Torsten Ochsenreiter at the University of Bern have studied the mitochondria, the "power plants" of single-cell trypanosomes. They observed the distribution of the mitochondrial genome during cell division. "We succeeded in describing in detail the machinery required for mitochondrial genome distribution during cell division in trypanosomes", Ochsenreiter says. The cell initiates the construction after which every component is added one by one to the machinery. Differently from previously investigated organisms, trypanosomes appear to have developed most modules exclusively for their function in the mitochondrial genome distribution machinery. The discovered mechanism potentially opens new avenues for drug interventions.
http://swissinnovation.org/news/web/2018/03-180216-ca

First Ever 3D Image of mTORC2

(UNIBAS, February 20, 2018)



The protein complex mTORC2 controls cellular lipid and carbohydrate metabolism. It stimulates, for example, the production of lipids and fatty acids, but it also controls carbohydrate metabolism. In the past, studies have shown that mTORC2 promotes tumor growth due to increased lipid production and that it is involved in the development of diabetes. Researchers from the Biozentrum of the University of Basel and the ETH

Zurich have now succeeded in deciphering the 3D structure of this important protein complex. Using Nobel prize-winning cryo-electron microscopy, the scientists led by Prof. Timm Maier and Prof. Michael Hall from the Biozentrum of the University of Basel as well as Prof. Nenad Ban, ETH Zurich, have been able to visualize the three-dimensional structure of the mTORC2 protein complex in its assembled state.
http://swissinnovation.org/news/web/2018/03-180220-34

Protein Self-Replication

(ETH Zurich, February 22, 2018)

Recently researchers discovered that amyloids appear as structural and functional building blocks in a wide range of life forms, from bacteria, yeast and fungi to humans. Composed of short peptides, amyloid fibres can accelerate chemical reactions in a similar way to enzymes; they have thus been viewed as candidates for the first precursor molecules of life. Until now, however, an important chemical property was lacking in the theory of amyloids role in abiogenesis: self-replication. Early proponents of the amyloid hypothesis include ETH Professor Roland Riek and his senior assistant Jason Greenwald. They have now been able to show that amyloids can serve as a chemical template for the synthesis of short peptides. The critical point: "This ability also potentially applies to the amyloid itself – meaning the molecules can self-replicate," says Riek.
http://swissinnovation.org/news/web/2018/03-180222-87

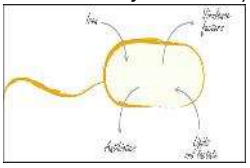
Advantages and Acceptability of Antidepressants

(UNIBE, February 22, 2018)

There is a debate regarding the effectiveness and potential differences of pharmacological interventions for treating major depressive disorder. Researchers from the Universities of Bern, Oxford and Kyoto identified and synthesized data from 522 trials published between 1979 and 2016 involving in total 116,477 participants. Using network meta-analysis, they compared the efficacy and acceptability of 21 commonly used antidepressants for major depression among adults. Their results suggest all 21 antidepressants are more efficacious than placebo. There were small but clinically important differences in efficacy and acceptability. While certain drugs showed comparatively favorable balance in terms of overall response to treatment and dropout rate, others were less so. The researchers hope the evidence from this large synthesis of studies will guideline developers forming relevant recommendations and mental health professionals and their patients making informed treatment decisions.
http://swissinnovation.org/news/web/2018/03-180222-83

Bacterium that Attacks Burn Victims Will soon be Unarmed

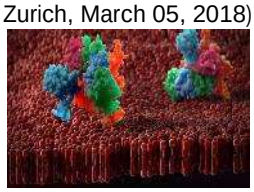
(UNIGE, February 27, 2018)



The bacterium Pseudomonas aeruginosa is one of the main causes of infections and sepsis in people suffering from severe burns because it is difficult, if not impossible, to fight. Researchers at the University of Geneva (UNIGE) have succeeded in revealing the dynamics of the pathogen's physiology and metabolism during its growth in exudates, the biological fluids that seep out of burn wounds. Their results provide crucial elements for the development of new therapeutic approaches. "Since the availability of iron is a limiting factor for bacterial growth, a Trojan horse type strategy should be considered, which is under development. This consists in binding certain antibiotics to siderophores so that the bacterium imports them in large quantities, together with soluble iron", explains Manuel Gonzalez.
http://swissinnovation.org/news/web/2018/03-180227-1d

New Tool for the Crystallization of Proteins

(ETH Zurich, March 05, 2018)



ETH researchers developed a new method of crystallizing large membrane proteins to determine their structure. The foundation laid in a method in which the proteins are isolated and concentrated using stable water-lipid mixtures known as lipidic mesophases. In such mesophases, a self-assembly process leads to a three-dimensional network of bent water channels with walls made up of lipids. These channels typically have a diameter of 3-4 nanometres. In these channels, the membrane proteins embed themselves into the walls using the hydrophobic part. The rest of the protein ends up in the channel's interior, and the proteins can then start to crystallize. Because the channels offered little space, large proteins were crushed out. The researchers now expanded the channels by mixing a small proportion of electrically charged lipids in with the lipids. These repel one another and thus inflate the channels, increasing their diameter to 20 nanometres.
http://swissinnovation.org/news/web/2018/03-180305-a3

Circadian Clock Controls Mitochondrial Energy Supply

(UNIBAS, March 06, 2018)

Until now, it was unclear how exactly the 24-hour circadian rhythm regulated energy metabolism. Researchers at University of Basel have now investigated exactly how the mitochondrial network interacts with our internal biological clock by using a combination of in vitro models and clock-deficient mice or mice with impaired mitochondrial fission. Their results show that the mitochondrial fission-fusion cycle is controlled by the fission protein Drp1, which is in turn synchronized by an internal biological clock. This rhythm is integral to determining when and how much energy the mitochondria can supply. They also showed that the mitochondrial network loses its rhythm if the circadian clock is impaired, which causes a decline in energy production in the cells. These findings could play a role in the development of new therapeutic approaches; for example Alzheimer's disease.
http://swissinnovation.org/news/web/2018/03-180306-a9

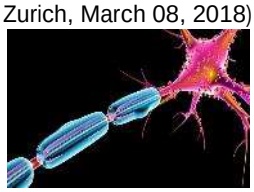
Many Small Factors Play a Role in Why Certain Drugs Affect People Differently

(ETH Zurich, March 06, 2018)

Researchers at ETH Zurich investigate the variable effects of drugs. They analyzed cholesterol regulation in four different human cell lines and tested how the cells responded differently to various drugs that affect cholesterol levels. It turned out that each of the cell lines responded differently. "Contrary to what one might expect, the differences were not due to one cell line simply taking up more of a pharmaceutical substance than another, or that one cell lacked a central regulation mechanism found in another cell," says Peter Blattmann. Instead, they showed that many enzymes and many of the complex biochemical pathways of a cell together contribute to the differences. "Our findings clearly show that simply measuring the amount of drug uptake is not sufficient to understand inter-individual differences in effectiveness, an approach that was typically taken in the past," says Blattmann.
http://swissinnovation.org/news/web/2018/03-180306-73

Fatty Acid Synthase in Schwann Cells

(ETH Zurich, March 08, 2018)



ETH researchers have revealed that Schwann cells in the peripheral nervous system largely produce their own fatty acids in order to create electrical insulation for nerve fibres. They synthesize around half of the lipids needed for building up the insulation from scratch and they obtain the other half of the lipids from food. Lipid synthesis relies on an enzyme whose absence leads to defective insulation and impaired motor function.

A large number of rare childhood diseases stem from mutations in genes that play an essential role in lipid synthesis. Based on the present findings, ETH researchers are aiming to gain a better understanding of how these kinds of diseases progress.
http://swissinnovation.org/news/web/2018/03-180308-a8

More Effective Retinal Implant Against Blindness

(EPFL, March 08, 2018)

Thirty-two million people around the world are blind. Between 2 and 4 million of them owe their condition to the loss of light-sensitive cells in their retinas. The most promising treatment for them is a retinal implant containing electrodes that electrically stimulate the retinal cells. “But current implants produce very poor results, and their wearers are still considered legally blind,” says Diego Ghezzi from EPFL. “In order to lead what is considered a ‘normal’ life, the implantee must recover a visual field of at least 40 degrees. Current implants achieve only 20 degrees." The researchers have come up with a pioneering, wireless implant made of a highly flexible and pliable material and containing photovoltaic pixels. It is expected to provide wearers with a visual field of 46 degrees along with much better resolution.
http://swissinnovation.org/news/web/2018/03-180308-ad

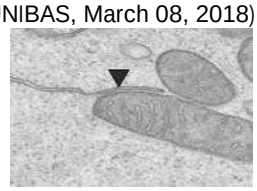
Mutation Leading to Overproduction of Red Blood Cells

(UNIBAS, March 08, 2018)

In patients suffering from erythrocytosis, the red blood cell mass (erythrocytes) is exceptionally high. The increased production of red blood cells is usually triggered by a genetic disorder in the bone marrow. Patients with erythrocytosis suffer from headaches and dizziness. Researchers from the Department of Biomedicine at the University of Basel and University Hospital Basel discovered, that a hereditary mutation is responsible for an increased production of erythropoietin (EPO) in the blood. This mutation causes a messenger RNA (mRNA) to be reprogrammed so that it produces EPO, thus abnormally increasing the number of red blood cells.
http://swissinnovation.org/news/web/2018/03-180308-31

How Immunologic Memory Works

(UNIBAS, March 08, 2018)



With every infection or vaccination, memory cells form that the body uses to remember the pathogen. This has been known for decades, but the structure of this cellular immunologic memory has previously proven impossible to pin down. An international research team, including researchers from the University of Basel and the University Hospital Basel have now found a structure that accounts for the rapid immunologic memory. Memory T cells concentrate all the signal transmission molecules and enzymes necessary for a rapid immune response between mitochondria and the endoplasmic reticulum, and so are prepared when the organism is exposed to the disease-causing pathogen.
http://swissinnovation.org/news/web/2018/03-180308-43

Prediction of Recovery from Spinal Cord Injuries

(UZH, March 08, 2018)

Injuries to the spinal cord result in tissue loss in the spinal cord and brain. An international team of researchers, headed by Patrick Freund from the Spinal Cord Injury Center of the University of Zurich and the Balgrist University Hospital, examined 15 patients who had suffered acute traumatic injuries to the spinal cord as well as 18 healthy study participants after 2, 6, 12, and 24 months. It emerged that there was a direct link between the recovery levels of patients after two years and the extent of neurodegenerative change within

the first six months after injury. “The smaller the overall loss of nerve tissue across the neuroaxis at the beginning, the better the patients’ long-term clinical recovery,” summarizes Patrick Freund.
http://swissinnovation.org/news/web/2018/03-180308-cf

CERN Isotope to Diagnose Cancer

(scnat, March 14, 2018)

The equipment in CERN that usually serves science can sometimes be used for practical purposes too. That's for example the case for the protons emerging from the Proton Synchrotron Booster (PSB): they are used in the large particle accelerator LHC for scientific experiments. The protons can also be used to produce isotopes that are useful in radiation medicine. Such isotopes are produced in the recently opened facility CERN-MEDICIS. The first and so far only radioisotope manufactured by CERN-MEDICIS is Terbium 155Tb. This isotope has recently been used by doctors to diagnose prostate cancer. "Before the isotopes in hospitals can be used for the benefit of patients, they have to come a long way, "says Stefano Marzari, a Swiss mechanical engineer who has been involved in the development of CERN-MEDICIS from the outset.
http://swissinnovation.org/news/web/2018/03-180314-40

New Understanding of Parasite Biology

(UNIBAS, March 15, 2018)

Malaria parasites multiply in the human blood, causing infections in a patient. During each multiplication, some parasites develop into so-called gametocytes, which are infectious to mosquitoes and therefore responsible for transmitting malaria to other humans. It is known that parasites respond to a molecule present in human blood. Under high concentrations, parasites multiply. When concentrations drop, as they do during infections, parasites convert into gametocytes to secure their transmission to the next host. Understanding how parasites switch to gametocyte production is central to develop efficient drugs. Researchers at the Swiss Tropical and Public Health Institute and the University of Basel have now identified a parasite protein that plays a crucial role in activating the gametocyte conversion. If the mechanism can be blocked or gametocytes can be eliminated altogether, this might be an important step towards fighting malaria transmission.
http://swissinnovation.org/news/web/2018/03-180315-ac

Mice Change Their Appearance as a Result of Frequent Exposure to Humans

(UZH, March 16, 2018)

Researchers led by Anna Lindholm have observed the domestication syndrome in wild mice. Within a decade, the investigated population developed two of the distinct phenotypic changes: white patches on their brown fur and shorter snouts. “The mice gradually lost their fear and developed signs of domestication. This happened without any human selection, solely as a result of being exposed to us regularly,” says Lindholm. It appears a group of stem cells in the early embryo is responsible for these changes. The ear’s cartilage, the teeth’s dentine, the melanocytes responsible for the skin’s pigmentation, and the adrenal glands which produce stress hormones are all derived from these stem cells. The selection of less timid or aggressive animals results in smaller, less active adrenal glands, leading to tamer animals. Changes in fur color and head size can thus be considered unintended side effects.
http://swissinnovation.org/news/web/2018/03-180316-e2

Protein Analysis for Personalized Medicine

(ETH Zurich, March 16, 2018)

Personalized medicine is promising treatments that are perfectly tailored to a patient. Since proteins often provide information about an organism’s health, analyzing the entire set of proteins and using data-driven technologies could soon make personalized medicine a reality. A professor at the Institute of Molecular Systems Biology at ETH,

Paola Picotti, plans to make use of this technology and develop biomarkers for the early detection and classification of Parkinson's disease. In a preliminary study, Picotti was able to detect defective proteins that cause the disease. In a next step, her team wants to look for correlations between structural changes in proteins and the appearance of symptoms, such as loss of cognitive functions. If the research is successful, it could enable doctors to predict how or whether a patient will respond to a certain treatment.
http://swissinnovation.org/news/web/2018/03-180316-e4

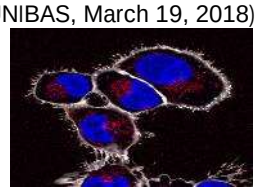
Paraplegic Rats Walk again after Therapy

(EPFL, March 19, 2018)

In EPFL scientist Grégoire Courtine's lab, rats with a contusion leading to complete paraplegia learn to walk again with the help of therapy that combines electrochemical stimulation of the spinal cord and robot-assisted rehabilitation. The rat's spinal cord is first stimulated with pharmaceuticals, then electrically stimulated below the injury to activate muscles in the legs. Combined with therapy in a smart harness that alleviates the body's weight providing natural walking conditions, and after a few weeks of training, the rats regain extensive control over their hindlimbs – at will – even without electrochemical stimulation or the harness. Comparing the brains of injured rats after rehabilitation with those of healthy ones, the scientists were able to identify a region in the brainstem, the reticular formation, as being key in leading to recovery.
http://swissinnovation.org/news/web/2018/03-180319-fb

Tiny Implants for Living Cells

(UNIBAS, March 19, 2018)



In the cells of higher organisms, organelles such as the nucleus or mitochondria perform many complex functions necessary for life. A group from the University of Basel has produced controllable artificial organelles, and has tried to integrate them into cells of living organisms for the first time. The artificial organelles consist of very small capsules that enclose various macromolecules such as enzymes, held together by a wall of chemically modified natural membrane proteins that control the passage of substances. To prove the functionality of the implants, the scientists used living cells of zebrafish embryos, since their transparent bodies allow for excellent tracking under a microscope. These implants could carry enzymes able to release a pharmaceutical ingredient on demand. Thus, administering drugs in this manner could reduce both the amounts used and the possible side effects.
http://swissinnovation.org/news/web/2018/03-180319-3e

LSD Blurs Boundaries and Affects Social Interaction

(UZH, March 19, 2018)

A study led by Katrin Preller and Franz Vollenweider in cooperation with the Max Planck Institute of Psychiatry, showed that LSD reduces the borders between the experience of our own self and others, and thereby affects social interactions. The researchers were also able to show that the LSD-induced changes were blocked by ketanserin indicating that the serotonin 2A receptor (5-HT2A receptor) plays a critical role in this mechanism. Varying impairments in self-experience and social interaction could be the result of an impaired transfer of information mediated by the 5-HT2A receptor system. Therefore, blocking this receptor in patients suffering from an incoherent sense (e.g. schizophrenia) could improve their symptoms as well as their social abilities. Stimulating it on the other hand could help patients who suffer from an increased self-focus (e.g. as is the case with depression).
http://swissinnovation.org/news/web/2018/03-180319-d9

Quest for Neuronal Origins

(UNIGE, March 21, 2018)

The cerebral cortex consists of a large diversity of neurons, each displaying specific characteristics in terms of molecular, morphological and functional features. Where are these neurons born? How do they develop their distinct properties? UNIGE researchers led by Alexandre Dayer have recently taken a step forward to answer these questions. They discovered a unique molecular factor allowing them to track, from birth to maturity, a homogeneous class of neurons called the neurogliaform cells. "Thanks to a genetically-modified mouse that makes the HMX3 lineage visible, we could uncover the origins of neurogliaform cells. We have suggested that this subtype of interneuron is defined by the expression of this transcription factor," explains Mathieu Niquille. "Not only this group of interneuron has its origins in a zone called the preoptic area, located far from the cerebral cortex, but it is specialized already at birth."
http://swissinnovation.org/news/web/2018/03-180321-ee

Combat Tuberculosis with Optimal Treatment

(UZH, March 22, 2018)

Tuberculosis can be cured if the relevant drugs are used correctly. But people often discontinue their treatment, because it is lengthy and comes with numerous side effects. In addition, the optimal dose has not yet been determined. Led by Jan Fehr, researchers at the University of Zurich and the University Hospital Zurich collaborated with researchers from a partner university in Kampala, Uganda, to tackle this problem. Over a 2.5 year period, they repeatedly measured the concentration of tuberculosis medication in the blood of 268 study patients and carried out tests to detect the pathogen in the sputum. Patients took their medication in accordance with the dosage guidelines of the WHO. The researchers demonstrated that the levels of medication used are often too low. Consequently, patients remained contagious with the dangerous disease for longer than necessary.
http://swissinnovation.org/news/web/2018/03-180322-55

Solid Salts Speed Up Development of Medication

(UZH, March 26, 2018)

A research group led by Bernhard Spingler from University of Zurich, has modified a method previously been used for the crystallization of proteins, and applied it to organic salts. The generation of solid salts of organic molecules is a key step in developing certain pharmaceutical ingredients. The positively and negatively charged particles making organic salts determine their properties, such as their solubility, crystal shape, ability to absorb water, melting point, and stability. The search for the ideal negatively charged anion to match the salt's positively charged cation has been a very resource-intensive process. Thanks to the semi-automatic combination of ion exchange screening and vapor diffusion for crystallization, this is now done quicker, at lower costs, and: "We can now also determine the structures of the salt combinations directly after screening, since doing so only requires only very small amounts," adds Spingler.
http://swissinnovation.org/news/web/2018/03-180326-88

Burned-Out Cancer Cells

(UZH, March 27, 2018)

A new approach to cancer therapy could be to create stress in all cells and having them perform at an even higher rate, which could send cancer cells over the edge and into a burnout, so to speak. Active ingredients would be of interest when they help the cancer circumvent further control and repair mechanisms. While healthy cells would be able to cope, it would finally throw cancer cells out of balance. For this to succeed, according to Matthias Altmeyer, researcher from University of Zurich, it would be necessary to precisely recognize the

precarious functioning of the cells' molecular-biological systems, and to know how close the cells are to the critical threshold: "We want to make sure that the dangerous cells go over the edge. It's the only way of knowing for sure that the therapy is actually combatting the cancer."
http://swissinnovation.org/news/web/2018/03-180327-b3

Screening Method that Speeds up the Search for Drugs

(ETH Zurich, March 28, 2018)

At the centre of a new screening method is a DNA-encoded chemical library containing 35 million different drug candidates. Each of them consists of a stable ring-shaped basic structure. Chemists from ETH Zurich attached three different small molecules to one side of each ring, forming a "fish hook". They then encoded the blueprint of the three molecules in three short DNA sequences, in which the DNA was chemically tied to the reverse of the basic structure. This worked like a barcode, helping to identify each hook. To find out if a target protein would be caught on the hooks, the researchers put the whole collection in a reaction vessel containing the protein on a carrier. Then they washed the chemical collection away. The drug candidates not binding to the protein were thereby removed; the ones sticking to the protein remained.
http://swissinnovation.org/news/web/2018/03-180328-20

How the Circadian Clock Regulates 3D Chromatin Structure

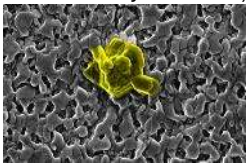
(EPFL, March 29, 2018)

EPFL biologists and geneticists have uncovered how the circadian clock orchestrates the 24-hour cycle of gene expression by regulating the structure of chromatin, the tightly wound DNA-protein complex of the cell. Their study found that promoter-enhancer interactions oscillate along the 24-hour cycle in the chromatin of healthy mice, as opposed to mice without a functioning circadian clock. The researchers inactivated a distal DNA enhancer element that contains instructions to transcribe Cryptochrome 1, which is a gene that produces a protein involved in maintaining the circadian rhythm itself. This small modification proved to be enough to disrupt the rhythmic chromatin looping in tissues, reduce the daily frequency of the gene's transcription, and even shorten the circadian period of locomotion in mice.
http://swissinnovation.org/news/web/2018/03-180329-bb

4. Nano / Micro Technology / Material Science

Study of Perovskite Formation

(EPFL, February 02, 2018)



Perovskite solar cells are a promising alternative to conventional silicon solar cells. One of the main methods for depositing perovskite films onto panel structures is a process known as sequential deposition. EPFL scientists have now systematically studied the path of the sequential deposition reaction used to build perovskite solar panels. The scientists began with X-ray diffraction analysis and scanning electron microscopy (SEM) to study in depth the crystallization of lead iodide (PbI2), which is the first stage of the reaction. They then used, for the first time, SEM-cathodoluminescence imaging to study the nano-scale dynamics of perovskite film formation. "Our findings finally answer several open questions regarding the location and role of residual PbI2 in perovskite solar cells," says Michael Grätzel from EPFL.
http://swissinnovation.org/news/web/2018/04-180202-4a

Properties of Nanolasers Revealed with Quantum Optics

(EPFL, March 02, 2018)

The laser was a pivotal invention in 1960, with applications ranging from telecommunications to eye surgery. Laser properties are still being investigated by scientists. Semiconductor-based nanolasers are a special type of laser – made from dielectric materials that can be engineered using techniques available in clean room facilities – that reach a size where the active volume responsible for light emission is about one cubic wavelength. Researchers from EPFL, the Technical University of Berlin and the University of Bremen have investigated nanolasers made from a gallium nitride semiconductor material and revealed their optical properties. This platform has many potential practical uses, ranging from photonic circuits to optogenetics. The study is published in Nature Communications.
http://swissinnovation.org/news/web/2018/04-180302-b8

A Treasure Trove of Nanomaterials

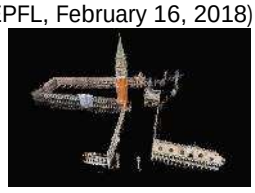
(EPFL, March 06, 2018)

The future of nanotechnology is often seen in two-dimensional materials, which consist of only a few layers of atoms. The first material of this kind was graphene, discovered in 2004. It has since paved the way for applications in fields like photovoltaics and optoelectronics. A team from EPFL and the NCCR MARVEL has now identified more than 1,000 materials that also have a particularly interesting 2D structure. In order to do so, they developed an algorithm to analyze the structure of more than 100,000 3D materials recorded in external databases. Focusing on materials with weak interactions between atoms of different layers, they created a publicly accessible database of more than 1,000 materials with particularly promising properties. According to NCCR MARVEL director Nicola Marzari, this digital way of experimenting shows that computer-assisted techniques can speed up the discoveries of new materials.
http://swissinnovation.org/news/web/2018/04-180306-6f

5. Information & Communications Technology

Venice Time Machine Project to Become a FET Flagship

(EPFL, February 16, 2018)



Frédéric Kaplan from EPFL is concerned that in the not-too-distant future, only information recorded in electronic form will be accessible – meaning information in all other formats will fall by the wayside. “We urgently need to bring our archives into the digital age. We mustn’t lose contact with the past.” Bringing the past into the digital age is exactly what the Venice Time Machine project sets out to do. It aims to build a multidimensional model of the city spanning the past millennium, using millions of historical documents stored in a variety of formats. The project is now reaching its halfway point in a year that will include two major steps forward: a drive to expand the project to cities across Europe, and the release of over two million documents that have already been digitized to historians and the general public.
http://swissinnovation.org/news/web/2018/05-180216-7e

Wireless Patch for Monitoring Emergency-Room Patients

(EPFL, March 09, 2018)

To make the right decisions, emergency-room doctors need to continuously monitor their patients’ vital signs. But existing monitoring systems rely on bulky sensors and an array of cables preventing patients from being able to move comfortably. Smartcardia, an EPFL spin-off, has developed a small patch that contains a fusion of wireless sensors on a single unit, thereby eliminating the need for cables to connect the data collection

devices with data storage and display equipment. An internet connection is all doctors need to be able to view and track patients' vital signs remotely and in real time, such as on a smartphone. The patch can be applied easily to patients' chests. It has been tested successfully on hundreds of patients at several hospitals and has proven to be just as reliable as existing systems.
http://swissinnovation.org/news/web/2018/05-180309-00

Success of Swiss Game Industry in San Francisco

(startupticker.ch, March 22, 2018)

The Game Developers Conference (GDC) in San Francisco held in March 2018 is the largest gaming industry show in the world. Several Swiss representatives provided good news during the fair: AnsharOnline was selected as one of three launch games for the OculusGo (virtual reality headset) and StrayFawnStudios won the pitch competition. In addition, MMOS, a platform combining games with scientific findings, received an award for serious games. Such successes show the strength of the Swiss game industry in international comparison and provide arguments for further promotion. The Swiss Game Development Association (SGDA) is pleased about the recognition of digital games as a cultural asset by the Federal Council. They also underline the "necessary formalized and sustainable promotion of the medium, which not only takes the cultural aspect into account, but also the profitability and innovative character of the industry."
http://swissinnovation.org/news/web/2018/05-180322-06

6. Energy / Environment

Continued Thinning of Ozone Layer

(ETH Zurich, February 06, 2018)

The ozone layer protects life on earth from high-energy radiation. In the 20th century, when excessive quantities of ozone-depleting CFCs were released into the atmosphere, the ozone layer in the stratosphere thinned out globally. After introducing a ban on these substances, the loss of stratospheric ozone seemed to have stopped and a recovery was expected. However, ETH researchers have now discovered that the vital ozone layer has continued to deplete in recent years over the densely populated mid-latitudes and tropics, while it is recovering at the poles. The researchers assume that these changes might be caused by either climate change or very short-lived substances (VSLSs). With the help of global climate models, the scientists now want to further investigate the causes behind the continuing lower stratospheric ozone decline.
http://swissinnovation.org/news/web/2018/06-180206-94

Real-Time Monitoring of Hydrology Infrastructure

(Eawag, February 08, 2018)

The hydrology infrastructure is one of Switzerland's largest civil engineering constructions. The system has been thought through, but times change: more surfaces are now sealed, climate change is resulting in new precipitation patterns, and knowledge about micropollution shows how important waterbody protection is. Since February 2016 the village Fehraltorf has become a field laboratory for the water in residential areas investigated by Eawag. Sensors in sewers, in sewage shafts, in brooks, in ground water and elsewhere measure rain, water levels and drainage. It is therefore possible to follow the processes nearly in real time. "With a better understanding of the precipitation and drainage processes, existing systems can be optimized before expensive excavations and laying of concrete becomes necessary. This helps the towns to make their water infrastructure more sustainable," says project leader Frank Blumensaat.
http://swissinnovation.org/news/web/2018/06-180208-18

Dispersal of Fish Eggs by Water Birds

(UNIBAS, February 19, 2018)

Many small lakes are found in remote, often mountainous areas with no inflow and outflow. Yet in most of these lakes, there are fish. But how do fish reach these lakes and ponds? This question was already addressed by some of the leading natural scientists of the 19th century such as Charles Darwin, Alfred Russel Wallace and Charles Lyell, who all came to the same conclusion: Their theory was that the fish eggs stick to water birds' feathers or feet; the birds then fly from one body of water to the next, where the fish hatch from their eggs. A systematic literature review carried out by scientists from the University of Basel has now shown that although the research community considers this to be a proven theory, no studies have been published to confirm it.
http://swissinnovation.org/news/web/2018/06-180219-88

Exploring the Efficiency of Plants

(ETH Zurich, March 06, 2018)

Plants convert sunlight into chemical energy with a high degree of efficiency. How they are able to do so is still not entirely clear. Several experiments have suggested that quantum physics plays an important role in energy conversion. Scientists assume that thanks to quantum effects the energy collected by chlorophyll molecules can be transferred without significant loss to the areas where the plants' energy blocks (the ATP) is formed. ETH physicists have constructed a quantum physical model that replicates basic structures of a plant cell. Their experiments show that the natural vibrations of the chlorophyll molecules play a key role during energy transfer. Depending on how rapidly the molecules move, energy is transported more or less efficiently. This new research can hopefully help to discover mechanisms that convert light into electricity more efficiently.
http://swissinnovation.org/news/web/2018/06-180306-9a

Understanding Why Rare Plants Are Rare

(UNIBE, March 06, 2018)

Rare plant species suffer more from disease than commoner species. The fact that rare species are more susceptible to attack by micro-organisms living in the soil, such as fungi and bacteria, may in fact be one of the reasons they are rare. Biologists have been trying to work out why some species are rare, while others are common, since Darwin's time and a new study from researchers at the University of Bern provides a possible answer. They have now shown that rare species, which occur in just a few places, are much more strongly harmed by soil organisms than common species.
http://swissinnovation.org/news/web/2018/06-180306-f6

Long-term Energy Storage for Power on Demand

(PSI, March 08, 2018)

If photovoltaic or wind power plants produce more electricity than the network can absorb, valuable energy is lost. To prevent this loss, PSI researchers at the Energy System Integration (ESI) Platform are investigating different ways to store electricity in times of surplus and make it usable again on demand. Their goal is to assess the potential of an industrial implementation of various techniques, known collectively as power-to-X methods. To enable longer-term storage of the energy contained in electric power, it must first be converted with a so-called electrolyser. There the surplus electricity is used to split water into hydrogen and oxygen. After these two gases have been purified, they are stored in tanks at the ESI Platform. Hence they can be stored for arbitrary lengths of time and put to use on demand.
http://swissinnovation.org/news/web/2018/06-180308-25

Solar Power from the Alps

(ZHAW, March 09, 2018)

Master students from ZHAW work on project that aims to increase the production of photovoltaic power in winter. The alpine photovoltaic test facility is located at 2'500 m above sea level in the area Davos-Parsenn. The 20 solar modules are arranged differently steeply and produce electricity since this winter. In addition to temperature, wind, humidity, solar radiation and various other parameters, the amount of electricity produced is precisely measured for each solar module and stored in a database. As a result, the potential for solar power from the Alps and the best construction for such alpine solar systems will be determined. The researchers were amazed when they saw that this alpine solar power system generates more electricity on a beautiful winter's day than on a beautiful summer day in the Central Plateau.
http://swissinnovation.org/news/web/2018/06-180309-da

Accurately Measuring Embodied Carbon in Buildings

(EPFL, March 12, 2018)

A reference text co-edited by Francesco Pomponi, Alice Moncaster and Catherine De Wolf, an EPFL researcher stresses the view of the Intergovernmental Panel on Climate Change, which is that the construction industry must eliminate its carbon footprint by 2050 to avoid a major crisis. Currently, at least 5% of anthropogenic greenhouse gas emissions come from cement production and 5% from steel production. But the way in which embodied carbon is calculated remains approximate, and data collection is a challenge. In theory, the calculation is done by applying a coefficient to the quantity of materials used in producing a building. In practice, however, the elements taken into account by the coefficient vary between regions of the world, because there are no standards and a lack of transparency on the part of certain industry participants.
http://swissinnovation.org/news/web/2018/06-180312-b4

Climate Change Drives Mountain Hares to Higher Altitudes

(UNIBE, March 13, 2018)

Species like the mountain hare, adapted to high altitudes, are particularly affected by climate change. If temperatures become too warm, it has limited options to move to cooler, higher elevations. The area of suitable mountain hare habitat in Switzerland is expected to shrink by an average of one third by the year 2100. This is the conclusion of a study by the University of Bern, the WSL, and the University of Natural Resources and Applied Life Sciences, Vienna (BOKU). The habitat will not only diminish in size, but also become more fragmented. Consequently, mountain hare populations will be less well interconnected, which may lead to genetic impoverishment. According to the study, overall numbers of mountain hares are expected to decline.
http://swissinnovation.org/news/web/2018/06-180313-59

Cleaner Diesel Emissions

(PSI, March 13, 2018)

The burning of fuel in diesel engines releases nitrogen oxides, which are harmful to humans. Therefore, the automobile industry has come up with a technique that reduces these emissions by up to 90 percent. Gaseous ammonia is added to the exhaust, and through catalyst it reacts with the nitrogen oxides to produce nitrogen and water, two harmless substances. However, this process does not work properly at temperatures below 200 degrees Celsius, which means that emissions remain high during the first few minutes of a trip. To find a solution to this, researchers at the Paul Scherrer Institute illuminated the catalyst material with highly concentrated X-rays and used a time-resolved spectroscopy to fully understand the process. They found that depending on the temperature different amounts of ammonia are required to achieve an optimal nitrogen oxide removal.
http://swissinnovation.org/news/web/2018/06-180313-d0

Global Warming Found to Increase Avalanche Risk

(UNIGE, March 14, 2018)

The impacts of global warming are felt especially in mountainous regions, where temperatures have risen above average. Changes have been observed on glacierized landscapes and water resources. The repercussions vary from retreating glaciers to an increase in the frequency and intensity of snow avalanches. Using dendrochronology – the reconstruction of past disasters as recorded in growth series of trees – researchers from the University of Geneva (UNIGE) have analyzed tree rings in the Indian Himalayas and discovered that avalanches have become bigger, travel greater distances and are triggered earlier in the year. A direct link has been confirmed between global warming and the growing frequency and intensity of avalanches. The study results are published in the Proceedings of the National Academic of Science (PNAS).
http://swissinnovation.org/news/web/2018/06-180314-6e

10th Anniversary of Global Seed Vault

(admin.ch, March 14, 2018)

Agroscope went to Svalbard to celebrate the tenth anniversary of the Global Plant Seed Vault, where over a million seed varieties from all around the world are stored in duplicate. Representatives of 23 gene banks, including Agroscope's, were welcomed by Norway's Minister of Agriculture. At the event, site upgrade works totaling EUR 11.5m ($14.2 mio.) were announced. Additionally, delivery was taken of 70,000 new samples in the warehouse which today houses more than a million varieties. Switzerland sent two crates containing 719 plant specimens. The samples contained seeds from ancient and new varieties of wheat, triticale (a hybrid of wheat and rye), oats, rye, barley and spelt, as well as two sage varieties and an Italian parsley. The latter three varieties are the first Swiss medicinal and aromatic plants to enrich the Svalbard store.
http://swissinnovation.org/news/web/2018/06-180314-e9

Removing Heavy Metals from Water

(EPFL, March 15, 2018)

A EPFL research team has in collaboration with researchers from the University of California Berkeley and the Lawrence Berkeley National Laboratory found a solution to remove heavy metals (including lead) from municipal drinking water using metal organic frameworks (MOFs), which are materials made up of metal nodes interlinked by organic chemical 'struts'. A PhD student has designed a water-stable MOF/polymer composite using cheap, environmentally and biologically friendly materials. He treated a MOF, known as Fe-BTC, with dopamine, which polymerized to polydopamine (PDA) pinning the polymer inside the MOF. The final composite, named Fe-BTC/PDA, can quickly and selectively remove high amounts of heavy metals from real-world water samples. In fact, it can remove over 1.6 times its own weight of mercury and 0.4 times of its weight of lead.
http://swissinnovation.org/news/web/2018/06-180315-a3

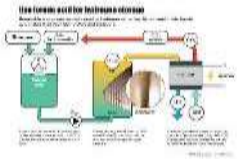
Vertical Solar Panels Compensate for Electricity Production

(ZHAW, March 15, 2018)

Conventional photovoltaic systems produce the most electricity at noon. In the morning, the performance increases continuously, in the course of the afternoon it decreases. Solarspar and ZHAW want to reverse this performance curve and create a balance in the electricity production. ZHAW researchers have created a possible solution, building a unique facility on a flat roof. The double-sided solar panels stand upright and their sides face east and west. "The performance curve of this plant is like a camel with two humps," says Baumgartner. "During the summer months we reach the first peak at eight o'clock in the morning, the second at about six o'clock in the evening." At noon, when the sun is steep and the electricity production at conventional solar systems is in full swing, the performance drops.
http://swissinnovation.org/news/web/2018/06-180315-92

The World's First Formic Acid-Based Fuel Cell

(EPFL, March 20, 2018)



Hydrogen is one of the most promising energy carriers when thinking of renewable energy storage solutions. But hydrogen is difficult to store and transport in its natural form (gas). One solution is a hydrogen carrier such as formic acid, which is the simplest combination of hydrogen and CO2. Researchers at EPFL and GRT Group have developed an integrated formic acid-hydrogen fuel cell device. The device used to extract the hydrogen from formic acid consists of two main parts, a hydrogen reformer (HYFORM) and a proton-exchange membrane fuel cell (PEMFC). This unit can produce 7000 kWh yearly, and its nominal power is 800 Watts. Its electrical efficiency is currently up to 45%. The HYFORM-PEMFC is also low-maintenance and features stable and long-term catalyst performance. It can be used in households and industry and does not require connection to power grids.
http://swissinnovation.org/news/web/2018/06-180320-9f

7. Engineering / Robotics / Space

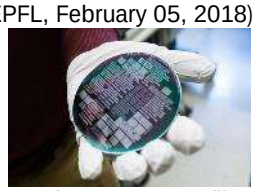
Standard Model of Cosmology Questioned by Rotating System of Satellite Galaxies

(UNIBAS, February 01, 2018)

Like other large galaxies, our Milky Way is surrounded by smaller galaxies that orbit it as satellites. According to the standard model of cosmology that describes the formation of galaxies and assumes the existence of dark matter, these satellite galaxies should be distributed randomly and should orbit the host galaxy in an unordered way. Researchers at University of Basel were now able to show that 14 of the 16 satellite galaxies of Centaurus A, a galaxy around 13 million light years away, follow the same pattern of movement and are likely rotating within the plane around the main galaxy. According to model simulations with dark matter, however, only half a percent of satellite systems in the local universe at most should behave this way.
http://swissinnovation.org/news/web/2018/07-180201-17

Revolutionary Material for Aerospace and Neuromorphic Computing

(EPFL, February 05, 2018)



First came the switch. Then the transistor. Now another innovation stands to revolutionize the way we control the flow of electrons through a circuit: vanadium dioxide (VO2). A key characteristic of this compound is that it behaves as an insulator at room temperature but as a conductor at temperatures above 68°C. EPFL researchers have now shown how this compound can be used to create programmable radiofrequency electronic functions for aerospace communication systems. They found that adding germanium to VO2 film can lift the material's phase change temperature to over 100°C and so make it usable for many different applications. These promising discoveries are likely to spur further research into applications for VO2 in ultra-low-power electronic devices.
http://swissinnovation.org/news/web/2018/07-180205-2f

Exoplanet TRAPPIST-1 Similar to the Earth

(UNIBE, February 05, 2018)

Of the known exoplanets, TRAPPIST-1e is so far the one that is most similar to the Earth in terms of its size, density, and the amount of radiation it receives from its star. It is the only one of the seven TRAPPIST-1 planets that is denser than the Earth, and it is not ruled out that liquid water exists on its surface. At least five of the lighter planets have a covering of volatile substances in the form of atmospheres, oceans or layers of ice. Their water content is up to 5 percent, which is a lot when compared to the Earth (seas account for only 0.02% of

the planet's mass). These are new findings from an international research team of the Centre for Space and Habitability (CSH) of the University of Bern and the National Centre of Competence in Research PlanetS.
http://swissinnovation.org/news/web/2018/07-180205-71

Camera for 2020 Mars Rover

(UNIBAS, March 07, 2018)

In 2020, the European Space Agency (ESA) is sending a rover into space to examine the surface of Mars for signs of life. Its on-board equipment includes a high-resolution camera developed in Switzerland, and researchers from the University of Basel are currently testing the camera's operation in an artificial Martian landscape. The aim of the joint European/Russian mission ExoMars is to search for possible signs of present or past life on Mars. The rover's on-board equipment will include the Close-Up Imager (CLUPI), a camera for taking high-resolution close-up shots in color. Before the camera sets off on its nine-month journey to Mars in 2020, it is undergoing intensive testing and optimization work. CLUPI was funded by the Swiss Space Office and developed at the Space Exploration Institute in Neuenburg under the leadership of Dr. Jean-Luc Josset.
http://swissinnovation.org/news/web/2018/07-180307-bb

Massive Telescope for Seeing the Invisible

(EPFL, March 16, 2018)

With the Square Kilometre Array (SKA) telescope, scientists hope to view matter and forces that have been invisible until now. Its antennas will be located on two continents. An impressive amount of data can be collected this way, but processing it is a big challenge. That is why EPFL's Signal Processing Laboratory decided to help set up a Biomedical and Astronomical Signal Processing (BASP) research group at Heriot-Watt University. "The data we collect from its various antennas will be highly fragmented. So we need to develop a system that can not only process those signals rapidly, but also piece them together," says Yves Wiaux, BASP group leader. They have to find an approach based on two methods: compressed sensing, which is used to construct signals and images from incomplete data, and optimization, which enables algorithms to run in parallel.
http://swissinnovation.org/news/web/2018/07-180316-82

Robotic Collaboration in Timber Construction

(ETH Zurich, March 22, 2018)

Digitization has found its way into timber construction. The raw material is cut to size by the machines, but in most cases it still has to be manually assembled. ETH Zurich researchers have developed a digital timber construction method called Spatial Timber Assemblies, that expands the range of possibilities for traditional timber frame construction. The robot first takes a timber beam and guides it while it is sawed to size. After an automatic tool change, a second robot drills the required holes for connecting the beams. Finally, the two robots work together and position the beams in the spatial arrangement based on the computer layout. Workers then manually bolt the beams together. Unlike traditional timber frame construction, Spatial Timber Assemblies can manage without reinforcement plates because the required rigidity and load-bearing result from the geometric structure.
http://swissinnovation.org/news/web/2018/07-180322-46

Smart Car Reads Brain Signals

(EPFL, March 26, 2018)

As part of a joint project with Nissan researchers based at the Defitech Foundation Chair in Brain-Machine Interface (CNBI), the researchers managed to read the brain signals that indicate what a driver is about to do, in order to send that information to the vehicle. With this advance notice of a few hundreds of milliseconds, the smart vehicle can anticipate the driver's movements and make the ensuing maneuver easier. The signals

produced in the driver's frontal motor cortex are detected using a sensor-equipped EEG headset. They are then sent to the smart vehicle for processing. By combining that data with the information detected by its own sensors, the car can react to the situation at hand. The vehicle learns from each driver and customizes its software. It stores each driver's regular routes, as well as their driving habits and style.
http://swissinnovation.org/news/web/2018/07-180326-07

8. Physics / Chemistry / Maths

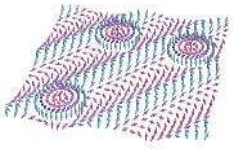
Computer Learns Quantum Physics

(ETH Zurich, February 26, 2018)

Quantum experiments are tricky, and to exactly determine the state of a quantum system requires a large amount of measurements. An international team led by ETH physicists has now developed a machine learning software that enables a computer to predict the quantum state of hypothetical physical systems. The quantum state is encoded in a so-called neural network, which then goes through training to match the computed and actual probabilities. Subsequently, the quantum state stored in the network can be used for virtual experiments. With the new method, larger and previously inaccessible quantum systems could be studied, and it could help to overcome the problem of exponential scaling. The latter is due to a phenomenon called entanglement, which causes distant parts of the system to be intimately connected without exchanging information.
http://swissinnovation.org/news/web/2018/08-180226-57

Controlling Skyrmions with Lasers

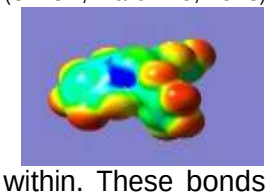
(EPFL, March 02, 2018)



Skyrmions have attracted attention for potentially being used in "spintronic" devices, which would use the spin rather than the charge of electrons, thus becoming more miniaturized and energy-efficient. Now, EPFL researchers have been able to write and erase stable skyrmions using laser pulses. They used an iron-germanium alloy, which can host skyrmions at around 0°C, not far from room temperature. This is important, since many of these experiments take place at temperatures too low to become commercially meaningful. The researchers took advantage of the supercooling effect that follows an ultrafast temperature jump, which is induced by an ultrashort laser pulse. During the supercooling, skyrmions can be frozen-in in places where they would not occur in conventional equilibrium conditions. The forming skyrmions were imaged by using time-resolved cryogenic Lorentz electron microscopy, which can "see" magnetic domain structures and magnetization reversal mechanisms in real space and time.
http://swissinnovation.org/news/web/2018/08-180302-96

Antimony Triggers Synthetic Chemistry Revolution

(UNIGE, March 20, 2018)



About a third of all Swiss exports result from fundamental discoveries in synthetic chemistry. Certain drugs and perfumes, as well as food and agricultural products, and even Ferrari's famous red color, are derived from new molecular structures invented by Swiss scientists. UNIGE chemists have just discovered that chemical bonds based on antimony – a forgotten element at the very bottom of the periodic table – yield powerful new catalysts that can be used to stimulate the transformation of a molecule from within. These bonds complement existing interactions such as conventional hydrogen bonds or the more recent chalcogen bonds with sulfur. This finding will lead to the creation of innovative materials. It has triggered a small revolution in the world of synthetic chemistry, which had always believed that there was a limit to the number of possible bonds to build new catalysts.
http://swissinnovation.org/news/web/2018/08-180320-74

Smaller and Cheaper PET Scanner

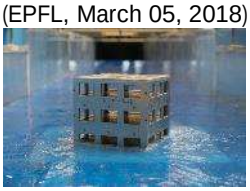
(ETH Zurich, March 29, 2018)

PET scanners can help to diagnose certain neurological health conditions 10-20 years before doctors are able to do so. The problem is that today, this is not done because these devices are very large and expensive. A conventional scanner takes up around 15 square meters of floor space and costs between CHF 1.5 and 5.5 million. ETH Zurich researchers are working to improve this situation. Their invention ("Brain PET") is supposed to cost just a tenth of current machines and its footprint will be less than two square meters. Because of its size, it is much more mobile, and therefore suitable for use in big hospitals and in smaller clinics. It is also cheaper to use. The higher the frequency of use, the lower the cost of the radioactive tracer substances.
http://swissinnovation.org/news/web/2018/08-180329-48

9. Architecture / Design

Large Openings in Lower Floors Lessen Impact of a Wave Hitting a Building

(EPFL, March 05, 2018)



Researchers from EPFL investigated methods for reducing the damage caused when a wave hits a building. They found that creating large openings in the lower floors can lessen the impact of a water surge significantly. This is especially important for houses located on riversides, lakesides and ocean fronts. "We found that there is a linear relationship between the amount of openings in a building's architecture and the reduction of a wave's impact. For instance, if a building's façade has 60% openings – due to doors and windows, for example – then the impact of a water surge will be 60% lower. And according to our calculations, a building needs to have at least three to five stories, depending on the size of the wave, for its occupants to be able to safely escape to its roof," says Davide Wüthrich.
http://swissinnovation.org/news/web/2018/09-180305-5b

Modular Wooden System for Vertical Extension of Buildings

(EPFL, March 20, 2018)

The Working Space research project focuses on developing new modular wooden system for the vertical extension of existing administrative buildings. Thanks to a partnership between the Canton of Vaud and the Laboratory of Architecture and Sustainable Technologies from EPFL, a first realization started on a building located in Lausanne. The structure consists of large-scale elements, composed of a frame of interconnected posts and beams. This primary load-bearing system allows to rely on a limited number of points and to easily transmit the loads on the bearing parts of existing buildings. All elements are composed in strict consistency with this basic structural grid and the same also applies for technical installations. The result is a particularly high level of prefabrication compared to current construction practices. In addition, the optimized dimensioning of each piece promotes an expression of lightness and simplicity.
http://swissinnovation.org/news/web/2018/09-180320-66

10. Economy, Social Sciences & Humanities

Swiss Tech Universities Boost Economy

(swissinfo.ch, February 05, 2018)

ETH Zurich and EPFL account for 100,000 jobs and CHF13 billion in added value to the economy, a report calculates. This represents a fivefold return on investment. The tech-institutes are vital components of the Swiss image and economy. According the consulting firm BiGGAR, the entire federal technology domain employs around 21,000 staff and has an annual budget of CHF3.5 billion ($3.74 billion). However, the estimated gross added value to the economy, BiGGAR claims, is almost four times as much, at CHF13.3 billion. The consultants also claim that another 98,000 jobs in Switzerland depend on the ETH Domain, meaning that each staff position is responsible for the creation of 5 more. The study points to the various international firms that have set up in close proximity to the universities in order to take advantage of the highly-trained graduates.
http://swissinnovation.org/news/web/2018/10-180205-47

No Persistent Effect on Job Satisfaction from Wage Increases

(UNIBAS, February 07, 2018)

After a wage increase, people tend to be more satisfied with their jobs – and even more so when what they have gained exceeds the wage increases of their colleagues. Yet, this effect on job satisfaction is not persistent. This was found by researchers of University of Basel. They found that the rise in job satisfaction after a wage increase is only temporary, as the effect almost fades out within four years. According to behavioral-economic theory, this can be explained by the fact that people do not evaluate their income in absolute terms, but rather in relation to their previous income. The researchers conclude that wage increases can be a tool to motivate employees, yet only under carefully designed conditions.
http://swissinnovation.org/news/web/2018/10-180207-21

Swiss Advice on EU on Blockchain Potential

(HSLU, February 20, 2018)

The European Union has recognized the potential of Blockchain. With the help of the "EU Blockchain Observatory and Forum*, the European Union wants to observe and help shape the development of this technology. It is an international research network that advises policy-makers. The Department of Computer Science of Lucerne University of Applied Sciences is the only Swiss institution involved in this project. "Our task is to provide the politicians with information about Blockchain that they need to make informed decisions," says Alexander Denzler, head of the project team at HSLU. The politicians are in a difficult situation: "They have to create legal framework conditions for a technology that is very complex and that they as lay people have so far understood poorly."
http://swissinnovation.org/news/web/2018/10-180220-bb

Religious Affiliation in Europe

(UNILU, February 27, 2018)

Data recalculated by Antonius Liedhegener and Anastas Odermatt from University of Lucerne show an astonishing picture in terms of religious affiliation in Europe. Contrary to the perception of many Europeans, the religious composition of most countries measured by formal or institutional religious belonging is remarkably stable. Roughly, 70 percent of all European countries are dominated by that religious tradition which shaped the territory historically. In these countries, more than 60 percent of the population declare themselves to belong to the historically dominant religious community. However, in some European countries, processes of

secularization resulted in a majority of the population declaring not to belong to any religious tradition. These countries are the Czech Republic, Estonia, the United Kingdom and France, and to a lesser extent the Netherlands, Hungary, Latvia and Germany.
http://swissinnovation.org/news/web/2018/10-180227-b7

Switzerland is a Leading Global FinTech Center

(HSLU, February 28, 2018)

A study carried out by researchers of the Lucerne University of Applied Sciences shows that this year, just as in the previous year, the fintech industry in Switzerland encounters good conditions: In the global comparison of 30 cities, Zurich and Geneva are again in second and third place, only Singapore scored even higher. "Switzerland has not yet fully exploited its potential," says study leader Thomas Ankenbrand. He states that above all, there is air in the technological area. The ranking is based on 72 indicators reflecting the framework conditions of the political and legal, economic, social and technological environment. "The industry has not only matured, it is also perceived as more mature: the hype has become a reality," says Ankenbrand. Swiss banks no longer perceive fintech companies as competitors, but seek collaboration.
http://swissinnovation.org/news/web/2018/10-180228-32

Role of Social Bots in a Recent Vote

(FHNW, March 07, 2018)

Researchers from FHNW investigated tweets during the time from 7 January until 4 March 2018 (voting day). In these eight weeks about 800'000 tweets (including retweets and replies) contained text about the No-Billag vote. The tweets originated from 26'000 accounts, 19.5% being in favor of the initiative and 80.5% against. But when looking at the tweets, 35% of them were in favor and 65% against it. In about 1% of the accounts manipulative activities were identified. «Hyperactive» accounts tweeted on average 200 messages per day, several accounts generated up to 1'000 messages per day. Pro and contra, so both sides, sent out manipulative messages: 19 out of the most active 50 accounts belonged to the pro side and 31 to the contra side.
http://swissinnovation.org/news/web/2018/10-180307-ed

Out of the Poverty Trap by Text Message

(UZH, March 07, 2018)

Poverty directs and changes attention since people deal with the many different things to cope with the problems poverty brings daily. Guilherme Lichand's conclusion is: "If this is the case, it also means we can influence attention." This means making sure the right things occupy the best spots in the priorities list – e.g. sending children to school. Lichand conducted a large-scale study in São Paulo. The children were divided into three groups: The parents of the first group received information about their children attendance; the second group received a twice-weekly text message emphasizing the importance of the children going to school; the third group did not receive any messages or information. Sending texts was the cheapest and most efficient strategy for directing parents' attention to their children's school attendance. This form of directing people's attention is called nudging.
http://swissinnovation.org/news/web/2018/10-180307-b0

"Swissness" Continues to be Rated First Class in Poland

(UNISG, March 12, 2018)

For the second time since 2014, a study of University of St. Gallen focused on the image of Swiss companies as business partners and employers. Generally, Swiss companies come off excellently and, in comparison with 2014, their image as a whole has improved once more. The outstanding features here are the companies' reliability in dealings with business partners, attraction as employers and respectful treatment of customers. Swiss products and services are still considered reliable, of high quality and luxurious. The interviewees are

also prepared to pay more for this quality. E.g. a price premium of 8% was calculated for kitchen sinks – a product that hardly evokes great emotions among consumers. At the same price, 82% of interviewees would prefer a kitchen sink from Switzerland to one without any indication of origin.
http://swissinnovation.org/news/web/2018/10-180312-00

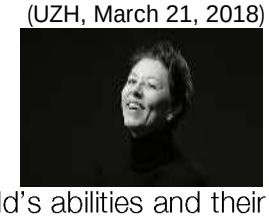
Dried Anise Stars

(UZH, March 15, 2018)

Star anise features heavily in traditional Vietnamese and Chinese medicine thanks to its healing properties. It was hoped the fruit would become the new star of the Vietnamese economy, but this anticipated boom did not happen. Annuska Derks from University of Zurich, together with Sarah Turner of McGill University have been researching the reasons. It was the opening up into a market-driven economy in 1986 that led to an increase in the price. In the mid-2000s, Roche's interest led to another price explosion: Roche bought star anise, sometimes at a rate of up to 90 percent of the global yield. But the demand was short-lived: Since 2012, Roche has obtained the required shikimic acid almost exclusively from genetically modified bacterial cultures. The vast majority of Vietnamese star anise ultimately makes its way to China – the largest exporter worldwide.
http://swissinnovation.org/news/web/2018/10-180315-e9

Developmental and Behavioral Pediatrics

(UZH, March 21, 2018)



Bea Latal, professor, researcher, and co-director of the developmental pediatrics team at the University Children's Hospital Zurich, treats children with developmental and behavioral issues. Demand for assessments to determine whether a child has a developmental problem has grown sharply. If there is a developmental disorder or impairment, it is important for the families to receive advice and a structured therapeutic plan, according to Latal. The aim is to find a degree of concordance between the child's abilities and their environment's demands. Latal also follows the progress of premature babies and babies born with heart defects. She monitors their development, looks for possible abnormalities, investigates potential late consequences, and tries to improve their quality of life. The aim of Latal's research is also to detect consequences that are not foreseeable at birth or early childhood since many problems do not surface until school age.
http://swissinnovation.org/news/web/2018/10-180321-45

11. Startups / Technology Transfer / IPR / Patents

World's first Secure Decentralized Cryptokeys Cold-Storage Service

(fintechnews.ch, March 19, 2018)

Swiss Blockchain Technology, a hardware blockchain technology startup headquartered in Lugano announces the development of safekee, an innovative decentralized solution created to push the security of crypto assets and the safety of cryptospace users to the maximum level. safekee empowers cryptospace users by providing them the tools required to easily and securely generate, store and manage their own cryptographic private keys. "safekee is the world's first secure decentralized cryptokeys cold-storage service, made available to the masses via a multi-currency crypto wallet!" safekee implements hardware-grade security on users' private keys and their personnel does not have access to users' keys. With safekee, users' keys are kept in a worldwide network of robust, remote and distributed secure hardware devices: i.e. not on software-based platforms affected by physical and digital vulnerabilities such as smartphones and IT servers.
http://swissinnovation.org/news/web/2018/11-180319-12

Switzerland Ranked Highly for International Patents in 2017

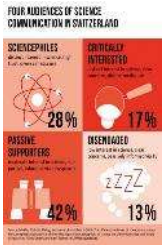
(swissinfo.ch, March 21, 2018)

Switzerland was the eighth biggest source of international patent applications and second of design applications last year, according to the World Intellectual Property Organization (WIPO). Switzerland moved up the WIPO 2017 rankingexternal link by one place with a total of 4,491 international patent applications (+2.8%). It remains behind United States (56,624), China (48,882; +36%) and Japan (48,208). Firms included in the ranking were ABB, which was behind 328 international patent applications, Philip Morris (268) and Nestec – Nestlé's research centre. Medical technologies were the leading industrial sector for patent applications, ahead of packaging, transport and delivery companies and electric machinery. Swiss trademark applications rose by 7% to 3,280. Novartis stands in fourth place for trademark applications. Germany remained the leader for filings of design applications to WIPO (4,261), ahead of Switzerland (2,935).
http://swissinnovation.org/news/web/2018/11-180321-d6

12. General Interest

High Number of Science Enthusiasts in Switzerland

(UZH, February 05, 2018)



In 2016 the Science Barometer Switzerland showed that Swiss people are interested in science and research, and think they are worth supporting. A newly published study by the universities of Zurich and Fribourg reveals more nuances by dividing the population into four categories. Attitudes to science differ by group: "sciencephiles" (28%) think science plays an important role in their life, is very useful and likely to solve many problems; "critically interested" (17%) are interested in science, but think that clear research constraints and boundaries are needed for moral and ethical reasons; "passive supporters" (42%) generally trust science and think it improves our lives, but are not actively involved; "disengaged" (13%) have a low level of trust in science and think that society relies too heavily on scientific research.
http://swissinnovation.org/news/web/2018/12-180205-4e

News Programme is Indispensable but Lifestyle Shows are Not

(UNISG, March 06, 2018)

With a clear no to the so-called No-Billag initiative, the Swiss voting public have said yes to the national broadcasting corporation SRG. The Institute for Systemic Management and Public Governance has conducted a survey to determine people's satisfaction with and willingness to pay for programmes on the two German-language TV channels SRF1 and SRF2. According to the study, a fair price for the current overall range of TV programmes would be between CHF 240 and 250. With regard to programme contents, the study revealed that prime-time news programmes, documentaries, Swiss films and sporting events are popular, whereas news about celebs, chat shows, music programmes as well as foreign series are not indispensable.
http://swissinnovation.org/news/web/2018/12-180306-86

13. Calls for Grants/Awards

Call: International Mobility and Cooperation Grants

(Movetia, March 21, 2018)

In the new international programmes 2018-2020 offered by Movetia institutions related to education and professionals working in education can test innovative funding models in international educational mobility and strengthen the international networking of Swiss educational institutions from primary schools to higher education institutions. There are different funding instruments in order to apply for a fund from Movetia: One instrument is the open project fund. In the projects funded by it, the project promotors are very free in designing their project, but the innovative nature of the projects is important. The submission deadline is 22 June 2018; the projects are set to start on 1 October 2018. In addition to the open project fund, the International Programme offers specific funding instruments for all education sectors. Pupils and people who are engaged with vocational education and training [VET] and can take part in an exchange. For these two options the registration deadline is 15 May 2018. For students and professors in higher education it is possible to try out innovative multidisciplinary learning opportunities in international intensive programmes (IP) for higher education. The application date for this third option is 31 May 2018.
http://swissinnovation.org/news/web/2018/13-180321-20

Call: Funding for Space Projects

(startupticker.ch, March 26, 2018)

The Swiss Space Office of the State Secretariat for Education, Research and Innovation (SERI/SSO) has launched the fifth call for proposals for space projects. Startups such as Astrocast, Sensnima, Swissto12 and Bcomp have benefited from previous programs. The proposed studies shall last for a maximum of 15 months from kick-off to delivery of the final report. During this period, each study will receive maximum amount of CHF 250'000 to pay for salaries and a limited amount for travel and subsistence expenses. Applicants may select their own topics, on condition that they are related to the development of hardware and/or software for space applications. Preference is given to topics linked to the priority areas according to the Swiss Space Implementation Plan. Eligible to participate are proposals submitted by Swiss academic institutions in partnership with industry. Registration closes on 25 April 2018.
http://swissinnovation.org/news/web/2018/13-180326-6e

Call: Empirical Research Methods Seminars

(UNISG, March 31, 2018)

The GSERM Global School in Empirical Research Methods at the University of St.Gallen is a high-calibre 3.5 week integrated programme teaching research methodology. We welcome PhD students, Master students, Post-Docs and Professionals of all fields but also members of academia. You enhance your skills in block seminars taught by world-class faculty amongst an international crowd of participants, also providing you with a unique opportunity for exchanging experiences. Participants can choose from different courses offered as block seminars led by internationally renowned lecturers. Application deadline is 30 April 2018.
http://swissinnovation.org/news/web/2018/13-180331-54

Upcoming Science and Technology Related Events

Innovating in the digital era: opportunities and challenges facing SMEs in a fast-changing world
April 19, 2018
https://goo.gl/Uf2Q7R
Startups, Innovation, SMEs, Partnerships
Lausanne

Kung Fu Motion: The Living Archive
April 27-August 12, 2018
https://artlab.epfl.ch/kungfu-motion_en
Material Arts, New Archival Technologies
Lausanne

Swiss Biotech Day
May 3, 2018
http://swissbiotechday.ch
Biotechnology, Pharmaceutics, Life Sciences
Basel

Swiss Medtech Day
June 12, 2018
http://www.swissmedtechday.ch
Medical Technology
Bern

POLAR 2018
June 15-26, 2018
https://www.polar2018.org
SCAR & IASC, Arctic/Antarctic Research
Davos

2nd Swiss Diagnostics Start-up Day
June 21, 2018
https://is.gd/eWNiLZ
Biomaterials, Biotech
Olten

International Symposium on Reactive Intermediates and Unusual Molecules (isrium) 2018
July 15-20, 2018
http://www.isrium2018.ethz.ch/
Chemistry, Research
Ascona

Industry Day - Current research highlights and spin-offs
September 3, 2018
http://www.ethz.ch/industryday
Technology Transfer, Innovation, Research
Zurich

The **Science-Switzerland** newsletter is a bimonthly electronic publication keeping you updated on all the latest news on Swiss science, technology, education, innovation and the arts. It is an official publication in English from a single source, with executive summaries of top-highlights on education, of new discoveries in science, and of the latest top-of-the-line technologies and innovational strengths of Switzerland. The Science-Switzerland Newsletter is produced by swissnex China in collaboration with the swissnex Network.

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