



Science-Switzerland, June-July 2018

News on Swiss science, technology, education and innovation



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Federal Council Appoints Martina Hirayama as New SERI State Secretary

(admin.ch, July 04, 2018)

The Federal Council appointed Martina Hirayama as the new State Secretary for Education, Research and Innovation at the request of the Federal Department of Economic Affairs, Education and Research EAER. On 1 January 2019 she will succeed Mauro Dell'Ambrogio, who reaches official retirement age in November 2018. Hirayama has been president of the Institute Council of METAS, the Federal Institute of Metrology, since 2012. She has also been vice president of the board of Innosuisse since 2011 and a member of the Swiss National Science Foundation's Foundation Council since 2016. Since 2011 Hirayama has been dean of the ZHAW School of Engineering and since 2014 she has also been Head of International Affairs. Hirayama studied chemistry at the University of Fribourg, at the ETH Zurich and at Imperial College London, obtaining a doctorate in technical sciences from the ETH. She later took a postgraduate degree in economics at the same institution. With a wide-ranging experience in research, teaching, entrepreneurship, management and administration, Hirayama is very well equipped to head the State Secretariat for Education, Research and Innovation SERI.



<http://swissinnovation.org/news/web/2018/00-180704-18>

1. Policy

2017 Was Record Year for Confederation R&D Expenditure

(admin.ch, July 12, 2018)

In 2017, the Confederation spent CHF 2.2 billion on research and experimental development (R&D). This represents a 7% increase compared with 2015, the year of the previous survey. This is a record amount, mainly paid in the form of contributions to support research activities. Over the same period, Confederation personnel employed in R&D activities declined by 4%, reaching 875 jobs in full-time equivalents. These findings are based on the analysis of administrative data by the Federal Statistical Office (FSO).

<http://swissinnovation.org/news/web/2018/01-180712-d0>

Doris Leuthard Appointed Member of High-Level Panel on Digital Cooperation

(admin.ch, July 12, 2018)

Recently, Secretary-General of the United Nations, António Guterres, announced the launch of a High-Level Panel on digital cooperation issues. Federal Councillor Doris Leuthard accepted Secretary-General Guterres' invitation to participate as a member of this Panel. It consists of 22 international leaders from government, the private sector, academia and civil society. The Panel will draw up proposals for improving global governance in relation to digitization.

<http://swissinnovation.org/news/web/2018/01-180712-88>

2. Education

ETH Zurich Moves Up to 7th in QS World Ranking

(ETH Zurich, June 06, 2018)

Achieving its highest ranking to date, ETH Zurich moves up three places alongside some of the most prestigious universities in the world. It is the highest ranking that ETH Zurich has achieved, thus far, in the highly competitive modern league tables. QS evaluated more than 4,700 institutions from 151 countries. Measured against top Ivy League and other private universities, ETH Zurich is one of the few publically funded institutions in the top ten and retains its leading position as the top-ranked university in continental Europe. ETH Zurich





president, Lino Guzzella, delighted with the ranking said, “The ranking reflects a great team effort from the entire ETH community. A community that dedicates their talents to outstanding teaching and research supported by a highly motivated administrative and technical staff. As a public university, for ETH such a result also reflects the support and commitment of the Swiss society.”

<http://swissinnovation.org/news/web/2018/02-180606-94>

Continuing Education in Lifestyle Change and Mind-Body Medicine

(University of Zurich, July 10, 2018)

Everyone knows that they ought to lead a healthy lifestyle. But not everyone finds it so easy to put into practice. That’s where experts offering effective and sustainable support can be of help. To train such experts, Urte Scholz and Claudia Witt from University of Zurich have developed a new continuing education course in physical and mental lifestyle change and mind-body medicine. “We use modern scientific findings and proven methods from nutrition and sports sciences as well as complementary medicine and psychology,” explains Claudia Witt. The unique cross-faculty and interdisciplinary CAS offers participants working in the field of psychology or the medical and healthcare sector an overview of evidence-based methods and theories in both disciplines. “There is always an interplay between physical illness and mental health,” says Urte Scholz.



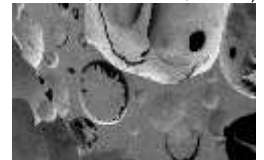
<http://swissinnovation.org/news/web/2018/02-180710-11>

3. Life Sciences / Health Care

Researchers Engineer Human Bone Marrow Tissue

(University of Basel, June 04, 2018)

Researchers from University of Basel, the University Hospital Basel, and ETH Zurich have engineered an artificial bone marrow niche, in which the stem and progenitor cells are able to multiply for a period of several days. The researchers have developed an artificial tissue that mimics some of the complex biological properties of natural bone marrow niches. To do this, they combined human mesenchymal stromal cells with a porous, bone-like 3D scaffold made of a ceramic material in what is known as a perfusion bioreactor, which was used to combine biological and synthetic materials. This gave rise to a structure covered with a stromal extracellular matrix embedding blood cells. In this respect, the artificial tissue had a very similar molecular structure to natural bone marrow niches, creating an environment in which the functionality of hematopoietic stem and progenitor cells could largely be maintained.

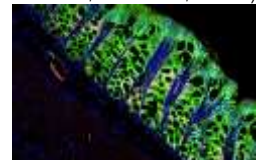


<http://swissinnovation.org/news/web/2018/03-180604-9a>

Cells Responsible for Renewal of Intestine

(University of Zurich, June 06, 2018)

The human intestine constantly renews itself. The intestinal epithelium is the layer of cells that forms the lining of both the small and large intestine and is responsible for absorbing nutrients. The regeneration process is driven by stem cells that are found in small folds of the epithelium (crypts), where they are in contact with other cells that produce the signals needed to drive regeneration. The key activating signal that sustains the stem cells is called “Wnt”. University of Zurich researchers have discovered the cells responsible for providing the activating signal to the stem cells. These so-called Gli1-positive cells surround the crypts in the epithelium and thereby form the stem-cell niche. The scientists performed studies in mice to demonstrate that these cells play an essential role in forming and repairing the intestinal epithelium.



<http://swissinnovation.org/news/web/2018/03-180606-ec>

Nighttime Noise Disturbs Lausanne Residents' Sleep

(EPFL, June 06, 2018)

Sleep disturbances can have serious health consequences, leading to daytime sleepiness, stress, and a greater risk of obesity, cardiovascular disease, fatigue-induced accidents, depression and other psychological disorders. Researchers at EPFL, the Lausanne University Hospital (CHUV) and the Geneva University Hospitals (HUG) have found a clear correlation between the amount of sleepiness reported by Lausanne residents and the level of nighttime noise in their neighborhoods. Data from nearly 3,700 Lausanne residents who reported high levels of daytime sleepiness in a CoLaus/PsyCoLaus study were compared with traffic-noise data from the Swiss Federal Office of the Environment's sonBASE. The findings, published in the International Journal of Hygiene and Environmental Health, could be used to develop new measures for reducing urban noise pollution.

<http://swissinnovation.org/news/web/2018/03-180606-41>



Single Control Center for Brain's Sleep-Wake Cycle

(University of Bern, June 11, 2018)

It was previously thought that multiple brain areas were involved in controlling sleep and wakefulness. Neuroscientists from the Department of BioMedical Research (DBMR) at the University of Bern and the Department of Neurology at Inselspital, Bern University Hospital, have now identified one single control center for the sleep-wake cycle in the brain. Neurons in the thalamus, a central hub of the brain, have dual control over sleep and wakefulness. The thalamus is connected to almost all other brain areas and supports key functions including attention, sensory perception, cognition and consciousness. The study findings, published in Nature Neuroscience, could help develop new sleep therapies – useful for the active population that sleeps about 20% less than 50 years ago and suffers from chronic sleep disturbances.

<http://swissinnovation.org/news/web/2018/03-180611-82>



Fighting Cancer with Vaccine Based on Spider Silk

(University of Geneva, June 12, 2018)

To fight cancer, researchers increasingly use vaccines that stimulate the immune system to identify and destroy tumour cells. However, the desired immune response is not always guaranteed. In order to strengthen the efficacy of vaccines on the immune system, researchers from the universities of Geneva, Freiburg, Munich, and Bayreuth, in collaboration with the German company AMSilk, have developed spider silk microcapsules capable of delivering the vaccine directly to the heart of immune cells. This process could also be applied to preventive vaccines to protect against infectious diseases and constitutes an important step towards vaccines that are stable, easy to use, and resistant to the most extreme storage conditions.

<http://swissinnovation.org/news/web/2018/03-180612-e2>



Neurons that Rewrite Traumatic Memories

(EPFL, June 15, 2018)

The question of whether fear attenuation involves the suppression of the original memory trace of fear by a new memory trace of safety or the rewriting of the original fear trace towards safety is long-debated. The mice investigated in a study by EPFL scientists underwent fear-reducing training. EPFL scientists found when working with mice, which were genetically modified to carry a "reporter" gene that produces an identifiable and measurable signal following neuronal activity, that remote fear attenuation in the brain is connected to the activity of the same group of neurons that are also involved in storing these memories. The scientists have located these neurons in the brain's dentate gyrus, an area of the hippocampus that is involved in the encoding, recall, and the reduction of fear.

<http://swissinnovation.org/news/web/2018/03-180615-5f>



Discovery of New Defense Against Oxygen Radicals

(University of Bern, June 18, 2018)

In order to survive, all living organisms burn nutrients. In some reactions oxygen is transformed to water, releasing oxygen radicals as intermediate products. Larger quantities of those radicals can be a hazard to the organism. Since they attack DNA, proteins, and fats, they are thought to be partly responsible for illnesses such as Alzheimer's or certain types of cancer. However, cells have defense mechanisms against those radicals in the form of special enzymes. Biochemists from the Universities of Bern and Stockholm have now described a previously unknown defense mechanism, namely an enzyme that detoxifies the radical by directly transforming it back to harmless oxygen and passing an extra electron to another molecule involved with the production of biological energy. After discovering the mechanism in *E. coli* bacteria the group hopes to find it in human cells too.



<http://swissinnovation.org/news/web/2018/03-180618-5e>

Caffeine to Control Genes

(Arstechnica, June 20, 2018)

A research team from ETH Zurich has shown that caffeine can be used as a trigger for synthetic genetic circuitry, which can then in turn do useful things for us - even correct or treat medical conditions. For a proof of concept, the team engineered a system to treat type 2 diabetes in mice with sips of coffee, specifically Nespresso Volluto coffee. Essentially, when the animals drink the coffee (or any other caffeinated beverage), a synthetic genetic system in cells implanted in their abdomens switches on. This leads to the production of a hormone that increases insulin production and lowers blood sugar levels - thus successfully treating their diabetes after a simple morning brew.



<http://swissinnovation.org/news/web/2018/03-180620-30>

Fat Cells Control Fat Cells

(ETH Zurich, June 20, 2018)

When gaining weight, energy-storing adipose tissue can grow in two ways. Either the existing fat cells get bigger, and at some point the cells release the fat into the bloodstream, which increases the risk of diabetes, cancer or heart attacks. In about 20 percent of overweight people, however, another mechanism applies: The fatty tissues produce new small cells. With these additional containers the individuals can better store excess fat and remain healthy. It is still not entirely clear exactly how fat cells are created and why new cells form so rarely. Researchers from ETH Zurich and EPFL might have found an answer by identifying a new type of fat cell in mammals that suppresses the growth of new fat cells. This breakthrough could help to find a therapy for protecting obese people from diabetes or other conditions.

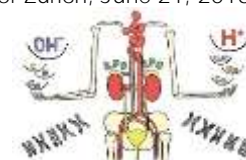


<http://swissinnovation.org/news/web/2018/03-180620-27>

Investigating the Two Most Common Kidney Diseases: Chronic Renal Failure and Kidney Stones

(University of Zurich, June 21, 2018)

Eight years ago, the Swiss National Science Foundation (SNSF) introduced the National Center of Competence in Research (NCCR) Kidney.CH. The research network includes (university) hospitals and research groups in Zurich, Aarau, Basel, Bern, Fribourg, Lausanne and Geneva. The leading house of Kidney.CH, is the University of Zurich. Kidney.CH's focus is on the two most common kidney diseases: Chronic renal failure and kidney stones. The aim is to investigate these diseases at the biochemical, molecular and genetic levels to be able to prevent renal diseases and improve their treatment options. In particular precision treatment of kidney stones is to be advanced. Kidney.CH's second phase of funding recently came to an end, which is why the SNSF performed an evaluation of the program – with excellent results. The program was thus given the green light to enter its third funding period.



<http://swissinnovation.org/news/web/2018/03-180621-6a>



Causes of Heart Problems

(University of Zurich, June 21, 2018)

Around 120,000 people suffer from heart failure in Switzerland. It affects one in three people over the age of 80, and half of all people over 90. “Age alone is not the reason for the problem though. The heart only gets weak if we expect too much of it,” explains Frank Ruschitzka from University Hospital Zurich. He is not just referring to smoking, poor diet and sedentary lifestyles. The largest risk factors are high blood pressure and increased levels of LDL-cholesterol. These are risk factors over which we have only partial control. If it is too late for prevention and the first signs of heart failure have been recognized, all hope is not lost. “It is important to find out exactly what caused the symptoms,” said Ruschitzka, “because only then can the best course of treatment be chosen.”



<http://swissinnovation.org/news/web/2018/03-180621-3d>

Tracking Cancer Cell Development in Real Time

(EPFL, June 22, 2018)

Thanks to an unorthodox approach proposed by EPFL researchers, it may soon be possible to track cancer-cell development by having patients drink a solution containing millions of tiny electronic biosensors. The microscopic sensors would be cube-shaped and have three complementary electrodes on their surfaces. The sensors would supply information on a cancer cell’s metabolism, or on the local concentration of a drug that had been administered. The data would be collected using a wireless energy transmission system. The research team, however, has yet considerable hurdles to overcome. Scientists must shrink the sensors, so that they are about the same size as red blood cells. Then they will have to demonstrate the feasibility of their technology.



<http://swissinnovation.org/news/web/2018/03-180622-cc>

Blood Pressure Medication Can Be Detrimental in Old Age

(University of Bern, June 28, 2018)

Blood pressure guidelines often ignore the broad spectrum of patients, from severely handicapped 75-year-olds who live in nursing homes to 95-year-olds who still do sports, and make the generally-accepted recommendation that blood pressure levels among all over-60s should be lowered to below 130mmHg. The group of patients under investigation in a study by University of Bern and University of Leiden included all inhabitants aged 85 of the city of Leiden in the Netherlands. This also accounted for patients suffering from dementia, living in nursing homes, or who are otherwise frail. From the just under 600 people investigated the researchers were able to demonstrate that the lower the extent to which blood pressure was reduced using antihypertensive medications, the higher the levels of total mortality and cognitive decline. This correlation only arose in those people who took antihypertensive medication, and particularly in those who were frail.



<http://swissinnovation.org/news/web/2018/03-180628-9d>

Administering Hormones Affects DNA

(ETH Zurich, June 29, 2018)

The public debate on endocrine disrupting chemicals (EDCs; exogenous substances that have the same/similar effects as endogenous hormones) has been going on for some time. Chemicals such as bisphenol A or phthalates, the latter of which are used to soften plastics, may be connected to rising infertility rates among men and women. In an experiment with pigs, researchers from ETH Zurich and the Technical University of Munich demonstrated that the administration of even extremely low doses of an endocrine disruptor leads to epigenetic changes in a pregnant sow’s DNA. These changes were also observed in the sows’ embryos, and similar changes were even evident after the offspring had reached adulthood. It remains unclear what long-



term effects the epigenetic changes might have, and whether the interaction of the many EDCs humans are exposed to on a daily basis render the situation more acute.

<http://swissinnovation.org/news/web/2018/03-180629-83>

Oxytocin Influences Cooperation and Conversation

(University of Neuchâtel, July 04, 2018)

Oxytocin is known to facilitate the bonds between a mother and her child. Researchers from University of Neuchâtel showed that it also intervenes in other areas. To investigate collaboration, their first experimental setup was an "egg hunt", the motivation for the participants was purely individual gain. Before starting the game, the participants were randomly assigned to one of two groups, which was visible to everyone. Then, pairs were formed, either composed of members of the same group or of different groups. A high level of oxytocin caused a desire to collaborate in the pairs, but only between two people affiliated to the same group. In a second setup, the scientists examined conversations. They found that in pairs of individuals from different groups, a high level of oxytocin resulted in an increased reference of individual goals in dialogues. The researchers concluded that oxytocin mainly reveals social cues to produce the most appropriate behavior.



<http://swissinnovation.org/news/web/2018/03-180704-8b>

Doubts on Previous Theory of Parkinson's Disease

(University of Basel, July 06, 2018)

In people affected by Parkinson's disease, the dopamine-producing nerve cells in the brain slowly die off. The lack of this neurotransmitter impairs motor function and often affects the cognitive abilities. Previously, it was assumed that alpha-synuclein is one of the triggers. This protein can clump and form small needles (fibrils), which accumulate and deposit as Lewy bodies in the nerve cells. These toxic fibrils damage the affected brain cells. Scientists from University of Basel, from Hoffmann-La Roche Ltd. and ETH Zurich, artificially generated an alpha-synuclein fibril. They visualized its three-dimensional structure with atomic resolution. But the result raised more questions. If the fibril structure causes Parkinson's disease, the genetic defect would have to protect against the disease, which is not the case. So, it could be possible that a different type of fibril or another form of the protein triggers the disease. Therefore, more investigations are needed.



<http://swissinnovation.org/news/web/2018/03-180706-1c>

Cold Leads to Slimmer Offspring

(ETH Zurich, July 09, 2018)

Exposure to cold prior to conception causes the resulting offspring to have more brown adipose tissue, which protects against excess weight and metabolic disorders. ETH Zurich scientists, together with colleagues at the University Hospital Zurich, analyzed computed tomography images of 8,400 adult patients. They noted that people born between July and November have significantly more active brown adipose tissue than people born between January and June. To follow up, the researchers conducted studies in mice. The offspring of males kept in a cool environment for several days prior to mating had more active brown adipose tissue than those of males kept in a temperate environment. Using in vitro fertilization and studies on sperm, they were ultimately able to demonstrate that the information about the ambient temperature a father was kept at is passed on to his offspring via his sperm's epigenetic programming.



<http://swissinnovation.org/news/web/2018/03-180709-ab>



Smart Nanoparticles Against Cancer

Immunotherapy is a highly promising approach to battling cancer. It works by enlisting the body's natural defenses to attack cancer cells. By stimulating T-lymphocytes, cancer researchers have already achieved unparalleled results in treating cases of leukemia and certain types of melanoma. However, these treatments often raise problems of toxicity for the rest of the body. MIT and EPFL researchers addressed this challenge by developing a nanoparticle gel that can be used to control exactly where and when drugs designed to boost the immune cells are applied. Two types of T-cell-based immunotherapy have been on the market since 2017. The EPFL and MIT researchers' method could improve these treatments and be used on different types of cancer, in particular, solid tumors.

<http://swissinnovation.org/news/web/2018/03-180709-5d>

(EPFL, July 09, 2018)



Origin of Specific Immune Cells Revealed

Plasmacytoid dendritic cells represent a group of circulating blood cells essential to protect us from viral induced disease. pDCs are equipped with specific viral sensors and upon detection of viral particles, early during infection, will produce high amounts of the antiviral molecule interferon (IFN). This immune response will drastically limit the spread of the infection within the patient. Despite the critical role played by pDCs in linking innate immunity (production of IFN) and adaptive immunity (antibody production), their origin from myeloid or lymphoid progenitors in the bone marrow was still a matter of debate. Research at the University of Basel showed that pDCs predominantly develop from a lymphoid precursor. Furthermore, they were also able to show that the expression of the transcription factor IRF8 (Interferon Responsive Factor 8) is essential for their development.

<http://swissinnovation.org/news/web/2018/03-180709-0f>

(University of Basel, July 09, 2018)



Every Person Has a Unique Brain Anatomy

Professional musicians or golfers, for example, have particular characteristics in the regions of the brain which they use the most for their skilled activity. Events of shorter duration can also leave behind traces in the brain: E.g. if an arm is kept still for two weeks, the thickness of the brain's cortex in the areas responsible for controlling the immobilized arm is reduced. "We suspected that those experiences having an effect on the brain interact with the genetic make-up so that over the course of years every person develops a completely individual brain anatomy," explains Lutz Jäncke from University of Zurich. To investigate their hypothesis the researchers examined the brains of 191 healthy older people using magnetic resonance imaging three times over a period of two years. For each of them an individual combination of specific brain anatomical characteristics was identified, whereby the identification accuracy, even for the general brain anatomy, was over 90 percent.

<http://swissinnovation.org/news/web/2018/03-180710-28>

(University of Zurich, July 10, 2018)



Measuring the Effects of Drugs on Cancer Cells

In certain types of breast and ovarian cancer weaknesses particular of cancer cells, but not healthy cells, is given by mutations in genes that play a role in DNA repair. Treating cancer cells of this kind with a group of newly approved drugs (PARP inhibitors) makes it difficult for these cells to replicate their DNA, and they ultimately perish. Normal cells solve such problems using their intact DNA repair machinery. At University of Zurich the effects of these drugs are investigated. "Our method of fluorescence-based high-throughput microscopy allows us to observe precisely when and how a drug works in thousands of cells at the same time," explains

(University of Zurich, July 11, 2018)



Jone Michelena. Her measurements have revealed how PARP inhibitors lock their target protein in an inactive state on the cells' DNA and how this complicates DNA replication, which in turn leads to DNA damage. If not repaired quickly, the cells can no longer replicate and eventually die.

<http://swissinnovation.org/news/web/2018/03-180711-b4>

New Control of Cell Division

(University of Zurich, July 12, 2018)

Researchers at University of Zurich have discovered that a class of enzymes – which are dual specificity kinases – actively control phase separation of molecules in cells. When a cell divides, the enzyme DYRK3 promotes the mixing of the phases. This guarantees that the cells can correctly build the machinery for separating the chromosomes and dividing the cell content. After division, the enzyme is broken down and the individual phases start to form again. If everything goes according to plan, the genetic material, organelles and cell contents are correctly distributed among the daughter cells. "These fundamental findings give us completely new insights into cell division: as a process in which the cell contents mix together and then separate again," says Lucas Pelkmans. This knowledge is highly relevant for the research and treatment of numerous kinds of cancer and neurodegenerative problems.

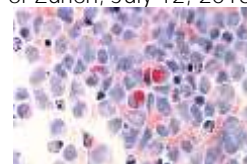


<http://swissinnovation.org/news/web/2018/03-180712-43>

Treatment of Acute Myeloid Leukemia

(University of Zurich, July 12, 2018)

Acute myeloid leukemia (AML) is a dangerous cancer of the blood cells. Mutations in the blood-forming stem cells in the bone marrow lead to degeneration and the uncontrolled formation of abnormal cells. In many cases the only hope – if any at all – is a bone marrow transplant. An interdisciplinary team of chemists, biochemists, geneticists and molecular biologists at University of Zurich is going in search of new approaches to treating the disease. They are addressing the question of how certain enzymes switch genes in the chromosome on and off. In more specific terms, the project is looking into a class of enzymes with special structures called bromodomains, which enable them to chemically mark the DNA packed in the chromosomes or remove existing markers. With these epigenetic modifications they activate or deactivate the genes affected to regulate complex cell activity.

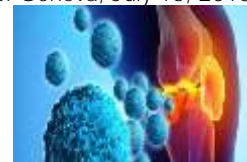


<http://swissinnovation.org/news/web/2018/03-180712-3b>

Nano and Micro Join Forces to treat Osteoarthritis

(University of Geneva, July 16, 2018)

Osteoarthritis is very common in the elderly, and the fact that the disease progresses very slowly hinders the development of new therapies. In fact, the outcomes of clinical trials can take years, a timescale that is often prohibitive for pharmaceutical companies setting their R&D priorities – which is why University of Geneva researchers decided to investigate the problem, focusing in particular on molecules that had already been clinically tested. In more concrete terms, the researchers focused their efforts on kartogenin (a molecule capable of regenerating cartilage) encapsulated in the form of nanocrystals in microparticles. With a diameter of 10 micrometers, these microparticles are made up of biodegradable polymer and can be easily administered by intra-articular injection. The treatment stays in place in the knee for several months, progressively delivering the kartogenin that helps rebuild the cartilage. The nanocrystals, which are wrapped in microparticles, can then be used to deliver the active principle over very extended periods without causing any inflammation – and even reversing the course of the disease, as suggested by the treatments conducted on mice.



<http://swissinnovation.org/news/web/2018/03-180716-7d>



Blindness Gene Named Mark3

(University of Geneva, July 23, 2018)

Our genome is made up of 20,000 genes, all of which may cause disease. At present, 4,141 genes have been identified as being responsible for genetic abnormalities, leaving around 16,000 genes with unknown implication in disease. Researchers from the University of Geneva, working in collaboration with scientists from Pakistan and the USA, have investigated a recessive genetic disorder that destroys the eyes from developing and results in childhood blindness. After analyzing the genomes of each member of a consanguineous family with affected children, the geneticists pinpointed pathogenic mutations in a new gene, MARK3, as being the cause. They subsequently confirmed their findings by modifying the homologous gene in drosophila flies, which resulted in abnormal eye development and blindness. The identification of the MARK3 related disease will help to understand the mechanism of the disease.

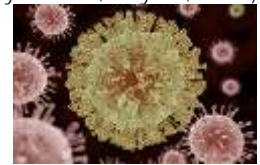


<http://swissinnovation.org/news/web/2018/03-180723-5c>

Zika Virus Is Infectious for Shorter Time than Previously Assumed

(University of Bern, July 24, 2018)

Sexual transmission of Zika virus (ZIKV) has previously been documented, but the risks of transmission are not well understood, and it is not known whether other flaviviruses can be transmitted this way. Therefore, researchers from University of Bern, from the World Health Organization, US Centers for Disease Control and National Institute of Allergy and Infectious Disease conducted a systematic review of evidence. They found that sexual transmission of ZIKV is more common from men to women than the opposite way. The time between onset of symptoms in two sexual partners is twelve days, and the median duration of ZIKV RNA persistence in semen is longer than in the female genital tract. They found no evidence of sexual transmission for other arthropod-borne flaviviruses. The researchers state: "Our findings suggest that the infectious period for sexual transmission of ZIKV is shorter than estimates from the earliest post-outbreak studies."



<http://swissinnovation.org/news/web/2018/03-180724-cb>

Electricity Sparks Neuronal Diversity

(University of Geneva, July 26, 2018)

The cerebral cortex is a highly developed brain region, which allows intellectual functions such as conscious perception, anticipation of events and language. These functions are mediated by specific sets of neuronal circuits. To understand how these circuits emerge during development, researchers from the University of Geneva, in collaboration with an American team, investigated what enables neuronal stem cells to generate successive subtypes of neurons as the embryo grows. By measuring the electrical activity of these progenitors, they found that akin to a battery getting charged, membrane voltage values increase as the embryo develops and new neurons are being created. To test the role of this electrical charge, neuroscientists experimentally manipulated progenitor voltage values, which allowed them to select which type of neuron was being born. These results reveal an unexpected role for bioelectric cell properties in the generation of neuronal diversity.

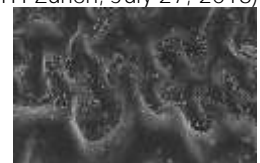


<http://swissinnovation.org/news/web/2018/03-180726-20>

New Reservoir of Antibiotics

(ETH Zurich, July 27, 2018)

A wide variety of different microorganisms live on the leaves of plants. Although they offer few nutrients, leaf surfaces are densely populated. In an effort to keep the competition at bay, many of the leaf dwellers turn to chemical warfare: they develop antibiotic substances that prevent the growth and reproduction of their fellow occupants. Researchers at ETH Zurich aimed to find new antibiotics in a previously unexplored habitat and so, during a systematic search of the leaves of thale cress (*Arabidopsis thaliana*), they





discovered a remarkably chemically productive bacterium: *Brevibacillus* sp. Leaf 182. In experiments, it inhibited half of the 200 strains that the researchers had isolated from the leaf surfaces. The bacterium produces and secretes at least four antibiotic chemical compounds. Two of these compounds were already known, while a substance called macrobrevin presented a previously unknown chemical structure.

<http://swissinnovation.org/news/web/2018/03-180727-5d>

Brain Injury Diagnosed with Single Drop of Blood

(University of Geneva, July 30, 2018)

Every year in Europe, three million people are admitted into hospitals for suspected mild traumatic brain injury (mTBI) cases. Yet 90% of these patients will be able to return home safely, as no trauma has been detected. Today, the only reliable diagnosis is the CT Scan, which is only available in some hospitals and, in addition to being expensive, exposes patients to radiations. Researchers from the University of Geneva, in collaboration with the Hospitals of Barcelona, Madrid and Seville, have developed a small device – Point-of-Care Test (POCT) - that analyses the level of proteins in the blood and allows, using a single drop of blood, to diagnose the possibility of a mild traumatic brain injury. This discovery will not only relieve emergency departments, free patients from often long waits, but also save on costly medical examinations.



<http://swissinnovation.org/news/web/2018/03-180730-0f>

4. Nano / Micro Technology / Material Science

Translating Molecules into Bar Codes

(EPFL, June 07, 2018)

Infrared spectroscopy detects whether a given molecule is present in a sample by seeing if the sample absorbs light rays at the molecule's signature frequencies. However, such analyses require lab instruments with a hefty size and price tag. Scientists at EPFL's School of Engineering and at Australian National University have developed a compact and sensitive nanophotonic system that can identify a molecule's absorption characteristics without using conventional spectrometry. The system consists of an engineered surface covered with hundreds of tiny sensors called metapixels, which can generate a distinct bar code for every molecule that the surface comes into contact with. This new technique might in future enable researchers to quickly and accurately spot miniscule amounts of compounds present in complex samples.



<http://swissinnovation.org/news/web/2018/04-180607-15>

Mushroom that Works Like Green 3D Printer

(EPFL, July 09, 2018)

A growing community of environmentally conscious consumers is looking more closely at mycelium, or the part of mushrooms that grows underground. This thread-like substance can bind together various substrates, such as woodchips, and the resulting mixture can be molded into things like bricks, panels, packing chips, furniture and a host of other objects. Eight students from EPFL are studying how mycelium, could potentially be used to replace plastic. The students tested the key properties thermal insulation, acoustic absorption, compressive strength, and water- and fire-resistance of their own mushroom-derived material by working together with "We worked with several EPFL labs. They found that its thermal insulation capacity was on par with other insulating materials, that it could easily withstand the weight of a human body, that it floats and is watertight, and that it is fairly fire-resistant. Acoustic absorption tests are still under way.



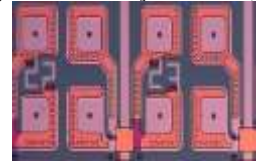
<http://swissinnovation.org/news/web/2018/04-180709-84>



Manufacture of Circuit Components from Individual Molecules Instead of Silicon

(University of Basel, July 12, 2018)

To further develop semiconductor technology, the field of molecular electronics is seeking to manufacture circuit components from individual molecules instead of silicon. Because of their unique electronic properties, molecules are suited to applications that cannot be implemented using conventional silicon technology. However, this requires reliable and inexpensive methods for creating electrical contacts at the two ends of a molecule. Researchers from the University of Basel and IBM Research–Zurich have developed a technique that allows electrical contact to individual molecules to be established. Thousands of stable metal-molecule-metal components can be produced simultaneously by depositing a film of nanoparticles onto the molecules, without compromising the properties of the molecules. This approach was demonstrated using alkane-dithiol compounds, which are made up of carbon, hydrogen, and sulfur.



<http://swissinnovation.org/news/web/2018/04-180712-84>

Element Ytterbium to Store and Protect Fragile Quantum Information

(University of Geneva, July 23, 2018)

Quantum communication and cryptography are the future of high-security communication. But many challenges lie ahead before a worldwide quantum network can be set up, including propagating the quantum signal over long distances. One of the major challenges is to create memories with the capacity to store quantum information carried by light. Researchers at the University of Geneva, in partnership with CNRS (France), have discovered a new material in which an element, ytterbium, can store and protect the fragile quantum information even while operating at high frequencies. This makes ytterbium an ideal candidate for future quantum networks, where the aim is to propagate the signal over long distances by acting as repeaters.



<http://swissinnovation.org/news/web/2018/04-180723-0b>

Insights into Stability of Materials Through World's Fastest Rotation

(ETH Zurich, July 24, 2018)

Nothing in the world rotates faster than a tiny particle in a laboratory at ETH Zurich. Researchers have succeeded in manipulating a minuscule piece of glass only a hundred nanometers in size to make it turn around its own axis more than a billion times a second. With a new detector, the researchers hope to be able to measure rotation frequencies up to 40 gigahertz. It is likely, however, that the nanoparticle will explode before turning that fast. Nobody knows exactly how robust a glass particle measuring only a few nanometers is against the extreme centrifugal forces that arise at these high rotation frequencies. Those forces can be up to a hundred billion times larger than the gravitational force of the earth. For nanotechnology, such measurements are important because the properties of materials at the nanoscale can differ drastically from those of larger objects.



<http://swissinnovation.org/news/web/2018/04-180724-78>

PEF Challenges PET to Battle

(ETH Zurich, July 25, 2018)

A research group at ETH Zurich investigates a promising bioplastic called polyethylene furanoate (PEF). PEF is chemically very similar to PET but consists of 100% renewable raw materials such as forestry and agricultural wastes. PEF bottles, for example, require less material, and are lighter and more stable than their PET competitors. Although PEF is not biodegradable, it can be incinerated in an environmentally friendly manner besides recycling, as no additional CO₂ emissions are produced. The fact that PEF has not yet been able to establish itself on the market is primarily due to its time- and energy-intensive production. Therefore, the researchers



have developed a method that could enable the commercial breakthrough of PEF. "Our method reduces production time from several days to a few hours. In addition, discoloration in the end product can be avoided in contrast to previous processes," says Jan-Georg Rosenboom.

<http://swissinnovation.org/news/web/2018/04-180725-6b>

Excitons to Take Electronics into the Future

Excitons could revolutionize the way engineers approach electronics. A team of EPFL researchers has created a new type of transistor – one of the components of circuits – using these particles instead of electrons. What is remarkable is that their exciton-based transistor functions effectively at room temperature, a hitherto insurmountable obstacle. They achieved this by using two 2D materials as semiconductors. Their study has numerous implications in the field of excitonics, one of the most promising new areas of study alongside photonics and spintronics. This breakthrough sets the stage for optoelectronic devices that consume less energy and are both smaller and faster than current devices. In addition, it will be possible to integrate optical transmission and electronic data-processing systems into the same device, which will reduce the number of operations needed and make the systems more efficient.

<http://swissinnovation.org/news/web/2018/04-180725-0f>

(EPFL, July 25, 2018)



5. Information & Communications Technology

Common Language for Organic Chemists

(University of Geneva, June 07, 2018)

Organic chemists often create new molecules based on carbon atoms. Due to the small size, however, it is impossible for the scientists to see what was synthesized. Therefore, researchers use magnetic resonance to verify the compositions. The way of describing the results varies from lab to lab and, until now, there was no database for the new molecular structures. But a team headed by chemists from the University of Geneva has recently developed an electronic language for sharing organic chemistry data with the international scientific community. The database, called NMReDATA, paves the way for creating an open-access database and specific tools, including artificial intelligence analysis, which will hopefully save considerable time and money for future organic chemistry research.

<http://swissinnovation.org/news/web/2018/05-180607-85>



Artificial Intelligence Capable of Complex Tasks

(University of Zurich, June 26, 2018)

Machine learning algorithms have made a quantum leap recently, as was demonstrated by a small quadcopter from University of Zurich which, loaded with a camera eye, that has learned astonishing skills with training from a research team. They fed the neural network of it not with data from flight maneuvers but from countless hours of bike rides and car drives through Zurich. The driver's perspective was sufficient to enable the artificial drone brain to draw conclusions and consequently follow a lane all by itself as well as react to obstacles. The researchers were able to show that artificial intelligence is quite capable of mastering a comparatively complex task such as navigating alone in an urban space, without the need for a giant computing tool. They also found an elegant solution to obtain the training data required to achieve a useful learning outcome.

<http://swissinnovation.org/news/web/2018/05-180626-eb>





6. Energy / Environment

Consumers Opinions on Cars and Airplane Use

(University of St.Gallen, June 01, 2018)

According to the Consumer Barometer of Renewable Energy, established by the University of St.Gallen, 68% of the surveyed people state that they are for a ban on the most environmentally damaging diesel vehicles in the cities. 57% say that flying is too cheap. Besides stemming the growth in traffic, switching to electro-mobility can lower emissions. For 42% of potential car buyers, an electric car is their first or second choice. Air traffic continues to be a problem in the Swiss climate policy. Aviation fuels make up to 18% of the total CO2 balance. Swiss consumers are in second place when it comes to air miles per capita. An environmental tax on air travel could counter this trend: around a third of those surveyed state that they would change their travel plans if a surcharge of 50 francs were introduced on European flights.



<http://swissinnovation.org/news/web/2018/06-180601-c1>

Male Vervet Monkeys Use Punishment and Coercion to De-Escalate Intergroup Fights

(University of Zurich, June 06, 2018)

Since social groups are collections of unique individuals, each member of the group obtains different benefits and experiences different costs when engaging in cooperative activities like hunting, raising offspring, defending the group against predators, and fighting with neighboring groups. As a result, group members may often disagree on when to cooperate, and when to defect. While we know a great deal about how humans resolve such conflicts, we know relatively little about other social species. A new study carried out by researchers of University of Zurich and University of Neuchâtel shows that male vervet monkeys use punishment and coercion to de-escalate costly intergroup fights. In particular, this strategy was used by males who were likely to have sired infants in the group but were themselves wounded and so may have felt unable to defend their offspring should the need arise.



<http://swissinnovation.org/news/web/2018/06-180606-68>

Swimming in Schooling Formations Saves Energy

(ETH Zurich, June 06, 2018)

Researchers at ETH Zurich have answered the longstanding question of whether fish gain an energetic advantage by swimming in schooling formations – and the answer is “yes.” The researchers also gained detailed knowledge about this process, which may have implications for energy-efficient swimming or flying swarms of drones. For their study, they developed a highly detailed simulation of the complex interplay between swimming fish and their flow environment. Fish schooling was previously only tackled with very simplified models that did not account accurately for the fluid dynamics of the fish swimming. However, the supercomputer ‘Piz Daint’ at the Swiss National Supercomputing Centre (CSCS) has now enabled for the first time these state-of-the-art computationally intensive simulations without simplifications.



<http://swissinnovation.org/news/web/2018/06-180606-41>

Individual “Names” Reveal Complex Relationships in Male Bottlenose Dolphins

(University of Zurich, June 07, 2018)

Scientists from University of Zurich, the University of Western Australia and the University of Massachusetts studied 17 adult bottlenose dolphins in Shark Bay in Western Australia. The researchers were able to identify each male’s individual voice label. They measured the similarity of these identifying signals, both within their immediate alliance and within another network in their community. They discovered that male dolphins,





despite their strong social bonds, retain their individual whistles to identify their partners and competitors, and that these do not become adapted to each other over time. The fact that the individual “names” are kept helps males to keep track of their many different relationships and distinguish between friends, friends of friends, and rivals. This way they’re able to negotiate a complex social network of cooperative relationships.

<http://swissinnovation.org/news/web/2018/06-180607-30>

Expedition Identifies Indian Ocean as Potential Methane Sink

(University of Geneva, June 07, 2018)

The Ocean Mapping Expedition, organized by the Geneva-based Pacific Foundation, aims to measure the human impact on oceans and promote sustainable development. The sailboat ‘Fleur de Passion’ left Seville in April 2015 on a four-year journey around the world in the wake of Ferdinand de Magellan, some 500 years after the first circumnavigation. The scientific program The Wind of Change, led by researchers from the University of Geneva (UNIGE) in collaboration with the Pacific Foundation, is studying greenhouse gases at the ocean surface. Reference field data on the concentration of methane and carbon dioxide collected during the 4,300-mile voyage so far indicate that the Indian Ocean may uptake atmospheric methane. More data is urgently needed to re-evaluate the oceans’ role in the carbon cycle.



<http://swissinnovation.org/news/web/2018/06-180607-92>

New Type of Rice Engineered with Increased Iron and Zinc Content

(ETH Zurich, June 11, 2018)

A team of researchers led by Navreet Bhullar from the Institute of Molecular Plant Biology at ETH Zurich has genetically modified one of the most commonly grown varieties of rice. The advantage over the original variety is that these plants are better at mobilizing their cellular stores of zinc and iron and depositing in the white part of the rice grain (known as endosperm). This means that the micronutrients are transported and concentrate there. The ETH Zurich researchers are the first to explore this aspect of cellular transport mechanisms of iron and zinc to enrich rice with micronutrients.



<http://swissinnovation.org/news/web/2018/06-180611-a4>

Optimization of Solar Energy Industry

(Bern University of Applied Sciences, June 11, 2018)

Together with academic and industrial partners from Europe, the Bern University of Applied Sciences is currently looking for ways in which the solar energy industry can optimize its ecological and economic balance. The project, called CIRCUSOL focuses on the development of business solutions based on the circular economy for the battery and solar module industries. Such business models create incentives to extend the lifespan of products. In order to favor sustainable models of the circular economy, the researchers want to start at different places. For example, photovoltaics (PV) modules that are easier to repair or recycle than those available on the market today need to be developed. New approaches to energy storage systems are also being sought. Together, the research partners now want to find out what it means for manufacturers and recyclers, when innovative technologies for PV modules and batteries are used.



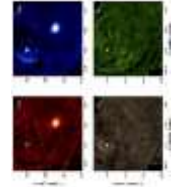
<http://swissinnovation.org/news/web/2018/06-180611-51>



Using Molecules to Identify New Planets

(University of Geneva, June 19, 2018)

Each exoplanet revolves around a star, like the Earth around the Sun. Since the star's light is so dazzling, exoplanets can rarely be observed directly. Previously only a few planets located very far from their host stars could be visualized, thanks to the SPHERE instrument installed on the Very Large Telescope (VLT) in Chile, and similar instruments elsewhere. However, an international team of astronomers led by the University of Geneva (UNIGE) has discovered how to make planets visible by detecting certain molecules on their surfaces – provided these molecules are absent from its star. Thanks to this innovative technique, the star becomes invisible, enabling astronomers to observe the planet directly. The findings, reported in *Astronomy & Astrophysics*, should change the way planets and their atmospheres are characterized.



<http://swissinnovation.org/news/web/2018/06-180619-6d>

The Carbon Cost of Deforestation

(EPFL, June 19, 2018)

Palm oil has become part of our daily lives, but a recent study by EPFL and the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL) serves as a reminder that intensive farming of this crop has a major impact on the environment. Both short- and long-term solutions exist, however. Each year, thousands of hectares of rainforest disappear in order to meet the growing demand for palm oil worldwide. Converting rainforest land into oil palm plantations leads to the most important carbon emissions: one hectare of converted land equates to a loss of 174 tons of carbon. “The quantity of carbon released when just one hectare of forest is cleared to grow oil palms is roughly equivalent to the amount of carbon produced by 530 people flying from Geneva to New York in economy class,” says the researcher.



<http://swissinnovation.org/news/web/2018/06-180619-0b>

The Survival of the Amazon Rainforest Hinges on Tall Trees

(EPFL, June 21, 2018)

An EPFL study has shown that Amazonian trees measuring more than 30 meters are more resistant to precipitation variations than other, shorter trees. This information is key to more accurately predicting how the rainforest, which is an important component of the carbon cycle, will react to climate change.



<http://swissinnovation.org/news/web/2018/06-180621-eb>

Maximizing Wind Energy While Preserving Biodiversity

(EPFL, June 25, 2018)

EPFL researchers have developed a simulator that can calculate the performance of wind farms over 30 years while also factoring in the need to preserve local biodiversity. The findings show that it's possible to reach a compromise between biodiversity and wind-energy production and that trying to achieve maximum energy output straightaway is an error. Tested at a site in the Carpathian Mountains in Romania, the simulator could be applied to the Swiss Jura region, which has a similar landscape. Adding various climate scenarios would make the model's predictions even more reliable and could be the topic of a future work.



<http://swissinnovation.org/news/web/2018/06-180625-9e>

Mars Valleys Traced Back to Rainfall

(ETH Zurich, June 28, 2018)

The surface of Mars bears structures that resemble river networks on Earth. Scientists therefore assume that there must once have been enough water on the red planet to feed streams that incised channels into the subsoil, but have also debated the origins of this water for years: Was it rainwater that caused streams and rivers to swell? Did ice in the soil melt due to volcanic activity, and seep out to form rivers? Each of scenario leads to a different conclusion about the climatic history of Mars. Using statistics from all mapped river valleys on Mars, researchers from ETH Zurich and University of Chicago conclude that the contours still visible today must have been created by surface run-off of (rain)water. They therefore exclude the influence of groundwater or melt water from the soil as a dominant process for shaping these features.



<http://swissinnovation.org/news/web/2018/06-180628-e5>

Sponge-Like Structure for Cleaner Emissions

(Paul Scherrer Institute, June 29, 2018)

Researchers at the Paul Scherrer Institute have developed a new catalytic converter for cleaning emissions from natural gas engines. In contrast to previous catalytic converters, it is very active even at low temperatures and remains that way over a long period of time. This makes it possible to burn natural gas in a cleaner and more climate-friendly way. Thus, natural gas and biogas become still more attractive as substitutes for petroleum products – for example, as fuel for passenger cars. The trick lies in the substrate material of the catalytic converter, whose structure resembles a sponge.

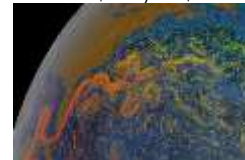


<http://swissinnovation.org/news/web/2018/06-180629-ad>

Gulf Stream Eddies as a Source of Iron

(ETH Zurich, July 02, 2018)

Until now, researchers have assumed that dust from the Sahara was the only significant source of iron to the North Atlantic Gyre. Then, out of curiosity, two ETH Zurich researchers examined data that had been gathered during a research cruise from the North American coast to Bermuda and discovered another source: cold, iron-rich seawater from the North American continental slope, which is captured by meanders of the Gulf Stream and carried out to the North Atlantic Gyre. These “water pockets” are visible at the ocean’s surface as circular eddies (the largest have a diameter of 200 kilometers). Beneath them are cylinder-shaped columns that reach down to 1,000 meters, rotating anticlockwise on their own axes. They last for about two years, during which time their rotation slows as they mix with the water and enrich it with iron.



<http://swissinnovation.org/news/web/2018/06-180702-90>

Charcoal as Major Missing Piece in the Global Carbon Cycle

(University of Zurich, July 09, 2018)

Due to its widespread occurrence and tendency to linger in the environment, black carbon may be one of the keys in predicting and mitigating global climate change. However, it is not taken into account in global carbon budget warming simulations, because its role in the global carbon cycle is not well understood. “Our study is the first to address the flux of black carbon in sediments by rivers on a global scale. We found that a surprisingly large amount of black carbon is exported by rivers,” says Alysha Coppola from University of Zurich. The researchers found that the more total river sediment is transported by rivers to the coast, the more black carbon travels with it and is ultimately buried in ocean sediments, forming an important long-term sink for atmospheric carbon dioxide.



<http://swissinnovation.org/news/web/2018/06-180709-9f>

Insectivorous Birds Consume Annually as much Energy as City of New York

(University of Basel, July 09, 2018)

Insectivorous birds, represented by more than 6,000 species, are found across the world in all major land ecosystems. The fact that they are extremely useful as natural enemies of herbivorous insects had been known for some time. Zoologists at the University of Basel, the University of Utah, the University of Illinois, and Koç University have used calculations to highlight their global ecological importance. Based on the estimates, the world's insectivorous birds have a total weight of around 3 million tons. Every year they eat 400 to 500 million tons of insects and other arthropods such as millipedes and spiders. Thus, the world's insectivorous birds annually consume about the same amount of energy as a megacity the size of New York, which has a value of about 2.8 exajoules.

<http://swissinnovation.org/news/web/2018/06-180709-ee>



Solutions to Water Problems Should Undergo Sustainability Analysis

(EAWAG, July 17, 2018)

Black plastic balls, which aim to reduce evaporation losses from open-air reservoirs under drought conditions, are not quite as efficient as previously assumed. Considerable quantities of water are already used in their production. An Eawag researcher has taken a close look at the water footprint of the shade balls together with his colleagues from Imperial College London and University of Twente. In the case of Los Angeles reservoir in Sylmar, researchers have calculated that thanks to the spheres, around 1.2 million cubic meters of water would evaporate less each year. However, depending on the wall thickness of the plastic, the production of the spheres, which measure around ten centimeters in diameter, required up to 2.9 million cubic meters of water. According to this, the balls must be used for at least two and a half years to have a sustainable effect.

<http://swissinnovation.org/news/web/2018/06-180717-f1>



Remote Sensing to Improve Aquatic Research

(EAWAG, July 19, 2018)

Thanks to Copernicus (the EU Earth Observation Programme initiated in 2014) environmental researchers have access to vast amounts of high-quality satellite data. This being invaluable for aquatic research, Eawag is expanding its capacity in remote sensing. One important forerunner of Copernicus was the FRESHMON project, in which Eawag researchers participated, carrying out studies on Lakes Greifensee and Constance. Various remote sensing techniques for monitoring water quality and water depth were improved, harmonized and integrated with hydrodynamic models. A research project, involving Eawag, EPFL and University of Bern, the researchers aimed to identify the optimal site for a new lake water intake to provide drinking water supplies for Biel. Also, other Eawag scientists use remote sensing data, for example, for the classification of vegetation in river catchments, for watershed-scale hydrological modelling, for the modelling of hydrodynamic processes in Lake Geneva, or for urban flood modelling.

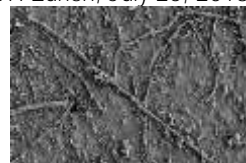
<http://swissinnovation.org/news/web/2018/06-180719-6a>



Soil Bugs Munch on Plastics

(ETH Zurich, July 25, 2018)

Farmers around the world apply enormous amounts of polyethylene (PE) mulch films onto soils to combat weeds, increase soil temperature and keep the soil moist, thereby increasing overall crop yields. After harvest, it often is impossible for farmers to re-collect the entire films. Film debris then makes its way into the soil and accumulates over time, because PE does not biodegrade. Film residues in soils decrease soil fertility, interfere with water transport and diminish crop growth. Like PE, PBAT is a petroleum-based polymer that is used to make various products, including mulch films. Because PBAT was already classified as biodegradable in





compost, researchers ETH Zurich and Eawag aimed at assessing whether PBAT also biodegrades in agricultural soils. They succeeded in demonstrating that soil microorganisms metabolically utilized the carbon in the PBAT polymer both for energy production and also to build up microbial biomass.

<http://swissinnovation.org/news/web/2018/06-180725-cd>

Exploration of Microbial Life in Glacier Streams

(EPFL, July 25, 2018)

A team of scientists led by EPFL will travel to the world's largest mountain glacier systems, collecting samples from biofilms, which are thin, viscous films of microbes that form on sediment surfaces in glacier-fed streams. They will then use deep sequencing on the microbial DNA to unravel the structure and biological processes of the biofilms' microbiomes. The sequencing data will be used for two purposes. First, to look back in time, since it may contain ancient biosignatures that could help the scientists to unravel the microbes' strategies for adapting to their surroundings over time. Second, to get a glimpse into the future, since it will help the scientists to better understand how biofilms are being affected by the melting of glaciers and, consequently, the role that biofilms play in ecosystem functioning and the biogeochemistry of Alpine glacier-fed streams.



<http://swissinnovation.org/news/web/2018/06-180725-8b>

7. Engineering / Robotics / Space

New Propulsion Concept for Swimming Robots

(ETH Zurich, June 05, 2018)

Researchers at ETH Zurich and colleagues at Caltech have developed a new propulsion concept for swimming robots. The robot exploits temperature fluctuations in the water for propulsion without the need for an engine, propellant or power supply. The paddles are actuated using a bistable propulsion element triggered by two shape memory polymer strips. Designed to expand in warm water, the polymer strips power act like "muscles". If the water in which the mini-submarine floats is heated, the expansion of the "muscles" causes the bistable element to quickly snap, triggering a paddle stroke. At present, each actuating element can execute a single paddle stroke and must then be reprogrammed manually. However, the scientists emphasize, it is possible to fabricate complex swimming robots with multiple actuators.



<http://swissinnovation.org/news/web/2018/07-180605-3c>

Zero-Gravity Flights for Research

(University of Zurich, June 13, 2018)

The newly opened Innovation Park Zurich repurposed old hangars on the military airfield in Dübendorf into office space, creating a novel combination of airfield and laboratory. This site is where the UZH Space Hub carries out joint research projects of the University of Zurich and its partners. Researchers from University of Zurich are using a special hyperspectral camera, which is attached to a zeppelin. This camera is to detect various plastic nets swimming in the ponds on Irchel Campus from the sky. On this year's zero-gravity flights a number of scientific experiments of Swiss universities and industry are carried out. For example, the Balgrist University Hospital investigates the influence of weightlessness on the human musculoskeletal system, while University of Zurich examines how cells respond to changes in gravity.



<http://swissinnovation.org/news/web/2018/07-180613-93>



Boosting Motor Recovery After a Stroke with Dual Therapy Approach

(EPFL, June 20, 2018)

Paralysis of an arm and/or leg is one of the most common effects of a stroke. But thanks to research carried out by scientists at the Defitech Foundation Chair in Brain-Machine Interface, in association with other members of EPFL's Center for Neuroprosthetics, the Clinique Romande de Réadaptation in Sion, and the Geneva University Hospitals, stroke victims may soon be able to recover greater use of their paralyzed limbs. The scientists have shown that combining a brain-computer interface (BCI) with functional electrical stimulation (FES) can help stroke victims recover greater use of their paralyzed arm – even years after the stroke.



<http://swissinnovation.org/news/web/2018/07-180620-e7>

Pilatus aircraft Able to Land on Unpaved Natural Runway

(20 Minuten, June 24, 2018)

For about two weeks Pilatus aircraft plants tested their PC-24 Super Versatile Jet at the Woodbridge airfield northeast of London. There the world premiere succeeded: The plane started and landed on the unpaved natural runway of the airfield. The PC-24 is the first business jet in the world to feature a cargo gate as standard and can take off and land on very short runways as well as on natural pistes, the company said. This was a "world premiere". Pilatus now hopes to receive the so-called "Rough Field" certification in the fourth quarter of 2018. The Businessjet makes it possible to get there faster and closer to many destinations: "The PC-24 gives you access to almost twice as many airfields worldwide compared to the jets currently available on the market," says the company.



<http://swissinnovation.org/news/web/2018/07-180624-f6>

Finding Signs of Life in Space

(University of Bern, June 26, 2018)

Three years ago, NASA has gathered researchers from around the world to support and accelerate techniques to answer the question: Are we alone? Researchers from the University of Bern are part of this international network that has produced a comprehensive series of papers outlining the research on how to search for signs of life on extrasolar planets outside our solar system. Since we are currently unable to visit exoplanets, scientists must use telescopes to remotely examine them for so-called biosignatures. The researchers co-authored an article discussing the existing and future telescopes, both ground-based and space-based. But Russell Deitrick warns: "Anything we detect will be ambiguous, so I see biosignature detection as really just the beginning of the search for life. After that we still have the whole process of vetting and understanding, which is why we are making so much effort to do this now."



<http://swissinnovation.org/news/web/2018/07-180626-bb>

Path to New High-Performance Transistors

(Paul Scherrer Institute, July 11, 2018)

The electronics industry expects a novel high-performance transistor made of gallium nitride to offer considerable advantages over present-day high-frequency transistors. Yet many fundamental properties of the material remain unknown. Now researchers at the Paul Scherrer Institute have observed electrons while they were flowing in this promising transistor. For that they used the world's top-performing source of soft X-rays at PSI's Swiss Light Source SLS. This unique experiment was conducted by PSI researchers together with colleagues from Russia and Romania. Their finding: When going into the high-power regime of the gallium nitride transistor, in specific directions the electrons move more efficiently. This insight will help to develop faster and more powerful transistors – a prerequisite for converting our communication network to the coming 5G standard.



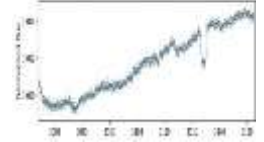
<http://swissinnovation.org/news/web/2018/07-180711-f1>



Finding Exoplanets

(University of Geneva, July 17, 2018)

To discover and confirm the presence of a planet around stars other than the Sun, astronomers wait until it has completed three orbits. However, this technique has its drawbacks since it cannot confirm the presence of planets at relatively long orbital periods. To overcome this obstacle, a team of astronomers under the direction of the University of Geneva have developed a method that makes it possible to ensure the presence of a planet in a few months. They analyzed data from the space telescope K2, where one star showed a significant long-duration temporary decrease of luminosity, meaning the passage of a planet in front of the star. This technique could be used to hunt habitable, Earth-like planets around stars like the Sun.



<http://swissinnovation.org/news/web/2018/07-180717-85>

Outperforming Torso Drone Control

(EPFL, July 18, 2018)

EPFL scientists wanted to observe how people use their bodies to pilot a flying object, in this case a drone, and determine which movements are most intuitive and natural. They started by monitoring the body movements of 17 individuals thanks to 19 infrared markers placed all over the upper body as well as their muscular activity. Each participant followed the actions of a virtual drone through simulated landscapes that passed-by as viewed through virtual reality goggles. Motion patterns emerged, and the scientists quickly established torso-related strategies for piloting drones: they found that only 4 markers (located on the torso) were needed to pilot flight simulators and real drones through a circuit of obstacles effectively. Overall, the scientists compared their torso strategies to joystick control in 39 individuals. They found that torso drone control outperformed joystick control in precision, reliability and with minimal training sessions.



<http://swissinnovation.org/news/web/2018/07-180718-7b>

Designing the Most Aerodynamic Shape for a Bike

(EPFL, July 18, 2018)

Thanks to a software developed by Neural Concept, an EPFL spin-off, bicycle engineers can quickly calculate the most aerodynamic shape for a bike. The software applies artificial intelligence to a set of user-defined specifications. Engineers have already used the program to design a bike that they hope will break the world speed record this fall at the World Human Powered Speed Challenge in Nevada, a competition involving bicycles designed by teams of university students. The software developed by Neural Concept has myriad other potential applications too, such as designing drones, wind turbines and aircraft.



<http://swissinnovation.org/news/web/2018/07-180718-47>

Insect Inspired Drone Deforms Upon Impact

(EPFL, July 25, 2018)

EPFL researchers, applying what they observed about insect wings, have developed a hybrid origami drone that can be stiff or flexible depending on the circumstances. When airborne, the structure is stiff enough to carry its own weight and withstand the thrust of the propellers. But if the drone runs into something, it becomes flexible in order to absorb the shock and therefore minimize any damage. The drone's resilience comes from a unique combination of stiff and elastic layers. An elastomer membrane is stretched and then sandwiched between rigid plates. When the system is at rest, the plates hold together and give the structure its stiffness. But when enough force is applied, the plates draw apart and the structure can bend.



<http://swissinnovation.org/news/web/2018/07-180725-43>

Stove Cope even in Strong Winds

(ETH Zurich, July 30, 2018)

ETH Zurich and Zurich University of the Arts researchers have developed a novel stove that can cope even in strong winds: a kettle shaped like a Bundt cake tin encloses a gas burner, protecting it from the wind. Also other design features make the kettle extremely energy efficient: the wall of the gas burner is rippled, like a citrus juicer. The interior of the burner is also packed with engineering expertise: the gas nozzles are what are known as Venturi nozzles. “Their geometry causes a localized drop in pressure. This increases airflow, which improves the quality of the flame and boosts efficiency,” says Julian Ferchow from ETH Zurich. The special design would not be possible without additive manufacturing. The researchers built the gas kettle layer by layer out of stainless steel using selective laser melting.



<http://swissinnovation.org/news/web/2018/07-180730-50>

8. Physics / Chemistry / Maths

Novel Insulators with Conducting Edges

(University of Zurich, June 01, 2018)

Topology examines the properties of objects and solids that are protected against perturbations and deformations. Materials known so far include topological insulators, which are crystals that insulate on the inside but conduct electrical current on their surface. The conducting surfaces are topologically protected, which means that they cannot easily be brought into an insulating state. Theoretical physicists at the University of Zurich in collaboration with international partners have predicted a new class of topological insulators that have conducting properties on the edges of crystals rather than on their surface. The research team dubbed the new material class “higher-order topological insulators”. The extraordinary robustness of the conducting edges makes them particularly interesting: The current of topological electrons cannot be stopped by disorder or impurities. If an imperfection gets in the way of the current, it simply flows around the impurity.



<http://swissinnovation.org/news/web/2018/08-180601-26>

Direct Coupling of Higgs Boson to Top Quark

(University of Zurich, June 04, 2018)

In the Standard Model, the Higgs boson can couple to the particles of matter called fermions, with a coupling strength proportional to the fermion mass. While associated decay processes have been observed, the decay into top quarks is kinematically impossible. Therefore, alternative routes for directly probing the coupling of the Higgs boson to the top quark are needed. One is through the production of a Higgs boson and a top quark-antiquark pair. The extraction of these events from the LHC data is challenging as there are many mundane types of events that can mimic them. Identifying these events requires measurements from all CMS subdetectors, which makes the reconstruction quite complex. Researchers at University of Zurich and ETH Zurich developed sophisticated techniques that allowed CMS to increase the sensitivity to these events. As consequence, this milestone has been passed considerably earlier than expected.



<http://swissinnovation.org/news/web/2018/08-180604-0d>

Another Step Towards Quantum Transfer

(ETH Zurich, June 14, 2018)

Modern cryptography relies on quantum entanglement, which creates an intimate link between two quantum objects even across large distances. The elementary units, called qubits, take on so-called superposition states, storing a lot more information than binary bits. But those states are sensitive and cannot be transmitted by using conventional technique. Now researchers at ETH Zurich have succeeded in realizing a transmission from one superconducting solid-state qubit to another. In order to do so they connected two qubits using a coaxial cable. The quantum state of the first qubit was transferred to a microwave photon of a resonator, from where it could then fly through the cable to a second resonator a meter away. There, microwave pulses transferred its quantum state onto the second qubit. The transmission procedure itself takes less than a millionth of a second, and according to the authors the transmission distance could be increased in the future.

<http://swissinnovation.org/news/web/2018/08-180614-0b>



New Method to Evaluate the Reactivity of Catalysts

(ETH Zurich, June 16, 2018)

About 90% of all chemical processes in industry depend on catalysts – molecules that enable or accelerate chemical reactions, thus allowing them to take place at lower temperatures. Catalysts are essential for saving energy, making processes more sustainable and therefore cost efficient. An international team of chemists at ETH Zurich has found a way of accelerating the development of new catalysts. Using nuclear magnetic resonance (NMR) spectroscopy together with state-of-the-art computational chemistry, they can gain insight into the electronic structure of catalysts and evaluate whether or not they can enable reactions. The findings are published in PNAS. The researchers believe this new method will improve chemists' understanding of catalysts' electronic structure and accelerate catalyst design and discovery in the future.

<http://swissinnovation.org/news/web/2018/08-180616-2a>

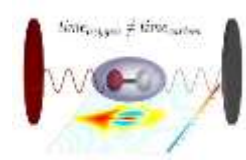


Studying the Photoelectric Effect

(ETH Zurich, June 22, 2018)

When a photon hits a material, it can eject an electron from it provided it has enough energy. This phenomenon is known as the photoelectric effect. An international team of physicists at the ETH Zurich has now added a new dimension to the experimental investigation of this important effect. Using attosecond laser pulses they were able to measure a tiny time difference in the ejection of the electron from a molecule depending on the position of the electron inside the molecule. In principle it should even be possible to use attosecond laser pulses not just to study those processes, but also to deliberately steer them and thus to control chemical reactions in detail.

<http://swissinnovation.org/news/web/2018/08-180622-86>



Solving the Mystery of Entangled Photons

(University of Bern, June 25, 2018)

Quantum technologies are used in various applications, taking advantage of the key quantum phenomenon; entanglement, the property that makes two particles behave like a single physical object. Entangled particles of light can be created by splitting a single photon into two with a special laser. Until now there has been no method to produce photon pairs that do not show quantum mechanical, but only classical energy correlations. In an experiment, a research team of the Institute of Applied Physics at the University of Bern has succeeded in transforming the observed correlations of photon pairs from purely quantum-mechanical to completely classical by inducing perturbation to the pairs. The more perturbation was added, the less did the photons behave in a quantum way. The most promising application of this finding is spectroscopy, a method to investigate properties of molecules with light.

<http://swissinnovation.org/news/web/2018/08-180625-f9>





Single-Atom Data Storage

Despite the rise of solid-state drives, magnetic storage devices such as conventional hard drives and magnetic tapes are still very common. As our data-storage needs are increasing, scientists are turning to alternative storage devices. One of these are single-atom magnets. As atoms are tiny enough to be packed together densely, single-atom storage devices promise enormous data capacities. EPFL researchers have used Scanning Tunneling Microscopy to demonstrate the stability of a magnet consisting of a single atom. They have demonstrated that the smallest bits can indeed be extremely stable, but next they need to learn how to write information to those bits more effectively to overcome the ‘trilemma’ of magnetic recording: stability, writability, and signal-to-noise ratio.



<http://swissinnovation.org/news/web/2018/08-180710-c0>

Cosmological Lithium Problem

Shortly after the Big Bang, radioactive atoms of the type beryllium-7 came into being. Today, throughout the universe, they have long since decayed and do not occur naturally, in contrast to their decay product lithium. Researchers at the Paul Scherrer Institute helped to better understand the first minutes of the universe by collecting artificially produced beryllium-7 and making it into a sample that could be investigated.

The beryllium-7 was subsequently probed at CERN. The joint study by PSI, CERN, and 41 other research institutions addresses the so-called cosmological lithium problem: There is a marked discrepancy between the amount of lithium the Big Bang theory predicts should be in the universe and the amount of lithium actually observed. According to the present study, it now appears more likely that the cause of this cosmological lithium problem lies in the theoretical description of the origin of the universe.

<http://swissinnovation.org/news/web/2018/08-180724-36>

(Paul Scherrer Institute, July 24, 2018)

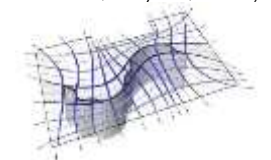


9. Architecture / Design

Concrete with Design Freedom of 3D Printing

Developed at ETH Zurich, Smart Slab is one of the core elements of the residential unit DFAB House. The 80 m², 15-ton ceiling consists of eleven concrete segments and connects the lower floor with the two-story timber volume above. For this project, the researchers produced the building formwork (mold). They used a large-scale 3D sand printer, which means the resulting molds consist of artificial sandstone. The researchers developed a software to fabricate the formwork elements, which is able to record and coordinate all parameters relevant to production. After planning on the computer is completed, the fabrication data can be exported to the machines. Several industry partners helped: One produced the high-resolution, 3D-printed sand formworks, while another fabricated the timber formwork by means of CNC laser cutting. The two types of formwork for the concreting were then brought together by a third company.

(ETH Zurich, July 27, 2018)



<http://swissinnovation.org/news/web/2018/09-180727-3c>



10. Economy, Social Sciences & Humanities

Rules About Technology Use Can Undermine Academic Achievement

(University of Zurich, June 05, 2018)

Researcher from the University of Zurich examined the impact that technology rules, and the reasons that parents give for those rules, have on later-life academic achievement. The study surveyed students' recollections and retrospective perceptions of the rules they faced in childhood and collected data on their socio-demographic traits and academic grades. The results showed that students whose parents had set clear rules on technology use and cited reasons for doing so do not outperform their fellow students in college. On the contrary, when parents justified their rule-setting with the reasoning that technology use cuts into homework time, their children actually performed worse in college. The picture looks different when parents cited health reasons (e.g. lack of exercise, eye overstrain, or poor sitting posture) as grounds for restricting technology use. Those parents' children later exhibited comparatively better academic performances in college.



<http://swissinnovation.org/news/web/2018/10-180605-8f>

Designing Solutions to Complex Problems

(University of Lausanne, June 06, 2018)

Organizational life is full of complex, ill-structured problems that need solving. Academics at HEC Lausanne analyzed two tools, the Business Model Canvas and the Team Alignment Map. The analysis of these two tools confirmed the significance of three key design principles. In proposing the design principles, the authors stress the need to test, evaluate, and refine any tool being developed, at each stage, in different settings and contexts, incorporating feedback from practitioners and facilitators. They also emphasize the need to include all three key design principles. With the development of these three key design principles, management teams finally have a thoroughly tested method for designing tools to help frame and collaboratively solve whatever ill-structured problem they hope to tackle.



<http://swissinnovation.org/news/web/2018/10-180606-c4>

Correlation of Local Journalism Crisis and Dwindling Turnout in Municipal Elections

(University of Zurich, June 06, 2018)

Is there a link between this crisis of local journalism and the dwindling turnout in municipal elections? Daniel Kübler and Christopher Goodman from University of Zurich tackled this question in a recent study. They have found a clear answer: Yes, there is a link. They were able to demonstrate this by focusing on data from 408 municipalities located in six metropolitan areas in Switzerland (Zurich, Geneva, Basel, Lausanne, Lucerne and Lugano), covering a population of more than three million. Their findings show that electoral participation varies greatly between the metropolitan areas included in the study. However, it became very clear that the higher the circulation numbers of local newspapers and the more the media cover local politics, the higher the voter turnout. This link is even evident when other relevant factors relating to electoral turnout are taken into account.



<http://swissinnovation.org/news/web/2018/10-180606-9b>



The Chimpanzee' Communication System

(University of Neuchâtel, June 18, 2018)

The chimpanzee has a powerful communication system that can be heard from far away. In the system there are about fifteen different cries, all serving a particular cause. Among these cries, the vocalization "hoo" is characterized by a low and acute sound, used in three main contexts: travel, rest and alert. Researchers from the University of Geneva, University of Neuchâtel and the Max Planck Institute of Evolutionary Anthropology in Leipzig wondered whether this vocalization varied according to the context in which it was expressed. They discovered that indeed, each "hoo" is pronounced differently according to the context in which the chimpanzee is, demonstrating that he wishes to transmit precise information to his fellows located nearby.



<http://swissinnovation.org/news/web/2018/10-180618-80>

Critical Tasks Are Better Scheduled in the Morning

(University of Lausanne, July 10, 2018)

Researchers from University of Lausanne, University at Buffalo and New York University investigated how the time of day affects the human biology, emotions, cognitive function, and ultimately the performance, of senior executives and other industry experts. Their research draws on two lines of research in the fields of psychology and physiology – personal resources theory and the study of the influence of circadian rhythms on human biology and behavior. They found that cognitive function, mood and the ability to communicate tend to decline throughout the day. For executives with packed diaries and little time to replenish reserves, it is best to get critical tasks scheduled for the morning.



<http://swissinnovation.org/news/web/2018/10-180710-64>

Mystery of the Basel Papyrus Solved

(University of Basel, July 12, 2018)

Since the 16th century, Basel has been home to a mysterious papyrus. With mirror writing on both sides, it has puzzled generations of researchers. It was only through ultraviolet and infrared images produced by researchers at University of Basel that it was possible to determine that this 2,000-year-old document was not a single papyrus at all, but rather several layers of papyrus glued together. A specialist papyrus restorer was brought to Basel to separate the sheets, enabling the Greek document to be decoded for the first time. What's more, it contains a previously unknown text from antiquity. "We can now say that it's a medical text from late antiquity that describes the phenomenon of 'hysterical apnea'," says Sabine Huebner. The text was likely written by the famous Roman physician Galen.



<http://swissinnovation.org/news/web/2018/10-180712-9e>

Babies Recognize Changes in Patterns of Activity

(University of Zurich, July 12, 2018)

Researchers at University of Zurich have investigated whether all children can already recognize changes in patterns of activity and react to them at the age of six to seven months. The findings are unequivocal: The researchers were able to demonstrate that the reactions of babies to a change in the order of a sequence of actions are similar to the reactions found in language research done with older children and adults. The babies were shown photographs that reproduced small individual steps of a normal action sequence. The pictures were shown either in the correct order, or two pictures were swapped so that the actions could no longer lead to the same outcome. The little ones were not yet able to express themselves using speech, but their brain activity showed that they knew which was the "right" order.



<http://swissinnovation.org/news/web/2018/10-180712-26>



People Have Higher Self-Esteem in Old Age

(University of Bern, July 19, 2018)

Researchers at the University of Bern analyzed data from more than 160,000 people in a meta-analysis to find out whether there is a typical course of development for self-esteem over a person's lifespan. The analysis shows the average rise in self-worth from childhood to retirement age is also large compared to other personality traits. Even though the increase temporarily stagnated between the age of 11 and 15, Ulrich Orth establishes: "Fortunately, self-esteem is at least stable in the time around puberty. Contrary to what had been assumed for a long time in literature, most youngsters do not experience low self-esteem during this time." In old age, the values for self-esteem only dropped very slowly at first from the age of 70 with stronger self-doubt increasing at the age of 90. Overall, many people therefore have higher self-esteem in old age than in their young years.



<http://swissinnovation.org/news/web/2018/10-180719-5d>

Generation Smartphone

(Zurich University of Applied Sciences, July 23, 2018)

The study "Generation Smartphone" by University of Applied Sciences and Arts Northwestern Switzerland and Zurich University of Applied Sciences showed that the smartphone is the focal point of everyday life for adolescents. The adolescents receive school relevant information in the WhatsApp class chat, look up timetables or need it to study. In addition, the phone also plays an important role in relaxation and entertainment. And yet many young people feel stressed out about the use of a smartphone. In communication, there is an obligation to respond quickly. With entertaining content, the smartphone also has a strong pull effect, because there is always an interesting video or news to click on. In this research project, however, it also became clear that the young people strive for a meaningful use of the smartphone in their everyday lives and.



<http://swissinnovation.org/news/web/2018/10-180723-b3>

Secondas and Secondos' Transition to Adult Life

(Zurich University of Applied Sciences, July 27, 2018)

In a long-term study from Zurich University of Applied Sciences 23 secondas and secondos from Emmen were interviewed three times in ten years. The researchers wanted to know how the young people positioned themselves at the transition to adult life. In the first survey, at an average age of 16, a mood of optimism prevailed around career choice and apprenticeship search. In the second survey, three years later, a certain disillusionment was noticeable, although most of the participants had made the entry into an apprenticeship and some attended middle school. Despite high commitment, some had initially found no apprenticeship for a long time, had to write more applications than their Swiss classmates and had to make use of bridging offers. At the age of 26, the third survey showed a heterogeneous picture: The secondas and secondos moved between establishing themselves and their struggle for existence.



<http://swissinnovation.org/news/web/2018/10-180727-81>

11. Startups / Technology Transfer / IPR / Patents

Swiss Railway Partners Up with Startup IDOSH

(startupticker.ch, June 07, 2018)

According to the Federal Statistical Office, 9 out of 10 workers commute in Switzerland. Half of them choose the car as their main means of transport, and one third travels to work by public transport. Now, SBB has teamed up with the mobility startup IDOSH to rethink the way to and from the station. The "First and Last Mile" pilot project is intended to connect car and train commuters by allowing motorists to take public transport users on their way to the station. The parties can find and book through the mobility platform IDOSH. In contrast to Uber, the driver does not drive a route that he would not have driven anyway. Thanks to algorithms, only trips are displayed that make sense both ecologically and economically. The goal is to make more efficient use of transport infrastructure and reduce CO2 emissions. During the pilot phase, ride on the IDOSH platform is free.

<http://swissinnovation.org/news/web/2018/11-180607-f1>



First Crowd-Funded Diamond "Mine" is Online

(EPFL, July 06, 2018)

In 2017, startups around the world raised some 4.6 billion dollars by issuing virtual tokens that can be exchanged for cryptocurrencies or services. Much of this activity is taking place in Switzerland, where ICOs brought in 850 million dollars last year according to figures published by IFZ (Institut für Finanzdienstleistungen). But so far, few manufacturers have gotten in on the act. LakeDiamond, an EPFL spin-off that develops customized, highly pure diamonds, is an exception. It launched its own ICO, selling machine-hours in the form of virtual tokens. Over two million tokens – worth a total of 60 million francs – were issued. The company plans to use this money to significantly ramp up its production capacity. Once the ICO has been completed, buyers will be able to sell their tokens or exchange them for diamonds, thereby creating the first-ever crowd-funded diamond "mine."

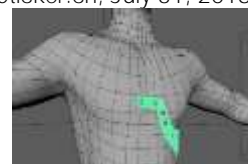


<http://swissinnovation.org/news/web/2018/11-180706-2d>

Remote Patient Monitoring

(startupticker.ch, July 31, 2018)

UbiHealth, a MedTech Startup based in Lugano is has launched its wearable device and software platform for continuous remote patient monitoring. UbiHealth is developing a solution comprising of a patch (UbiPatch) and a software platform. The wearable patch is applied to a patient's chest to collect biometric data and share it wirelessly within the practitioners' network. The data is then assessed on the software platform. The solution is based on Cat-M1 technology which facilitates remote monitoring of patients who are victims of particular cardiovascular conditions and are at risk of complications. With their solution, the startup aims to bring the quality and the professionalism that characterize hospitals, allowing healthcare professionals to monitor in real time their patients' status in order to make better diagnoses, understand whether they have taken their prescribed medications regularly, and understand the impact they have on the body.



<http://swissinnovation.org/news/web/2018/11-180731-79>

12. General Interest

Initiative for Media Innovation (IMI)

(University of Geneva, July 19, 2018)

EPFL, SRG, Ringier and Triangle Azur—a cooperation network between the Universities of Geneva, Lausanne and Neuchâtel—are joining forces to create the Initiative for Media Innovation (IMI), a consortium of public and private partners. This alliance aims to foster innovation in the media and IT sector. The Federal Office of Communications (OFCOM) will also support projects under this initiative. The IMI is open to all private and public organizations, in Switzerland or abroad, who wish to join and are active in the relevant fields. Switzerland has a very dense print, audiovisual and digital media sector, as well as a network of top-level universities. The IMI's founding members wish to create an interface between these two worlds in order to support and develop media innovation.



<http://swissinnovation.org/news/web/2018/12-180719-d1>

ZHAW's Innovation Immersion Tour “Made in China 2025”

(Zurich University of Applied Sciences, July 31, 2018)

China is rapidly turning itself into an innovation leader, pushing their companies and products towards the innovation frontier. The “Made in China 2025” policy launched by the Chinese government to boost its economy will make sure of that. This policy will provide innovation opportunities also for foreign companies. Understanding industry trends and the implications of this policy is therefore key. ZHAW's Innovation Immersion Tour provides a selected group of executives with a thorough understanding of the “Made in China 2025” policy with the aim to derive actionable insights for businesses or organizations. The intense 5-day tour (29 October - 2 November 2018) will take the participants to major hotspots of innovation in China, to Shenzhen/Guangzhou and Shanghai. Registering interest is possible until 30 September 2018.



<http://swissinnovation.org/news/web/2018/12-180731-85>

13. Calls for Grants/Awards

Call: Research and Innovation Actions in Societal, Public Health and Biomedical Industry

(Innovative Medicines Initiative, July 18, 2018)

The Innovative Medicines Initiative is a jointly funded partnership between the European Union and the European Federation of Pharmaceutical Industries and Associations. The Innovative Medicines Initiative 2 Joint Undertaking (IMI2 JU) follows these principles: Research related to the future of medicine should be undertaken in areas where societal, public health and biomedical industry competitiveness goals are aligned and require the pooling of resources and greater collaboration between the public and private sectors, with the involvement of SMEs. The scope of the initiative should be expanded to all areas of life science research and innovation. The areas should be of public health interest. The IMI2 JU objectives are implemented through Research and Innovation Actions, and Coordination and Support Actions where public and private partners collaborate. The initiative therefore seeks to involve a broader range of partners. Applicants are invited to submit a proposal for each of the topics that are relevant for them. Submission deadline for stage 1 is 24 October 2018 and for stage 2 it is 15 May 2019.



<http://swissinnovation.org/news/web/2018/13-180718-f4>



Upcoming Science and Technology Related Events

ETH Industry Day

September 5, 2018

<http://www.ethz.ch/industryday>

Technology Transfer, Innovation, Research
Zurich

Swiss Biotech Day Fall 2018

September 27, 2018

<https://is.gd/eFcFiF>

Innovation, Developers, Investors, Academia
Lausanne

Rob | Arch 2018 Conference

September 9-15, 2018

<http://www.robarch2018.org>

Robotic Fabrication in Architecture, Art and Design
Zurich

FinTech+

October 1-2, 2018

<https://2018.fintechplus.ch/>

Wealth Management, Insurance, Social Finance
Zurich

Digital Concrete 2018

September 10-12, 2018

<http://digitalconcrete2018.ethz.ch/>

Concrete and Digital Fabrication
Zurich

Digital Health

October 4, 2018

<http://www.lifeinnumbers.ch/>

Computational Technology, Healthcare
Wädenswil

30th Annual EAIE Conference and Exhibition

September 11-14, 2018

<https://www.eaie.org/geneva.html>

Higher Education Exhibition
Geneva

1st International FinTech, InsurTech & Blockchain Forum

October 24, 2018

<https://is.gd/30DHXV>

Digitalization of Financial Services
Zurich

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