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# Science-Switzerland, June – July 2020

## News on Swiss science, technology, education and innovation



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### Switzerland Ranks First on European Innovation Scoreboard

(startupticker.ch, June 24, 2020)

According to the European Innovation Scoreboard 2020, Switzerland continues to be the most innovative country in Europe. The scoreboard interactive tool provides a comparative assessment of the research and innovation performance of EU Member States and selected third countries. Attractive research systems, human resources and firm investments are the strongest innovation dimensions. Switzerland scored particularly well on public-private co-publications, foreign doctorate students, lifelong learning, and international scientific co-publications. It also scored quite well on venture capital, an indicator that has clearly improved over the last year. However, there are relatively few employees in fast growing companies in Switzerland and there is room for improvement regarding exports of knowledge-intensive services, and innovative SMEs collaborating with others.
/web/2020/00-200624-ce

## 1. Policy

### Global Vaccine Summit Mobilizes Funds for COVID-19 Activities

(Admin.ch, June 04, 2020)

On 4 June, President Simonetta Sommaruga represented Switzerland at the Global Vaccine Summit. The summit, which was originally due to have taken place in London at the UK's invitation, was instead conducted by video conference. Among the issues addressed was how any future vaccine against COVID-19 could be made globally accessible. Switzerland will contribute CHF 30 million to Gavi, the Vaccine Alliance. In her video statement, Ms. Sommaruga said the prospect of developing a vaccine gives people hope: "Switzerland shares with others the aim of accelerating research, development and production of a vaccine, as well as its equitable distribution". The organizations active in these fields will play a key role in this regard. Due to its mandate and experience, Gavi is well placed to ensure that any future vaccine against COVID-19 will also reach people in the poorest countries.
/web/2020/01-200604-47

### Leader for Sustainable Financial Services

(admin.ch, June 26, 2020)

In an effort to make Switzerland a leader in sustainable financial services, the Federal Council recently adopted a report and guidelines that aim to "shape the framework conditions in such a way that the competitiveness of Switzerland's financial center is improved and, at the same time, the financial sector can make an effective contribution to sustainability." According to the official press release, this report constitutes the first overview of international developments and Switzerland's positon by providing a detailed examination of thirteen measures for sustainability in the financial sector, which primarily address transparency, investment activities, training and further education, and risks.
/web/2020/01-200626-8f

### Swiss Government Spent CHF 2.6 Billion on Research in 2019

(admin.ch, July 07, 2020)

In 2019, the Confederation spent CHF 2.6 billion undertaking or in support of research and development activities. Compared with 2017, the last year observed, this represents an increase of CHF 279 million (+12%). Almost 90% of the funding was dedicated to the support and promotion of research, in the form of federal contributions. During the same period, the number of federal staff dedicated to research activities also grew (+19) to just over 1,000 jobs (in full-time equivalents).
/web/2020/01-200707-3f

### Adapted Mandate and New Chair for Swiss National COVID-19 Science Task Force

(admin.ch, July 20, 2020)

In order to continue to promote intergovernmental coordination and to obtain independent scientific advice in accordance with the Epidemics Act (EpG), the Federal Office of Public Health (FOPH), along with the Federal Department of Home Affairs (FDHA), recently adapted the mandate of the Swiss National COVID-19 Science Task Force (SN-STF). In addition, Prof. Martin Ackermann, an expert in microbiology at the ETH Zurich and Eawag, has been elected as the new chair of the SN-STF, and will replace current chair Prof. Matthias Egger on 1 August 2020. The SN-STF was originally created as a scientific advisory body by a consortium of federal agencies to respond to the 'extraordinary situation' triggered by the COVID-19 pandemic at the end of March 2020, but subsequently lost its initial official mandate once the situation was reclassified as 'special'.
/web/2020/01-200720-2a

## 2. Education

### EPFL Launches New Interdisciplinary Research Fund

(EPFL, June 04, 2020)

EPFL Professor Anna Fontcuberta i Morral recently secured CHF 1.2 million in federal funding to launch an initiative to support "research projects that would otherwise never have seen the light of day." Proposals primarily focused on the fields of artificial intelligence, health technology or climate change, and in order to be selected, projects had to be genuinely innovative and bring together researchers that had not previously collaborated with each other. In one of the winning proposals for example, researchers from the School of Architecture, Civil and Environmental Engineering collaborated with the School of Life Sciences to develop an AI-based system that allows paraplegic patients to walk again. Reports suggest that based on its considerable success, this initiative is likely to be repeated next year.
/web/2020/02-200604-84

### New Open Access Agreement between Swissuniversities and Springer Nature

(University of Bern, July 01, 2020)

Swissuniversities has adopted a new transformative Open Access agreement with Springer Nature. This agreement provides Swiss researchers with access to SpringerLink, which contains over 2'000 journals, and enables authors affiliated with the Swiss academic and research institutions to publish accepted research papers under the Open Access model, making this primary research immediately and freely accessible from the point of publication. The agreement with Springer Nature is an important step towards achieving the goal of Open Access. It guarantees researchers and students optimal access to publications during the transitional period. The agreement is effective until December 2022.
/web/2020/02-200701-73

### Michael Schaepman is the New Rector of the University of Zurich

(University of Zurich, July 03, 2020)

Michael Schaepman was elected as the new Rector of the University of Zurich by the Board of the University on 9 July 2020.The University's Senate – comprising 736 professors and 88 representatives of the student body, junior researchers, advanced researchers and lecturers, plus administrative and technical staff – had previously nominated him. Michael Schaepman, originally from Zurich, is 54 years old and professor of remote sensing and Vice Rector Research. His research focuses on earth observation, remote sensing and spectroscopy for measuring biodiversity from space. In 2014, he was appointed Vice Dean and in 2016 Dean of the Faculty of Mathematics and Natural Sciences. Since August 2017, he has been

a member of the University Executive Board, responsible for research, innovation and the promotion of young scientists.
/web/2020/02-200703-99

# 3. Life Science

## Tissue Healing Process

(ETH Zurich, June 02, 2020)

If wounds that heal too quickly can heal badly: if the concentration of certain growth factors becomes too high and the healing process overshoots the mark, then bulging (in technical jargon: hypertrophic) scars form and even the surrounding skin loses some of its elasticity. This is the conclusion that Professor Sabine Werner, at the Institute for Molecular Health Sciences, and Professor Edoardo Mazza, at the Institute for Mechanical Systems, as well as their two research groups have reached, following joint investigations. They have developed a new method that allows the biomechanical properties of the healing tissue to be measured in vivo for the first time.
/web/2020/03-200602-66

## Improved Model for Neutrophil-Related Diseases

(EPFL, June 02, 2020)

As the COVID-19 pandemic continues to spread, researchers are investigating the virus' biology, mechanisms of action, and possible treatments. Within this context, much attention has been given to a group of immune cells called neutrophils. Although critical for antimicrobial defense, these cells can exacerbate a number of diseases, and have also been found in the respiratory tract of patients who died from COVID-19. While attacking the virus, researchers hypothesize that neutrophils might be aggravating the disease's symptoms by invading the lungs and exacerbating inflammation there. Because traditional approaches to study neutrophils in animal models are limited in specificity and effectiveness, EPFL scientists recently developed a new, optimized mouse model to study the role of neutrophils in the context of disease, using a double antibody depletion strategy.
/web/2020/03-200602-ec

## Paola Picotti Receives Rössler Prize

(ETH Zurich, June 04, 2020)

We now know that deciphering the proteome – the entire set of proteins and their interactions – is an additional piece of the puzzle in understanding human health. This specialist field is known as proteomics, and Paola Picotti, Associate Professor for Molecular Systems Biology at ETH Zurich, is one of its leading lights. In 2019, she won the EMBO Gold Medal, awarded annually for internationally recognized contributions to the life sciences. This is now being followed by the Rössler Prize in 2020. Worth 200,000 Swiss francs, it is the most highly endowed research award at ETH Zurich and was made possible by a gift to the ETH Foundation from ETH alumnus Max Rössler.
/web/2020/03-200604-33

## Equally Effective Treatments but with Fewer Antibiotics

(University of Geneva, June 05, 2020)

Growing antibiotic resistance and the lack of new molecules is currently a major global health challenge. Reducing the consumption of antibiotics could be one of the only ways of preserving the effectiveness of products and limiting the emergence of resistance. Relatively long courses of treatment are common, e.g. 14 days for bacteremia (a dangerous blood infection), even if this is primarily based on tradition rather than on sound scientific evidence. A multicenter study conducted by a team from UNIGE, HUG, CHUV and St. Gallen Hospital shows that shorter treatment, with a more restricted use of antibiotics, does not reduce their effectiveness and limits the development of resistance. Their results, published in the journal JAMA, show that treatment reduced by half was equally effective. Personalized treatment also appears feasible.
/web/2020/03-200605-f0

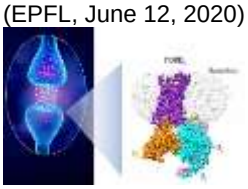
## New Method to Decipher Links between Genes and Metabolism

(EPFL, June 09, 2020)

Over the last two decades, life sciences have progressively strengthened their collaborations with information technology, as the immense volume and complexity of data across multiple fields has become increasingly difficult to standardize and process. To address this issue in the context of genes and metabolism analysis, scientists at EPFL have developed a new method that simplifies the processing of genetic-metabolic data by picking up changes in metabolism, a hallmark of numerous diseases like cancer and Alzheimer's. The new method, named redHUMAN is robust and features guaranteed predictability, overcoming a major hurdle of current genome-scale metabolic models (GEMs). The study was published in Nature Communications.
/web/2020/03-200609-b0

## Protein Design Facilitates Drug Discovery for Parkinson's Disease

(EPFL, June 12, 2020)



The neurotransmitter dopamine is involved in higher cognitive functions, motor control, motivation, arousal, reinforcement, and sexual gratification. The receptors it acts on have long been a target for treating disorders like Parkinson's disease, caused by the degeneration of dopamine-using neurons that control movement. Until now, no one has been able to "see" what a dopamine receptor looks like when activated by dopamine – at least not in high enough resolution to help design drugs that can effectively target the receptors. However, EPFL researchers, in collaboration with UTSW and UCSD scientists, recently developed a computational protein design approach, and used it to obtain the first ever high-resolution structure of an activated dopamine receptor in its natural cell membrane environment. The breakthrough will facilitate drug discovery for Parkinson's disease and potentially other disorders.
/web/2020/03-200612-41

## Unique Biosafety Level 3 Laboratory is Operational

(University of Bern, June 16, 2020)

Bacteria or viruses that are highly infectious, and for which no therapy or vaccination is available, are examined under the strictest safety measures in a Biosafety Level 3 (BSL-3) laboratory. Despite the Covid-19 pandemic, the University of Bern Institute of Infectious Diseases recently opened Switzerland's newest BSL-3 laboratory on schedule, which is located in the Swiss Institute for Translational and Entrepreneurial Medicine (sitem-insel) building. It is one of the largest in the nation and the only Swiss BSL-3 laboratory to combine diagnostics, research and translation under one roof. Human pathogens will be researched here, and findings will be transferred into products and therapies in the spirit of translational medicine. This new lab is open to both public and private R&D, making it unique in Switzerland.
/web/2020/03-200616-69

## Successful Clinical Trial for Breast Cancer Diagnosis

(University of Basel, June 23, 2020)

Artidis, a spin-off from the University of Basel, recently announced that one of their new test methods was able to detect breast cancer with a very high degree of accuracy. This followed a clinical trial with 520 patients, which demonstrated that an Artidis-developed nonomechanical biomarker was able to detect breast cancer with a sensitivity of 96 percent – thereby surpassing the stated goal of 90 percent. Dr. Marija Plodinec, CEO of Artidis, highlighted the importance of these results by stating that this brings them one step closer to “being able to diagnose patients undergoing a biopsy on the same day using the ArtidisNet platform and to pave the way for personalized cancer treatment."
/web/2020/03-200623-a3

## Inhibiting Sugar Metabolism Slows Lung Tumor Growth

(EPFL, June 23, 2020)

Blocking a pair of sugar-transporting proteins may be a useful treatment approach for lung cancer. Cancer cells use a lot of sugar to fuel their rapid growth and spread. This has led scientists to consider cutting off their sugar supply as a way to treat cancer. The current study suggests this could be an effective approach, but it will be necessary to block multiple pathways at once to be effective. When the researchers genetically engineered mice with lung cancer that lack both Glut1 and Glut3, they found that the animals grew fewer tumors and survived longer. By using an imaging technology called positron emission tomography (PET) and sugar labelled with radioactive tags, the team confirmed that the tumors used less sugar. The tumor cells also grew more slowly.
/web/2020/03-200623-65

## Botond Roska Receives Körber European Science Prize

(University of Basel, June 23, 2020)

Botond Roska, professor at the University of Basel and director of the Institute of Molecular and Clinical Ophthalmology Basel (IOB), has recently been awarded the highly coveted Körber European Science Prize for his research on how the retina functions at the cellular level. Having focused on gene therapies that restore light sensitivity to the cells of the retina, Professor Rosaka and his team are using their findings to develop therapeutic approaches for treating vision loss and blindness caused by retinal diseases. The prize, which is worth EUR 1 million and has become one of the world’s most renowned research awards over the last few years, will be presented to Professor Roska in Hamburg on 7 September.
/web/2020/03-200623-78

## Genetic Malfunction of Brain Astrocytes Triggers Migraine

(University of Zurich, June 24, 2020)

Migraine is one of the most disabling disorders, affecting one in seven people and causing a heavy social and economic burden. Several studies suggest that migraine is a complicated disease that affects a large part of the central nervous system and is characterized by a global dysfunction in sensory information processing and integration, which also occurs between migraine episodes. Until now, the cellular mechanisms responsible for these alterations were largely unknown. Neuroscientists at the University of Zurich, collaborating with the University of Padua, have discovered that a genetic dysfunction in astrocytes – star-shaped brain cells in the cingulate cortex, a brain region involved in the feeling of pain – strongly influences the occurrence of head pain. Identifying the link between astrocyte dysfunction and familial migraine could help in devising new migraine treatment strategies.
/web/2020/03-200624-15

## Understanding Rare Metabolic Disorders with DNA Sequencing

(University of Bern, June 30, 2020)

Researchers from the University of Bern, together with colleagues from Spain, have studied the genetic basis of aromatase deficiency, a rare metabolic disorder that prevents the production of estrogen in humans. By employing next-generation DNA sequencing technology, the researchers were able to identify the exact metabolic step where the aromatase deficiency originated, which can help guide the therapy of aromatase deficiency in a very precisely manner, thereby preventing side effects associated with steroid supplementation. Furthermore, the research team from the University of Bern extended its studies to patients with aromatase deficiency in Africa and India in order to support local hospitals with advanced diagnostic and assay technologies.
/web/2020/03-200630-64

## "Breathe" – Simple and Inexpensive Ventilator to Fight Novel Coronavirus

(ETH Zurich, July 01, 2020)

Although many countries have struggled to overcome widespread shortages of essential medical equipment, and in particular ventilators, to respond to the coronavirus pandemic, this problem is especially pronounced in emerging and developing countries. In an attempt to help alleviate this deficit, a team led by ETH Professor Kristina Shea recently developed a simple and relatively inexpensive ventilator as part of the “breathe” project, which aims to provide an alternative for countries that cannot afford more expensive machines. Convinced of the project’s importance, the Federal Department of Foreign Affairs (FDFA) agreed to offer start-up financing of 1.5 million Swiss francs to support the production of the ventilators.
/web/2020/03-200701-ed

## New Alternatives to Animal Testing

(University of Bern, July 01, 2020)

In an effort to replace, reduce and refine animal experiments – also known as the “3Rs principle” – the Swiss 3R Competence Centre (3RCC) recently announced that it has allocated CHF 1.3 million to fund four innovative projects – three at the University of Bern and one at ETH Zurich. These grants will support the development of human-based models to study cancer, lung fibrosis and materno-fetal drug transfer during pregnancy at the University of Bern, as well as the development of tools to analyze the behavior of laboratory rodents at ETH Zurich. This research therefore not only promises to contribute to the improvement of animal welfare and the reduction of animals used in experiments, but also to encourage the advancement of non-animal methods, which the 3RCC contends are more “reliable, reproducible and relevant to humans.”
/web/2020/03-200701-9a

## Age-Related Impairments Reversed in Animal Model

(University of Bern, July 06, 2020)

Elderly people are more prone to infectious diseases, as their immune systems decline with age. Since the efficacy of vaccination in the elderly is strongly reduced, this age group is particularly vulnerable to infectious pathogens, like influenza and Covid-19, and often shows the highest mortality rate. In addition to age-related immune decline, aged individuals are commonly affected by frailty that negatively affects their quality of life. In this context, researchers from the University of Bern and the University Hospital Bern recently reported that certain immune cells, known as eosinophils, play an essential role in regulating chronic low-grade inflammation and aging processes. As reported in Nature Metabolism, the researchers were able to demonstrate, in an animal model, that these processes can be halted, and even partially reversed, using a novel eosinophil cell therapy.
/web/2020/03-200706-7f

## University of Basel Professor Elected as Member of the European Molecular Biology Organization

(University of Basel, July 07, 2020)

Professor Fiona Doetsch from the University of Basel has been elected as a new member of the prestigious European Molecular Biology Organization (EMBO). With this life-long EMBO membership, the neuroscientist and stem cell biologist joins a group of more than 1,800 of the best researchers in Life Sciences in Europe and around the world. This year, 63 scientists from 25 different countries, including three from Switzerland, have been selected to join the EMBO community.
/web/2020/03-200707-b6

## Restoring Vision through Electrical Stimulation

(University of Zurich, July 09, 2020)

Assembling a formidable interdisciplinary team from seven European universities and institutions, the international Neural Active Visual Prosthetics for Restoring Function project, which will be coordinated by University of Zurich Professor Shih-Chii Liu and is supported by a 4 million euros EU research grant, aims to develop a novel neuroprosthesis system to restore the vision of blind people. To do this, the team aim to develop innovative "adaptive machine learning algorithms for a new brain-computer interfacing technology", which drives a neuroprosthesis composed of thousands of electrodes. Significant breakthroughs are expected in the approach to high-electrode-count cortical visual interfacing, electrode design, and artificial neural networks trained by deep learning, while also greatly improving the effectiveness and longevity of cortical vision prostheses.
/web/2020/03-200709-fc

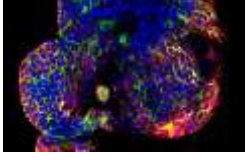
## Using AI to Count Wheat Heads

(ETH Zurich, July 10, 2020)

Plant breeding is not an easy job, as the successful development of new varieties of crops that are able to thrive under a very particular set of conditions greatly depends on being able to collect a considerable amount of reliable data. Until now, this has been an incredibly laborious and monotonous task, but ETH Professor Achim Walter argues that machine learning could be ideally suited to quantify a plethora of vital information, such as soil properties, crop quantities, and even the number of pests, from images. To drive this technology forwards, ETH Zurich launched the "Global Wheat Head Detection Challenge" competition in July, which challenged participants to develop a software that is able to reliably determine the correct number of wheat heads in several hundred previously annotated pictures.
/web/2020/03-200710-96

## Growing Transplantable Liver Organoids

(EPFL, July 10, 2020)



A team of EPFL researchers has recently succeeded in developing a new method for growing liver organoids – a simplified miniature version of the organ – which most notably employs an innovative matrix to provide structure, similar to scaffolding. This could potentially be a major breakthrough in the development of transplantable lab-grown tissues, because this new matrix is more stable and non-immunogenic compared to its commercially available counterparts, all while containing no animal products. Although the team stresses that more research is needed before transplantable organs can be grown using this novel method, their work is nevertheless already contributing to research on non-alcoholic fatty liver disease, an incredibly prevalent liver disease that is associated with obesity and diabetes, and can cause liver fibrosis, cirrhosis and potentially even liver cancer.
/web/2020/03-200710-c4

## Lopinavir and Hydroxychloroquine Ineffective Against SARS-CoV-2

(University of Basel, July 10, 2020)

In recent study by the University of Basel and the University Hospital Basel, researchers refuted the efficacy of lopinavir and hydroxychloroquine in combating the coronavirus SARS-CoV-2, as the results demonstrated that neither drug would likely be able to reach sufficient concentrations in the lungs to inhibit the virus from replicating. Both drugs, which usually are used to fight HIV (lopinavir) and to treat malaria and rheumatism (hydroxychloroquine), had initially been considered as potential treatment options for hospitalized COVID-19 patients. The results of this study greatly contributed to the WHO's decision to discontinue the lopinavir/ritonavir arm for treating COVID-19 on 4 July 2020 – the hydroxychloroquine arm was discontinued on the same day as well.
/web/2020/03-200710-06

## Diagnosing Schizophrenia through Brain 'Signatures'

(EPFL, July 13, 2020)

Although it is known that individuals are much more likely to develop schizophrenia if a close relative possesses the disorder, scientists have struggled to make specific predictions for individual people, as it is not caused by a unique genetic variant. However, by analyzing endophenotypes – quantifiable traits that "connect the connect the symptoms of a disorder to the underlying genetic risk factors" – a team of EPFL researchers have not only been able to detect abnormal EEG microstates – "specific patterns of neuronal activity" often described as the "building blocks of cognition and emotion" – in schizophrenic individuals, but also in their unaffected family members. This is a major step towards being able to detect at-risk individuals prior to the onset of clinical symptoms, as well as in developing personalized treatments.
/web/2020/03-200713-72

## Novel Method to Quantify the Biodistribution of Metal-Based Nanoparticles

(University of Basel, July 13, 2020)

Researchers from the University of Basel have recently developed an innovative approach to study the distribution of metal-based nanoparticles inside zebrafish embryos, using a sophisticated 3D imaging method. Until now, researchers have struggled to understand how these particles move and accumulate within the body, as conventional labeling methods using radioactive or fluorescent markers often distort the results. However, by employing a synchrotron light source, located at the Paul Scherrer Institute, in phase contrast mode, the team was able to obtain high-definition images of individual organs and even the optic nerve of zebrafish embryos without any special labeling. This is a significant development for the field of toxicology, which often studies zebrafish because of their human-like immune system.
/web/2020/03-200713-b4

## Autism Drug Advancement Using Oxytocin Receptor Blueprint

(University of Zurich, July 15, 2020)

Researchers at the University of Zurich have been able to determine the structure of the oxytocin receptor using a combination of recently developed directed evolution and protein engineering methods. Given the significant role of oxytocin in numerous mental health and sexual reproduction disorders, this understanding could play a vital role in the development of new drugs that that regulate the receptor's functioning. Furthermore, the researchers hypothesize that their findings may also be pertinent to understanding the structure of vasopressin receptors, which are frequently targeted by pharmaceutical interventions because vasopressin regulates the water content of body fluids and controls blood pressure. Andreas Plückthun, who led the research team, therefore argued that these findings could potentially "boost the development of new drugs for a very broad range of widespread and severe human diseases."
/web/2020/03-200715-5f

## Identifying the Root of Biomedical Problems with AI

(EPFL, July 20, 2020)

Researchers led by EPFL Professor Grégoire Courtine recently developed a novel machine-learning method called “Augur”, which promises to revolutionize biomedical studies by being able to identify which cell types respond to a particular treatment. The team tested their method by comparing two groups of paralyzed rodents, and were able to pinpoint which types of neurons were particularly important in the gait reacquisition process. Given the dramatic impact that this novel method could have in the development of more effective treatments for a wide variety of diseases, the team decided to make Augur freely available to the public. As summarized by Courtine, “whether you are working on cancer, Crohn’s disease, COVID, or multiple sclerosis, the central question remains the same, what type of cell is at the source of the problem?”
/web/2020/03-200720-f0

## Novel Fluorescent Tumor Marker Recognized with 2020 Spark Award

(ETH Zurich, July 22, 2020)

Chemical biologists Helma Wennemers and Matthew Aronoff recently received the 2020 Spark Award – which recognizes the “most promising invention at ETH Zurich resulting in a patent application” – for the development of a fluorescent marker that aims to help surgeons distinguish diseased tissue from healthy tissue. Exploiting the fact that uncontrolled tissue growth in fibrotic diseases or cancerous tumors often involves an enzyme called LOX, the team designed their novel marker to accumulate where LOX is active, thereby illuminating the exact location of the pathologically altered tissue. According to Aronoff, the patent application for this innovation should be completed by the end of the year, and the team is currently contemplating the option of launching a spin-off.
/web/2020/03-200722-7d

## Spin-Off T3 Pharma Announces Clinical Trials for Bacterial Cancer Treatment

(University of Basel, July 22, 2020)

Following a total investment of over CHF 25 million during their third financing round, the University of Basel spin-off T3 Pharmaceuticals AG (T3 Pharma), recently announced their plans to commence clinical testing of a novel bacterial cancer treatment. The idea behind this innovative approach is to promote the growth of live bacteria in solid tumors, which subsequently could inject self-made bioactive proteins to attack the cancer cells using a “type III secretion system.” The aim of this initial phase is to “focus on safety and tolerability of the lead candidate, and the identification of the optimal dosage”, so that the team can proceed with clinical trials in patients by early next year.
/web/2020/03-200722-25

## Immunoprotein Impairs SARS-CoV-2

(University of Bern, July 28, 2020)

A recent study by an international team, which included researchers of the Institute of Virology and Immunology (IVI) of the University of Bern, as well as the Swiss Federal Food Safety and Veterinary Office (FSVO), demonstrated that LY6E, a protein that is produced by the human immune system, could potentially inhibit several coronaviruses, including those that cause MERS, SARS and COVID-19. This is because according to Professor Volker Thiel from the IVI, LY6E impairs the ability of coronaviruses to fuse with the host cells, and by extension, to cause infections. Although the coronavirus used in their experiments differ from SARS-CoV-2, the team nevertheless stress that the insights gained during their study could prove vital in the development of a therapeutic approach that acts as a “first line of defense against novel coronavirus infections.”
/web/2020/03-200728-24

### New Targeted Cancer Immunotherapy Approach

(University of Basel, July 30, 2020)

Despite significant advances in cancer immunotherapies, which employ so-called T cells to attack and eradicate cancer cells, some tumors are nevertheless able to resist these attacks, and patients remain at risk of a number of severe side effects. However, in a recent study by the University of Basel and University Hospital Basel, which was carried out in collaboration with the Roche Innovation Center Zurich and the Cantonal Hospital Baselland, researchers developed a novel immunotherapy approach, whereby the T cells are only stimulated when they are in the immediate vicinity of the tumor. This not only enhances the “killer function” of T cells, but crucially, because the effect is focused on the tumor, the risk of developing severe side effects is considerably reduced
/web/2020/03-200730-a6

### New Computational Tool to Accelerate Drug Design

(University of Lugano, July 31, 2020)

Developing novel drugs is a complex and laborious process, as tens of thousands of pharmaceutical compounds must first be prepared and analyzed in order to identify those with the highest pharmacological potential. However, thanks to the research carried out by a team led by USI Professor Vittorio Limongelli, in collaboration with Professor Siewert Marrink's group of the University of Groningen, a new and effective computational method to simulate the interaction between a series of drugs and their biological "targets" has been identified, which promises to considerably speed up the aforementioned "screening" phase. This novel technique therefore represents a significant advance for drug design, as current drug development studies typically take between 10 and 11 years.
/web/2020/03-200731-a5

## 4. Nano / Micro Technology / Material Science

### Smart Textiles Powered by Intelligent Electronic Fibers

(EPFL, June 01, 2020)

EPFL researchers have developed electronic fibers that, when embedded in textiles, can collect a wealth of information about our bodies by measuring subtle and complex fabrics deformations. Their technology relies on transmission line theory and offers a host of applications, such as in health care and robotics. The team was able to create soft fiber-shaped sensors that open up new doors for smart textiles. The technology works similar to a radar, but it sends out electrical pulses instead of electromagnetic waves. This kind of detection technology has never before been used in structures combining extended mechanical flexibility and high electronic performance, which are key for measuring deformations.
/web/2020/04-200601-74

### Strong and Deformable Silicon for Smartphones

(ETH Zurich, June 10, 2020)

Scientists from ETH Zurich and Empa recently were able to demonstrate that under certain conditions, silicon can be much stronger and more deformable than was previously thought. The results obtained could have an immediate impact on the fabrication of smartphones, as gyroscopes for example could be made even smaller and more robust. The method could also be applied to other materials that possess similar crystal structures to silicon. Moreover, more elastic silicon could be used to further improve the

electrical properties of the material for certain applications. The findings were published in Nature Communications.
/web/2020/04-200610-cc

## 3D-Printed Micromagnets

(EMPA, June 11, 2020)

Researchers at Empa have developed an innovative method to precisely produce different alloy compositions in a single component, using a 3D laser printer. Until recently, 3D printing has presented unique challenges to metal processing, as temperatures nearly instantaneously exceed 2,500 degrees Celsius in the melting zone, which can alter the properties of alloys as some components evaporate. However, a team at Empa, led by Aryan Arabi-Hashemi and Christian Leinenbach, discovered that by varying the power and duration of the laser beam, they could modify the alloys with micrometer precision, thereby "producing new materials with completely new functionalities." Prospective applications include manufacturing "smart" shape memory alloys and designing more efficient electric motors.
/web/2020/04-200611-18

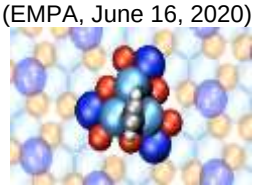
## Quantum Effect Observed on a Surprisingly Large Scale

(EPFL, June 12, 2020)

Although it is known that electrons behave both as particles and as waves when moving in the interstitial spaces of metals, researchers until now have only been able to observe this quantum effect under very specific laboratory conditions. As a result, it came as a surprise to an EPFL team working on the resistivity of a type of delafossite – PdCoO2 – when then they noticed that the electrons in their sample retained signatures of their wave-like nature, even at relatively high temperatures (up to 60 Kelvin). Even more surprising however was that this phenomenon could also be observed at length scales of up to 12 microns, which in the words of Philip Moll, the head of EPFL's Laboratory of Quantum Materials, "is gigantic!" Although more research needs to be conducted, this is already an exciting discovery for the field of quantum computing.
/web/2020/04-200612-f8

## Molecular Motor Provides Insights to Quantum Tunneling

(EMPA, June 16, 2020)



Researchers from Empa and EPFL have recently developed a miniature motor that only consists of 16 atoms – theoretically the smallest size of a mechanical motor, due to the effects of quantum tunneling. However, researchers have nevertheless been able to observe surprising quantum effects, such as the rotor being able to overcome the resistance of the chute with less kinetic energy than would be predicted by the laws of classical physics. At the same time, the motor nevertheless appears to rotate almost exclusively in one direction, thereby challenging the common understanding that no energy is lost during a tunneling event. This discovery therefore not only brings researchers closer to being able to harvest energy from atomic or molecular motors, but also provides them with a unique opportunity to "study the processes and reasons for energy dissipation in quantum tunneling processes," as stated by Empa researcher Oliver Gröning.
/web/2020/04-200616-6c

## Cutting Nanometer-Sized Patterns into 2D Materials

(EPFL, June 19, 2020)

Researchers from EPFL have pioneered an innovative technology that allows them to carve nanometric patterns into two-dimensional materials using a heated miniature scalpel. Unlike conventional lithography, with which it is virtually impossible to structure 2D materials because of the destructive nature of the habitually used chemicals or charged particles, this novel thermal scanning probe lithography (t-SPL)

technique allows researchers to precisely cut the links between atoms without damaging the rest of the material. As pointed out by Xia Liu, one of the co-authors, “a lot of 2D materials are semi-conductors and can be integrated into electronic devices,” meaning that this technological advancement promises to help make electronic components smaller and more efficient.
/web/2020/04-200619-f2

## Precision Diffraction Grating to Control Light Pulses

(ETH Zurich, June 24, 2020)

Various technologies are used to steer and control light pulses. One of the most important is diffraction grating, which deflects light of different colors in precisely determined directions. In this context, researchers at ETH Zurich recently developed a method for the production of wavy surfaces with nanometer precision, which in turn enable new possibilities for controlling light. For example, this novel technology can be used to build tiny diffraction gratings into integrated circuits, with which optical signals for the internet can be sent, received and routed more efficiently. Alternatively, highly miniaturized optical devices, such as on-chip micro-lasers, can be built. These miniaturized devices range from ultra-thin camera lenses, to compact holograms with sharper images.
/web/2020/04-200624-24

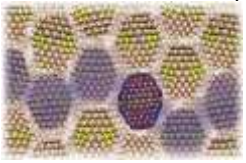
## New Method for Designing Lower-Power Circuits

(EPFL, June 26, 2020)

Researchers from EPFL’s Integrated Systems Laboratory recently developed a new type of logic diagram and related optimization methods that can be used to design computer chips with a nearly 20 percent gain in energy efficiency, speed or size. By only using two logic primitives – majority and inverter – that are displayed in so-called majority-inverter graphs (MIGs), fewer logic steps are needed to execute a given task compared to standard programs, thereby freeing up transistor capacity for other tasks. This method therefore not only reduces the power requirement of computer chips, but according to Mauro Lattuada, the technology-transfer manager at EPFL, also provides a “new logic paradigm that can be used in other applications, such as designing and improving FPGAs [field-programmable gate arrays] or searching and analyzing data sets.”
/web/2020/04-200626-23

## New Theory for Semiconductors Made of Nanocrystal

(ETH Zurich, June 29, 2020)



Researchers at ETH have provided the first theoretical explanation for how electrical current is conducted in semiconductors made of nanocrystals. In the future, this could lead to the development of new sensors, lasers or LEDs for TV screens. After eight years of research, the scientists have now created a model that can explain how the electronic properties of the nanocrystal-based semiconductors are changed by varying the size of the nanocrystals and how they pack in the film. To test the predictions of their simulations, the team produced thin films of nanocrystals in the laboratory and measured the electric response for different applied voltages and temperatures. The result: for each of the several hundred different tests, the computer simulation perfectly predicted the electrical properties.
/web/2020/04-200629-0e

## World’s Lightest Shielding Material

(EMPA, July 02, 2020)

Electric motors and electronic devices generate electromagnetic fields that sometimes have to be shielded in order not to affect neighboring components or the transmission of signals. However, the thin metal sheets or metallized foils that are conventionally used for this purpose are often too heavy or too rigid for many applications. To address this shortcoming, Empa researchers recently succeeded in

applying very light aerogels, based on cellulose nanofibers, to microelectronics, which can effectively shield electromagnetic radiation over a wide frequency range. Cellulose fibers are obtained from wood, and due to their chemical structure, enable a wide range of chemical modifications, which are maintained even after being subjected to strong mechanical stress. Combined with two-dimensional nanoplates of titanium carbide, the material has proven to be the lightest electromagnetic shield in the world.
/web/2020/04-200702-4a

## Novel Plasmonic Chip for Ultrafast Data Transmission

(ETH Zurich, July 03, 2020)

ETH researchers have built an ultrafast chip that can speed up data transmission in fiber optic networks. The chip combines several innovations at the same time and, given the growing demand for streaming and online services, represents a significant development. In particular, the team was able to combine electronic and photonic elements on a single chip for the first time, thereby enabling the chip to directly convert fast electronic signals into ultrafast light signals – with practically no loss of signal quality. This represents a significant breakthrough in terms of the efficiency of optical communication infrastructures that use light to transmit data, such as fiber optic networks, and according to Professor Juerg Leuthold, “pave[s] the way for faster data transmission in optical communication networks of the future.”
/web/2020/04-200703-83

## Porous Nitrogen-Doped Graphene Ribbons for Future Electronics

(University of Basel, July 08, 2020)

Graphene – a material that consists of a single layer of carbon atoms arranged in a honeycomb structure – is of interest not only in basic research, but also for various applications, due to its unique properties, which include excellent electrical conductivity, as well as astonishing strength and rigidity. In order to further expand these characteristics, a team of researchers, led by the physicist Professor Ernst Meyer of the University of Basel and the chemist Dr. Shi-Xia Liu from the University of Bern, recently produced the first porous graphene ribbons in which specific carbon atoms in the crystal lattice are replaced with nitrogen atoms. These ribbons have semiconducting properties that make them attractive for applications in electronics and quantum computing, as reported by researchers from the Universities of Basel, Bern, Lancaster and Warwick.
/web/2020/04-200708-ce

## Self-Pre-Stressing Concrete Technology for Sustainable Construction

(EMPA, July 15, 2020)

Although concrete provides many advantages as a construction material, it is also responsible for a significant amount of anthropogenic emissions. With global demand projected to increase in the coming decades, a team at Empa therefore developed a novel self-pre-stressing concrete technology using carbon fiber-reinforced polymers (CFRP), with which stable concrete structures can be built with significantly less material. Although CFRP has been used since the 1990s, the team has been able to dramatically lower production costs cost by removing the need for the expensive pre-stressing beds and complicated anchoring procedure that were needed until now, as their newly developed formula allows the concrete to automatically pre-stress itself as it hardens. Potential new applications include simultaneously pre-stressing concrete in several directions to produce thin concrete slabs or filigree curved concrete shells, as explained by Empa researcher Mateusz Wyrzykowski.
/web/2020/04-200715-f4

# 5. Information & Communications Technology

## First High-Level Programming Language for Quantum Computers

(ETH Zurich, June 15, 2020)

Computer scientists from ETH Zurich recently made an important breakthrough in the field of programming languages, when Professor Martin Vechev and his team developed Silq – the very first high-level programming language for quantum computers. Until now, researchers have struggled to utilize the potential of quantum computation, as contemporary quantum programming languages are closely tied to specific hardware, thereby making them cumbersome and error prone. By contrast, Silq is more compact, faster, more intuitive and easier to understand for programmers than the aforementioned "hardware description languages", and crucially, can be use with different computer architectures. The greatest innovation that Silq brings to quantum programming however is that it is the first quantum programming language that automatically identifies and erases values that are no longer needed.
/web/2020/05-200615-92

## Performing Logical Operations Directly within Magnetic Racetrack Memory

(ETH Zurich, June 16, 2020)

Computers normally store and process data in separate modules. However, researchers at ETH Zurich and the Paul Scherrer Institute recently developed a method that allows logical operations to be performed directly within a memory element. To achieve this, the researches had been working on the development of magnetic racetrack memory for a number of years, which eliminates the need for the mechanical movement of a read/write head used in traditional hard disk drives, and therefore offers much faster access times. Unlike conventional methods, where logical operations are performed in the main memory, this novel method uses an electric current to reverse the polarity of the magnetic regions, thereby performing a logical operation, such as NOT, on the stored data. This novel technology is primarily envisioned to be used in microprocessors with low computing power, which is especially relevant for the Internet of Things.
/web/2020/05-200616-b5

## Top 5 Ranks at the Cyber 9/12 Strategy Challenge 2020

(ETH Zurich, July 09, 2020)

In a stunning demonstration of teamwork, preparation and talent, five teams from ETH Zurich competed in the Cyber 9/12 Strategy Challenge 2020 and were not only awarded the top five places, but also all the special prizes. This unprecedented result – until now, no ETH team had managed to take first place, predominately due to the fierce competition from U.S. military academies – has largely been attributed to the invaluable support provided by the Cyber Group, a student organization that was recently founded by seven participants of the 2019 challenge. The group not only backs the teams financially, but also allows them to hone their skills during weekly four-hour training sessions, as well as to benefit from inputs given by past participants and an interdisciplinary team of experts.
/web/2020/05-200709-1d

# 6. Energy / Environment

## Investment for Direct CO2 Capture Technology from Air

(startupticker.ch, June 02, 2020)

Climeworks, a Swiss startup that has established itself as one of the global leaders in carbon dioxide removal, has successfully raised CHF 75 million in equity from private investors, which constitutes the largest private investment into direct air capture made to date. The company aims to use the funds to scale up its patented technology, which captures CO2 directly from the air using clean energy, thereby providing a sustainable, and truly pure, carbon dioxide removal solution. Current customers include established businesses and organizations worldwide that have ambitious climate targets, as well as a growing community of private individuals inspired to contribute to the vision of a climate-positive world.
/web/2020/06-200602-74

## New Climate Research Center in Davos

(ETH Zurich, June 12, 2020)

Leading scientists worldwide agree that global climate change is progressing fast. Climate change particularly influences extreme weather and natural events in the alpine region, where warming levels are twice as high as the global average, leading to flooding, debris flows, landslides, and extended droughts in summer. The Canton of Grisons and the Federal Institute for Forest, Snow and Landscape Research (WSL) therefore recently established a new research center, which will employ up to 40 people in Davos. From January 2021, the center will cover six research areas, examining social and economic issues connected with climate change, extreme events and natural hazards in mountainous regions. Two new professorships will be established, funded jointly by WSL and ETH Zurich: one investigating alpine mass movements and permafrost; the second how climate change impacts mountainous regions.
/web/2020/06-200612-2f

## Na-Doped Graphene Could be an Alternative to Lithium-Ion Batteries

(EPFL, June 18, 2020)

As the demand for lithium-ion batteries continues to grow, lithium stocks are running low. Therefore, a team of researchers at EPFL embarked on a quest to develop a new battery architecture, using sodium-doped graphene. Unlike lithium, sodium is relatively abundant and can be extracted from various sources, including rock salt or seawater, but until now, researchers have struggled to produce sodium batteries that could match the superior charge storage capacity and lifetime of conventional lithium-ion batteries. However, by developing a novel synthesis route to dope a few layers of graphene with sodium, the team was able to produce a material with a highly efficient storage capacity, which according to the researchers, could provide the basis for a plethora of promising innovation possibilities
/web/2020/06-200618-a9

## Alarming Increase of Invasive Species

(University of Fribourg, June 24, 2020)

Following an international collaboration between scientists from 13 countries, including Sven Bacher of the University of Fribourg, new data has emerged that cautions of the alarming rate at which invasive alien species are spreading. According to this recent study, over 18,000 such species have already been recorded globally, and experts warn that this trend will likely continue to accelerate in subsequent years due to the rise in global traffic, as well as the appearance of new ways in which invasive alien species can spread. The scientists also demonstrated that climate change greatly contributed to the exponential

increase of invasive species in new areas, and therefore called on “politicians and the general public to make the containment and control of this biological invasion a priority.”
/web/2020/06-200624-1c

## Pilot Biomass Conversion Plant

(Bern University of Applied Sciences, June 25, 2020)

Following the successful development of a process to extract numerous valuable substances from forest biomass – such as conifer bark – in a laboratory, the Bern University of Applied Sciences, along with its industrial partner, Schilliger Holz AG, have teamed up to construct a pilot plant to perform further testing at an intermediary stage. The goal is to scale up the process to an industrial level and establish a new, sustainable value chain for wood. Extracts derived from the pilot plant will subsequently be used as a substitute for oil-based components to manufacture low-emission adhesives, highly fire-resistant resin, and even animal feed additives that reduce bacterial growth and parasite infestation in livestock.
/web/2020/06-200625-52

## Positive Impact of Energy Efficiency Support Programs

(University of Geneva, June 30, 2020)

Although programs to promote energy efficiency are now widespread, critics sometimes question the long-term impact of these incentives. A study by the University of Geneva, coordinated by energy efficiency expert Daniel Cabrera, concludes that support programs could reduce long-term energy consumption – provided the target groups are addressed appropriately. This study, supported by the Swiss Federal Office of Energy (SFOE), shows that savings from the Ecosocial Program will likely continue in the long term. In 2018, Swiss households consumed 19% (480 kWh) less electricity than in 2009. The reduction in consumption was even larger in households that also participated in other programs like DoubleÉco and/or ActivÉco (-23% or 600 kWh/year). The combined effect of several programs appears to have a greater impact than a single program.
/web/2020/06-200630-eb

## Making Geothermal Energy Safer through Simulation

(ETH Zurich, July 01, 2020)

Despite the potential of geothermal energy to significantly contribute to the expansion of renewable energies, it remains a dangerous and risky undertaking. The movements resulting from hydraulic simulation – a technique engineers employ to harness geothermal energy – cause shaking, which at times have inadvertently superseded the maximum permissible strength of generated earthquakes (e.g. St. Gallen in 2013 and Basel in 2006). Researchers from the Swiss Seismological Service SED and ETH Zurich therefore collaborated with the Swiss National Supercomputing Centre CSCS and the Università della Svizzera italiana USI to develop a system that predicts the probability of perceptible earthquakes during the process of hydraulic stimulation. Following initial simulations on a supercomputer, the team now plan to expand their testing to the real world, at ETH Zurich’s Bedretto Lab. The benefits from the knowledge gained will not only benefit geothermal engineering, but any activity that carries a risk of artificially induced earthquakes.
/web/2020/06-200701-a9

## Quantifying Anthropogenic Emissions

(EMPA, July 07, 2020)

Researchers at Empa continue to be an integral part of international efforts to quantify harmful anthropogenic emissions in order to develop effective counter-strategies. For example, as part of the Horizon2020 project MEMO2 (“Methane goes Mobile, Measurements and Modelling”), a team at Empa developed a new, lightweight spectrometer that can be mounted on a drone to measure Methane (CH4)

concentrations, with the hope of deterring mine emissions in Romania – a leading emitter of in CH4 Europe due to its numerous oil and gas fields. Other noteworthy initiatives include the recently developed QCL spectrometer by Empa spin-off MIRO Analytical Technologies, which can simultaneously detect ten environmental gases, as well as Empa's contribution to ESA's CO2M satellite mission ("Copernicus Anthropogenic Carbon Dioxide Monitoring").
/web/2020/06-200707-15

## 1.5 Billion People Will Depend on Water from Mountains

(University of Zurich, July 07, 2020)

Water is a key resource for the 21st century. Global water consumption has increased almost fourfold in the past 100 years, and many regions can only meet their water demand thanks to essential contributions from mountain regions. In 30 years, almost a quarter of the world's lowland population will strongly depend on runoff from the mountains, particularly to irrigate agricultural land. Only sustainable development can ensure the important function of mountain areas as Earth's "water towers". A study led by the University of Zurich has now quantified this dependence for the first time by comparing water supply and consumption in the world's lowland areas with runoff contributions from the mountains. Based on a high-resolution global model, the study provides detailed information on the dependence on mountain water resources around the globe.
/web/2020/06-200707-05

## Novel Technique to Mimic Endangered Tropical Wood

(Bern University of Applied Sciences, July 08, 2020)


Elena Nedelkoska, a Master student at the Bern University of Applied Sciences, was recently awarded CHF 30,000 for her innovative WoDens technology during the fourth First Ventures call for proposals. Concerned by the widespread use of endangered tropical wood to manufacture exquisite furniture, musical instruments, and other premium objects, Ms. Nedelkoska developed a novel technique that employs machine learning to modify sustainably farmed domestic wood to mimic the appearance and properties of tropical wood. In order to help Ms. Nedelkoska successfully market her innovative project, the Arts and Design Manufacture SA, an industrial partner of the Bern University of Applied Sciences, will support her in the development of a business plan and connect her to potential customers worldwide.
/web/2020/06-200708-7e

## Assessing Alternatives to Lithium-Ion Batteries

(EMPA, July 13, 2020)

With the demand for cheap, stationary storage batteries projected to skyrocket over the coming decades as conventional pump storage power plants become overwhelmed by the increased production of temporarily available renewable energy, Empa and ETH Zurich researchers Kostiantyn Kravchyk and Maksym Kovalenko recently conducted an in-depth analysis of potential alternatives to lithium-ion batteries. The sobering reality that emerged was that considerable work still lies ahead, as conceivable replacements such as sodium, magnesium or aluminum are not only outmatched by the energy density of lithium-ion batteries, but would also require the development of completely new battery management systems. Nevertheless, the team remains optimistic and have already obtained promising results in their experiments to use graphite as cathode material.
/web/2020/06-200713-e0

## Fluorine Recycling for Lithium-Ion Batteries

(EMPA, July 21, 2020)

As the demand for batteries continues to skyrocket, scientists worldwide are intensifying their efforts to improve their sustainability. In this context, a team at Empa recently developed a revolutionary non-combustible water-based electrolyte for lithium-ion batteries, which not only promises to make the recycling process of rechargeable batteries safer, but also less complicated and cheaper. Until now, the long term stability and high cell voltages of lithium-ion batteries was conventionally ensured by a fluoride compound (PF6) contained within the electrolyte liquid, which lamentably emits highly toxic and corrosive hydrogen fluoride (HF) when exposed to water or humid air. Although the commercialization and long-term stability of their experimental battery cells still need to be improve, the team is adamant that their work is opening up exciting new opportunities for a circular economy.
/web/2020/06-200721-dd

## Altering Terrestrial Water Availability

(ETH Zurich, July 30, 2020)

It is scientifically indisputable that increased atmospheric concentrations of CO2 influence the complex global water cycle in various ways. However, until now, it has been impossible to prove a direct effect of global warming on available terrestrial water resources over recent decades. Now, an international research team led by Sonia Seneviratne, ETH Professor of Land-Climate Dynamics, has proved this. As the scientists report in the current edition of Nature Geoscience, they reconstructed worldwide water availability in the driest month of years between 1902 and 2014 using climate models and new observations-based data. In order to determine how water availability changed over time, the researchers compared the reconstructed water resources of the years 1985 to 2014 with those of the first half of the 20th century. In this way, they mapped out a global pattern of changes in available water over the past three decades. In this pattern, the researchers found the fingerprint of climate change.
/web/2020/06-200730-45

## Funding for High-Efficiency Solar Panels Startup Insolight

(EPFL, July 30, 2020)

Following the completion a CHF 5 million fundraising round, as well as receiving a four-year, CHF 10 million EU grant, the EPFL startup Insolight recently announced its plans to partner with major solar energy suppliers to produce and sell its high-efficiency solar panels, primarily to the agricultural sector. To be more specific, Insolight developed a novel approach to solar power generation that employs a series of lenses, which are embedded within a thin layer of glass, to focus sunlight onto tiny, high-efficiency, space-grade solar cells, thereby being able to achieve a record-breaking efficiency of 29% for sun-to-electricity conversion. These innovative, translucent photovoltaic modules can either be used to maximize the energy production of conventional solar panels, or as standalone power plants, making it a very versatile system.
/web/2020/06-200730-e2

# 7. Engineering / Robotics / Space

## Sustaining Life on the Moon Using Robotics

(EPFL, June 17, 2020)

GrowBotHub is an interdisciplinary EPFL project that uses robotics to grow and harvest plants without human intervention. It is part of IGLUNA 2020, which was launched by EPFL's Swiss Space Center on the initiative of the European Space Agency (ESA), in order to determine which technologies astronauts need to survive on a mission to the Moon (or other planets). This year's IGLUNA campaign focused on remote control included a dozen teams, comprising some 130 students from universities in ten European countries, which each developed their own innovative solutions for sustaining life in extreme environments. The potential applications for GrowBotHub extend far beyond aerospace, as it can conceivable be used for polar expeditions or underwater exploration. Moreover, it aids sustainable living, as it supports small-scale, local, autonomous vegetable production.
/web/2020/07-200617-d9

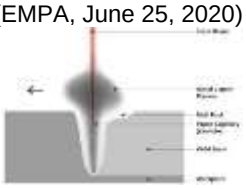
## Navigation Algorithm for Autonomous Drones

(University of Zurich, June 23, 2020)

Working together with microprocessor company Intel, a team of researchers at the University of Zurich recently developed a quadrotor helicopter, or quadcopter, that can learn to autonomously fly acrobatic maneuvers. While a power loop or a barrel role might not be needed in conventional drone operations, a drone capable of performing such maneuvers is likely to be much more efficient. It can be pushed to its physical limits, make full use of its agility and speed, and cover more distance within its battery life. The development of this quadcopter is an important step towards integrating autonomous drones in our daily lives.
/web/2020/07-200623-9c

## Using AI to Precisely Monitor Laser Weld Seams in Real Time

(EMPA, June 25, 2020)



Researchers at Empa recently developed an innovative method to precisely monitor laser weld seams in real time, using inexpensive acoustic and optical sensors, as well as a powerful convolutional neural network. The accuracy of this novel method was subsequently demonstrated with an X-ray experiment at the European Synchrotron ESRF in Grenoble (France), where the team was able to detect the formation of unwanted pores that impair the quality of weld seams with almost 90 percent reliability – and in just 70 milliseconds. The team contend that their method therefore has major potential applications in the field of highly automated production, where existing methods are only able to document the quality of weld seams retrospectively, as well as for quality control of 3D-printed metal parts.
/web/2020/07-200625-17

## Calculating the Ethical Implications of AI

(EPFL, July 01, 2020)

Rapid advances in the development and implementing of artificial intelligence (AI) technologies promise a wide variety of potential applications and benefits. However, there is also widespread concern regarding the ethical implications of AI. In a recent paper by EPFL Professor Anthony Davison and several UK colleagues, these questions were addressed from a mathematical point of view, while focusing on commercial AI that seek to maximize profits. Their results suggest that an AI is likely to pick an unethical strategy in many situations – summarized by Davison and his co-authors as the "Unethical Optimization Principle" – thereby accentuating, as stated by Professor Wendy Hall, that "we can't just rely on AI systems

to act ethically because their objectives seem ethically neutral." These findings therefore can help risk managers, regulators and others detect problematic strategies and modify AI search algorithms accordingly.
/web/2020/07-200701-f6

## First Exposed Exoplanet Core Discovered

(University of Bern, July 01, 2020)

Christoph Mordasini from the University of Bern is spearheading the theoretical interpretation of the first exposed core of the exoplanet TOI 849 b, which was recently discovered by a team led by David Armstrong from the University of Warwick. TOI 849 b is unique because it orbits much closer to its star than expected and contains astonishingly low amounts of hydrogen and helium for a planet with its mass. In this context, Christoph Mordasini hypothesized that either TOI 849 b is a gas giant that progressively lost its gaseous atmosphere because of numerous processes, or that exceptional circumstances inhibited the typical formation of a massive atmosphere in its early life. This discovery therefore not only presents researchers with a unique opportunity to study the interior composition of a planet, but also reinforces the continued importance and relevance of the world-renowned "Bern Model of Planet Formation and Evolution."
/web/2020/07-200701-1e

## Predicting Solar Weather

(Paul Scherrer Institute, July 02, 2020)

In an effort to mitigate the potentially devastating effects of solar storms – which occur when particularly large quantities of charged particles are emitted from the sun – on critical infrastructure, such as satellites and power grids, the Paul Scherrer Institute (PSI) continues to actively participate in a variety of "space weather" research projects. On the upcoming Solar Orbiter mission for example, a joint project of ESA and NASA that aims to investigate the causes of solar wind, PSI has collaborated with the University of Applied Sciences Northwestern Switzerland to develop one of the probe's ten instruments, the X-ray telescope STIX, which will be used to study the processes involved in solar flares. These efforts therefore continue to consolidate Swiss expertise in developing sophisticated space equipment that can contribute to the development of vital early warning systems.
/web/2020/07-200702-03

## Autonomous Vehicles Will Impact Urban Mobility

(University of St.Gallen, July 09, 2020)

Although autonomous vehicles (AVs) promise to considerably reduce anthropogenic emissions produced by urban centers, as well as alleviate traffic congestion and diminish the amount of space needed for parking, not all cities stand to benefit equally from this new technology. These were the findings of a recent study by Boston Consulting Group and the University of St.Gallen, where researchers used a tool to simulate 1.7 billion trips and conducted a series interviews with leading executives on the opportunities and challenges of AVs. To ensure the successful widespread introduction of AVs in suitable cities, the report further highlights the importance of municipal authorities possessing a strong vision for their city's urban mobility, collaborating closely with relevant stakeholders and proactively taking steps today to make their vision a reality.
/web/2020/07-200709-8c

## Virtually Recreating the Sense of Touch

(EPFL, July 23, 2020)

In an effort to augment the immersive experience of virtual reality, a team led by EPFL Professor Herbert Shea recently created "HAXELs" – a system that uses a series of miniature soft actuators to simulate the sensation of touching a number of different objects. This innovative technology can subsequently be integrated into a thin glove and combined with tactical illusions, as well as a system that "actively blocks

your fingers from going through the virtual object", to complete the virtual experience. Although the team is still developing a software that is able to accurately program the feeling and weight of a virtual object into the glove, Shea is convinced that this system will not only be a fun addition to video games, but also a useful tool to improve surgical simulators and teleoperations.
/web/2020/07-200723-c8

### Innovative Technologies to Help Astronauts Live in Space

(EPFL, July 24, 2020)

Following a digital reboot in response to the COVID-19 pandemic, 15 international teams recently presented their projects on the theme of "a remote-controlled space habitat" to the general public and aerospace professionals during the culminating event of IGLUNA 2020. Coordinated by the Swiss Space Center, as part of the European Space Agency's @ESA_Lab initiative, this competition challenged 150 students from 10 European countries to develop technologies for a space habitat that could sustain life in an extreme environment, and as well as be operated remotely. Participants included the SWAG team from the University of Zurich, the LDMS for Life team from the University of Bern, as well as students from ETH Zurich, EPFL and EAWAG, who submitted projects in collaboration with several international partners.
/web/2020/07-200724-b1

### Using Artificial Intelligence to Model Safety-Critical Industrial Assets

(ETH Zurich, July 29, 2020)

Modeling the behavior safety-critical industrial assets is not an easy task, as their consistent reliability implies that researchers only have very limited data samples at their disposal to help train algorithms on the patterns of these rare failures. To address this conundrum, ETH Professor Olga Fink and her team recently developed an innovative method that uses physical models that imitate the behavior of industrial assets to develop artificial intelligence algorithms capable of predicting system failures with very little data. However, the potential applications of these algorithms extend far beyond industry and Professor Fink is currently working on making her algorithms applicable to other areas, such as flood forecasts or the early detection of natural hazards.
/web/2020/07-200729-18

## 8. Physics / Chemistry / Math

### Surprising Signal in Dark Matter Detector

(University of Zurich, June 17, 2020)

Researchers recently noticed a surprising signal excess registered by the hypersensitive XENON1T detector, which is attempting to discover dark matter particles – a material hypothesized to make up 85 percent of the matter in the universe. Although the team is still unable to fully explain the unexpected signal excess, University of Zurich professor and a lead member of the project team Laura Baudis nevertheless affirmed that these new findings are very exciting, as potential explanations include non-standard neutrino interactions, or even the existence of Axions. The latter would be particularly revolutionary, as Axions are speculated to be the source of dark matter, but so far, they have never been observed. Other possible explanations are less groundbreaking however, such as the existence of minute amounts of tritium in the liquid xenon.
/web/2020/08-200617-af

### Producing Polymers with Different Lengths

(ETH Zurich, June 23, 2020)

In the past, chemists used a single catalyst to control the radical polymerization process. While this ensures that the resulting polymer chains become uniformly long, it does not allow the overall dispersity to be controlled as desired. Therefore, ETH researchers recently developed a new method, whereby two catalysts are simultaneously employed to produce two different effects. This has enabled them to adjust the dispersity precisely as a function of the ratio in which they mixed the two catalysts. The high efficiency and scalability of the new approach have already attracted interest from industry. Polymers produced with the new process could be put to use in medicine, vaccines, cosmetics or 3D printing.
/web/2020/08-200623-91

## 9. Architecture / Design

### New Augmented Reality Construction Technology

(ETH Zurich, July 02, 2020)

Combining the advantages of computer design and human craftsmanship, incon.ai, an ETH spin-off, developed a new augmented reality software that enables masons and carpenters to construct even the most unorthodox ideas with pinpoint accuracy. By comparing individual components to a virtual design in real time, the software is able to show construction workers exactly where individual bricks or timber blocks need to be placed through a monitor. This considerably expands the number of shapes and structures that can be built, while simultaneously ensuring the stability and integrity of the structure. The team has already successfully completed two pilot projects – one of which was a wine cellar in Greece, which featured a semi-transparent facade that created mesmerizing visual effects in the wall, while maintaining optimal light and air conditions inside – and continues to refine the technology in order to accelerate the process and make the software more precise, stable and user-friendly.
/web/2020/09-200702-06

## 10. Economy, Social Sciences & Humanities

### Revising the Commentaries to the Geneva Conventions

(University of Geneva, June 30, 2020)

The Geneva Conventions and their Additional Protocols protect persons who are not, or no longer, participating in hostilities during an armed conflict. On 16 June 2020, the International Committee of the Red Cross (ICRC) launched the new Commentary to the Third Geneva Convention, which defines and protects prisoners of war. For this occasion, Marco Sassòli – Professor of International Law at the University of Geneva and member of the editorial committee for this Commentary – was invited to speak on a panel of distinguished experts and practitioners to mark the occasion. Because it is virtually impossible to update the Geneva Conventions in the current international atmosphere, revising their Commentaries is an important development, as this helps adapt the interpretation of the Geneva Conventions to the current social realities and to recent developments in other branches of international law.
/web/2020/10-200630-ba

### Nobel Laureate Michel Mayor Receives Gal Hassin Prize

(University of Geneva, July 02, 2020)

Michael Mayor, honorary Professor of the Faculty of Science at the University of Geneva, and recipient of the Nobel Prize in Physics 2019, was recently awarded the prestigious Gal Hassin Prize – which recognizes outstanding contributions to astronomical science research – for his discovery of the first extra-solar planet with Didier Queloz. According to the Italian foundation GAL Hassin, this discovery "opened up a new field of research which revolutionized the way we see planet Earth and the solar system, with enormous scientific implications and anthropological fallout." The award will be presented to Professor Mayor on 5 September 2020.
/web/2020/10-200702-d6

## 11. Start-ups / Technology Transfer / IPR / Patents

### Startup DePoly Secures Seed Funding for PET Recycling

(startupticker.ch, June 05, 2020)

DePoly, a start-up that collaborates with EPFL Valais-Wallis to recycle post-consumer PET plastic waste, has recently secured a Tech Seed loan of CHF 100,000 from the Foundation for Technological Innovation (FIT). This loan will be used to fund a larger demo-plant to further refine a novel recycling process developed by DePoly, which is able to selectively treat any PET plastic at room temperature, using exclusively sustainable and environmentally friendly chemicals, and most importantly, even in the presence of other plastics – a major challenge encountered by contemporary PET recycling technologies. The recycled chemicals can subsequently be reused to manufacture virgin quality PET resins, thereby conserving a considerable amount of energy and reducing anthropogenic pollution.
/web/2020/11-200605-82

### ETH Zurich Spin-Off Paves the Way to Smaller Chips

(startupticker.ch, June 16, 2020)

ETH Zurich spin-off UNISERS may play an important role in the next miniaturization step of computer chips, thanks to their affordable, automated particle scanner, which is able to detect contaminations on wafers in the ten-nanometer range. Tiny impurities represent a major problem in the production of computer chips, as up to forty percent of the chips produced are ultimately not used because of quality with the newest miniaturization steps. Unlike other alternatives, which either require a lot of manual work or are very expensive issues, thereby preventing semiconductor manufacturers form reaching profitable yields, the UNISERS particle scanner automates detection and is massively cheaper than the only competing product on the market. UNISERS is currently seeking investors for the next development step and exploring the option of concluding a strategic partnership with two semiconductor companies.
/web/2020/11-200616-c1

### Three Swiss Startups among WEF's Technology Pioneers

(startupticker.ch, June 19, 2020)


The World Economic Forum announced its 2020 Technology Pioneers – a selection of 100 of the most promising early to growth-stage companies that are transforming industries from agriculture to healthcare, while also working on questions regarding sustainability. From Switzerland, three startups made it into the ranking: Akselos, Climeworks and Energy Vault. Akselos offers the first simulation technology that is powerful enough to create holistic, real-time digital twins of large and complex assets, such as drilling

platforms or wind energy plants. Climeworks's patented technology captures CO2 directly from the air using clean energy, thereby offering a truly pure carbon dioxide removal solution. Energy Vault provides utility-scale storage of clean energy that will be connected directly to the Swiss national grid for full charging and continuous power discharging capabilities.
/web/2020/11-200619-93

## 10 Cloud-Enabled Startups to Watch in 2020

(venturelab, June 22, 2020)

Cloud computing is the on-demand technology platform that offers computer system resources like data storage, server maintenance, and databases without direct active management by the user, and as such, has become the backbone IT infrastructure of many successful startups. In order to provide an overview of some the most exciting developments in Switzerland, Venturelab recently introduced 10 promising Swiss startups that aim leverage cloud services to offer better products and scale faster. These include Archlet, Dotphoton, MapTiler, Neural Concept, optimyze.cloud, qiio, Scailyte, Seervision, Smallpdf and xFarm.
/web/2020/11-200622-e9

## Spin-Off to Offer Scanning Software for Semi-Structured Documents

(ETH Zurich, June 22, 2020)

Entering invoices, checking delivery slips, auditing expense receipts: these repetitive tasks fill the days of many office employees. To address this problem, the ETH spin-off BLP Digital has recently developed an innovative new software that employs sophisticated image and text recognition to automate more of these processes. Although they are not the only startup that aims to develop automated document recognition solutions, BLP Digital stands out due to their ability to correctly recognize and reproduce tables. Furthermore, by employing machine learning, their software has been specifically designed to improve over time as it collects greater volumes of data. Although the startup currently relies on its own capital and grants from Innosuisse, it plans to get investors on board for the first time towards the end of the year.
/web/2020/11-200622-7e

## Oxyle Wins the Grand Prize at >>venture>>

(startupticker.ch, June 23, 2020)

Co-organized by ETH Zurich, McKinsey & Company, Knecht Holding, Innosuisse, and EPFL, >>venture>> is an annual competition that supports Swiss startups in five verticals: health care & nutrition, industrials & engineering, retail & consumer services, ICT, and finance & insurance. In 2020, over 320 startups battled for their place within the prestigious competition, and on 23 June 2020, Oxyle, a startup dedicated to the sustainable removal of micropollutants from wastewater, was announced as the Grand Prize Winner, which earned them CHF 150,000, as well as a McKinsey & Company business consulting package. Furthermore, UrbanDataLab, URODEA, KaiosID and Nuniq each won their respective verticals, and Rea was awarded the audience award.
/web/2020/11-200623-87

## Startup ClearSpace Supported by Microsoft

(startupticker.ch, June 24, 2020)

Despite the increased reliance on space infrastructure, it is becoming exceedingly challenging to ensure the safety of satellites orbiting Earth, due to the exponential growth of man-made debris during the last decade. To address this issue, ClearSpace, a Swiss start-up that collaborates closely with leading science and research institutions, including EPFL, space agencies and major prime integrators, has committed itself to "capture and remove non-functioning or unresponsive satellites in space." Convinced by their mission, Microsoft recently pledged to support ClearSpace through its Global Social

Entrepreneurship Program, which provides social impact startups with technology, connections and grants to develop their groundbreaking visions. Furthermore, ClearSpace is scheduled to lead the European Space Agency's (ESA) ClearSpace-1 mission in 2025, which aims to execute the first-ever capture and removal of an uncontrolled satellite.
/web/2020/11-200624-4b

## PharmaBiome Raises CHF 1.75M to Advance Preclinical Development

(venturelab, June 25, 2020)

PharmaBiome, a Venture Kick winner and Venture Leader Life Sciences in 2016, has been one of the Top 100 Swiss Startups for the last four consecutive years. This pioneer in next-generation microbiome therapies recently raised CHF 1.75 million in new capital to bridge to a planned Series A financing. The company also elected Dr. Thomas Meier as Chairman of the Board and Dr. Patrik Forrer as a new Board member. The funding will allow the company to advance the preclinical development of its most advanced product (PB002), which is used to treat ulcerative colitis (UC), as well as to strengthen its unique production and to lead identification platforms. Having planned its first clinical trial with PB002 in UC, PharmaBiome aims to become a leading European company in the microbiome field.
/web/2020/11-200625-af

## AgeTech Startup with Smart Emergency Speaker Closes CHF 3 Million Series A Financing Round

(venturelab, July 01, 2020)

CARU, which ranked at the TOP 100 Swiss Startups Award in 2018, makes devices that monitor the air-quality and temperature of rooms, can warn users about anomalies, and suggest improvements to make rooms healthier. The sensors are voice activated and may be used in an emergency to connect a user with caretakers or medical services. CARU offers a "digital flatmate" which helps older adults enrich, improve and manage their day through simple voice commands such as "Hilfe - Hilfe!" (emergency call) and "Hallo CARU!" (Family Chat). Furthermore, CARU detects anomalies in their daily routines by integrated sensors and AI, and informs trusted people.
/web/2020/11-200701-97

## 10 Startups to Venture Leaders China 2020

(venturelab, July 01, 2020)

Ten Swiss deeptech startups – providing diverse solutions from crop protection, compliance with marine air emission regulations, and antibody therapy for cancer, to semiconductor substrates – have been selected for the Venture Leaders China program. This new Swiss National Startup Team will participate in the 2020 China roadshow, the sixth edition of Venturelab facilitating connections between Swiss startups and Chinese investors. Scheduled for September 2020, the roadshow includes pitching and networking sessions, where the entrepreneurs will showcase Switzerland's innovative technology to Chinese investors, thereby laying a foundation for the startups' global expansion goals. The program is co-organized by Venturelab and swissnex China.
/web/2020/11-200701-36

## Exolabs Receives Funding from PARSEC

(startupticker.ch, July 06, 2020)

The PARSEC Open Call 2 aimed to select the 15 best Earth Observation based innovations for the food, energy or environment sectors. Exolabs, a spin-off from the University of Zurich, is among the winners. The start-up uses remote sensing as a tool to understand and monitor the influence of human activities on the environment. State-of-the-art data analysis techniques enable the simulation, evaluation, and ultimately prediction of environmental changes and their interactions with other natural processes and

human activities. One application field is hydropower. Using scalable cloud processing and innovative machine learning algorithms, the start-up is able to serve hydropower stations globally.
/web/2020/11-200706-7c

## Cybersecurity Startup Raises CHF 1.2 Million in Pre-Series Round

(startupticker.ch, July 07, 2020)

Xorlab AG was founded in 2015 and has successfully found product-market fit for its platform ActiveGuard in the enterprise market, currently focusing on the finance, logistics and health sectors. ActiveGuard protects company communication against sophisticated threats such as spear-phishing, impersonation, ransomware and zero-day exploitation by observing, learning and ultimately enforcing a company's legitimate communication behavior. The financing round was led by Spicehaus Partners AG through its Spicehaus Swiss Venture Fund.
/web/2020/11-200707-25

## Novel Bioactive Compound Paves the Way to Antibiotic-Free Farming

(startupticker.ch, July 08, 2020)

Embion Technologies – an EPFL spinoff providing plant-based bioactives to improve the functionality and affordability of nutrition innovation – has just launched its first product, Prembion. This soluble bioactive compound, manufactured from brewers' spent grains, has complex prebiotic properties for animal nutrition that were created using Embion's novel rapid prototyping platform technology. While the global bioactive ingredients market is confronted with long development phases and inconsistent results, Embion's platform improves biomass upcycling and reduces waste via biocatalytic processing, thereby reducing the time from discovery to commercial production by up to 80%. Market introduction tests of Prembion are currently underway with leading global corporations in the food, feed and drinks sectors. The launch of this innovative solution paves the way to antibiotic-free farming.
/web/2020/11-200708-2f

## New Miniseries on Swiss Deep Tech Startups

(startupticker.ch, July 10, 2020)

In a recently launched miniseries, aptly entitled "Start-up", director Manuel Stagars provides an intimate, behind the scenes glimpse of six Swiss deep tech startups. Challenging the opulent image of startups projected by a select few unicorns, this miniseries instead adopts a modest and human-centered approach, by documenting the real life trials and tribulations, as well as successes, of scientists and entrepreneurs who often go unnoticed by the broader public. "Small wins, challenges, and emotional setbacks that entrepreneurs deal with on a daily basis" form the cornerstone of this unique introduction to the life of the young entrepreneurs and scientists driving global innovation. The miniseries is available free of charge, with English and German subtitles, on Startup-documentary.com and on YouTube.
/web/2020/11-200710-f8

# 12. General Interest

## helpfulETH Initiative Can Produce up to 1000 Face Shields per Day

(ETH Zurich, June 26, 2020)

The helpfulETH initiative is supporting hospitals during the coronavirus crisis by producing special face shields. ETH Zurich is working on the project alongside the University of Applied Sciences Rapperswil (HSR Rapperswil), Geberit and Swiss Prime Pack. As part of the helpfulETH initiative, a student workshop on Hönggerberg campus began producing face shields for hospitals at the end of March. The project has been expanded, and the face shields are now being mass-produced. Members of the ETH community have worked together with HSR Rapperswil, Geberit and Swiss Prime Pack to set up a manufacturing process that can produce at least 1,000 face shields per day if required. This project is based on doctors' requests for personal protective equipment during the corona crisis. Around 20 hospitals and care facilities have been supplied with masks since March.
/web/2020/12-200626-2b

## More Entrepreneurs in Switzerland than Ever Before

(startupticker.ch, July 07, 2020)

The Global Entrepreneurship Monitor (GEM) is the largest international study on entrepreneurship, and for the past 20 years, has measured the total entrepreneurial activity (TEA) of nascent and new business owners in several countries around the world. Encouragingly, the 2019 Swiss GEM illustrated that the TEA in Switzerland is currently higher than ever before, as Swiss entrepreneurial intentions are higher (10.7%) than in 2018 (6.9%) and more Swiss individuals (9.8%) acted on their entrepreneurial aspersions. Nevertheless, these rates are still below the average of other high-income economies – 20.2% for entrepreneurial intentions and 12.3% for entrepreneurial activities. Finally, although the gender gap still persists in Switzerland, it narrowed in 2019, when six female entrepreneurs were counted for every ten male entrepreneurs.
/web/2020/12-200707-7e

## Considering Ethical and Legal Implications of Coronavirus Apps

(ETH Zurich, July 20, 2020)

Despite the undeniable benefits of employing digital tools to supplement conventional non-pharmaceutical public health measures in the effort to contain the spread of the coronavirus SARS-CoV-2, developers nevertheless need to consider a range of issues, such as data privacy, accessibility and discrimination, in order to mitigate unintended adverse effects. Based on the considerable risks, an ETH Zurich team led by Effy Vayena recently published a comprehensive outline of ethical and legal aspects that should be addressed during the development and implementation of these digital tools. These aspect were subsequently summarized in a "step-by-step overview of the questions that must be answered in each phase of the development process," thereby providing app developers with a helpful guide as they perfect novel technical tools that address the COVID-19 pandemic.
/web/2020/12-200720-1d

# 13. Calls for Grants/Awards

## First Call for the New Energy Research Program SWEET

(admin.ch, June 25, 2020)

The Swiss Federal Office of Energy recently launched the first call for proposals within the new energy research program SWEET (Swiss Energy Research for the Energy Transition). The theme of this call is the integration of renewables into a sustainable and resilient Swiss energy system. Four challenges have been defined, which are all related to the Energy Strategy 2050, and include: the improvement of renewable energy system efficiency through flexibility and sector coupling; the integration of decentralized supply of renewable energy into the Swiss energy system; enabling renewables for heating and cooling; and sustainability as the core of a resilient Swiss energy system. The application deadline has been set for 12 October 2020 and the results of this first call will be announced in January 2021.
/web/2020/13-200625-58

## Innosuisse Expands Funding Portfolio

(admin.ch, July 27, 2020)


Innosuisse, the Swiss Innovation Agency, recently approved twelve NTN – Innovation Boosters for the funding period 2021-2024, which, in particular, focus on health, digitalization and sustainability. Open to all interested Swiss stakeholders, the NTN – Innovation Boosters aim to bring together the most important players from science, industry and society in Switzerland in promising fields of innovation in order to stimulate the testing of jointly developed, concrete innovation ideas in an open innovation culture. The program has been allocated a funding budget of 21.3 million Swiss francs over four years, which Innosuisse expects will help generate approximately 1,000 radical innovation ideas, around a third of which should be developed further into concrete solutions. Subsequent calls for proposals for this program will take place annually in November, and the next deadline for submissions has been set for the end of February 2021.
/web/2020/13-200727-61

# Upcoming Science and Technology Related Events

**Virtual Higher Education Summit 2020**
August 31 – September 2, 2020
https://is.gd/uEgsEf
Education, Sustainable Development
Online

**The 8th Swiss Green Economy Symposium**
September 1, 2020
https://is.gd/O5Gnlh
Digitalization, Sustainability, Innovation
Winterthur

**Swiss Economic Forum (SEF.2020)**
September 2-3, 2020
https://is.gd/1Uyk47
Startups, Business,
Montreux

**Top 100 Swiss Startup Award**
September 9, 2020
https://is.gd/qCMPbw
Startups, Innovation
Zurich

**The 8th World Sustainability Forum**
September 15-17, 2020
https://is.gd/SimacK
Sustainability, Medicine, Energy, Agriculture
Geneva

**Swiss Medtech Day**
September 21, 2020
https://is.gd/bNsFC8
Medicine, AI, Startups, Research
Bern

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