



Science China Newsletter, August 2019

Trends in education, research, innovation and policy



Jiuzhaigou, China

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Swiss Spotlight

Scientist: Knowledge and Innovation: New Ways to Create Bridges

(Monique Bolli, August 23)

Monique Bolli is a doctoral assistant at the College of Humanities at EPFL. She is a social anthropologist (University of Bern) specialized in Asian Studies (University of Geneva, Graduate Institute and Peking University). She is currently finalizing her PhD on communities and politics of innovation in urban China, more specifically on the makerspaces and the maker movement in Shanghai, Shenzhen, Beijing and Addis Ababa. Not only are the communities - at the edge of the start-up world - of interest, the global outreach and impact of the Chinese ecosystem and innovation strategies, which led her to Ethiopia, are also fascinating. In the context of her multidisciplinary research, she has been part of New York University Shanghai in China and Curtin University in Australia. Prior to joining EPFL, she was working at the International Cooperation Division of the Embassy of Switzerland in China on policy dialogue for poverty reduction, Public-Private Partnerships for Development (PPDP) and trilateral cooperation. Additionally, and before that, she was working at the Swiss-Chinese Chamber of Commerce in Beijing. Creating bridges is essential.



<http://swissinnovation.org/newsChina/web/2019/00-190823-c3>

Startup: Pioneers in Contactless Micro Handling

(Touchless Automation, August 20)

Touchless Automation was born in the middle of the famous Swiss Watch Valley. The push for quality and perfection allowed them to develop a revolutionary technology that allows the manipulation of components in a contactless way. Leveraging this technology, Touchless Automation developed its own line of contactless industrial machines. These machines can perform a wide range of operations, all by never touching the target component. His patent pending technology is based on manipulation with air flows and vibrations, hence it can manipulate any material: silicon, glass, plastic, metal or any other. The company is strong in the optoelectronics, MEMS and micro-optics markets, where surface perfection and quality are of the outmost importance. The main product is Levio, a contactless automatic pick and place machine. The main applications are the sorting of laser diodes, image sensor, VCSELs, micro-optics and MEMS. Touchless Automation has already found customers from 3 different continents and it is now expanding further, with trade exhibitions in China, Germany and USA already planned for the coming months.



<http://swissinnovation.org/newsChina/web/2019/00-190820-f7>

1. Policy

Beijing Science Award Adds Category for Foreigners

(China Daily, August 05)

The Beijing's municipal science and technology award has added three categories. The expansion is intended to promote international communication and cooperation in the sector. The three categories are for individuals who have made outstanding contributions, for young scientists and for foreign individuals who contribute in science and technology cooperation with Beijing or have helped to raise the capital's international influence in the sector. The ones eligible for the young scientists must not be older than 40 years. Previously, the awards recognized teams for achievements or projects. In 2018, 212 projects and achievements were honored, including 24 first-prize, 58 second-prize and 130 third-prize winners. Each year's awards are announced in the first quarter of the subsequent year.

<http://swissinnovation.org/newsChina/web/2019/01-190805-36>

Scientists Call for More Women in Basic Science

(Xinhuanet, August 12)

In China, women account for roughly 40% of the scientific and technological human resources, which is comparable to many other countries. Even though, 40% seems like a fairly high number, when it comes to women who are actually involved in cutting-edge scientific research or decision-making, the number is much smaller. During a recent forum called "Women and Mathematics", scientists voiced the importance of women's engagement in basic research to help improve science education and scientific research. Many policies still need improvement in order to achieve gender equality. For instance, one survey of over 6,000 women showed that 32% had encountered a preference for men when seeking their first job. Also, in the 210 societies affiliated with the China Association for Science and Technology, women who serve as deputy directors or above only account for about 7 percent.

<http://swissinnovation.org/newsChina/web/2019/01-190812-3e>

China to Fund 41,752 Science Projects

(China Daily, August 16)

China will allocate 21.03 billion yuan (\$2.99 billion) to finance 41,752 science projects, the National Natural Science Foundation of China (NSFC) announced Friday. The funds will go to 10 types of science projects including national key projects, key international cooperative research projects, projects conducted by



distinguished young scholars, as well as major projects on scientific instruments and equipment. The NSFC received more than 240,000 applications in March, up 12 percent year on year. China will further strengthen its basic research and original innovation capability with the funds. Efforts will also be made

to ensure the fairness of the review process and optimize the management of the funds, according to the NSFC.

<http://swissinnovation.org/newsChina/web/2019/01-190816-1e>

Facial Recognition for University Enrollment

(South China Morning Post, August 22)

Facial recognition is becoming part of Chinese citizens everyday life, just like mobile payment, online shopping or social media have previously. At Tsinghua University in Beijing - the top one university in China and one of the world-leading universities - over 3,800 undergraduate students were processed with face-scanning machines. Tsinghua University is only one of several Chinese institutions that started using facial recognition for the enrollment registration process. According to the Ministry of Industry and Information Technology, AI has now entered student life, including face scan enrollment, a guided campus tour by robots and use of big data analysis software to help students choose their college major. Many Chinese consumers provide their personal data to the major online services providers in exchange for convenience in using these firms' products. The broad availability of data, in turn, has helped these providers improve their AI algorithms and levels of service.



<http://swissinnovation.org/newsChina/web/2019/01-190822-65>

2. Education

Chinese Candidates Prime Themselves for WorldSkills

(China Daily, August 17)

Chinese candidates for the 45th WorldSkills competition had their zeal drummed up at a morale-motivating conference held by the Ministry of Human Resources and Social Security in Beijing on Friday. The biennial WorldSkills competition will be held from Aug 22 to 27 in Kazan, Russia, and will involve about 1,355 candidates from 69 member countries and regions. At the conference, the candidates were encouraged to present high-quality performances through effort and composure. Working staff members, including coaches, interpreters and consultants, are encouraged to work closely with the candidates. It's the fifth competition that China has participated in the delegation group, with 63 candidates joining the competitions, among whom 54 are male and nine are female.



<http://swissinnovation.org/newsChina/web/2019/02-190817-c8>

More Compulsory Education Support for Poor Students

(China Daily, August 29)

The Ministry of Education (MOE) and the State Council Leading Group Office of Poverty Alleviation and Development recently released a work plan to support compulsory education and promote education poverty alleviation, the MOE said Thursday. According to the plan, children of school age from impoverished families should not drop out of school and should be guaranteed affordable education. The causes of students dropping out will be analyzed and targeted assistance will be provided, the plan says. It also stresses improving the conditions of schools in poor areas, promoting the use of information technology in education, providing support to rural teachers and improving the nutritional conditions of rural students undergoing compulsory education.



<http://swissinnovation.org/newsChina/web/2019/02-190829-63>

3. Life Sciences / Health Care

Psoriasis Treatment "Diamond Standard" from China

(China Daily, August 02)

Recently, the Ministry of Science and Technology said Benvitimod cream, which is used for treating mild to moderate psoriasis, had been approved by the National Medical Products Administration. Psoriasis is a chronic skin condition that can cause red, scaly patches of skin to appear and there is no cure. More than eight million people in China and more than 125 million worldwide suffer from psoriasis. Calcipotriol, a form of vitamin D, is the first choice for many patients. It is called the gold-standard therapy for psoriasis patients. Compared with Calcipotriol, Benvitimod should be called the diamond-standard therapy. The cream is a global first-in-class drug for the disease developed by Beijing Wenfeng Tianji Pharma Ltd and supported by China's major new drug development program. It is considered to be at the highest-level in terms of breakthrough in the pharmaceutical industry as it uses a new and unique mechanism of action for treating a medical condition.



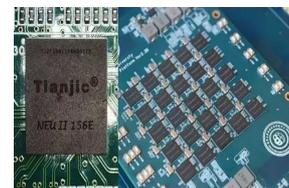
<http://swissinnovation.org/newsChina/web/2019/03-190802-34>



Hybrid Chip for Artificial General Intelligence

(China Daily, August 02)

Chinese scientists have successfully developed a ground-breaking electronic chip and incorporated it into a riderless autonomous bicycle. The bicycle can detect and track targets, avoid obstacles, self-balance, understand voice commands and even make independent decisions as a result of the chip's simultaneous processing of versatile algorithms and models. There are two main approaches to developing artificial general intelligence. One is rooted in neuroscience and attempts to construct circuits that closely mimic the brain. The other is grounded in computer science and uses computers to execute machine-learning algorithms. The so-called Tianjic chip can integrate the two approaches into one hybrid platform, which enables it to accommodate both machine-learning algorithms and brain-inspired circuits. Compared with similar chips in the market, this one's density is 20 percent higher, at least 10 times faster and its bandwidth has been increased by at least 100 times.



<http://swissinnovation.org/newsChina/web/2019/03-190802-63>

Increasing Use of Tech in Beauty Industry

(South China Morning Post, August 11)

Western skincare brands have introduced a new generation of tech-enabled devices that allow for a very personal approach to beauty and skin health. Throughout the past couple of years, big names such as Neutrogena and L'Oreal have been racing to upgrade their at-home skincare capabilities with the help of AI, sensors, and connected wearables. Chinese tech giant Meitu hasn't been far behind. Meitu, whose app gives its users a way to digitally buff out blemishes in their selfies, records 455 million monthly users. Recently, Meitu tapped into the cosmetics and skincare economy, releasing an AI-powered facial cleansing device costing just under US\$100. The trend towards leveraging tech for helping consumers achieve ultimate customization in every step of their beauty routines doesn't show much sign of slowing down, either in China or globally. Tech giants Alibaba and Ant Financial announced that they will add beauty filters to facial recognition tech.



<http://swissinnovation.org/newsChina/web/2019/03-190811-ec>

First Full-Digital PET Provides Brain Images

(Xinhuanet, August 16)

China's first home-developed full-digital positron emission tomography (PET) scanner has completed multiple clinical cases of brain imaging. It was recently installed in a university hospital in the southern Chinese Guangdong Province. Mainly used for early diagnosis and accurate treatment of neurological diseases such as brain tumors and Parkinson's disease, the equipment is believed to be the world's

first full-digital PET exclusively developed for cerebral imaging. The development period for the device exceeded 19 years, however, now it has provided clear images of brain sulci and gyri and legible pictures of ventricles of the brain. The brain imaging results reflected an ultra-high biochemical sensitivity of the PET system, which has great potential for exploring brain science and studying brain diseases.

<http://swissinnovation.org/newsChina/web/2019/03-190816-1a>

Elusive Relation of Polycystic Ovary Syndrome Explored

(Xinhuanet, August 21)

Polycystic ovary syndrome is a hormonal disorder that can affect women's periods and lead to difficulties in getting pregnant. It is often accompanied by insulin resistance. The mechanism of ovulatory dysfunction and insulin resistance in the symptom remains elusive and therefore it is difficult to find therapies. Recently, Chinese researchers have found that gut microbiota plays an important role in regulating polycystic ovary syndrome. These findings providing a new perspective for the prevention and treatment of the symptom. According to the researcher team, they are going to recruit volunteers and conduct large-scale multi-center joint clinical trials in the future to verify the treatment target.

<http://swissinnovation.org/newsChina/web/2019/03-190821-f7>

Highly Sensitive Drug Detection Device

(South China Morning Post, August 25)

China has deployed a portable drug detector at some border checkpoints that can radically improve the speed and accuracy of narcotics testing. Visitors to the country, where drug trafficking can result in the death penalty, can have their luggage or personal belongings poked with a needle by security staff. The portable device - which is the size of a home printer - can detect the presence of narcotics in quantities as small as 50 picograms, which corresponds to one trillionth of a gram. The unprecedented sensitivity of the needle means that a person who has had recent contact with drugs, even molecules of a substance on clothes or accessories, can trigger an alert. According to an official, the detector could become standard in public transport hubs and mass production was about to start soon.



<http://swissinnovation.org/newsChina/web/2019/03-190825-fa>

4. Engineering / IT / Computer Science

COMAC's C919 Mid-Range Jet Makes Maiden Flight

(China Daily, August 01)

The Commercial Aircraft Corporation of China (COMAC) has seen its fourth prototype of the C919 passenger jet complete its maiden flight in Shanghai. The flight, which started from a runway at Shanghai Pudong International Airport lasted around 1 hour and 25 minutes. The fourth prototype is mainly undertaking tests covering the avionics system, taking-off and landing performance, automatic flight system and performance in icy conditions. So far, four C919 prototypes have completed their maiden flights, while two more prototypes are scheduled to have their first flight later in the second half of 2019, according to the Commercial Aircraft Corporation of China.



<http://swissinnovation.org/newsChina/web/2019/04-190801-bd>

Micro Lunar Orbiter Crashes After Exceeding Lifespan

(China Daily, August 02)

China's micro lunar orbiter Longjiang-2 has crashed into the Moon under ground control after it completed its mission. Weighing 47 kg, Longjiang-2 was sent into space on May 21, 2018, together with the Chang'e-4 lunar probe's relay satellite "Queqiao," and entered the lunar orbit four days later. It operated in orbit for 437 days, exceeding its one-year designed lifespan. The development of the micro lunar orbiter explores a new low-cost mode of deep space exploration. The micro satellite carried an ultra-long-wave detector, developed by the National Space Science Center of the Chinese Academy of Sciences, aiming to conduct radio astronomical observation and study solar radiation. The Lunar Exploration and Space Program Center said it was an important space cooperation achievement for countries participating in the Belt and Road Initiative.



<http://swissinnovation.org/newsChina/web/2019/04-190802-83>

Newspaper with Robot Science News Writer

(China Daily, August 02)

China Science Daily announced that it has used software to automatically generate news stories about the latest discoveries from the world's leading science journals. The robot science reporter, called "Xiaoke," was co-created by the newspaper and researchers from Peking University in about half a year. Before publication, the automatically generated articles will go through a review process. A group of scientists and the newspaper's editors will verify the content or give supplementary information. It is the latest case of Chinese news organizations using algorithms to create content. Xiaoke has

generated over 200 stories based on the English abstract of papers published in journals such as Science, Nature, Cell and the New England Journal of Medicine. The China Science Daily is administered by the country's highest academic institution in natural sciences and has a circulation of nearly 100,000 across the country.

<http://swissinnovation.org/newsChina/web/2019/04-190802-2c>

Research Vessel Returns from Green Tide Mission

(China Daily, August 07)

A Chinese research vessel called Kexue03 has completed an investigation of late enteromorpha green tide and returned to Qingdao, which is in East China's Shandong province. The vessel departed with the mission of conducting investigation and research such as quantitative distribution, sedimentation and ecological effect on the late period of the green tide. A total of 20 crew members took part in the investigation covering 33 hydrology, biology and chemistry stations. They analyzed the influence of enteromorpha green tide on marine ecological environment and provided data support for the observation, alarm, prevention and control of the enteromorpha green tide.



<http://swissinnovation.org/newsChina/web/2019/04-190807-4c>

Chameleon-Inspired Color-Changing Robot

(China Daily, August 08)

Intelligent actuators with the ability to interact with the environment have become an emerging topic. A Chinese research team got inspired by chameleons, which can adjust their skin color to communicate and disguise during locomotion. Taking the animal as a model, the team developed a soft robot with both color-changing and locomotion capabilities, offering a new perspective for future robot-environment interaction. According to the researchers, chameleons adjust a lattice of light-reflecting nanoparticles in their upper layer of skin cells to adapt to the changing environment. By mimicking this mechanism, the team developed a new material for creating actuators that can sense the changing environment and exhibit vivid color alterations. Although similar materials have been developed before, the actuator shows faster color changes and longer endurance compared with previous prototypes. Nature will continue to offer inspiration for the future design of sensors.

<http://swissinnovation.org/newsChina/web/2019/04-190808-b8>

Mass Production of Super-Thin Atomic Clock

(China Daily, August 08)

In 2018, a Chinese research institute affiliated to the China Aerospace Science and Industry Corporation Limited developed a super-thin rubidium atomic clock, which is just 17 millimeters thick. The clock is

the key to the positioning and timing accuracy of BeiDou navigation satellites. It was recently announced that this clock is going into mass production now. Currently, the main application areas are in aviation, aerospace and telecommunications. According to its developers, the ultra-accurate clock will have a broader market prospect in the future. The atomic clocks are the workhorses that send synchronized signals so sat-nav receivers can triangulate their position on Earth.

<http://swissinnovation.org/newsChina/web/2019/04-190808-01>

AI to Handle Airline Complaints

(South China Morning Post, August 13)

Airlines receive around one million complaints a year. With such a vast amount of information, it is critical and crucial to handle large amounts of data well.

For this reason, state-owned China Eastern Airlines is now using artificial intelligence (AI) to improve the customer experience, using the technology's



ability to handle huge amounts of data to tailor its services for individual consumers. The airline's data labs unit is even trying to solve problems before they happen by, for example, developing a pilot service that will allow customers to give better instructions and feedback on their in-flight meals. More broadly, the airline's data lab now automatically classifies thousands of complaints and offers recommended solutions, to help front line customer relations staff. This shortens the customer response time and helps improve the overall quality of service.

<http://swissinnovation.org/newsChina/web/2019/04-190813-ce>

AI Sorting Trash

(China Daily, August 17)

In July, Shanghai enacted a compulsory waste sorting law. At the same time, a plan to expand AI's application in trash sorting was announced which contributes to the city's attempt of becoming a national and global leader in the technology. Trash bins that use AI to automatically sort and properly



organize garbage have been set up in Shanghai's AIsland, a dedicated hub for AI innovation and application. Trash cans will eventually be able to distinguish between various kinds of waste and alarm users if they sort trash incorrectly. Garbage trucks will be able to identify different trash cans and process them accordingly. In waste disposal transfer stations, robots will collect recyclable trash and put it into recycling devices after inspecting it. Residents can also use apps to command robots to collect their trash. According to an official, it will take a while for the culture of sorting to set in and thus AI is needed to accelerate the process.

<http://swissinnovation.org/newsChina/web/2019/04-190817-61>

BeiDou Navigation System Overtook GPS in Size

(Nikkei Asian Review, August 19)

The Chinese BeiDou navigation system, the equivalent to the US Global Positioning System (GPS) and the European GALILEO, has recently overtaken the GPS in terms of size and number of satellites. Only in 2000 has China joined the satellite-based positioning, which builds the foundation for a variety of services. These services range from smartphone games, over emergency notification systems, to aircraft and ship navigation and even touch on mining machines. In 2018 alone, China launched 18 satellites for the BeiDou system and currently a total of 35 satellites are in operation. This compares to 31 satellites that are in operation for the US GPS. Meanwhile, the European GALILEO showcases 22 positioning satellites. Many major Chinese tech companies are using BeiDou to sharpen their edge and improve their accuracy, which for the lion's share of smartphones is about 3 to 5 meters.

<http://swissinnovation.org/newsChina/web/2019/04-190819-d7>

Chang'e-4 Probe Awakes for Ninth Lunar Day

(Xinhuanet, August 25)

Again, the lander and rover of the Chang'e-4 probe have resumed work for the ninth lunar day on the far side of the moon after "sleeping" during the extremely cold night. The lander and the rover, Yutu-2 (Jade Rabbit-2), both woke up again, according to the Lunar Exploration and Space Program Center of the China National Space Administration. For the ninth lunar day, the lander's neutron radiation detector and low-frequency radio detector, as well as the rover's infrared imaging spectrometer and other instruments will be restarted to conduct scientific tasks including moon surface observation and composition analysis. China's Chang'e-4 probe, launched on Dec. 8, 2018, made the first-ever soft landing on the Von Karman Crater on the far side of the Moon. Its missions include low-frequency radio astronomical observation, surveying the terrain and landforms and detecting the mineral composition.

<http://swissinnovation.org/newsChina/web/2019/04-190825-0f>

5. Energy / Environment

The Effect of Fungi and Bacteria on Carbon Accumulation

(China Daily, August 03)

To achieve a reduction in the accumulation rate of carbon dioxide in the atmosphere, scientists have been studying the relations between the land use and carbon sequestration in soil. The researchers studied the contribution of fungi and bacteria residues to the organic carbon accumulation in paddy soil. Fungi





and bacteria can transform unstable organic carbon into the composition of their own cells by anabolism, and ultimately stabilize organic carbon in the form of microbial residues through cell growth and death. The analysis shows that the increase of temperature and rainfall firstly inhibits growth of fungi and additionally leads to lower levels of soil pH value. The latter effect normally promotes the growth of fungi, however the two effects combined cancel themselves out, thus fungi are unresponsive to climate conditions in terms of the organic carbon accumulation. However, higher temperatures and rainfall will foster the growth of bacteria and thus increase the organic carbon accumulation in paddy soil.

<http://swissinnovation.org/newsChina/web/2019/05-190803-e0>

Highly Efficient Goji Berry Harvesting Method

(China Daily, August 05)

Chinese goji berries, also known as Chinese wolfberries, are increasingly sought after by consumers worldwide. Picking goji berries takes a lot of manual work and the manual cost accounts for half of its total production cost. There is a growing need for mechanized harvesting methods to increase efficiency.



Researchers in China have developed a new method to facilitate mechanized harvesting which solves this problem. They propose a new goji berry cultivation method and have developed new harvesting equipment. The cultivation method makes goji berries suitable for mechanized harvesting and the vibrating wolfberry-picking machine can pick more than 90 percent of the goji berries at a time, with a damage rate of less than 5 percent. It can harvest around 144 goji berry trees in an hour, equivalent to the work of 30 berry pickers. The technology is expected to address the labor shortage and increase the efficiency of the industry.

<http://swissinnovation.org/newsChina/web/2019/05-190805-b8>

Heat-Related Deaths will Increase

(South China Morning Post, August 08)

China could see more than 27,000 additional heat-related deaths each year in its cities if the world's temperature rises by just half a degree above the UN baseline of 1.5 degrees Celsius according to a study. The study looked at heat-related deaths in Chinese cities between 1986 and 2005, while taking into account factors such as the age of the population and levels of socio-economic development. Additionally, it used the data to calculate the respective impact of an average increase in global temperatures of 1.5 and 2 degree Celsius compared with pre-industrial levels. The rate of heat-related deaths between 1986 and 2005 in China was 32 for every million people - it will more than double



between 2016 and 2099. The publication of the research follows a heatwave across much of China last month in which daytime temperatures reached the high thirties and often remained above 30 degrees at night.

<http://swissinnovation.org/newsChina/web/2019/05-190808-73>

5000 Years of Data: Possible Period of Global Cooling Ahead

(South China Morning Post, August 11)

A new study has found winters in northern China have been warming since 4,000 BC independent of human activity. The study found that winds from Arctic Siberia have been growing weaker, the conifer tree line has been retreating north, and there has been a steady rise in biodiversity in a general warming trend that continues today. It appears to have little to do with the increase in greenhouse gases which began with the industrial revolution. The research, which drew on 5,000 years' worth of data, suggested the current warm phase of the cycle could terminate over the next several decades, ushering in a 250-year cool phase, potentially leading to a partial slowdown in man-made global warming. However, the scientists warn that despite these findings there is no room for complacency or inaction on climate change.



<http://swissinnovation.org/newsChina/web/2019/05-190811-40>

New and Highly Endangered Snow Lotus Species

(Xinhuanet, August 11)

In a nature reserve in the southwestern province of Sichuan, a new but highly endangered species of snow lotus was discovered. The snow lotus, named *Saussurea balangshanensis*, was spotted in the alpine zone at a high altitude of between 4,400 to 4,700 meters. The plant is quite different from other known species of snow lotus and has a pungently fragrant smell. Researchers and reserve management staff conducted separate investigations and determined that fewer than 500 such plants remain, and the Balang Mountain is the only place the snow lotuses grow. The plant's colony is very limited, which causes a singular genetic feature and it is therefore extremely endangered. As its habitat is close to a highway, it urgently needs protection. There is limited human activity around the plants and the reserve makes further plans to conserve.

<http://swissinnovation.org/newsChina/web/2019/05-190811-34>

Smart Float Systems Collect Ocean Data

(Xinhuanet, August 12)

In China's Zhejiang Province, the trail run for a retractable intelligent float observation system to monitor ocean conditions has started. The float system features the technologies of intelligent control

and retractable structures to continuously observe ocean profiles such as the water temperatures, depth, turbidity and pH levels in real-time. There are sensors attached to the float equipment which can achieve to judge ocean conditions in real-time. Additionally, some progress has been made in multi-power supply modes featuring solar and wave energy, as well as the observation of multi-layer wind flux. Up until now, 21 sets of float observation systems have been running in the Yellow Sea and the East China Sea.

<http://swissinnovation.org/newsChina/web/2019/05-190812-9e>

Plants Use Self-Cannibalism to Resist Drought

(Xinhuanet, August 14)

Dehydrin is a multi-family of proteins present in plants that is produced in response to cold and drought stress. According to researchers dehydrin plays a key role in autophagic degradation. Under drought stress, dehydrin facilitates the autophagic degradation of aquaporins and reduced root hydraulic conductivity, thus reducing water loss and improving drought tolerance. Aquaporins, also called water channels, are integral proteins from a larger family of major intrinsic proteins, mainly facilitating the transport of water between cells. In face of drought, the plants cannot move, but can reduce proteins they no longer need through autophagic ways, comparable to auto-cannibalism.

<http://swissinnovation.org/newsChina/web/2019/05-190814-01>

Virus Could Help Cleaning Water Poisoned by Algae

(South China Morning Post, August 20)

Lake Chao, in Anhui province in the country's southeast, lies at the very bottom of the central government's rankings for water quality, partly because of algae outbreaks there. However, recently researchers have found a previously unknown algae-eating virus that could combat the outbreaks. The so-called Mic1 is a virus with an oversized head and elongated tail, a body structure resembling human sperm. It can infect, suppress or kill blue-green algae, the most abundant photosynthetic micro-organism on Earth. Using the tail as an anchor, the virus can inject its DNA into a blue-green algae cell with relative ease. The virus will then multiply before tearing the host apart and moving on to other cells. Despite the virus' presence in Lake Chao, a yearly algae bloom kills fish and poisons drinking water. In Lake Chao, the growth of blue-green algae seems to have outpaced the spread of the virus.

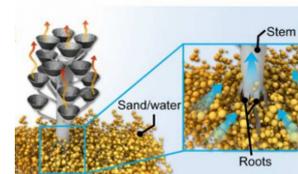


<http://swissinnovation.org/newsChina/web/2019/05-190820-34>

Solar-Powered Desalination Tree

(South China Morning Post, August 22)

A Chinese-led international research team has created a “tree” that can generate clean drinking water. Drawing its energy entirely from the sun just like a real tree, the “water tree” has a root made of cotton fabric that can absorb water from its surroundings, similar to sand on a beach. After water moves up the stem, it is vaporized by “leaves” made of black-carbon paper cones that convert light energy to heat, reaching nearly 50 degrees Celsius. The tree sits in a glass chamber with a relatively cool surface that collects the vapor. Using standard cotton fabric and a new nanomaterial that can be cheaply mass-produced from charcoal, a paper cone with a surface area as large as 1 square meter would cost only US\$2. A cone that size can generate up to 3.4kg of condensed water per hour, faster than any other solar-powered desalination methods previously reported. The condensed water meets stringent safety standards for direct drinking set by the World Health Organization.



<http://swissinnovation.org/newsChina/web/2019/05-190822-f9>

Light-Responsive Pesticide

(Xinhuanet, August 27)

It is difficult for traditional pesticides to achieve on-demand dosing, and the utilization rate is only about 20 to 30 percent. This not only increases the cost but also causes serious environmental pollution and damage. In recent years, the development of new pesticide formulations which increase utilization efficiency has become a focus of agricultural and environmental research. Chinese scientists have now developed a light-responsive controlled-release pesticide to reduce pesticide loss and increase the utilization efficiency. They fabricated controlled-release pesticide particles by combining materials including biochar and attapulgite. The particles can control the release of pesticides by the near infrared light and the thermal effect generated. The technology is very cost-effective, and applications could be very broad.

<http://swissinnovation.org/newsChina/web/2019/05-190827-4d>

6. Physics / Chemistry / Material Science / Nano- & Micro Technology

Reversing Fertilization Method Leads to less Nitrogen Leaching

(China Daily, August 05)

Fertilizers like nitrogen are necessary for the cotton plant's growth, however the ease with which they leach into sandy soil through traditional flood irrigation methods results in low nitrogen uptake efficiency and cotton productivity. Now, researchers have devised a new method of efficient fertilization of cotton with lower nitrogen leaching. The researchers reversed the order of the traditional irrigation and fertilization. When the water was drained after irrigation, the urea with high nitrogen was added into the wet soil and was found to be dissolved in mud. The nitrogen can remain in the cotton roots for a long time, which contributes to a high nitrogen recovery efficiency. This result is also of great significance for the scientific management of the nitrogen leaching of cotton as well as other crops grown on sandy soil under traditional flood irrigation conditions.



<http://swissinnovation.org/newsChina/web/2019/06-190805-39>

World's Most Powerful Laser Radar

(South China Morning Post, August 05)

China has started building the world's most powerful laser radar designed to study the physics of the Earth's high atmosphere. It is described as having a detection range of 1,000km, which is 10 times that of existing lasers, and will be used to study atmospheric particles that form the planet's first line of defense against hostile elements from outer space such as cosmic rays and solar winds. The radar will use a high-energy laser beam that can pierce through clouds, bypass the International Space Station and reach the outskirts of the atmosphere, beyond the orbiting height of most Earth observation satellites. Chinese laser scientists have developed some of the world's most sophisticated systems in recent years, including ranging stations that can track the movement of satellites and space debris.

<http://swissinnovation.org/newsChina/web/2019/06-190805-3f>

Color-Changing Reflection Film for Traffic

(Xinhuanet, August 10)

In collaboration, Chinese and US scientists have developed a thin film that can shine brightly and even change color at night. This invention could be used for road signs to benefit drivers as well as pedestrians. An advantage of the film is that it is energy-efficient, cost-effective and thanks to its color-reflecting ability, the film is brilliantly visible from multiple angles when light shines on it. The material used is polymer microspheres which is laid down on the sticky side of an ordinary transparent

tape. When light shines on it, some observers see a single color reflect, while others see changing colors, depending on the angle. According to the researchers of Fudan University and University at Buffalo, the film is able to withstand underwater immersion and extreme temperatures ranging from minus 196 to 100 Celsius degrees.

<http://swissinnovation.org/newsChina/web/2019/06-190810-33>

Chinese Researchers Head the Field in Nanoscience

(China Daily, August 19)

China has become a global powerhouse in nanoscience research and will continue to collaborate with other countries to maximize its potential, especially in sectors such as chemical engineering, biomedicine and electronics, a top scientist in China said on Saturday. Thanks to strong governmental support, more research funding, and active international cooperation, China is now the largest contributor to the most-cited papers related to nanoscience and technology, Bai Chunli, president of the Chinese Academy of Sciences, said during the opening ceremony of the 8th International Conference on Nanoscience and Technology in Beijing, which ends on Monday. Some research highlights in China include smart drug delivery nanorobots to treat tumors, long-endurance lithium ion batteries, green nanoprinting technologies and effective catalysts for industrial applications and carbon dioxide reduction.



<http://swissinnovation.org/newsChina/web/2019/06-190819-35>

7. Economy, Social Sciences & Humanities

Chinese Designers Win Competition to Rebuild Notre Dame

(China Daily, August 07)

After the devastating fire in Notre Dame, which left the French landmark partly destroyed, a competition was launched seeking for proposals to rebuild the Gothic cathedral. A total of 226 proposals from 56 countries were handed in, with over 30,000 people voting during the competition. In the end, two Chinese designers, with their work Paris Heart Beat, won the design competition for rebuilding Notre Dame Cathedral in France. Their names are Cai Zeyu and Li Sibe and they respectively graduated from Tsinghua University and Beijing University of Technology. Three highlights of their design Paris Heart Beat are the Paris Time Capsule, City Kaleidoscope and Mirror Roof. They used magnetic levitation technology to design a time capsule device, which opens every half-century and moves rhythmically up and down, breathing and beating together with the city.



<http://swissinnovation.org/newsChina/web/2019/07-190807-d8>



China's Fertility Rate Issue and Attempt to Tackle it

(China Daily, August 08)

In China, a debate has sparked on whether the legal marriage age for men and women should be lowered from 22 years and 20 years to 20 and 18 years, respectively. The idea initially came from a law professor and was originally intended to tackle China's low fertility rate. The rising divorce rate has coincided with a decline in the marriage rate, which was 0.72 percent last year, the lowest in the past decade. Data shows that an average Chinese couple prefers to have one child, and many couples opt to not have any children at all. Given the rising cost of living and very high property prices, a man alone cannot support a family, which means the wife cannot afford to stay at home to take care of kids. Arguably, the government should take measures to encourage couples to have more children, however, in the past 3 decades, a three-person family was promoted as the norm and it could be difficult to enforce a sudden change.

<http://swissinnovation.org/newsChina/web/2019/07-190808-e6>



Waste Policies in Shanghai Bring Positive Results

(China Daily, August 29)

Shanghai's waste sorting-policies have achieved positive results in the past two months. Since the municipal regulation on waste management took effect on July 1, up to 8,200 tons of kitchen garbage has been handled separately per day, an increase of 110 percent from the end of last year, official data has shown. The city's ability to recycle kitchen waste has improved as well. According to the data, up to 4,600 tons of organic garbage is reused per day, and the amount is expected to surge to 5,800 tons by the end of the year. The amount of residual waste is now less than 17,000 tons per day, dropping 21 percent from last year, while the weight of recyclables hit 4,400 tons per day, five times higher than last year.

<http://swissinnovation.org/newsChina/web/2019/07-190829-f0>



China's Internet User Number Hits 854 Million

(China Daily, August 30)

The number of internet users in China had hit 854 million as of June 2019, with the internet availability rate reaching 61.2 percent, according to a report on China's internet development released Friday. The number increased by 25.98 million from the end of last year, with the internet availability rate up 1.6 percentage points, stated the report issued by the China Internet Network Information Center. A total of 847 million Chinese people used mobile phones to surf the internet, an increase of 29.84 million



from the end of last year. Mobile phone users accounted for 99.1 percent of the total netizens, up 0.5 percentage points.

<http://swissinnovation.org/newsChina/web/2019/07-190830-71>

8. Corporates / Startups / Technology Transfer

AI Startup to Identify Self-Harming Behavior in Prison

(South China Morning Post, August 03)

A Hong Kong start-up, called Wildfaces Technology, is looking to ward off suicide attempts and violence in prisons with the help of artificial intelligence, as the government and private enterprises in the city step up use of AI to build smart city infrastructure. Using AI-powered cameras, the startup has developed a video analytics system for the city's Correctional Services Department to detect suspicious behavior among large numbers of inmates, including self-harm and fighting. A general lack of data on these kinds of behavior prompted Wildfaces to steer away from deep learning and turn to rule-based behavioral analytics to detect signs of potentially negative behavior. More than 40 cameras with the AI system were installed in a minimum-security prison in Hong Kong in early 2019. It is expected that more cameras will be installed in the future.



<http://swissinnovation.org/newsChina/web/2019/08-190803-14>

Startup Sends Satellite to Space

(Xinhuanet, August 14)

China's Smart Dragon-1 rocket will carry a heavy satellite developed by a commercial Chinese space company in its upcoming launch. The satellite, which weighs 65 kg, was manufactured by Beijing Qiansheng Exploration Technology Co., Ltd. founded in 2017 with a license to develop microsatellites and satellite data applications. With remote sensing and communication functions, the satellite will provide soil moisture monitoring for a pilot site. The data and images captured by the satellite will have wide use in many sectors. The Smart Dragon-1 rocket, which will transport the satellite to space, is China's first carrier rocket for commercial use. The satellite will be sent into the solar synchronous orbit at an altitude of 540 km.

<http://swissinnovation.org/newsChina/web/2019/08-190814-b8>

Upcoming Science and Technology Related Events

Open Codes. Connected Bots

July 20- October 07, 2019

<https://is.gd/eEXRtG>

Art, Computer Codes

Shanghai

The Kind Stranger

July 23 – October 20, 2019

<https://is.gd/lftMBH>

Contemporary Society, Tech Revolution

Shanghai

Christophe Gubaran

September 08 – 17, 2019

<https://is.gd/f2lQ9w>

Swiss Universities

Shanghai

Einstein Days @ Fudan University

September 17, 2019

<https://is.gd/DUnix>

Swiss Universities

Shanghai

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