

Science China Newsletter, March 2018

Trends in education, research, innovation and policy



Guangzhou, China

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Swiss Spotlight

Scientist: China Brain Project

(Fred Mast, March 31)

Fred Mast is a cognitive scientist and visiting professor at the Institute of Neuroscience, Chinese Academy of Sciences in Shanghai. He obtained his PhD at the University of Zürich, and spent several years at Harvard University and MIT for postdoctoral research. Fred Mast is currently on a 1-year Sabbatical leave from the University of Bern where he is a full professor for quantitative research and experimental psychology. He is an expert in high-level cognitive functions such as decision making, perception, and consciousness and he uses functional brain imaging, virtual reality, psychophysics and computational modeling for his research. The China Brain Project is a highly innovative research initiative focusing on the neural basis of cognitive functions. There is still a huge gap between studies with humans and animals, and the Institute of Neuroscience with its cutting edge research facilities is just the ideal place for fostering mutual exchange, inspiration and common projects. Fred Mast also gives lectures and seminars to doctoral students in Neuroscience.



<http://swissinnovation.org/newsChina/web/2018/00-180331-15>

Startup: Global Pioneer in Urban Farming and Aquaponics

(UrbanFarmers, March 31)

UrbanFarmers (UF) is a global pioneer in urban farming and aquaponics. It is a Swiss life-science champion with several prizes and awards. UF design and build modular urban farms, deploy state-of-art technology to operate smart farms and aquaponics systems, and manage urban farms under the UF brand. UF farms monetize vacant real estate properties while providing ultra-fresh, ultra-local high quality vegetable and fish to consumers, in a sustainable way. UrbanFarmers was founded in Zurich in 2011 and has established a global presence with operations in Switzerland, Netherlands, US and Brazil. Since mid 2017, UF is active in its China expansion and looking for partners to launch the fresh revolution in the Chinese market. UF was a member of swissnex Venture Leader China program 2017, and has formed partnership with local industry leaders such as StarGlobal and BGI.



<http://swissinnovation.org/newsChina/web/2018/00-180331-50>

1. Policy

11 Innovation Platforms with Germany

(China Daily, March 01)

Minister of Science and Technology Wan Gang announced that China and Germany have set up 11 innovation cooperation platforms. The platforms cover fields such as electric vehicles, bioscience, clean water, intelligent manufacturing and clean energy. Georg Schuette, state secretary of the Federal Ministry for Education and Research of Germany, said that the German government attached great importance to science and technology innovation cooperation with China, and would strengthen cooperation with China in areas like climate change, environmental protection, the Internet of Things and lightweight manufacturing. China and Germany have respectively adopted "Made in China 2025" and "Industry 4.0" strategies in response to the new round of technological and industrial revolution.

<http://swissinnovation.org/newsChina/web/2018/01-180301-63>

Researchers Get Renewed Support from China's Top-Level Political Meetings

(Nature, March 07)

As Chinese leaders gather for the government's most significant meetings of the year (annual assembly of the Chinese People's Political Consultative Conference, and National People's Congress), researchers are anticipating major policy announcements for science and innovation that could shape the country's research agenda for years. "China will announce new policies to promote development of science and technology," says Yutao Sun, an economics and policy expert at the Dalian University of Technology. He says that fostering innovation, and using it to drive development, are among China's most important strategies. Yutao expects the government to renew its support for basic research and emerging technologies, such as electric vehicles, artificial intelligence and biomedicine. These are fields in which "China has a good chance to catch up" with other world leaders, such as the United States, he says.



<http://swissinnovation.org/newsChina/web/2018/01-180307-ae>

Government to Boost use of AI in Key Public Sectors

(China Daily, March 10)

Many AI applications are used in many industries and in daily lives, ranging from the bike-sharing technologies to package delivery. AI is also entering hospitals, courtrooms, city planning, public transportation and many other public services, he added. The key for utilizing AI in various fields is to have solid research in its core technologies and basic research, and make it open source so innovators,



entrepreneurs and other people across all facets of society can add or benefit from the technology. In the future, China will strengthen its AI research and train a new generation of talents to tackle key and frontier AI-related science issues. China will soon publish a guideline on AI research and technologies for solving these key issues, Wan Gang, science and technology minister said.

<http://swissinnovation.org/newsChina/web/2018/01-180310-c5>

Minister Stresses Commercialization of Research Findings

(China Daily, March 10)

Commercialization of scientific and technological research findings should be a crucial part in strengthening the country's innovation-driven development, said Wan Gang, minister of science and technology, on March 10, during the ongoing two sessions. Wan said China's current technology market size is about 1.3 trillion yuan (\$205 billion). Wan said the ministry will release more related policies to help tackle those problems, including providing preferential tax policies and standardizing the management of researchers who belong to an institute and also work for other organizations or enterprises.



<http://swissinnovation.org/newsChina/web/2018/01-180310-82>

Ministry of Science and Technology Adds new Functions

(Xinhua, March 13)

The new ministry is tasked to plan and implement national strategies for innovation-driven development, basic researches, and policies, coordinate major research projects, promote reforms in scientific and technology sector, and recruit foreign experts, said the plan delivered by State Councilor Wang Yong at a plenary meeting of the ongoing session of the 13th National People's Congress. The National Natural Science Foundation of China will be supervised by the ministry. The move is aimed at enhancing a national innovation system, better allocating scientific and technological resources, and develop a high-level taskforce of scientists, the document said.

<http://swissinnovation.org/newsChina/web/2018/01-180313-36>

China to Dismantle Family Planning Commission

(Global Times, March 13)

China plans to set up a national health commission in a move to promote the healthy China initiative and ensure the delivery of comprehensive life cycle health services for the Chinese people, according to a document on a State Council institutional reform plan submitted on 13 March to the ongoing national legislative session for deliberation. The website of China Population Association, which had been promoting population control, has also been closed on 13 March.

<http://swissinnovation.org/newsChina/web/2018/01-180313-31>

2. Education

New Orders on National College Entrance Examination

(Global Times, March 26)

Chinese Ministry of Education has issued a circular on the country's annual national college entrance examination, commonly known as gaokao, to further promote educational equality. Starting from this year's gaokao, sports, math and science competition winners nationwide will no longer get bonus points added to their gaokao results. The ministry also canceled extra points for those who are named "provincial-level outstanding students" or those recognized for excellent moral performance. The ministry said it would raise enrollment quotas for students from less developed central and western parts of the country and those from populous provinces.

<http://swissinnovation.org/newsChina/web/2018/02-180326-9d>

Poor Rural Students get Priority in College Admissions

(Global Times, March 27)

Chinese students from impoverished families will have an advantage over other college applicants, according to a circular released by the Ministry of Education. The new policy is part of a project to prioritize students from poor and rural areas in enrollment at key colleges and universities. Among applicants with the same score on the national college entrance exam, those from registered impoverished families will receive priority in enrollment at key colleges and universities. In 2012, key colleges and universities admitted 10,000 students from rural and underdeveloped areas through the project, and enrollment expanded to 100,000 in 2017.

<http://swissinnovation.org/newsChina/web/2018/02-180327-6a>

More Global Students in China to Study Medical Sciences

(Global Times, March 30)

One may think of European, American and Japanese universities as the best choices for Western medical science studies. But a rising number of students from around the globe are choosing Chinese universities as China takes a more important role in world healthcare issues. According to statistics collected by the Chinese Service Center for Scholarly Exchange (CSCSE) under the Ministry of Education, the number of international students in China rose by 24.2 percent from 356,499 in 2013 to 442,773 in 2016. Among them, students who majored in Western medicine rose from 34,899 in 2013 to 45,461 in 2015, increasing from 9 percent to over 11 percent in two years. No official figure for 2016 has been published as yet.



<http://swissinnovation.org/newsChina/web/2018/02-180330-00>

3. Life Sciences / Health Care

Traditional Chinese Medicine is Going Global

(China Daily, March 03)

A senior official said on 3 March that Traditional Chinese medicine (TCM) has shown good momentum of going global. TCM is now practiced in 183 countries and regions across the globe, with 86 of them signing agreements with China to promote TCM, according to Wang. A total of 17 TCM centers have been set up worldwide and a series of standards in the sector have been unveiled, which are signs of TCM's growing global appeal.

<http://swissinnovation.org/newsChina/web/2018/03-180303-bd>

AI-General Practitioner System Starts Hospital Trial

(China Daily, March 05)

An AI-general practitioner system developed by a Chinese tech firm has started its "internship" in a community hospital in East China's Anhui province. The system called "AI doctor assistant" can listen to doctors diagnosing inquiries with patients and automatically produce e-documents for patient case reports. The system was developed by Shenzhen-listed iFlytek in partnership with Tsinghua University. The company's medical robot passed China's national medical license examination with a high score in 2017. It was the world's first robot to pass a national medical license examination. Currently, the system's diagnosing reports and prescriptions still need the signatures of doctors for approval.

<http://swissinnovation.org/newsChina/web/2018/03-180305-b2>

Facilitator in Zika Transmission Found

(Xinhua, March 07)

Identified in the 1940s in Africa, Zika is primarily spread by the bite of an infected mosquito. It can be passed from a pregnant woman to her fetus, leading to defects in infants, including microcephaly that causes abnormally small brains and heads. Scientists have found that LTRIN, a protein obtained from the salivary glands of *Aedes aegypti*, or yellow fever mosquito, modulates the host immune responses to a mosquito bite, providing chances for Zika virus to spread, according to Jin Lin, researcher with the Kunming Institute of Zoology under the Chinese Academy of Sciences and the lead author of the research paper. The researchers said that the finding offers a potential therapeutic strategy for diminishing Zika transmission.



<http://swissinnovation.org/newsChina/web/2018/03-180307-2c>

Key Factor Activating Genome Expression in Human Embryos

(Xinhua, March 09)

Scientists have identified the crucial factor that activates gene expression in human embryos, bringing them a step closer to explaining the mystery of human development at a very early embryonic stage. During human growth, different genes must be expressed at the right time and place. The genetic code stored in DNA is "interpreted" by gene expression, which gives rise to all the particular features of an individual. Researchers from Beijing Institute of Genomics, Chinese Academy of Sciences, led by Liu Jiang, from Center for Reproductive Medicine, Shandong University, and from Guangzhou Medical University found that Oct-4, a transcriptional factor, plays a crucial role in activating zygotic genome expression. The research also found genome activation follows a particular sequence. "The older genes usually start expression at early embryonic stages, and younger ones at later stages," Liu said.

<http://swissinnovation.org/newsChina/web/2018/03-180309-6d>

Gene to Increase Corn Yields

(Xinhua, March 09)

Scientists have found a gene that can help grow bigger grains of corn to raise yields. The gene, named *urb2*, is crucial in the growth of grains, according to the research by Henan Agricultural University and Chinese Academy of Agricultural Sciences. The result of the research can help increase corn yields and lay a foundation for related studies in breeding, said Tang Jihua, head of the research team. The research results were published in the journal *New Phytologist*.



<http://swissinnovation.org/newsChina/web/2018/05-180309-d2>

Novel Hydrogel for Post-Surgical Cancer Treatment

(Xinhua, March 20)

Cancer patients often blame radiotherapy and chemotherapy for serious complications and side effects. More and more people are opting for photothermal therapy (PTT). "PTT can treat cancer with minimal invasiveness, yet it has been stifled in clinical adoption for the insufficient biodegradability of the PTT agents. Our hydrogel tackles this problem," said Yu Xuefeng, the leading researcher at Shenzhen Institutes of Advanced Technology. The researchers design a new PTT system by incorporating black phosphorus (BP) nanosheets with a thermosensitive hydrogel for the postoperative photothermal treatment of cancer. Yu said the hydrogel had excellent near infrared (NIR) photothermal performance and good biodegradability and biocompatibility *in vitro* and *in vivo*. "Under NIR irradiation, the sprayed BP hydrogel can rapidly form a gelled membrane on wounds and help eliminate residual tumor tissues after tumor removal surgery," Yu said.

<http://swissinnovation.org/newsChina/web/2018/03-180320-30>

Analysis of the Prefrontal Cortex

(Xinhua, March 20)

The prefrontal cortex (PFC) contains billions of cells and serves as the center of advanced intellectual activity, such as memory, cognitive ability, decision making and social behavior. Scientists from Peking University as well as Capital University of Medical Sciences applied single-cell transcriptional profiling to identify cell types in the developing human PFC and their developmental features. In order to systematically analyze the cellular basis and molecular regulation of the PFC, scientists traced the molecular features of cells in the PFC during human brain development at gestational weeks 8 to 26. They analyzed more than 2,300 single cells and identified 35 subtypes of cells in six main classes. They also traced their development process. The research will provide a powerful tool for investigating the mechanisms behind neurological diseases related to abnormal structure or dysfunction of the PFC and for exploring potential therapies.



<http://swissinnovation.org/newsChina/web/2018/03-180320-78>

AI Could Alleviate Doctor Shortage

(MIT Technology Review, March 21)

The Chinese government has called for technology to help with computerized medical diagnosis as part of the first stage of its grand plan to embrace AI by 2020. In some ways the trend mirrors what is happening in the US and Europe. In China, however, restrictions on the use of data and new technologies are looser, and the need for automation is more pronounced. There are 1.5 doctors for every 1,000 people in China, compared with 2.5 in the US. China is moving quickly, 131 companies are currently working on applying AI in the country's health-care sector. The way people perceive AI in China may make it easier for the technology to flourish in medicine. In the West, advances in AI have prompted debates about job losses, but most Chinese doctors seem keen to automate away their most repetitive work.



<http://swissinnovation.org/newsChina/web/2018/04-180321-4a>

Keyfactor Found to Main Wastewater Treatment Technology

(Xinhua, March 27)

Sludge accumulates as a result of the treatment of domestic sewage and industrial wastewater. Sludge can be highly toxic and needs treatment before disposal. "Over 90 percent of municipal sewage and over 50 percent of industrial wastewater are treated using an activated sludge (AS) process in China. But challenges such as high energy-consumption, frequent sludge bulking and foaming still remain, causing water contamination," said Qiu Dongru, researcher at the Institute of Hydrobiology of CAS. The AS process involves the production of an activated mass of microorganisms capable of aerobically

stabilizing the organic content of waste water. The key factor in the technology had been unclear until now. Therefore, researchers led by Qiu studied the microbiome of AS and found bacterial floc formation plays a central role in the process, allowing the sludge-and-effluent separation and recycling of AS.

<http://swissinnovation.org/newsChina/web/2018/03-180327-a4>

4. Engineering / IT / Computer Science

Alibaba's E-Commerce to Adopt Blockchain

(CoinDesk, March 01)

Alibaba's T-Mall e-commerce platform is reportedly adopting blockchain technology in its cross-border supply chain through a partnership with logistics company Cainiao. According to a recent report by Xinhua, the partnership aims to move information on goods for import and export onto a blockchain that can then track their country of origin, shipping port and method, arrival port as and customs report details. The new launch comes as Cainiao, of which Alibaba is an investor, is doubling down on its belief that blockchain has a significant potential to be adopted for cross-border e-commerce. The partnership claims Chinese consumers from various cities covered by Cainiao will be able to track the blockchain-based logistic information for some 30,000 goods from 50 countries through the mobile application. The partnership marks the latest move by Alibaba to improve consumer confidence in the battle against counterfeit products.

<http://swissinnovation.org/newsChina/web/2018/04-180301-14>

High-tech Dining Debuts in University Canteen

(Global Times, March 02)

A canteen in Zhejiang University has become popular online for offering high-tech dining experiences. Students and teachers at the university can register online with their personal information, mobile phone number, and a campus card used for payment. Using a facial recognition scanner in the canteen, a diner is paired with a chip-embedded food tray and can start taking food from the buffet. Each dish has a sensor recording the price, while the table the tray is placed on works as a scale. By walking through the buffet area, the price of the meal is calculated and money is automatically deducted from a corresponding campus card. Once the meal is taken, a report specifying total calories and proportion of protein, carbohydrates and fat will be sent to the diner's mobile, to encourage them to eat a more balanced diet.

<http://swissinnovation.org/newsChina/web/2018/04-180302-9a>



Launch of Long March-5B Rocket in 2019

(Xinhua, March 05)

The Long March-5B carrier rocket will launch into space in 2019, according to a spokesperson for the China Manned Space Engineering Office. The rocket will help carry the core module and experiment modules to China's space station. The Long March-5B carrier rocket undergoes testing in March in preparation for the first launch mission. The third batch of astronauts will be selected in the first half of this year. The new astronauts will include not only pilots, but also maintenance engineers. More manned and cargo spacecrafts have been scheduled for development. The spokesperson also said the CMSEO would cooperate with the United Nations for Outer Space Affairs to offer opportunities on the application of the Chinese space station, with the European Space Agency on module development and with other countries on the lunar probe.



<http://swissinnovation.org/newsChina/web/2018/04-180305-02>

Tapping 6G Mobile Communication Technology

(China Daily, March 10)

Researchers have already begun working to tap the potential of 6G - the sixth generation of mobile communication technology - even though 5G is still several years away from large-scale commercial application, Miao Wei, minister of Industry and Information Technology, said recently. The move highlights China's eagerness to prepare for cutting-edge technologies as the country aims to gain a lead in the global race toward a fully internet-connected world. "As mobile communication technology advances rapidly, it not only connects people with people, but links machines with machines as well as machines and humans. That is why we rush into the research on 6G. We want to prepare for such a world," Miao said.

<http://swissinnovation.org/newsChina/web/2018/04-180310-4b>

Biggest Science Ship

(China Daily, March 10)

A major shipbuilder has unveiled plans to start the construction of China's biggest research vessel this year, with the project expected to take about two years to complete. Work on assembling the ship will begin at Shanghai's Jiangnan Shipyard using a design from the Marine Design and Research Institute of China, Hu Keyi, the shipyard's technical director, said recently. With a displacement of 6,800 metric tons, it will be the country's largest research vessel, said Hu, who noted that it will use an advanced podded propulsion system, giving it better mobility. The ship will be able to operate in rough seas and will consume less fuel than other ships of the same size. Furthermore, the ship will



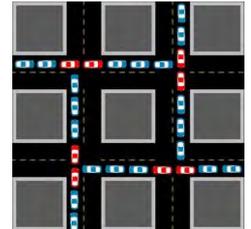
have room for 120 crew members and researchers and be capable of extended missions of up to 60 days.

<http://swissinnovation.org/newsChina/web/2018/04-180310-1b>

AI-Driven Technology Reshaping City Traffic

(Xinhua, March 10)

An ambulance in Hangzhou avoids gridlock and all red lights switch to green as it approaches. "The travel time was cut to half," said Sun Shixiang, of Hangzhou's public security bureau, while pointing to a big screen. The progress is attributed to Alibaba's "City Brain", an AI platform on Alibaba's cloud infrastructure. It is a support to cities in digital transformation. In Hangzhou, the "City Brain" pulls in traffic and weather data and analyzes real-time traffic flow, adjusting traffic lights accordingly. Over the past year, the technology has controlled traffic lights in 128 intersections in Hangzhou. The average speed of cars on these roads has increased by 15.3 percent, and travel time on bridges similarly reduced. In addition to transport, the technology is expected to provide solutions for the city's energy and water supplies.



<http://swissinnovation.org/newsChina/web/2018/04-180310-c3>

Race for the Mother of all Supercomputers: Quantum Computer

(South China Morning Post, March 12)

Baidu, Alibaba and Tencent jockey for position in the development of quantum computing, which delivers a faster and more efficient approach to processing information than today's fastest computers. Quantum computing is poised to move on the fast track as the internet giants pour new investment into this field, boosting efforts by the country to become a hi-tech innovation powerhouse. "Whoever can build a fully functioning quantum computer will rule the world," said Manas Mukherjee, an assistant professor in the physics department of the National University of Singapore and a principal investigator at the country's Centre for Quantum Technologies. "There are only a small number of companies with deep pockets [to make quantum computers]. Even if there are just four or five companies to achieve this, they would already dominate [this new market]."



<http://swissinnovation.org/newsChina/web/2018/04-180312-3f>

Five-hundred-meter Aperture Spherical Radio Telescope (FAST) Identifies 11 Pulsars

(Xinhua, March 13)

Since China's Five-hundred-meter Aperture Spherical Radio Telescope (FAST), the world's largest single-dish radio telescope, started trial operations in September 2016, it has discovered 51 stars which bear features similar to pulsars, and 11 of them have been confirmed as new pulsars by observatories in other countries. A pulsar is a highly magnetized, rotating neutron star, which emits two beams of electromagnetic radiation. According to Zhang Pei, pulsars with high density and energy are irreplaceable "celestial laboratories" and could be used to replace navigational satellites to locate spacecraft. Pulsar observation is an important task for FAST, which can be used to confirm the existence of gravitational radiation and black holes and help solve many other major questions in physics. FAST is also in charge of the exploration of interstellar molecules and interstellar communication signals.



<http://swissinnovation.org/newsChina/web/2018/04-180313-e2>

Tencent Opens Robot Research Lab

(MIT Technology Review, March 16)

Tencent is about to bring its AI research to life by opening a robotics lab in China's center of manufacturing, Shenzhen. The move will see the company explore an exciting new technological frontier that potentially could have a big payoff. Tencent is already researching many kinds of AI algorithms, and even has a rival to DeepMind's Go-playing program AlphaGo, called Fine Art. But it's more difficult to have AI software control systems operating in the messy real world. The challenge of interacting with real objects can also feed back into AI research on vision and language. Robots cannot currently do the kind manufacturing work performed by low-wage workers in Shenzhen, like putting together electronic components. With those wages rising rapidly though, there is a desire for robots to take on more tasks.



<http://swissinnovation.org/newsChina/web/2018/04-180316-47>

Construction of China's First Polar Adventure

(Xinhua, March 17)

Construction has begun on China's first polar expedition cruise ship in Jiangsu Province, and is expected to be completed by August 2019. According to China Merchants Industry Holdings Company, the ship will be 104.4 meters long, 18.4 meters wide and weigh 7,400 tonnes, with a speed of at least 15.5 knots. With an advanced electric propulsion and control system, the ship will be able to navigate through high-latitude sea ice. The vessel was designed by Ulstein Group, a Norwegian ship design and building



company. Cruise shipbuilding is a key objective of the "Made in China 2025" action plan, which aims to turn China into a global leader in manufacturing by increasing investment in R&D and the application of the latest technology.

<http://swissinnovation.org/newsChina/web/2018/04-180317-5a>

Tests on Faster, Extra-Long Bullet Train

(China Daily, March 18)

The Fuxing - or Rejuvenation - is China's developed new generation of a bullet train. A new one is now being tested. The 415-meter-long train has 16 carriages, twice as many as trains already in operation. The units are undergoing final tests at the China Academy of Railway Sciences, which focus on 28 major functions, including tractability, braking, network communications and aerodynamic performance. The train, which will have a designed speed of up to 350 kilometers per hour, will receive permits for manufacturing on a large scale if it passes all tests. More than 80 percent of the 254 major industrial standards under which it falls are Chinese, and are higher standards than in their Japanese and European counterparts. The new model has made great progress in reliability and energy conservation, and it reduces life-cycle costs below previous models.

<http://swissinnovation.org/newsChina/web/2018/04-180318-31>

World's Fastest Wind Tunnel to Spur Spaceplane Development

(Xinhua, March 19)

Wind tunnels move air around objects, making it seem like the objects are really flying. Spacecraft engineers use them to test ideas for various spacecraft designs. The world's fastest hypersonic wind tunnel to help with the development of spaceplanes is now about to be built. "The 265-meter-long tunnel can be used to test hypersonic aircraft that can travel at speeds of up to Mach 25 (30, 625 kph), 25 times the speed of sound," says Han Guilai, a researcher with China's State Key Laboratory of High Temperature Gas Dynamics of the Chinese Academy of Sciences. The research was published in February and it unveiled the "I Plane" model, which is capable of transporting people and payloads from Beijing to New York within two hours, beating any commercial airline flight.

<http://swissinnovation.org/newsChina/web/2018/04-180319-40>

Construction of a Lead-Based Reactor Industrial Supply Chain

(Xinhua, March 19)

A lead-based reactor industrial supply chain will be built, according to the Institute of Nuclear Energy Safety Technology (INEST) under the Chinese Academy of Sciences. The lead-based reactor is a type of advanced nuclear system that uses lead or lead alloy as the coolant. It is safer and more affordable, according to INEST. China began research on the lead-based reactor in the late 1980s. The lead-based

reactor provides an important way to safely and efficiently promote the commercial application of advanced nuclear energy. The reactor is expected to support power supply, ocean development, and aerospace power. It can also be used in nuclear waste treatment and fusion power plants. A lead-based reactor industrial alliance was established earlier this month in China, led by INEST.

<http://swissinnovation.org/newsChina/web/2018/04-180319-c7>

Bee-Inspired Morphing Aircraft

(Xinhua, March 24)

A bee-inspired morphing airplane, which is currently designed by China Academy of Launch Vehicle Technology (CALT), is expected to reduce resistance during flight and be more fuel-efficient. According to the designer Hu Guotun, morphing aerospace aircraft travel through the atmosphere to space before returning to the atmosphere. In the process of re-entry, the aircraft will use its own inertial glide for a period of time. Minimizing flight resistance is vital for saving fuel. "We have drawn inspiration from the bee's abdomen structure, which allows the bee to flex freely and control the direction of flight," said Hu. Based on the bee's flexible abdomen structure, CALT designed a morphing nose cone for the aircraft, which changes in different stages of flight. Through simulation, they found that the morphing nose cone can reduce aerodynamic drag by more than 20 percent.

<http://swissinnovation.org/newsChina/web/2018/04-180324-14>

5. Energy / Environment

Vegetation Productivity Monitored by the TanSat Satellite

(Xinhua, March 03)

Chlorophyll fluorescence is an electromagnetic signal emitted by growing plants. Researchers have now achieved a global image of solar-induced chlorophyll fluorescence which can clearly indicate vegetation productivity, according to the Science and Technology Daily. Applying the data from the carbon dioxide observation satellite TanSat, the researchers monitored the atmospheric carbon dioxide concentrations and identified the chlorophyll fluorescence of terrestrial vegetation with high accuracy. The global image of the chlorophyll fluorescence showed vigorous vegetation productivity in the corn belt in North America, European plain, and agricultural regions in East Asia in July 2017, as well as Amazon forest in December. China launched the 620-kilogram TanSat satellite in December 2016, becoming the third country after Japan and the United States to monitor greenhouse gases using its own satellite.



<http://swissinnovation.org/newsChina/web/2018/05-180303-cc>

First Ultra High-Voltage DC Power Line

(Xinhua, March 07)

China's first ultra high-voltage power superhighway for transmitting clean energy has been approved, with construction to start in the second half of the year. The 800-kilovolt direct current transmission line will extend 1,600 km across five provinces, from the Qinghai plateau in the northwest to densely populated Henan in central China, according to the State Grid, Qinghai branch. Qinghai has a large solar power capacity, reaching 9.53 million kilowatts at the end of 2017, accounting for 37.5 percent of its total power capacity. Shu Yinbiao, chair of the State Grid, said the power line will use Qinghai's advantage in clean energy resources for industrial upgrades and raise the amount of clean electricity used in Henan.

<http://swissinnovation.org/newsChina/web/2018/05-180307-1c>

Universities to Work Together on Polar Research

(Xinhua, March 08)

Fifteen Chinese universities will form a joint center engaged in polar research, according the Ministry of Education (MOE). They will monitor and investigate the conditions of ecology, atmosphere, ocean, and glaciers in the polar regions, by sharing data with the research stations of other countries. Researchers from BNU have provided remote sensing support for ice condition surveys onboard the research vessel and icebreaker Xuelong, Chinese for Snow Dragon, six times since 2011. "We will also transport advanced equipment and instruments there and establish joint observation stations," said Cheng Xiao, dean of the College of Global Change and Earth System Science at BNU. Cheng expects the joint research center to integrate talent resources and cultivate more high-level personnel both in natural and social sciences as China develops its research in the Antarctic and Arctic regions.



<http://swissinnovation.org/newsChina/web/2018/05-180308-83>

PowerChina Eyes Bigger Global Footprint

(China Daily, March 10)

Power Construction Corp of China (PowerChina), the biggest hydropower designer and builder in China, has vowed to work more closely with countries and regions participating in the Belt and Road Initiative through further investment in the energy sector and contribute to the overall progress of local economies. PowerChina envisages more than 1,400 projects in 57 countries and regions involved in the initiative, with contracts valued at more than \$600 billion. The 350 projects under construction have total contract value of about 300 billion yuan (\$47 billion). It makes more than 50 percent of its gross profits from its international business. In addition to water conservancy and hydropower construction, in which the company has 50 percent of global market share, it is expanding to new

energy infrastructure, EPC (engineering, procurement and construction) projects and investment in minerals.

<http://swissinnovation.org/newsChina/web/2018/05-180310-24>

"Planting" Trees on Mobile Phones

(Xinhua, March 11)

A nonprofit project by Ant Financial, See Foundation and China Green Foundation, is rewarding low-carbon acts by Alipay users with "energy" that is used to "water" virtual trees in their mobile phones. "When a virtual tree grows up, we plant a real tree," said Xu Di, who heads "Ant Forest," a function embedded in the Alipay app. In addition to public transportation, "energy" rewards are given for online purchases of movie and train tickets and online trade in second-hand items. The campaign has attracted 280 million participants and brought more than 12 million Haloxylon trees in Alxa and Ordos in north China's Inner Mongolia Autonomous Region and Wuwei in Gansu Province, according to Xu. Herders are also beneficiaries of the campaign. They are paid to plant the samplings in their pastures and care for them.

<http://swissinnovation.org/newsChina/web/2018/05-180311-61>

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

Autonomous DNA Nanorobots to Treat Cancer

(Xinhua, March 02)

Scientists said they have successfully created and tested the world's first autonomous DNA nanorobots to combat cancer tumors, paving the way for revolutionary cancer therapy. "The nanorobot is exceptionally small and impossible to see with naked eyes. It is about 5,000 times smaller than the tip of a needle", researcher Ding Baoquan said. It can travel through the bloodstream searching for tumors. When detecting a tumor, it will release its load of thrombin directly into the tumor to cut off its blood supply and "starve" the tumor to death. As the nanorobot is a natural biocompatible and biodegradable material, it is cleared out of the body after it has finished its task. Ding said this is the first time that experiments have been completed on living organisms with sophisticated biological environments.

<http://swissinnovation.org/newsChina/web/2018/06-180302-99>

Development of Micro Rockets

(China Daily, March 19)

China plans to develop micro solid-propellant carrier rockets for commercial use to meet growing needs for launching micro-nano satellites. China Academy of Launch Vehicle Technology (CALT) said that its subsidiary company, China Rocket, was in the process of appraising the plan. Since its establishment in 1957, the CALT has been China's largest developer and producer of carrier rockets. It has designed and manufactured the Long March carrier rockets, which have a good reputation globally. According to the CALT, the global demand for commercial satellite launches will exceed 10,000, and domestic demand will reach 1,000. Many Chinese tech giants also have satellite launch plans.

<http://swissinnovation.org/newsChina/web/2018/06-180319-83>

7. Economy, Social Sciences & Humanities

Attract Global Talent and Venture Capital to Accelerate Technology Push

(South China Morning Post, March 05)

China has pledged to accelerate its efforts to surpass the US in advanced technologies from artificial intelligence (AI) to robotics by wooing overseas talent and venture capital investment. Premier Li Keqiang mentioned the terms "internet Plus" – the strategy of harnessing the internet to upgrade the country's economy – and "innovation" several times during his annual speech at the National People's Congress. "The latest global revolution in science and technology and industrial transformation are trends we must be on board with", he said. The contribution of technological advances to economic growth has risen from 52.2 per cent to 57.5 per cent, according to the government work report.

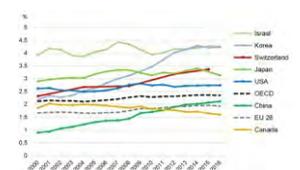


<http://swissinnovation.org/newsChina/web/2018/07-180305-59>

On Course to Match OECD R&D Intensity by 2020

(OECD, March 09)

The latest available data on expenditure on R&D for OECD countries and other major economies published in the OECD Main Science and Technology Indicators shows that in 2016 R&D intensity - expenditure on R&D as a percentage of GDP - remained stable at 2.4% across OECD countries for the fourth year running. China continued its steady increase in R&D intensity, reaching 2.12% in 2015 – only 0.23 of a percentage points below the OECD average. Having overtaken the EU in R&D intensity in 2013 and in raw R&D spending in 2015, China spent 15% more on R&D than EU countries spent collectively in 2016. The latest patent data show the number of patents filed by Chinese inventors



increased by 28% in 2015, while filings under the Patent Cooperation Treaty by United States inventors declined for a second successive year.

<http://swissinnovation.org/newsChina/web/2018/07-180309-fb>

Top Science Academy Plans Tech Patent Auctions

(Xinhua, March 09)

The Intellectual Property Operation and Management Center of CAS is promoting the patents in the provinces of Shandong, Jiangsu and Zhejiang as well as the cities of Shanghai, Fuzhou and Shenzhen, where auctions are held. Sui Xueqing, head of the center, said the auctions would increase the use of national-level science and technology resources in the economy. The academy wishes to lead by example to encourage more science institutes to commercialize their scientific achievements. He said that the patents were selected from those obtained by 104 institutes and 89 national labs affiliated with the academy. Together they held 46,000 patents in total by the end of 2017. According to An Lili from CAS's intellectual property center, the minimum starting bid for the patents is expected to be 100,000 yuan (15,700 U.S. dollars).

<http://swissinnovation.org/newsChina/web/2018/07-180309-f1>

Foreign Streaming Giants Miss Out

(South China Morning Post, March 20)

China has become a market where consumers are increasingly paying for online video content. But it is a boom foreign streaming giants like Netflix and Amazon are missing out. The spoils are going to home-grown companies like Tencent Holdings, whose Tencent Video unit said it had 62.6 million paying subscribers as of the end of February, compared with 43 million in September. Its biggest competitor, Baidu Inc.-backed iQiyi, added about 10 million paying customers in the first two months of this year to reach 60.1 million. Foreign providers have so far made little headway into the Chinese market because of strict controls the government imposes on overseas content. There is a quota on the number of overseas films that can be imported and played in theaters.



<http://swissinnovation.org/newsChina/web/2018/07-180320-45>

The Elderly Enjoy Going Online

(Xinhua, March 20)

A new report shows 75.8 percent of people aged 50 and over read news online. More than 80 percent can send emojis, a "thumbs up" and digital red envelopes. Almost 70 percent can use a smartphone to shoot and repost photos or videos. About 20 percent can create personalized emojis. The report by Tencent and the Chinese Academy of Social Sciences is based on a year-long study. Respondents

were elderly and middle-aged users of WeChat. Researchers used methods including big data analysis, questionnaires, and face-to-face interviews. China's online population hit 772 million last year. About 10.4 percent were over 50, and 5.2 percent were over 60, up 1.2 percent from 2016. More than 70 percent of elderly web users read online articles, including political, military and health news.

<http://swissinnovation.org/newsChina/web/2018/07-180320-d0>

8. Corporates / Startups / Technology Transfer

Court Turns to Virtual Reality

(Xinhua, March 01)

While virtual reality (VR) technology may be most used at home or museums, it could also help lawyers and judges in the courtroom to get a better idea of how an alleged offence took place. Wearing a pair of VR glasses and operating a hand set, a witness moved the simulated images of a suspected murderer and victim on the screen to replicate the crime scenes he had seen. The VR technology was used at a courtroom in Beijing's No. 1 Intermediate People's Court. It was the first time for Beijing's courts to use such technology in hearing a criminal case, according to the Beijing Municipal People's Procuratorate.

<http://swissinnovation.org/newsChina/web/2018/08-180301-3a>

Emerging Smartphone Markets in Southeast Asia

(South China Morning Post, March 08)

Oppo, Vivo and Huawei Technologies shipped a total of 29.8 million smartphones across the emerging markets of Southeast Asia last year to corner a combined 29.6% market share, according to research firm IDC. That was enough to edge out Samsung, which shipped 29.3 million smartphones in the region last year for a 29.1% share. Those emerging markets tracked by IDC included Indonesia, Myanmar, Malaysia, the Philippines, Thailand and Vietnam. Samsung ranked last among the major brands with just over 2% share in the smartphone market in China. In contrast, the emerging markets in Asia are shaping up as the future growth engines for the mainland's top smartphone companies. "China's smartphone market is a saturated space, and these brands are looking to overseas markets for more profitable growth," said Jensen Ooi researcher at IDC.



<http://swissinnovation.org/newsChina/web/2018/08-180308-27>



Global Electric Vehicles to Enter the Chinese Market

(China Daily, March 10)

Wan Gang, minister of science and technology, made remarks at a news conference when asked about his opinion on Tesla chief Elon Musk's public statement to Donald Trump that he hopes Trump can focus on the trade imbalance between the two countries caused by electric cars and related fields.



Wan said that he has not heard any problem raised since he and Musk first knew each other in 2008. He stressed that China and the US have a close cooperation in the sector of electric vehicles. Many efforts are underway to promote the vehicles in China, including fiscal and tax incentives, said Wan, adding that many global brands have entered Chinese market and they are produced by joint ventures, enjoying same treatments.

<http://swissinnovation.org/newsChina/web/2018/08-180310-2e>

Meal Delivery is next Battlefield for Tech Giants

(South China Morning Post, March 13)

Like many other consumers, the 27-year old Chen has grown accustomed to all the modern conveniences accessible through a smartphone: meal recommendations from local services platform Meituan-Dianping, food delivery via the Meituan Waimai app and payments on WeChat Pay.



Consumers like Chen are a big reason Alibaba Group Holding is widely expected to pull the trigger in taking over food delivery service Ele.me, which would enable the e-commerce giant to run its own delivery network to support the company's strategy of merging online commerce with physical retail. Currently there is not a mere competition for the food delivery market for Meituan, Ele.me and Didi, it is also a race to gain new users and guide them into their ecosystem of other service.

<http://swissinnovation.org/newsChina/web/2018/08-180313-b7>

China Literature Combines Walt Disney and Marvel

(South China Morning Post, March 19)

China Literature is banking on developing and marketing its massive pool of intellectual property at home and abroad to help it become a combination of the Walt Disney Company and Marvel Entertainment. Recently, it reported a 15-fold increase in net profit last year on the back of a surge in number



of paying subscribers. The company will see more cooperation with parent Tencent in the entertainment fields, including films, television and games, he said. China's tech giants are engaged in intense competition to acquire and create content, whether movies, TV dramas or games, to attract and retain users across their various platforms. At stake is the world's largest internet market with

almost 800 million users, with the growing number of younger digital-native consumers more willing to spend on content.

<http://swissinnovation.org/newsChina/web/2018/08-180319-4a>

9. Bilateral News

China's HNA Group to Publicly List Swiss Airline Caterer Gategroup

(Reuters, March 06)

Chinese conglomerate HNA Group is seeking a public listing for airline caterer Gategroup raising funds to tackle HNA's liquidity crunch. The move is the latest in the aviation-to-financial services conglomerate's drive to restructure its operations, while raising cash by selling equity and real estate assets. No valuation was given for the Gategroup flotation, although an issue of new shares will generate 350 million Swiss francs (CNY2332 million) for Gategroup. HNA will raise money by selling a 65 percent stake. Gategroup Chief Executive Xavier Rossinyol said a valuation would be announced in the next few weeks, adding he believed it would be "significantly" higher than in the past. HNA paid CNY 9.52 billion for Gategroup. HNA wants to list Gategroup in Zurich at the end of the first quarter or during the second quarter of 2018.



<http://swissinnovation.org/newsChina/web/2018/09-180306-db>

swissnex CEO: Airpocalypse in China?

(Energieia, March 16)

A decade ago, China saw the western climate change initiatives as a conspiracy to limit China's rapid growth. Today, avoiding pollution-related social unrest against the «airpocalypse», the Chinese government sees new opportunities and gets serious about addressing air pollution and protecting the environment. This represents a radical policy shift which in one example strengthens the domestic car industry by a comprehensive switch to electric vehicle (EV). The government is to spend over USD 2 billion in R&D in 2018 by investing heavily in modern technologies including Internet of Things and Artificial Intelligence, two key components of the Energy Internet for a cleaner and more efficient use of energy. The two-way exchange of energy and information would upgrade traditional power grids into new intelligent platforms, where end-to-end interactions across the entire value chain are implemented.



<http://swissinnovation.org/newsChina/web/2018/05-180316-2e>

Sending Students to Telecom Giant Huawei

(luzernerzeitung.ch, March 21)

"The Chinese telecom giant is above all known for its mobile phones," says Daniel Peter from HSLU. "Less known, however, is that Huawei is also the most important provider of network infrastructure." Five years ago, for the first time, Peter traveled with students to the company's headquarters in Hong Kong and Shenzhen. For the students - three to four each year - all costs, except the visa fees, are covered. "The students gain insight into a global corporation and are working on their own projects during this time," explains Peter. Behind the generous commitment is certainly the intention to correct a false image. China is perceived as a land of ruthless copiers, especially in terms of technology. "China not only copies, but with the copying the products are also improved. Adding new knowledge works really well in China," says Peter.



<http://swissinnovation.org/newsChina/web/2018/09-180321-7a>

Upcoming Science and Technology Related Events

Sino-Swiss Contemporary Jewelry and Accessory Design Exhibition

April 6-27, 2018

<https://is.gd/XqOa8e>

Designers, Sino-Swiss Dialogue

Shanghai

CES Asia

June 13-15, 2018

<http://www.cesasia.cn/>

Consumer Technology, Innovation

Shanghai

AI in WealthTech - Future of Money series - 2nd edition

April 9-11, 2018

<https://is.gd/ihE2ue>

FinTech, Artificial Intelligence

Shanghai, Beijing, Hong Kong

Swiss Pavilion, China International Import Expo CIIE

November 5-10, 2018

<http://www.shanghaiexpo.org.cn/zbh/en/>

International Import Exhibition

Shanghai

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