Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Embassy of Switzerland in China
瑞士驻华大使馆
Science, Technology and Education Section
科技与教育处

swissnex
China

Science China Newsletter, July 2019

Trends in education, research, innovation and policy

Shanghai, China

Table of Contents

1. Policy 3
2. Education 5
3. Life Sciences / Health Care 7
4. Engineering / IT / Computer Science 11
5. Energy / Environment 15
6. Physics / Chemistry / Material Science / Nano- & Micro Technology 18
7. Economy, Social Sciences & Humanities 19
8. Corporates / Startups / Technology Transfer 20
9. Bilateral News 21
Upcoming Science and Technology Related Events 22

Swiss Spotlight

Scientist: From Photosynthesis to Algal Biotechnology

(Jean-David Rochaix, July 10)

After retiring as Emeritus Professor of the University of Geneva, Jean-David Rochaix went to China to pursue his studies in plant molecular genetics through collaborations with researchers and students at the Institute of Botany of the Chinese Academy of Sciences in Beijing. He spent there 15 months from 2014-2016 studying the assembly and regulation of membrane protein-pigment complexes involved in the primary reactions of photosynthesis. Besides his research activities, he gave lectures to students and organized seminars. In 2017 he joined the College of Life Sciences as Visiting Professor of Shanghai Normal University where he spends every year three months, doing both research and teaching in the fields of photosynthesis, organelle biogenesis and signaling. Since 2019, he has extended his teaching and research to Henan University in Kaifeng. More recently he was also involved in the establishment of an algal biotechnology group in Qingdao with the aim of producing compounds of high added value in microalgae useful for medicine, nutrition and phytoremediation through genetic engineering. Besides his involvement in Chinese plant science, he is very much interested in Chinese culture and history.

http://swissinnovation.org/newsChina/web/2019/00-190710-12

Start-Up: The World of Silicone 3D Printing

(Specrtoplast AG, July 10**)**

Spectroplast AG is a Swiss Spinoff from ETH Zurich that introduces the next material revolution to the World of 3D Printing: Silicones! Thus far, only rigid materials such as plastics and metals were accessible to 3D Printing. With the World's first Silicone 3D Printing technology, Spectroplast AG has a positive impact on many industries by providing customised Silicone solutions for applications ranging from industrial sealing solutions to life-saving healthcare products. The Silicones for healthcare applications are safe and certified. With Silicone 3D Printing, Spectroplast offers patient-specific healthcare products intended for life-enhancing and life-saving applications. For example customised hearing aids, ear protection and headphones, orthopaedic shoe insoles, snoring remedies - to name a few - will have a positive impact on enhancing the lives of patients in need today. It is Spectroplast's mission to provide customised Silicone products to the market through our unique industrial-scale Silicone 3D Printing service. Recently, Spectroplast attended the CES Asia 2019 as an exhibitor and won an innovation award in the area of 3D Printing for its unique Silicone 3D Printing Service.

http://swissinnovation.org/newsChina/web/2019/00-190710-eb

1. Policy

China Tightens Regulation on PPP Projects

(China Daily, July 01)

China's top economic planner has demanded tighter scrutiny over public-private partnership (PPP) projects as the government seeks to boost infrastructure funding while containing fiscal risks. All PPPs are required to go through a thorough feasibility study, including the project cycle and cost, operation efficiency as well as risk management, according to a notice from the National Development and Reform Commission (NDRC). PPP projects that do not follow standard procedures are not allowed, the planner stressed. Public bidding should be the main means of soliciting private capital, the notice said, adding a level playing field should be ensured for fair competition. The NDRC also pledged severe punishments on malpractice during the implementation of PPPs.

http://swissinnovation.org/newsChina/web/2019/01-190701-c6

China Starts Campaign to Protect Data Security

(China Daily, July 02)

China's Ministry of Industry and Information Technology (MIIT) has started a one-year campaign on data security protection, targeting security risks including data leakage and data abuse. The four-stage campaign aims to finish data security checks on all telecom companies, 50 major Internet companies and 200 popular applications by the end of October, according to an action plan released by the MIIT. The plan called for establishing an industry data security protection mechanism, developing data protection catalogs and formulating security standards in more than 15 industries. The regulator will also select no less than 30 innovation demonstration projects in data security protection, pledging to effectively build a security management system in telecom companies and Internet firms.

http://swissinnovation.org/newsChina/web/2019/01-190702-ff

Joint Law Enforcement in Jing-Jin-Ji Area

(China Daily, July 05)

Authorities in Beijing, Tianjin and Hebei will conduct joint law enforcement in environment-related areas from 2019 to 2020. That was learned from a working meeting, held Wednesday in Langfang of Hebei Province, on joint law enforcement involving ecology and environment in Beijing, Tianjin and Hebei. The campaign is aimed at handling cases of cross-region environmental pollution and related violations. The authorities will inspect industries, with priority going to polluters such as printing, furniture-making,

medicine and pesticide, and rubber products. They will also inspect water resources in regional border areas. China pledged to coordinate its efforts on environmental protection and economic development in 2019. It promised to push for better air quality with better regional coordination and heavy-polluter revamps, according to the Ministry of Ecology and Environment.
http://swissinnovation.org/newsChina/web/2019/01-190705-2b

Waste Policy Comes With Multitude of Apps

(China Daily, July 18)

可回收物
RECYCLABLE WASTE

Shanghai has recently introduced a waste classification system and apps and services to support the general public are sprouting from the ground. The rules require every household and institution to classify waste into four categories - recyclables, kitchen waste, hazardous waste and residual waste - with a long list of items in each category. Noncompliance can lead to fines up to 7,200 US$ which also contributed to the fast development of aid services. To smooth the transition and raise public awareness, Shanghai's municipal government launched a sweeping publicity campaign featuring posters and TV programs introducing garbage-sorting techniques. Many of the apps use A number of apps use speech and image recognition to make the process easier. One app allows to snap a picture of the waste before disposal and the app gives the proper classification. Another one uses speech recognition - it was downloaded 130,000 times in its first week. Additionally, schools teach children how to correctly classify.
http://swissinnovation.org/newsChina/web/2019/01-190718-48

China's Online Payment Providers Spread in Asia

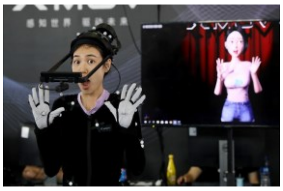
(People's Daily, July 23)

China’s leading role in various digital services, its rising e-commerce and mobile payment systems are helping the expansion of the country’s internet technology in a global context. Chinese enterprises are leading a new trend in the internet industry and have established “super applications” such as mobile payments, providing modern systems for the world. People who have lived in India for the past couple of years, can recognize a trend towards a Chinese lifestyle. Apart from online shopping platforms and car-hailing services, mobile payment and food delivery enjoying huge popularity in China, they are also seeing rapid development in India. Apart from India, many supermarkets, restaurants and hotels in Cambodia’s Phnom Penh, Siem Reap and Sihanoukville now accept Alipay and WeChat Pay, the two largest mobile payment service providers. Thailand is a further country where these two mobile payment providers have started to penetrate the market.
http://swissinnovation.org/newsChina/web/2019/01-190723-e5

2. Education

AI Courses in Primary and Middle School

(China Daily, July 05)



Guangzhou in Guangdong was chosen as a pilot AI education demonstration zone. By 2022, all primary and middle schools in the city will have AI courses in their regular curriculum to help train and nurture AI talent for the city, traditionally a commercial hub. First trials will start this year in September. The provincial capital's bureau of education is now selecting about 100 schools to feature the pilot AI courses and further promote intelligent education. AI is the main global development trend in science and technology and represents the future, thus the strategy demonstrates the strategic long-term foresight of the government. A main priority of the city other than AI is the development of information and the biopharmaceutical industries. Some people, however, warn that such changes should not be done too hastily as AI is not integrated in the gaokao, the national college entrance examinations.
http://swissinnovation.org/newsChina/web/2019/04-190705-fe

New Guidelines to Improve Compulsory Education

(China Daily, July 08)

The Communist Party of China Central Committee and State Council Monday published a new guideline for advancing education reform and improving the quality of compulsory education. The guideline aims to develop an education system that will foster citizens with an all-round moral, intellectual, physical and aesthetic grounding, in addition to a hard-working spirit, according to the document. Efforts will be made in fostering comprehensive quality with firm faith, patriotism, integrity, broad knowledge and striving spirit, it said. Moral education and all-round development of students will be priorities and the efforts must cover every student in every school, it added. According to the guideline, compulsory education should emphasize the effectiveness of moral education with efforts on cultivating ideals and faith, core socialist values, China's fine traditional culture and mental health.
http://swissinnovation.org/newsChina/web/2019/02-190708-50

Joint Center for AI Established by Chinese and Sigaporean Universities

(China Daily, July 09)

An international joint center for artificial intelligence (AI) research has been established by China's Shandong University and Singapore's Nanyang Technological University (NTU). The research institute was inaugurated earlier this month in Jinan, capital of east China's Shandong Province. The two

universities have planned the research focuses of the institute, including AI basic theory, AI health care and cross-media intelligence. NTU has cooperated with Shandong University for 15 years. It is known for its strong scientific research and has made great achievements in AI in recent years. "The establishment of the joint research center has overcome geographical barriers, and it will strengthen cooperation and academic exchanges between the two universities," said Lam Khin Yong, vice president of NTU.
http://swissinnovation.org/newsChina/web/2019/02-190709-24

Hainan Opened Up to Overseas Education

(China Daily, July 09)

China will give the green light to overseas engineering vocational institutions to run independent educational services on Hainan Island on a pilot basis, in a bid to promote international education innovation, according to a recent circular jointly issued by the Ministry of Education and the Hainan Provincial People's Government. The document, entitled "Circular on Supporting the Implementation Plan of Deepening Education Reform and Opening-up in Hainan", said the nation will promote Hainan to build an international island for educational innovation, deepen educational reform in an all-round way, further open up the sector and make Hainan a vivid example of open and innovative development of socialist education with Chinese characteristics.
http://swissinnovation.org/newsChina/web/2019/02-190709-fc

Higher Vocational Schools Upgraded to Universities

(China Daily, July 17)

Fifteen higher vocational schools have been upgraded to universities for the first time in China amid efforts to improve skills in the work force and expand employment. The new universities, in 10 provinces, will be able to enroll students for bachelor's degrees in the new semester after the Ministry of Education recently approved their name changes. Shandong Vocational School of Foreign Affairs has become Shandong Vocational University of Foreign Affairs, with the other new universities dropping school from their name including Shandong Vocational and Technical University of International Studies, Nanchang Vocational University and Guangdong Business and Technology University, the ministry said.
http://swissinnovation.org/newsChina/web/2019/02-190717-f6

63,000 International Students Received Chinese Government Scholarship

(China Daily, July 20)

A total of 63,000 international students were funded by Chinese government scholarships in 2018, accounting for 12.8 percent of the total foreign students in China, the Ministry of Education said Saturday. According to the ministry, 70 percent of the funded students were pursuing master or doctoral degrees. China has signed official education exchange agreements with more than 180 countries, under which both sides can send students to each other's countries for further study. In 2018, China welcomed 492,000 international students from 196 countries and regions to study at 1,004 universities and research institutes across the country, said the MOE.

http://swissinnovation.org/newsChina/web/2019/02-190720-a4

3. Life Sciences / Health Care

Multi-Patient and Remote 5G-Assisted Operation

(China Daily, July 02)

In a Beijing hospital, doctors conducted orthopedic surgeries for two patients from remote hospitals using 5G wireless technology. A doctor performed the remote operation with two surgery robots on two patients in parallel and implanted a total of 12 pedicle screws in the spine of them. With the support 5G network and technology, the signal transmission was smooth and stable during the operation, and enabled seamless coordination between Beijing experts, local surgeons and the orthopedic surgery robots. This is the first time that China has conducted surgeries for two patients from two different hospitals at the same time with the help of 5G technology. The success of the surgeries indicates that the teleoperation technology of intelligent robots has been put into clinical practice in China, which is of great significance to improve the quality of medical service.

http://swissinnovation.org/newsChina/web/2019/03-190702-e3

Scientists Use Gene-editing Tech to Expand Soybean Planting Area

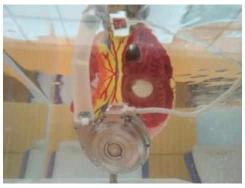
(China Daily, July 05)

Chinese scientists have used gene-editing technology to create soybean mutants that can adapt to low altitude areas, paving the way for the breeding of new soybean varieties. Scientists from the Chinese Academy of Agricultural Sciences used the CRISPR/Cas9 gene-editing tool to knock out two key genes that regulate soybean flowering, and adopted hybridization technology to create the mutants. According to Han

Tianfu, the leading researcher, soybeans are sensitive to photoperiod and when soybeans are transplanted to south China, they often faces problems including premature flowering, a shortened growth period and reduced yield. The soybean mutants exhibited late flowering, improved height and an increased number of pods, providing a basis for the breeding of soybean varieties that grow well in low altitude regions. The research was published in the Plant Biotechnology Journal.
http://swissinnovation.org/newsChina/web/2019/03-190705-9f

Two Survive Thanks to Artificial Heart

(China Daily, July 08)



Two patients in China were saved thanks to HeartCon, "artificial hearts" made by TEDA International Cardiovascular Hospital and the China Academy of Launch Vehicle Technology, the country's rocket developer. The successful operations which lie back over 100 days were celebrated in July. The HeartCon is considered the first of its kind in China. The device is a titanium alloy system of hybrid magnetic-hydrodynamic impeller suspension weighing 180g. Powered by two batteries connected to the three-core driveline, it delivers 1-10L of blood per minute. In 2009, the two institutions started cooperating on this and 4 years later, they implanted a HeartCon into a sheep, which survived for 120 days. In a later trial with 6 sheep, all of them survived for more than 90 days. The device was submitted for special review and approval procedure for innovative medical devices in June 2018.
http://swissinnovation.org/newsChina/web/2019/03-190708-27

Association Established to Foster Brain Imaging Technique

(China Daily, July 15)

China has set up an association for brain imaging in Beijing to further promote the development of brain science, China Science Daily reported Monday. The association was initiated by more than 50 research institutes, universities, hospitals and brain imaging equipment manufacturers. It is supported by five national key laboratories related to brain science and 10 national clinical medical research centers in the fields of neurology and senile diseases. The association will establish standards for brain imaging data collection and analysis, promote the open sharing of brain imaging equipment among its members and organize academic conferences and training activities. It will also promote exchange and cooperation with international brain imaging research organizations.
http://swissinnovation.org/newsChina/web/2019/03-190715-31

China to Implement Healthy China Initiative

(China Daily, July 16)

The State Council, China's cabinet, has issued a new guideline to implement the country's Healthy China initiative and promote people's health. With a focus on disease prevention and health promotion, the guideline proposed 15 special campaigns to "intervene in health influencing factors, protect full-life-cycle health and prevent and control major diseases." An action plan for 2019-2030 devised by a newly-established State Council special committee was also made public Monday, specifying the objectives and tasks of each campaign, as well as the responsibilities of different actors in the campaigns. The General Office of the State Council also released a plan on the organization, implementation and appraisal of the campaigns.
http://swissinnovation.org/newsChina/web/2019/03-190716-32

Nanoparticle Technique Increases CRISPR/Cas9 Efficiency

(Xinhuanet, July 17)

Gene editing refers to technologies that enable scientists to change an organism's DNA, allowing genetic material to be added, removed or altered at particular locations in the genome. CRISPR/Cas9 has drawn significant attention as a major gene editing tool in recent years, holding promise for the treatment and prevention of diseases. However, CRISPR/Cas9 is a large molecular complex, making it difficult to be delivered directly into the nucleus of the cell, limiting its potency and use. An international team with the involvement of Chinese scientists developed a type of biodegradable synthetic lipid nanoparticle to deliver CRISPR/Cas9. The researchers said that the lipid nanoparticles are one of the most efficient carriers they have seen, and it holds promise for therapeutic applications of the gene editing tool.
http://swissinnovation.org/newsChina/web/2019/03-190717-f2

Accurate and Low-Cost Cervical Cancer Diagnosis with AI

(China Daily, July 18)

Through the application of Artificial Intelligence (AI), Chinese scientists have developed a rapid and accurate screening model to diagnose cervical cancer, a common and fatal disease in women. The cancer, caused by the human papilloma virus (HPV), has caused an estimated 311,000 deaths in 2018. In China, the incidence and death rates of cervical cancer are also high, with 106,000 new cases reported and about 48,000 deaths last year. The current method to detect abnormal cervical cells is cytology-based screening, known as the Pap test. Based on more than 200,000 pathological images selected from over 43.5 million cervical screening samples, a medical diagnostic testing company developed an AI-assisted

screening model, which can diagnose the disease with an accuracy of over 99 percent, while costing only one-tenth of the examination time performed by pathologists. In the future, more AI-based applications will be explored.
http://swissinnovation.org/newsChina/web/2019/03-190718-1e

Success: Remote 5G Breast Surgery

(China Daily, July 19)

An elderly woman who received the first remotely controlled breast surgery using 5G technology, has been able to leave the hospital. With the help of 5G and mixed reality technologies, the signal transmission during the operation was smooth and stable. A breast surgery expert stayed 20km away, designed the surgical incision on a projection board and gave the executing doctors instructions on how to operate. During the surgery, the local doctors asked questions and the remote expert answered in real time. Two hours later, the tumor was removed completely. This is the second attempt of a 5G and MR-assisted operation; the hospital succeeded in the country's first remote lung surgery on May 13. Earlier this year, a Chinese surgeon performed the world's first remote surgery using 5G technology. 64 kilometers from the operating location, he removed the liver of a laboratory animal with a manipulator arm.
http://swissinnovation.org/newsChina/web/2019/03-190719-d6

Humanitarian Aid Using Chinese Technology

(China Daily, July 19)

In recent years, Chinese companies have increased contributions to global humanitarian relief efforts with their innovative technologies. It can be expected that this trend will continue. The head of the International Committee (ICRC) of the Red Cross, Pierre Dorbes, recently mentioned that an increasing amount of Chinese companies is interested in developing products with them and they have established several partnerships already. Products made by Chinese companies in partnership with ICRC in recent years have been used globally for humanitarian aid, including fireproof tents and solar power lamps. One example is LED lamps with solar panels that can last for thousands of hours produced by Chinese companies, which have replaced candles that were formerly distributed in Syria. Additionally, ICRC is in discussion with a Shanghai based company providing mobile DNA identification equipment that can be useful in identifying badly damaged bodies in disasters such as earthquakes. The Chinese market is extremely helpful and well-suited for humanitarian aid and many lives have been saved by Chinese technology.
http://swissinnovation.org/newsChina/web/2019/03-190719-16

4. Engineering / IT / Computer Science

World-Leader in IoT

(China Daily, July 02)

China is the world's largest IoT market with some 960 million devices connected via cellular networks, accounting for 64 percent of global cellular connections. Backed by the government, China is now at the forefront of the development and deployment of IoT solutions based on mobile IoT technology. Also, the mobile operators are leading the deployment of transformative IoT solutions. In Shanghai's Jing'an District China Telecom has installed over 500,000 NarrowBand-IoT sensors, turning the area into a truly smart community. The devices are used to monitor from manhole covers, gas and smoke detectors to other environmental monitors. There are various applications in all areas of life and IoT will fundamentally change the way people live and work.

http://swissinnovation.org/newsChina/web/2019/04-190702-f8

Gait-Based Identity Recognition

(China Daily, July 03)

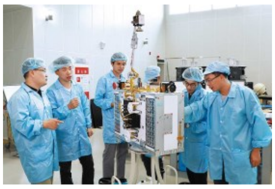
Watrix Technology Gait Recognition System (GRS)

A person's gait is a rather unique trait. Compared with conventional biometric parameters like fingerprints, faces and irises, gaits are easily collected, hard to copy, and can provide constant recognition. However, the application of gait-based identification faces certain challenges, for instance that varying walking speeds deteriorate the recognition performance drastically. To deal with this issue, an international team of researchers with the involvement of Chinese scientists developed a new method that manages to eliminate the influence of walking speed variation and individual gait fluctuation. Based on information collected by wearable sensors, the team increased the accuracy of identification in wearable health devices for elderly users. The accuracy of gait recognition improved by 25.8 percent and user authentication by 21.5 percent. In tests carried out, the average recognition rate of the method reached 96.7%.

http://swissinnovation.org/newsChina/web/2019/04-190703-85

72 Satellites for Internet of Things Development Until 2022

(China Daily, July 03)



A research institute of the Chinese Academy of Sciences has announced a plan to launch 72 small satellites for Internet of Things (IoT) purposes in the next three years. The satellites will serve different segments including wildlife protection, field emergency rescue, vehicle and ship monitoring and logistics tracing. The

private satellite company Commsat, which is based in Beijing, will to implement the program. A total of eight communication satellites were already sent into space last year for in-orbit tests and it is planned that in 2020, the commercial use can be initiated with the launch of another 4 satellites. By the end of 2022, 72 low-earth orbit satellites should be deployed. Some of the smaller satellites that have already been launched are used to test a closed-loop system for the Internet of Things, which includes satellites, cloud computing platforms, ground control stations and terminals.
http://swissinnovation.org/newsChina/web/2019/04-190703-cf

Smart Traffic Lights Reduce Rush Hour Delay

(China Daily, July 04)

Smart traffic lights developed by tech giant Baidu have been installed in many cities in China. Based on data from Baidu Maps and its vehicle navigation system, the smart traffic lights have significantly improved traffic efficiency in the city. Tests showed that the delay time during peak hours in the morning and evening was reduced by 20-30 percent. The smart traffic lights performed remarkably, especially in relieving unexpected traffic congestion. Robin Li, the CEO and chairman of Baidu, believes that in the near future, more people will enjoy and efficient and cozy city life as more traffic light access to smart control and traffic delay is improved.
http://swissinnovation.org/newsChina/web/2019/04-190704-a7

Cryogenic Rocket Engines' Orbit Time Increased

(China Daily, July 05)

Cryogenic rocket engines are specially designed to work at extremely low temperatures. They use non-toxic and non-polluting propellants, such as liquid hydrogen and liquid oxygen, which are more cost-efficient than others. Chinese scientists have made a breakthrough in cryogenic rocket engine technology and managed to extend the orbital period of rockets from a few hours to 30 days. This serves as proof of China's space abilities and gives the country major support for future deep space exploration. The scientists from the China Academy of Launch Vehicle Technology have developed two insulating materials that can reduce propellant evaporation loss and keep rockets in flight for longer than before. One of the newly-developed materials is made of polyurethane foam, a chemical composition, which can increase the insulation capacity by more than 50 percent compared with traditional materials. The other uses variable density multilayer insulation and shows improved thermal performance by 18% compared to traditional materials.
http://swissinnovation.org/newsChina/web/2019/04-190705-19

National Domain ".cn" of China Reaches 21.24 Million

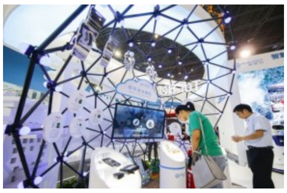
(Xinhuanet, July 05)

The number of China's top-level domain name ".cn" stood at 21.24 million by the end of 2018. There were 1.72 million domain names using two Chinese characters meaning "China," when releasing a report on the development of domain names in 2018 at the China Internet Infrastructure Resources Conference 2019. Nearly 1,000 experts, scholars, entrepreneurs and representatives of the industry attended the conference which revealed these latest numbers.

http://swissinnovation.org/newsChina/web/2019/04-190705-a1

World Internet of Things Exposition in China

(China Daily, July 07)



The World Internet of Things Exposition (WIOT) 2019 will be held in China later this year. This year's exposition will focus on the Internet of Vehicles (IoV), the convergence of the mobile Internet and the Internet of Things (IoT). Exhibitors including traditional car makers, automotive electronics manufacturers and IoV platform service providers will showcase new achievements of the IoV industry. More than 30 of the world's top 500 companies will participate in the exposition. Around 180,000 visitors are expected to attend the exposition, including guests from over 30 countries and regions. Events and discussions will involve sectors like intelligent manufacturing, intelligent robots, information security, big data and 5G.

http://swissinnovation.org/newsChina/web/2019/04-190707-6d

Chips to Track how Linen was Washed

(China Daily, July 08)

A washing service in Central China's Hubei province implants chips for each towel and sheet with the help of Internet of Things technology so hotel guests can scan them to get information they need. The chip, in size smaller than a cigarette lighter, and resistant to water and heat is being stitched onto towels and blankets. Thanks to this device, reservation information and washing information are linked. Soon in the future, QR codes will also be printed on each towel and sheet. Hotel clients will be able to scan the QR code to find out the once-unknown “secrets” of the towels and sheets, including when it was washed last, how many times it has been used and at what temperature it was disinfected.

http://swissinnovation.org/newsChina/web/2019/04-190708-f7

China to Launch 100 Additional Satellites by 2025

(Global Times, July 10)

Nearly 100 Chinese satellites will be launched into space before 2025, adding to the more than 200 that are already in orbit, said a Chinese official on Tuesday. The announcement was made by Yu Qi, an official at the China National Space Administration, at a conference held in Beijing, news portal chinanews.com reported on Tuesday. Developing the space economy has become a trend in space development around the world, said Yu, noting that China had developed the fundament and proper environment to accelerate the space economy with breakthroughs in space technologies. China broke a record in 2018 by conducting 39 launch missions, ranking the first in the world and accounting for one-third of all launches worldwide, the report said.

http://swissinnovation.org/newsChina/web/2019/04-190710-85

China Expected to Send Man to Moon by 2035

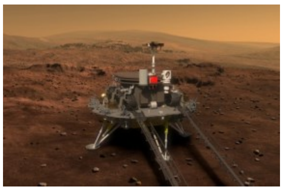
(Global Times, July 16)

With the coming 50th anniversary of the moon landing, a Chinese aerospace expert speculated that China would be able to achieve its own manned lunar landing by around 2035, establishing a permanent lunar base rather than NASA's symbolic footprint of 1969. Saturday marks the 50th anniversary of the first man on the moon, with posts to commemorate the historic moment going viral on Chinese social media platforms such as Sina Weibo. Encouraged by China's space achievements, many posted online that lunar exploration was viable in the foreseeable future. Among them, Wang Ya'nan, chief editor of Aerospace Knowledge magazine, speculated that China will be "technically ready" for a manned lunar landing by around 2035.

http://swissinnovation.org/newsChina/web/2019/04-190716-b0

Martian Explorations in 2020

(China Daily, July 19)

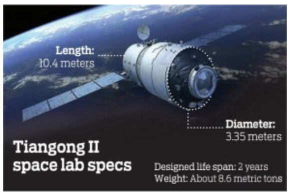


Only once every two year, the conditions for explorations on the Red Planet are favorable because Mars' orbit brings the planet relatively close to Earth. Several probes are scheduled to be launched in 2020, such as NASA's 1 metric ton rover, the European Space Agency-Russian ExoMars lander and rover, alongside China's Mars 2020 mission spacecraft. Chinese scientists anticipate that the country's first mission to the Red Planet will include orbiting, soft landing and roving on the Martian surface. China's plan to achieve all three goals in one mission is challenging. Mars is much further than the moon and the farther the probe goes, the weaker the signal will become, resulting in a delay of at least 10 minutes

in communications. During that time, the probe will have to make judgments based on figures inputted by researchers in advance. The probe's goal is to explore the landscape and water resources.
http://swissinnovation.org/newsChina/web/2019/04-190719-1b

Space Lab Returns After Nearly 3 Years

(China Daily, July 20)



China's Tiangong II space lab made a controlled descent back into the atmosphere after a 1,036-day space journey. Much of the spacecraft burned up during reentry while a small amount of debris fell in a designated secure area in the South Pacific. Tiangong II's chief designer at the China Academy of Space Technology in Beijing, said that although the spacecraft was still in good condition and had sufficient fuel before reentry, scientists decided to retire it for operational and safety reasons. The spacecraft had significantly outlived its designed life span by a year and an extended period in orbit might create hazards. It carried about 600 kilograms of scientific payloads in 14 categories and fulfilled more than 60 scientific experiments and technological tests, gaining a great deal of achievements.
http://swissinnovation.org/newsChina/web/2019/04-190720-a8

5. Energy / Environment

Amber Contained Unknown Species of Ancient Bird

(Xinhuanet, July 13)

A joint research team of scientists from China and other countries announced that they had discovered a new species of ancient bird fossilized in amber in northern Myanmar. The amber, about 3.5 cm long and weighs 5.5 grams, was formed nearly 100 million years ago during the early stage of the late Cretaceous Period, with a well-preserved bird's skeleton. According to the team, the new specimen includes a partial right hindlimb and remiges from an adult or subadult bird. Its foot, of which the third digit is much longer than the second and fourth digits, is distinct from those of all other currently recognized Mesozoic and extant birds. Given how small the preserved leg part is, the researcher assume that the bird was much smaller than a sparrow.
http://swissinnovation.org/newsChina/web/2019/05-190713-c4

Battery Recycling Sector: Growth with Challenges

(China Daily, July 17)

The Chinese battery recycling sector's annual value is likely to exceed 15.6 billion yuan (2.2 US$ billion) next year. Even though the battery-processing industry is still in the early stages, an unexpectedly

large number of players plan to have a finger in the pie. Industry insiders say the government must introduce a high entry threshold to prevent excessive competition in a sector that may have to depend on subsidies to survive, and the crackdown on unlicensed processors needs to be intensified to ensure sustainable development. Investors have hyped the industry via a large number of investment plans because of the government placing such a high importance placed on it. Price fluctuations of the main metals extracted from spent batteries could have a significant effect on the future development.
http://swissinnovation.org/newsChina/web/2019/05-190717-f7

New Flying Squirrel Species Discovered

(Xinhuanet, July 19)

A Sino-Australian research team has discovered a new species of flying squirrel in a national nature reserve in southwest China's Yunnan Province, the Eastern Himalayan region. The new species has been added to the rarest and most "wanted" genus of flying squirrels listed by the International Union for Conservation of Nature and the Global Wildlife Conservation. Previous to the finding, the genus only comprises two species found in India and Laos. The team has discovered two specimens of the new flying squirrel species, and used monitoring cameras to capture the images of a live squirrel. It was discovered in the 1,250-km "blank area" between the isolated habitats of the two previously found species. According to the researcher, there's a possibility that there are more populations of this group in the area.
http://swissinnovation.org/newsChina/web/2019/05-190719-5f

Plastic Surge Since Waste Classification Policy

(South China Morning Post, July 22)

Shanghai's new policies on waste disposal and classification aimed at increased eco-friendliness. However, due to a drastically increased demand for plastic bags and bins designed for specific types of rubbish, the policy has led to a plastic surge. People used to put everything into one bag but the new rules requires them to adapt a color-coded regime. For instance, recyclables have to go into a blue bag, hazardous waste into a black bag. While some industry insiders see this as a short-term impact of the new waste policy, others expect it to last for some time, due to the central government’s intention to extend waste classification to more than 40 major cities across the country. On Taobao, China’s biggest online shopping platform, 3 million household rubbish bins were sold last month – or more than one per second – according to its own data.
http://swissinnovation.org/newsChina/web/2019/05-190722-28

Lowering Emissions from Burning Coal

(China Daily, July 23)

Coal is the main source of energy in China. According to the International Energy Agency, the country has been the world's largest producer of coal since 1985 and produced nearly half the world's coal in 2014. Pollutants such as nitrogen oxides, particulate matter and sulfur dioxide emitted when coal is burned are major causes of atmospheric pollution, including smog. Researchers at Zhejiang University aim to further lower the emissions of coal-fired power plants by improving the ultralow emission technology they have developed. Their system can effectively reduce the emissions of pollutants such as sulfur dioxide, sulfur trioxide and heavy metals such as mercury. According to a researcher, they are improving the accuracy of the system and lowering the operating costs under variable load conditions. The team aims at further lowering emissions and fostering young talents in this area.
http://swissinnovation.org/newsChina/web/2019/05-190723-39

Liquid Oxygen-Methane Rocket Engine Conducts First Tests

(China Daily, July 23)

China has developed a liquid oxygen-methane engine which has completed a full-thrust run test with a duration of 100 seconds. The engine, named TQ-12, was independently developed by the private rocket company LandSpace and has the third-highest thrust level among liquid oxygen-methane engines globally. The engine will conduct further tests including a test under extreme working conditions and a long-run test. However, the first test demonstrated that the key technical parameters have reached the design requirements and further verified the product's quality and structural reliability. The Chinese government encourages the participation of private enterprises in the space industry. The country had more than 60 private companies in the commercial space industry as of December 2018.
http://swissinnovation.org/newsChina/web/2019/04-190723-9b

Methanol-Fueled Ship Set Afloat

(China Daily, July 25)

Environmental aspects are becoming more and more anchored in people's minds around the globe. China has made tremendous advances in this respect and begun to target the ever-worsening emission pollution by vessels. The country has launched its first methanol-fueled ship, which measures 40 meters in length and 8 meters in width, and weighs about 172 metric tons. After having been in the making for three years, the vessel was set afloat in July 2019. The ship scores better emission indices than the limits set in the latest vessel engine emission standard of the country, according to a report by Tianjin University.
http://swissinnovation.org/newsChina/web/2019/05-190725-3e

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

Largest Radio Telescope Identifies 84 New Pulsars

(China Daily, July 03)

A pulsar is a highly magnetized, rotating neutron star, which emits two beams of electromagnetic radiation. Pulsar observation is an important as it can be used to confirm the existence of gravitational radiation and black holes and help solve many other major questions in physics. China's Five-hundred-meter Aperture Spherical Radio Telescope (FAST), the world's largest single-dish radio telescope, has discovered 84 new pulsars since its trial operation began in September 2016. In order to better understand the evolution of the universe, the research team of FAST is ready to conduct an in-depth research on the distribution and status of cold gas in and around the galaxy, the circulation of gas within the galaxy, as well as other related frontier issues. The telescope additionally explores interstellar molecules and communication signals. It is believed to be the world's most sensitive radio telescope.
http://swissinnovation.org/newsChina/web/2019/06-190703-7c

Highest Photon Energy Ever Registered

(China Daily, July 03)

Recently, scientists from China and Japan detected the highest energy photon that was ever observed on earth. In connection with the ASgamma experiment, which is located on an altitude of 4300 meters above sea level in the Tibet autonomous region, two dozen photons with energies above 100 trillion electron volts (TeV) were spotted, one of them even registered a staggering 450 TeV. This represents the first measurements of high energy photons over 100 TeV and the highest ever recorded with the previous record being at 75 TeV. These ultra-high energy photons are believed to have originated in the Crab Nebula, the remains of a supernova that was first observed in 1054 AD, 6,500 light years away from Earth. The findings open a new window for the exploration of the extreme universe, and are key to understanding the origin of ultra-high energy cosmic rays.
http://swissinnovation.org/newsChina/web/2019/06-190703-89

Heavy Ion Cancer Treatment System to be Operational

(Global Times, July 10)

A heavy ion cancer treatment system developed by Chinese researchers will soon be put into operation in northwest China's Gansu Province, researchers said. The system will be used in a hospital in Lanzhou, capital of Gansu, which is mainly dedicated to treating cancer patients with the technology of heavy-

ion accelerators. Cancer radiation treatments employing heavy-ion accelerators can bombard a target with high-energy electrons to kill cancer cells. Compared to traditional therapy such as radiation, heavy ion treatment is considered to have more balanced properties with less radiation on healthy cells. The treatment period is shorter and the therapy could more effectively control cancer cells, according to Wang Xiaohu, deputy director of the Gansu Provincial Cancer Hospital.
http://swissinnovation.org/newsChina/web/2019/06-190710-20

7. Economy, Social Sciences & Humanities

Shandong to Upgrade Its Economic Structure

(China Daily, July 17)

Following a planned explosion, a 150-meter-high smokestack that stood for 15 years at a traditional thermal power generation plant in Weifang, Shandong province, collapsed last Wednesday, making room for a new energy industrial park. The park, which is designed to feature five new energy projects, is expected to be completed in 2025. Facilities related to the hydrogen fuel cell project, a major national science and technology undertaking, are under construction. The park is part of the local government's efforts to upgrade its economic structure from traditional industries, such as heavily polluting chemical factories and coal-fired power plants, to new ones that are highly efficient and environmentally friendly.
http://swissinnovation.org/newsChina/web/2019/07-190717-a9

Full-Coverage 5G Network in Eco-City

(China Daily, July 17)

China-Singapore Tianjin Eco-city is a cooperative program between the two countries, designed to be a demonstration zone of green development. According to the city management bureau, by the end of this year, the city will achieve full 5G network coverage. The eco-city, located in northern China's Tianjin municipality, signed a cooperative agreement with Chinese telecom giant China Mobile to jointly build a 5G-based data platform, Internet of things and infrastructure. The two parties will enhance the application of 5G technology in more areas such as autonomous driving, drones, public transport service, GPS service, energy and medical services.
http://swissinnovation.org/newsChina/web/2019/07-190717-8f

Core Tech Development for Self-Reliance

(South China Morning Post, July 25)

During recent times, when the US-China trade war has transformed into a technology conflict, China answered by steering ever-increasing resources into developing new products. This happened in an effort to reduce the country's reliance on the global supply chain, which is developing to smaller, regional entities. One Shenzhen-based company is combing through the lists of products currently subject to US tariffs in search of suitable targets for development and research. The gathering clouds of the trade war and the increasing likelihood of a decoupling between the US and Chinese economies have given added impetus. The preparation of "spare tyres" - the name for the strategy - has started to speed up in May when the US banned exports from tech giant Huawei. Industry experts mention that it could be difficult for China to sustain its growth if the country does not develop their own infrastructure and core technologies.

http://swissinnovation.org/newsChina/web/2019/07-190725-9f

8. Corporates / Startups / Technology Transfer

VR to Train Fire Investigators

(China Daily, July 17)

The idea of using VR technology to train investigators came from a fire investigation expert with Shanghai's Fire and Rescue Bureau. Over the past nine years, a host of investigations to help determine the origins and causes of fires and explosions have been conducted. Trainee investigators can immerse themselves in 3D fire scenarios based on real blazes that happened in various locations. The controller allows the trainee to explore and interact with the computer-simulated environment, such as opening a door or picking up an object from the ground. The VR technology simulates as many senses as possible, for instance seeing, hearing, touching and even smelling. Therefore, it offers a safer and more economical solution for newly trained fire investigators.

http://swissinnovation.org/newsChina/web/2019/04-190717-d1

WeChat Launches In-Flight Mobile Payment

(People's Daily, July 25)

WeChat, the famous social media platform of China, recently made in-flight mobile payment possible by post-landing settlement. It was firstly tried on two flights carried out by Shanghai-based Spring Airlines. The plan is to now promote the service to other airlines in order to improve the in-flight shopping experience. China is the largest mobile payment service market globally and has both tech and financial giants promoting their own tools to facilitate easier payments for daily shopping, dining

and commuting. Data from the country's central bank showed that the number of mobile payment transactions surged by 79.6 percent year on year in the first quarter of 2019 while the total value saw a 22.32-percent rise.
http://swissinnovation.org/newsChina/web/2019/04-190725-62

Made-in-China Tesla Could Start in November

(Quartz, July 25)

Tesla is building a production facility in Shanghai and it is expected to start production this year in November. Tesla will probably sell around 40,000 Model 3 in China next year. In the recently published second-quarter earnings call, Musk said he expects the demand for made-in-China Model 3s to reach 5,000 vehicles a week in the longer term. Caught up in the China-US trade war, Tesla's revenue dropped 13% from 2017 to $1.8 billion in 2018. The Shanghai factory will focus on the Model 3 and Model Y, a compact crossover utility vehicle. Tesla has set a starting price of 328,000 yuan ($48,000, some links in Chinese) for the cheapest version of the made-in-China Model 3, or around 40% of the starting price of a Model S in China. The made-in-China Model Y will come later, in 2021. Tesla currently imports all the cars it sells in the country.
http://swissinnovation.org/newsChina/web/2019/08-190725-e1

9. Bilateral News

Swiss Medtech Companies and Chinese Market Potential

(Global Times, July 18)

To leverage its leading position in the healthcare industry, Switzerland has set sights on the Chinese market, which has a burgeoning middle class ready to loosen bulging purse strings to access advanced medical services. Top-notch Swiss health businesses are looking for wealth from health in the Chinese market. The Swiss healthcare company Exploris, which possesses artificial intelligence-based diagnostic and therapeutic solutions that have passed clinical studies, is one of the companies seeking to take advantage of the massive Chinese market potential. On one hand, they are looking for investments in China but also for hospitals and medical institutions to partner with. An additional company in the medical field is Lymphatica Medtech, which develops medical devices to treat lymphatic diseases. According to CEO Marco Pisano "there is a big demand in the Chinese market for a solution to this disease". They are the first company developing such a solution.
http://swissinnovation.org/newsChina/web/2019/09-190718-6a

China Wins Ranks and Switzerland Remains Innovation Leader

(WIPO, INSEAD & Cornell University, July 25)

In the recently published Global Innovation Index 2019, Switzerland is yet again the most innovative country, for the eighth consecutive year. China has advanced in a spectacular fashion over the years, climbing from the 35th rank in 2013 to the 14th rank in 2019. The country additionally leads the upper middle-income countries, maintaining top ranks in patents by origin, industrial designs, and trademarks by origin as well as high-tech net exports and creative goods exports. Meanwhile, Switzerland's strong suit is in areas such as knowledge and technology output - including knowledge creation and patent applications - as well as ICT and business model creation. The Global Innovation Index is yearly conducted and published by WIPO, INSEAD and the Cornell University.

http://swissinnovation.org/newsChina/web/2019/09-190725-ce

Upcoming Science and Technology Related Events

Applied Science and Technology Innovation Summit

August 13, 2019

http://t.cn/AiThuzGR

Exhibition, Smart City, Cloud Computing

Beijing

Café des Sciences: Technical Spiral that We Inspire

August 15, 2019

https://is.gd/UIsRlx

Design, Quarks, Quantum Phenomena

Shanghai

Venture Leaders Fintech

November 3-9, 2019

https://is.gd/z3ckBq

Fintech, Roadshow, Swiss

Hong Kong, Shenzhen

Open Codes. Connected Bots

July 20 – October 7, 2019

https://is.gd/eEXRtG

Art, Coding

Shanghai

The **Science China Newsletter** is a monthly electronic publication keeping you updated on all the latest news on Chinese science, technology, education, innovation and health. It is an official publication in English from a single source, with executive summaries of top-highlights on education, of new discoveries in science, and of the latest top-of-the-line technologies and innovational strengths of China. The Science China Newsletter is produced by Embassy of Switzerland in China and swissnex China in collaboration with the swissnex Network. To subscribe/unsubscribe or send us your comments, please write an email with the corresponding subject to yijun.wu@eda.admin.ch.

Disclaimer

The information in this newsletter is an opinion excerpt of news material from Switzerland and gathered to the best knowledge of the writer. The newsletter tries to provide information without any news preferences, and takes no claims, promises or guarantees about the accuracy, completeness, or adequacy of the information. No legal liability or responsibility can be taken. The information is provided for informational purposes only. No part of the newsletter may be used for any commercial or public use. Open disclosure of this newsletter is not permitted.