



Science China Newsletter, August 2018

Trends in education, research, innovation and policy



Shanghai, China

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Swiss Spotlight

Scientist: Experimental Museology for Cultural Heritage

(Sarah Kenderdine, August 31)

A former maritime archaeologist, Professor Sarah Kenderdine researches at the forefront of interactive and immersive experiences for galleries, libraries, archives and museums. Formerly in Hong Kong and now a professor at EPFL, she co-leads the most extensive motion capture data collection of any living tradition, 33 elite kung fu masters from Hong Kong. This archive has formed the basis for four major exhibitions across Hong Kong, Australia and Switzerland. Upcoming research involves embodied cognition, sports science and the comparative analysis based on historical European martial arts. Sarah created the application Pure Land: Inside the Mogao Grottoes of Dunhuang, a seminal VR and AR experience of the UNESCO World Heritage site. Sarah currently collaborates on the Confucian Rites re-enactment project with renowned historian Prof. Peng Lin, Tsinghua University. In 2019 she will complete the Atlas of Maritime Buddhism exhibition which charts the ancient trade from India to China.



<http://swissinnovation.org/newsChina/web/2018/00-180831-a1>

Startup: Next Generation of Navigation and Localization Systems

(Fixposition, August 31)

Fixposition AG is a spin-off from ETH Zürich and is committed to develop the next generation of navigation and localization systems.

FIXPOSITION

The emerging market for autonomous vehicles has a strong need for cm-precise navigation. Current localization systems based on the Global Navigation Satellite Systems (GNSS) have two main limitations: The precision and the reliability of a position provided by GNSS is too low to meet the needs of applications such as autonomous vehicles in a dense, urban traffic scenario or autonomous delivery robots in residential areas. Particularly in urban environments, high buildings and bridges will block and disturb the GNSS signals causing accuracy degradation or even failure of positioning. Fixposition is solving this problem through coupling of machine vision and high-precision GNSS positioning technology. Fixposition visits China this year as part of Venture Leaders.

<http://swissinnovation.org/newsChina/web/2018/00-180831-51>

1. Policy

China Tightens Up Regulation on Live-streaming

(China Daily, August 21)

Chinese authorities will enhance regulation of live-stream services, the National Office Against Pornographic and Illegal Publications (NOAPIP) said Monday. A notice was jointly issued by six departments, namely the NOAPIP, the Ministry of Industry and Information Technology, the Ministry of Public Security, the Ministry of Culture and Tourism, the State Administration of Radio and Television, and the State Internet Information Office, said a NOAPIP statement. The notice clarifies the responsibilities of live-stream service providers, network service providers and application stores. The live-streaming industry has been highlighted in operations targeting online pornographic content launched since February.



<http://swissinnovation.org/newsChina/web/2018/01-180821-cb>

Renewed Restrictions on Cryptocurrency Accounts

(MIT Technology Review, August 29)

Nearly a year after the government banned initial coin offerings and shut down domestic cryptocurrency exchanges, it is again tightening the screws on the industry. Censors have blocked a number of blockchain and cryptocurrency-focused accounts from WeChat. WeChat, as well as online payment service Ant Financial, announced that it will restrict or ban cryptocurrency-related transactions. Authorities will block access to 124 websites operated by offshore cryptocurrency exchanges that had provided trading services to Chinese users. Baidu will restrict or ban cryptocurrency-related content on its Reddit-like discussion platform. Despite all this, "many industry insiders" say that blockchain technology is still thriving in China. The government recognizes its long-term value, according to Jehan Chu, cofounder of a Hong Kong-based cryptocurrency investment firm. It is not that the Chinese government does not like blockchains, it just does not like blockchains it cannot control.



<http://swissinnovation.org/newsChina/web/2018/01-180829-5c>

Stricter Intellectual Property Rights Protection in China

(Xinhua, August 30)

China will adopt stricter intellectual property rights (IPR) protection to give impetus to its opening-up, an official said Thursday. China will firmly uphold international rules on IPR and protect IPR owned by both domestic and foreign companies, Shen Changyu, head of the State Intellectual Property Office, said at the China Patent Annual Conference held in Beijing. Since the implementation of the Patent Law, foreign applicants have applied for more than 1.77 million patents in China, an average annual

increase of more than 11 percent. In 2017, China ranked second in international patent applications, with 51,000 Patent Cooperation Treaty applications.

<http://swissinnovation.org/newsChina/web/2018/01-180830-cb>

2. Education

China Has World's Second-Largest Number of Top Ranking Universities

(China Daily, August 16)

The 2018 Academic Ranking of World Universities released on Wednesday by Shanghai Ranking Consultancy reveals that 62 research universities in China have made their list of the world's top 500 universities. The 62 universities account for 12.4 percent of the list. The only country with a larger number of universities listed is the United States, which accounts for 27.8 percent. Every year since 2003, Shanghai Ranking Consultancy has been releasing its rankings of the world top 500 universities based on third-party data.



<http://swissinnovation.org/newsChina/web/2018/02-180816-ad>

China Pushing for Education Equality

(China Daily, August 29)

China endeavors to narrow the gap between rural and urban education through a range of efforts, the education minister said in a report on education equality to the country's top legislators. The country has formulated unified standards on construction of school buildings, teaching staff quotas, public expenses per student and equipment for schools to eliminate the gap between rural and urban compulsory education, said Chen Baosheng, the education minister. In 2017, the nationwide number of migrant children of compulsory education age stood at 14 million, of which 80 percent attended public schools while 7.5 percent studied at private schools through government-purchased services.



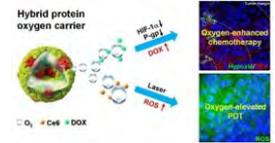
<http://swissinnovation.org/newsChina/web/2018/02-180829-b2>

3. Life Sciences / Health Care

Novel Nanosystem for Oxygen-Enhanced Chemotherapy and Photodynamic Therapy

(Chinese Academy of Sciences, August 02)

A research team at the Shenzhen Institutes of Advanced Technology of the Chinese Academy of Sciences constructed a novel hybrid protein nanoparticle as an oxygen carrier for conquering cancer resistances. With targeted delivery of oxygen, chemodrug and photosensitizer by this nanosystem, the oxygen-intervened chemophototherapy was achieved with potent efficacy. The researchers developed a method called "disulfide bond reconstruction" to fabricate the hybrid protein nanoparticle. This nanoparticle can be selectively absorbed by cancer cells of vigorous metabolism, delivering bound oxygen and encapsulating drugs at the same time. In vitro experiment indicated that the expression of P-glycoprotein (causing low chemodrug accumulation) was downregulated to 48% after six hours incubation with hybrid protein nanoparticle.



<http://swissinnovation.org/newsChina/web/2018/03-180802-13>

China's First Internet Plus Healthcare Demo Zone

(China Daily, August 02)

Northwest China's Ningxia Hui autonomous region plans to establish the country's first "Internet Plus Healthcare" demonstration zone, the regional government announced Tuesday. According to the plan approved by the National Health Commission, Ningxia will build a healthcare big data center in the city of Zhongwei and will set up an industrial park in Yinchuan, the regional capital, to attract healthcare enterprises. China issued a guideline in April to enhance the role of Internet Plus in medical care, calling for the use of Internet technologies to improve the quality of public health services.

<http://swissinnovation.org/newsChina/web/2018/03-180802-2e>

AI Speeds Up Radiation Treatment for Cancer Patients

(China Daily, August 02)

At the Cancer Hospital of Chinese Academy of Medical Sciences, a new AI-powered computer program has helped doctors cut hours from the meticulous manual process of targeting radiation treatment. The new program, developed by the Beijing-based cancer hospital and Shenzhen Haichuang medical company, uses deep-learning technology to predict patterns from previous samples and automatically produces plans for radiotherapy. The program, which was put into clinical use in June, can now be used for rectal, breast and nasopharynx cancer. As the program improves, it is expected to be used for more types of cancer in the future.

<http://swissinnovation.org/newsChina/web/2018/03-180802-99>

Tea Substance Helps Diabetic Patients Wound Healing

(Xinhua, August 08)

Researchers from Yunnan Agricultural University have found that substances used in tea may be useful to speed up skin wound recovery in diabetic patients. They used epigallocatechin gallate (EGCG), a substance commonly found in tea, to help wound healing in mice. The recovery rate of mice using EGCG was 18% higher than those not using the substance. It has proven useful in reducing the inflammation response of diabetic mice, by targeting the Notch signaling pathway, the researchers said. China has over 100 million diabetic patients. Delayed wound healing is one of the most prominent clinical manifestations of diabetes and lacks satisfactory treatment options. The findings provide insight into the therapeutic strategy for diabetic wounds and recommend EGCG as a potential medicine to treat chronic wounds.



<http://swissinnovation.org/newsChina/web/2018/03-180808-d2>

Nano "Trojan horse" to Strangle Tumors

(Xinhua, August 09)

Scientists have folded DNA molecules in an origami-like process to make a nano "Trojan horse", which can release "killers" to fight cancer tumors. Through precision control, researcher Ding Baoquan folded a single-strand DNA of a phage (a type of virus) into a rectangular sheet. Then he put four "killers", molecules of thrombin (a clotting enzyme in blood plasma), on the sheet and rolled them up. At the interface, "locks" made by fragments of nucleolin protein DNA were installed, forming a tube-shaped nano "Trojan horse" or nanorobot. After injection, the "Trojan horse" travels in blood vessels and only tumors have the "key" to open the "locks." Once unlocked, the killer thrombin molecules are released, attracting platelets and fibrinogen protein to form a large thrombus, or clot, in the blood vessel within hours to cut off the blood supply and "starve" the tumor to death.

<http://swissinnovation.org/newsChina/web/2018/03-180809-fc>

Key Gene Related to Primates' Growth and Lifespan

(Xinhua, August 23)

Scientists at the Institute of Biophysics of the Chinese Academy of Sciences have identified a gene playing an important role in regulating the development and lifespan of primates through genome-editing technology and experiments on monkeys. The study may open the door to new research on human development and aging, as well as new treatments for age-related disorders. A joint research team of scientists from the Chinese Academy of Sciences biophysics and zoology institutes injected gene editing tools into monkey zygotes, generating the first primates that were deficient in SIRT6 gene. The SIRT6-depleted monkeys died within hours after birth. Notably, they exhibited severe prenatal developmental retardation. "Our results for the first time suggest that SIRT6 is involved in

regulating development in non-human primates, and might provide an insight into the research of human developmental disorders," said Liu Guanghui.

<http://swissinnovation.org/newsChina/web/2018/03-180823-ac>

4. Engineering / IT / Computer Science

China Launches Exascale Supercomputer Prototype

(China Daily, August 06)

China on Sunday put into operation a prototype exascale computing machine, the next-generation supercomputer, according to the developers. The Sunway exascale computer prototype was developed by the National Research Center of Parallel Computer Engineering and Technology (NRCPC), the National Supercomputing Center in Jinan, east China's Shandong Province, and the Pilot National Laboratory for Marine Science and Technology (Qingdao). An exascale computer is able to execute a quintillion calculations per second. In China, prototypes are being developed by three teams led by the NRCPC, Dawning Information Industry C. (Sogon), and National University of Defense Technology (NUDT). The United States and Japan are also speeding up the development of the exascale supercomputer, expecting to unveil it in as early as 2021.



<http://swissinnovation.org/newsChina/web/2018/04-180806-21>

Aim to Dominate 5G Mobile Technology

(MIT Technology Review, August 07)

China has spent tens of billions more dollars than the US on infrastructure that will support next-generation cellular networks, according to a new Deloitte study. 5G is the successor to today's 4G networks and will be deployed in limited areas in some countries later this year. Because 5G will use different frequency bands than 4G, it is expected to bring greater capacity, higher speeds, and more rapid reaction times to everything from autonomous vehicles to VR headsets and smartphones. Countries that roll out 5G early will have a head start creating and selling a wide range of technology products and services. Currently, China is in the lead, with 350,000 5G cell sites compared to fewer than 30,000 in the US.



<http://swissinnovation.org/newsChina/web/2018/04-180807-8f>

'Flying Scooter' Inspired by a Legend

(South China Morning Post, August 17)

When Zhao Deli was young, his idol was the Monkey King, a character from the Chinese classic 'A Journey to the West', who was able to conjure up a cloud with a somersault and stand on it to fly above everyone else. Inspired by his childhood memories, the self-taught engineer has now developed his own prototype "flying scooter". The prototype he has developed uses a quadruple axis structure and eight rotors – two on the end of each axis – that lift it into the air in a similar fashion to helicopter blades. At present he claims the lithium battery-powered scooter can spend up to 30 minutes in the air, has a top speed of 72km per hour and can reach a height of 3,000 metres.



<http://swissinnovation.org/newsChina/web/2018/04-180817-1f>

Senior Care Robots Look After Elderly

(China Daily, August 18)

At the 2018 World Robot Conference held in Beijing many of intelligent service robots were on display. The robot iPal (from AvatarMind) reacts to touch and voice turning its head towards elderly users and offering simple conversations. Besides singing opera, it can give weather reports and remind users to take their medicine. The robot can send a live feed of its elderly users to relatives and through motion detection and facial recognition send alerts if users are injured. The robot P-Care (from Zhongrui Funing Robotics Co Ltd) can chat, sing, dance, and remind the elderly to exercise. With strong arms and dexterous hands, it can serve food and drinks and help the seniors stand up and walk. P-Care will be able to monitor the elderly's health conditions by measuring their blood pressure, body temperature, and heart rate.



<http://swissinnovation.org/newsChina/web/2018/04-180818-73>

5. Energy / Environment

New Soybean Genome Facilitates Soybean Elite Cultivar Improvement

(Chinese Academy of Sciences, August 02)

Asia is one of the largest soybean planting and consuming areas, so its soybean production is essential for global food security. A high-quality reference genome is crucial for functional analysis of a species. Therefore, it is necessary to assemble a new high-quality soybean genome from Asian soybean accessions to facilitate Asia soybean functional genomics study and elite cultivar improvement. Biologists from the Institute of Genetics and Developmental Biology of CAS, University of Science and

Technology of China, Jiangsu Academy of Agricultural Sciences, and Berry Genomics Corporation assembled a new soybean genome for a Chinese soybean accession "Zhonghuang 13" by a combination of SMRT, Hi-C and optical mapping data. Compared with the previously reported soybean reference genomes, the quality of this new assembled genome is significantly improved which has longer total sequence length, higher contig N50 and scaffold N50, and fewer gaps.

<http://swissinnovation.org/newsChina/web/2018/05-180802-3e>

Efforts to Limit Global Warming May Reduce Global Desertification

(Chinese Academy of Sciences, August 06)

Scientists from the Xinjiang Institute of Ecology and Geography of the Chinese Academy of Sciences made a projection of actual evapotranspiration (ETa; quantity of water loss due to evaporation and transpiration) under the 1.5°C and 2.0°C global warming scenarios in sandy areas in northern China. The climate models indicated significant increases in ETa. Under global warming of 2.0°C during the year of 2040 to 2059, relative to that of 1.5°C during 2020 and 2039, the area of sandy land will increase at a rate of 27.04km² per decade, according to the scientists. The projection analysis showed that after this period, the sandy land area in northern China may gradually stabilize. The researchers concluded that early efforts to achieve the 1.5°C temperature goal (Paris Agreement goal) could therefore markedly reduce the likelihood that large regions will face substantial global desertification.

<http://swissinnovation.org/newsChina/web/2018/05-180806-13>

0.5°C Less Warming Can Avoid Precipitation Extremes

(Chinese Academy of Sciences, August 09)

Just half a degree Celsius could make a major difference when it comes to global warming according to researchers from State Key Laboratory of Numerical Modeling for Atmospheric Sciences and Geophysical Fluid Dynamics at the Institute of Atmospheric Physics (IAP) in the Chinese Academy of Sciences. They combined CMIP5, an archive of comprehensive climate models, with socio-economic projections to investigate future climate changes and the accompanying impacts and specifically examined extreme precipitation events in the global monsoon region, which sprawls north and south from the Earth's equator and includes nearly two-thirds of the world population. This region is more impacted by extreme precipitation than any other land mass on Earth. The scientists found that by reducing the global warming limit by 0.5°C, a significant number of extreme precipitation events and their impacts could be avoided.

<http://swissinnovation.org/newsChina/web/2018/05-180809-08>

Gene Helping Rice Adapt to Cold Climate

(Xinhua, August 18)

Rices grown in Asia include two subspecies: indica rice and japonica rice. The heat-resistant indica rice is mainly planted in southern China, as well as the tropical and subtropical areas in South Asia and Southeast Asia, while the japonica rice, after nearly 10,000 years of domestication and selection, can tolerate cold weather and has been expanded to northern China and the temperate zones in Northeast Asia. After analyzing 202 rice samples from various growing regions around the world collected by the Department of Agriculture of the United States, researchers at the Institute of Genetics and Development Biology of the Chinese Academy of Sciences identified a gene, bZIP73, associated with cold tolerance. The researchers believe the gene has facilitated the adaptation of rice to low temperatures. The discovery may help breed new rice varieties which can grow in high latitude and high altitude regions.



<http://swissinnovation.org/newsChina/web/2018/05-180818-6e>

In-situ Raman Quantitative Method for CO₂ Detection in Hydrothermal Environment

(Chinese Academy of Sciences, August 20)

Carbon dioxide emitted from hydrothermal vents, as an important part of the global carbon cycle, can directly affect hydrothermal ecosystems. However, traditional chemical analysis methods cannot directly measure the concentrations of dissolved CO₂ in high - temperature hydrothermal fluids. A research team from the Institute of Oceanology of CAS made progress in in-situ Raman spectroscopy quantitative detection of deep-ocean hydrothermal fluid system. With the homemade Raman insertion probe (RiP), they conducted the in-situ quantitative Raman spectroscopy detection of high-temperature hydrothermal fluids in the hydrothermal field in the middle Okinawa Trough. The researchers found that the influences of hydrothermal fluids on global carbon cycle and climate change might be much greater than people thought. Their findings are of great significance in promoting the in-situ spectroscopy detection in extreme deep ocean environment, and may help people re-understand the influences of hydrothermal fluids on global oceans.

<http://swissinnovation.org/newsChina/web/2018/05-180820-91>

Conversion of Black Dust into Rich Soil

(China Daily, August 20)

Over two decades, it has been the main source of pollution in villages and rivers near Beijing: 20 million tonnes of pulverized fuel ash from a coal-fired power plant. After three years of research, a research team at Beijing University of Agriculture has turned the ash into artificial soil, which can be used to grow seedlings and make cities greener. The team developed a new type of nutritional soil

with the ash as the main material, supplemented by mushrooms, straw, livestock manure and sawdust. In certain temperatures, humidity and air conditions, the ash ferments and gradually acquires organic substances. The artificial soil, known as nutrition substrate, has perfect voids and acidity, very similar to peat, a natural resource that was widely used in agriculture and forestry, according to the researchers.

<http://swissinnovation.org/newsChina/web/2018/05-180820-3c>

Diversified Tree Species Brings more Carbon Storage in Forests

(Xinhua, August 25)

Forest ecosystems are an integral component of the global carbon cycle as they take up and release large amounts of carbon over short time periods, or accumulate it over longer time periods. However, there remains uncertainty about whether carbon fluxes and stocks differ between forests of high and low species richness. Scientists at the Institute of Botany of the Chinese Academy of Sciences together with scientists from Germany and Switzerland monitored 27 forest plots in Gutianshan Nature Reserve of east China's Zhejiang Province over six years. They found that species-rich forest plots had higher carbon stocks and fluxes than the plots with lower species richness. Additionally, old forest plots had higher carbon stocks than young ones. The forest ecosystems with higher species richness had faster carbon cycle rates. Meanwhile, more carbon can be reserved above or below ground in stems, roots, dead and drying wood, litter and soil.

<http://swissinnovation.org/newsChina/web/2018/05-180825-c1>

Smart App to Identify Pests on Crops

(China Daily, August 25)

A pest-recognizing application developed by the Hefei Intelligent Machine Institute with the Chinese Academy of Sciences has tested successful for recognizing over 50 varieties of rice pests. According to the researchers, excessive use of pesticide and a lack of pest monitoring and farming technology support for farmers were the primary problems in agriculture. The application developed with artificial intelligence technology and a database of 1 million pictures of pests could immediately match the photo with pictures in its memory, diagnose pest types and give tips on how to accurately use pesticide to control the damage. The institute had teamed up with experts from the Anhui Provincial Academy of Agricultural Sciences to rapidly extend the system's applications to recognize more pest varieties in agricultural plants ranging from wheat, corn, soybean, to rapeseed, vegetables and fruit trees.



<http://swissinnovation.org/newsChina/web/2018/05-180825-9e>

China Builds National Database for Water Networks

(China Daily, August 29)

A national database for water networks containing the physical data of over 3.33 million natural and artificial rivers, lakes, reservoirs and canals has been formally completed. Now, every river more than 500 meters in length and each lake, reservoir and pond larger than 5,000 square meters has its own unique "ID number". This is the first time that the water networks in China have been coded. This move will greatly facilitate future work on water resource management, land and space planning, disaster emergency response and government decision-making to provide basic data services for natural resource survey and monitoring management.



<http://swissinnovation.org/newsChina/web/2018/05-180829-3c>

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

Robust and Versatile Technique for Band Structure Engineering of Graphene

(NYU Shanghai, August 01)

Graphene is a material comprising a single layer of carbon atoms. It is a superior conductor of electricity, the unique atomic arrangement of the carbon atoms in graphene allows its electrons to easily travel at extremely high velocity, and its intrinsic two-dimensional geometry opens promising research on exploring band structure engineering through manipulating its electrons. Researchers from NYU Shanghai and from Columbia University established a robust and versatile technique for band structure engineering of graphene by using an electrostatically defined periodic potential. In the research, graphene protected by layers of hBN (a very close isoelectronic match with graphene and a good insulator) is placed on top of the patterned dielectric layer to form square or triangular superlattices. Through theoretical calculations, they discovered the emergence of new Dirac cones (the unusual electron transport properties of graphene) by the superlattice potential and the fractal evolution of energy spectrum.



<http://swissinnovation.org/newsChina/web/2018/06-180801-77>

Tattoo-Like Electronic Skin

(Xinhua, August 04)

Electronic skin (e-skin) refers to thin, flexible and stretchable electronic material that mimics human skin and can sense pressure, temperature and stretch. Scientists from Tsinghua University demonstrated a graphene (super thin material with excellent flexibility and conductivity) electronic skin

based on laser scribing technology. With the assistance of water, the electronic skin is transferable not only to human bodies, but also to other substrates such as leaves and silk. It could be attached to human skin as well as masks and throats to measure body signals such as breathing, heartbeat and voice. The electronic skin exhibits high sensitivity and long-term stability. It can withstand higher temperatures and is comfortable to wear. With laser scribing technology, the pattern of the graphene-based electronic skin can be personalized, a feature that will help future commercialization. The electronic skin has huge potential in health care and intelligent systems.

<http://swissinnovation.org/newsChina/web/2018/06-180804-0d>

Discovery of Most Lithium-Rich Giant in Galaxy with LAMOST

(Chinese Academy of Sciences, August 07)

A research team, led by the astronomers from National Astronomical Observatories of China Chinese Academy of Sciences, discovered the most lithium-rich giant ever known to date, with lithium abundance 3,000 times higher than normal giants. It is in the direction of Ophiuchus, north side of the Galactic disk, with a distance of 4,500 light years to Earth. The findings were realized with the help of The Large Sky Area Multi-Object Fiber Spectroscopic Telescope (LAMOST), a special quasi-meridian reflecting Schmidt telescope located in Xinglong Observatory of NAOC in northern China. The telescope can observe about 4,000 celestial bodies at one time and has made a massive contribution to the study of the structure of the Galaxy.



<http://swissinnovation.org/newsChina/web/2018/06-180807-d5>

Near-Infrared Fluorescence Imaging

(Chinese Academy of Sciences, August 08)

Near-infrared (NIR) fluorescence imaging is a powerful technique for visualizing deep-tissue structures, like blood vessels, lymph nodes and detecting tumors. Currently, the scientific community posits that there are two biologically transparent windows where NIR fluorescence imaging can be performed: one called NIR-Ia (700–900 nm), the other called NIR-II (1,000–1,700 nm) window. Most people have been avoiding the NIR-Ib (900–1,000 nm) window due to the lack of suitable fluorophores and the presence of a water overtone absorbance peak. A research team at the Shenzhen Institutes of Advanced Technology of the Chinese Academy of Sciences has now extended near-infrared fluorescence imaging window ranges. This has markedly enhanced signal-to-background ratio because autofluorescence, scattering and light absorption by biological tissues and water are weaker at longer



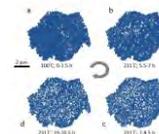
wavelengths. Their technique could yield images of lymph nodes, subcutaneous tumors, brain tumors and also leaf veins and early infected anthracnose of plant leaves.

<http://swissinnovation.org/newsChina/web/2018/06-180808-7e>

Propagation of Redox Phase Transformations Using Synchrotron

(Chinese Academy of Sciences, August 10)

Researchers from Beijing Synchrotron Radiation Facility at the Institute of High Energy Physics of Chinese Academy of Sciences and the Stanford Synchrotron Radiation Light Source at SLAC and Virginia Tech have used the synchrotron based nano-scale spectro-microscopy technique to visualize the thermally driven propagation of a reaction front in charged. They developed a numerical model to describe the dynamic behavior in highly inhomogeneous polycrystalline particles, and concluded this methodology is applicable to redox phase transformations far beyond battery systems that are polycrystalline in nature. The implementation of their method not only reveals the heterogeneous phase transformation, caused by thermally driven oxygen release, in an NMC battery electrode, but also can potentially provide a universal approach to study phase transformation behaviors in battery materials and beyond.



<http://swissinnovation.org/newsChina/web/2018/06-180810-8e>

Record Efficiency on Organic Solar Cells

(Xinhua, August 10)

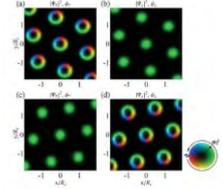
Organic photovoltaic cells are made from carbon-based materials that are light, soft and semi-transparent. They can be printed on thin rolls of plastic and are more environmentally-friendly than traditional silicon-based solar panels. However, organic photovoltaics are less efficient at converting sunlight to electricity. A study conducted by scientists at Nankai University proved that the organics have the potential to be just as efficient as silicon. They have achieved a record 17.3% power conversion efficiency on organic solar cells. "Low charge mobility of organic materials limited the active layer thickness and light absorption efficiency," said Chen Yongsheng. The researchers used tandem cells, which are put together by different layers of organic materials, to address the problem. "Different layers of the tandem cells can absorb different wavelengths of light. That means you can use sunlight more effectively and achieve a higher power conversion rate," according to Chen.

<http://swissinnovation.org/newsChina/web/2018/06-180810-16>

Improved Understanding of Spin-orbit Coupling and Supersolid Phenomena

(Chinese Academy of Sciences, August 15)

A research group from the National Time Service Center (NTSC) of CAS investigated the ground-state quantum phases of Bose gases with spin-orbit coupling and soft-core long-range interactions. They found that the combined effects of spin-orbit coupling and soft-core long-range interaction could lead to a chiral supersolid in which spontaneous circulation of particles emerges in each unit cell. The discovery provides a new understanding of spin-orbit coupling and the supersolid phenomena, and opens up a new direction for the exploration and discovery of novel quantum states.

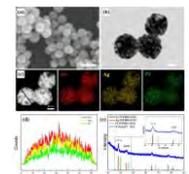


<http://swissinnovation.org/newsChina/web/2018/06-180815-cd>

New Material to Improve Fuel Cells

(Chinese Academy of Sciences, August 16)

Researchers at Hefei Institutes of Physical Science developed a new nano-alloy material to improve performance of fuel cells. A fuel cell is a kind of device similar to a power station, which generates electricity from fuel and an oxidant. And it is commonly used in many fields as clean energy. Among the various clean fuel cells, direct methanol fuel cells are considered ideal for energy conversion, thanks to their excellent features of low cost, high theoretical energy density, facile transportation, and good renewable fuel source. Currently, platinum and platinum-based nanostructures are the widely investigated and most efficient catalysts for catalyzing the methanol oxidation reaction, but also have many disadvantages. The work of the research team offers a new efficient strategy for the rational design of 3D spongy electrocatalysts with highly active and stable components.



<http://swissinnovation.org/newsChina/web/2018/06-180816-95>

World's Largest SiC Optical Mirror

(China Daily, August 22)

After 15 years of exploration and nine years of research, scientists at Changchun Institute of Optics, Fine Mechanics and Physics, Chinese Academy of Sciences successfully developed the world's largest aspherical silicon carbide (SiC) optical mirror - a high-precision SiC aspherical mirror with a diameter of 4.03 meters, Chinanews.com reported. China owns all intellectual property rights of the core manufacturing equipment and techniques of the mirror, and it can be widely used in fields such as astronomical telescopes and spacecrafts, marking that China currently has the world-leading state-of-the-art technologies of large-diameter SiC aspherical optical mirrors. Europe and US have long held monopoly in the manufacturing technology of large diameter SiC optical mirrors, so China had to

develop the techniques independently, said Zhang Xuejun, deputy director at the institute, also the person in charge of the project.

<http://swissinnovation.org/newsChina/web/2018/06-180822-b5>

7. Economy, Social Sciences & Humanities

40% of Young Chinese Entrepreneurs are Female

(Xinhua, August 12)

About 40% of young Chinese entrepreneurs are female, according to a report by the China Foundation for Youth Entrepreneurship and Employment, and the Chinese Academy of Labour and Social Security. The report was based on a survey of 6,928 entrepreneurs aged 16 to 35. Nearly 70% of the surveyed entrepreneurs are over 25, while about 55% were college students before starting their businesses. Under preferential policies, people from all walks of life are becoming entrepreneurs, but college students remain the majority. The report also noted that 63% of the respondents run service industry businesses.

<http://swissinnovation.org/newsChina/web/2018/07-180812-fa>

Youth Receiving Inadequate Parental Care More Likely to Be Addicted to Internet

(Xinhua, August 19)

A survey has found that children who do not receive adequate care from their parents are more likely to become addicted to the internet. Sun Hongyan, director of the childhood research institute at China Youth and Children Research Center (CYCRC), said that these children may experience underachievement at school, social isolation, and low self-esteem. The findings were based on a survey conducted in six provincial-level regions, which polled over 6,000 children and parents, according to an article in the China Youth Daily. "Our research shows that the more resistant parents are to the internet, the more addicted their children may become. Also, careless parents are more likely to see their children become addicted to the internet," the newspaper quoted Sun as saying.

<http://swissinnovation.org/newsChina/web/2018/07-180819-7f>

Tax Cuts in Support of Real Economy in China

(Xinhua, August 31)

China is unveiling new tax cuts to boost the real economy while working to ensure full implementation of all existing tax reduction measures, a State Council's executive meeting presided over by Premier Li Keqiang decided on Thursday. The Chinese government places high importance on cutting taxes and non-tax fees. President Xi Jinping emphasized the need to stick with the proactive fiscal policy and

prudent monetary policy, and called for the fiscal policy to play a bigger role in boosting domestic demand and economic restructuring. Premier Li Keqiang laid out clear targets for tax and fee reduction in this year's Government Work Report, and underlined on multiple occasions the need for a more proactive fiscal policy.

<http://swissinnovation.org/newsChina/web/2018/07-180831-ac>

8. Corporates / Startups / Technology Transfer

Google Is in China Cloud Talks With Tencent and Others

(Bloomberg, August 04)

Google wants to get back into China, and is laying the groundwork for a key part of the initiative: bringing in its cloud business. The internet giant is in talks with Tencent Holdings Ltd., Inspur Group and other Chinese companies to offer Google cloud services in the mainland. The goal is to run Google internet-based services, such as Drive and Docs, via the domestic data centers and servers of Chinese providers, similar to the way other U.S. cloud companies access that market. In most of the rest of the world, Google Cloud rents computing power and storage over the internet, and sells a collection of workplace productivity apps called G Suite that are run on its own data centers. China requires digital information to be stored in the country and Google has no data centers in the mainland, so it needs partnerships with local players.



<http://swissinnovation.org/newsChina/web/2018/08-180804-46>

Tibet Sets Up Tech Incubator

(Xinhua, August 09)

A tech incubator was officially open on Wednesday in Lhasa, capital of southwest China's Tibet Autonomous Region. The incubator, invested by Lhasa Science and Technology Bureau, covers 16,000 square meters, with an investment of 16.2 million yuan (about 2.35 million U.S. dollars), the bureau said. It has attracted 50 firms working in electronics, artificial intelligence, new energy, healthcare, agricultural technology, finance and software development. The incubator is the largest of its kind in Tibet. Tibet has vigorously promoted entrepreneurship and technological innovation. It has 27 maker spaces and five tech incubators, which have helped establish about 200 companies.

<http://swissinnovation.org/newsChina/web/2018/08-180809-3f>

Beijing Builds 5G Base Stations for Faster Networks

(China Daily, August 13)

Chinese telecom giant China Unicom's Beijing subsidiary launched a "5G NEXT" plan Monday, to embrace faster wireless 5G networks in the near future. With an aim to build an "open, sharing, prosperous, and win-win" 5G ecological system, the subsidiary will build 300 5G base stations this year in Beijing, one of the 16 pilot cities previously announced. Other cities to pilot 5G technology include Tianjin, Qingdao, Hangzhou, Nanjing, Wuhan, Guiyang, Chengdu, Shenzhen, Fuzhou, Zhengzhou, and Shenyang. Beijing will apply 5G technology in major projects and events in the next five years, such as those in Tongzhou District, Beijing's subsidiary administrative center, the capital's new international airport, the International Horticultural Exhibition 2019, and Beijing 2022 Winter Olympic Games.

<http://swissinnovation.org/newsChina/web/2018/08-180813-f7>

Electric Vehicle Start-up NIO is Seeking IPO

(South China Morning Post, August 14)

NIO, the electric vehicle start-up backed by Tencent Holdings, is seeking to be the first Chinese carmaker to list in the US, at a time when Elon Musk-led Tesla Inc. is seeking to go private. The Shanghai-based company, which is seeking a US\$1.8 billion IPO, disclosed a US\$502.6 million net loss in the first half of this year in a regulatory filing made public on Monday. Nio had revenues of less than US\$7 million as it ramps up production and sales of its first vehicles. As of the end of July, NIO had delivered 481 ES8s, the company's first production model launched in December. The company is still fulfilling more than 17,000 reservations, of which 12,000 were reserved with an initial refundable deposit of 5,000 yuan (US\$725).

<http://swissinnovation.org/newsChina/web/2018/08-180814-d5>

Ex-Baidu Executive Joined Y Combinator as CEO

(South China Morning Post, August 15)

Former Baidu executive Qi Lu has been named head of Y Combinator China, marking the American start-up incubator's first full-fledged international effort. Y Combinator, which has seeded companies including Airbnb, Stripe, Reddit and Dropbox, will start its programme in China as soon as next summer. In the US, the accelerator selects two batches of companies a year for financing, advice and connections in exchange for a small percentage of equity. Lu will lead the Chinese programme, which will be called YC China and adopt a similar approach though there may be tweaks to fit the domestic market, said Sam Altman, Y Combinator's president.

<http://swissinnovation.org/newsChina/web/2018/08-180815-40>

'100pc China-Developed Browser' Is Built on Google's Chrome

(South China Morning Post, August 17)

Redcore, which recently raised 250 million yuan (US\$36 million) in funds, said that its browser had "broken the American monopoly". That claim was challenged after an online posting purporting to show the installer containing Chrome files went viral. Chen Benfeng, founder and chief executive of Redcore, said later in an interview that it was wrong to have made such a claim. "We don't deny building on Chrome's browser engine," said Chen. "The web browser is a very old technology, writing the code from scratch will take many years. It's like Android was built on the foundation of Linux, but nobody doubts Android or Google's innovation. Google and Apple also did not write the first line of code, doing so would be reinventing the wheel." The public climbdown by Redcore is sure to add to the growing debate about China's overblown technological strength.



<http://swissinnovation.org/newsChina/web/2018/08-180817-f3>

Alibaba Pushes Into On-Demand Local Services

(South China Morning Post, August 23)

Alibaba plans to ramp up investments in Ele.me's operations amid increased competition from rival Meituan-Dianping. Recently Ele.me announced a 3 billion yuan investment to provide subsidies and other incentives to users. The firm aims to win at least a 50% share of China's on-demand food delivery market in the near term. It also aims to expand its business beyond transporting meals to consumers to other on-demand services, potentially delivering items such as flowers and over-the-counter medication. Along with expansion overseas, Alibaba's push into on-demand local services would help add greater momentum to the "New Retail" strategy. The term refers to the integration of online and offline experiences for consumers in areas from shopping, food delivery to buying groceries.



<http://swissinnovation.org/newsChina/web/2018/08-180823-c0>

9. Bilateral News

Swiss Federal Councillor Leuthard Visited China

(admin.ch, August 09)

Swiss Federal Councillor Doris Leuthard was in China on 9 and 10 August 2018. The trip first took her to Shenzhen, where she visited companies that are leaders in digitization and electromobility. There, in the presence of Federal Councillor Leuthard, a letter of intent was signed on the "Swiss House - Sunlon" in Beijing.



In Hong Kong, Federal Councillor Leuthard visited an innovation and technology park and got an insight into the measures that Hong Kong has initiated as Smart City. She also met with Innovation and Technology Minister Nicholas W. Yang.

<http://swissinnovation.org/newsChina/web/2018/09-180809-8b>

Upcoming Science and Technology Related Events

Swiss-Chinese Life Sciences Forum 2018

September 13, 2018

<http://www.swiss-chinese-life-sciences-forum.ch/>

Health Sector, Life Sciences, Collaboration
Basel

Swiss Pavilion, China International Import Expo CIIE

November 5-10, 2018

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

International Import Exhibition
Shanghai

CHina CHat 2018

September 20-21, 2018

<https://is.gd/2rtr0S>

WeChat, China Digital Marketing
Shanghai

Money 20/20

November 14-16, 2018

<https://www.money2020-china.com/>

FinTech, Future of Money
Hangzhou

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