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Science China Newsletter, September 2018
Trends in education, research, innovation and policy

Jiuzhaigou, China

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Swiss Spotlight

Scientist: Using Internet of Things Technology for Structured Finance Solutions

(Martin Schnauss, September 30)

Martin Schnauss holds a PhD in Management and Industrial Engineering and an MSc in Mathematics. He is specialized in structured finance and M&A, organizational design and the industrialization of processes. He has worked in leading positions in companies like UBS and Bank Julius Baer in various countries for more than 20 years. He is a member of the CFA Institute and Global Association of Risk Professionals. During his stay in China in summer 2018, Martin Schnauss presented financial applications related to Internet of Things and Big Data at 22nd China International Software Expo Beijing. In summer 2019, he will teach Statistics and Internet of Things at University of Science and Technology Beijing. Martin Schnauss has a lot of practical experience with financial products and solutions, has led projects with an asset volume of more than 100 Mio EUR and has managed asset portfolios for banks of above 1.000 Mio. EUR. Martin Schnauss lectures at the School of Management and Law in Zurich and is currently involved in projects, which use the Internet of Things technology for structured finance solutions.

http://swissinnovation.org/newsChina/web/2018/00-180930-87

Startup: Analysis of Biological, Clinical and Digital Data Streams

(SimplicityBio, September 30**)**

SimplicityBio's machine learning platform BOSS (Biomarker Optimization Software System) analyses biological, clinical and digital data streams to extract knowledge and insight that can lead to disease mechanism understanding, drug target discovery, biomarker identification, patient stratification, and drug repositioning. SimplicityBio's unique multi-biomarker agnostic approach discovers novel combinations of new (or validated) biomarkers from structured data provided by pharma, biotech and diagnostic clients. The resulting models are also human interpretable and robust. This year SimplicityBio was selected by a jury of experts and investors to be part of the Venture Leaders China 2018, which offers 10 startups the opportunity to participate in a ten-day road show across five cities in China.

http://swissinnovation.org/newsChina/web/2018/00-180930-89

1. Policy

Scientists' Research Must Align With National Needs

(China Daily, September 11)

This is an excerpt from a speech delivered by Hou Jianguo, vice-president of the Chinese Academy of Sciences, at the launch ceremony of the academy's first education center on patriotism in July. The Party and the nation have great expectations for science, technology and innovation. President Xi Jinping has emphasized on many occasions that powerful technologies are needed so China and its people's livelihoods can improve. Xi has also asked us to uphold the honorable tradition of contributing to the nation through science and technology, seek truth and knowledge, be innovative and practical, and fuse our personal aspirations with the development of the country.

http://swissinnovation.org/newsChina/web/2018/01-180911-17

National Planning Push to Build Industrial Internet

(China Daily, September 17)

China is beefing up efforts to boost the development of the industrial internet, which serves as a key growth engine for its digital economy, according to the country's top industrial development regulator. More efforts are needed to make breakthroughs in key technologies - such as chips and smart sensors - participate in international standard-setting activities, apply new industrial internet technologies and products to key industries, and accelerate development of the internet of vehicles and the internet of things, according to Miao Wei, minister of industry and information technology. The industrial internet, a new type of manufacturing automation that combines advanced machines, internet-connected sensors and big data analysis, is expected to boost productivity and reduce costs in industrial production.

http://swissinnovation.org/newsChina/web/2018/01-180917-fe

New Regulation Made on Fruad in Statistics

(China Daily, September 18)

China has introduced a new inspection regulation to crack down on statistical fraud and related illegal operations, which is expected to improve the authenticity of economic data and better support policymaking. The 20-clause regulation, focusing on preventing and punishing statistical fraud, was disclosed by the general offices of the Communist Party of China Central Committee and the State Council on Sunday. It was approved at a meeting of the Committee for Deepening Overall Reform of the CPC Central Committee on July 6 and has been in place since Aug 24. According to the new regulation, the National

Bureau of Statistics is responsible for organizing and conducting statistical inspections, building a mechanism to prevent and penalize fraud and making sure violators are held accountable.

http://swissinnovation.org/newsChina/web/2018/01-180918-0c

Improvement of Global Scientific Literacy

(China Daily, September 20)

China will work with other nations and international science organizations to facilitate the sharing of resources and practices for promoting scientific literacy around the world, a declaration adopted in Beijing said. The Beijing Declaration for Promoting Public Science Literacy Across the World was adopted by attendees during the closing ceremony of the World Conference on Science Literacy. The declaration calls for working together to close the gap in scientific literacy between different countries, and build a coordinated working mechanism to improve global scientific literacy and fulfill the United Nation's 2030 Agenda for Sustainable Development. The declaration also called for countries to prioritize the improvement of scientific literacy across different races, genders and borders, so that more people can truly reap the benefits of scientific development. Youths, females and impoverished communities should be the key target demographics in such efforts.

http://swissinnovation.org/newsChina/web/2018/01-180920-4a

China to Better Protect Intellectual Property

(China Daily, September 20)

Premier Li Keqiang said on Wednesday that China will adopt stricter measures for protection of intellectual property rights. Li made his comment in a speech at the annual meeting of New Champions in Tianjin, also known as Summer Davos. Intellectual property rights will be strongly protected to stimulate innovation, Li said. Without an environment that respects knowledge and protects property rights, China cannot achieve innovation-driven development, he said. China has a complete legal system for intellectual property rights protection, he said. Since joining the World Trade Organization, the payments made by Chinese companies for using intellectual property rights increased by 14 times, Li said. Stricter measures will be taken to punish violators and provide fortified backing for innovations, he added.

http://swissinnovation.org/newsChina/web/2018/01-180920-d0

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2. Education

China to Improve Use of Education Funds

(China Daily, September 02)

China will improve the use and management of public spending on education to promote fair and quality education. In accordance with a recent circular issued by the General Office of the State Council on improving the efficiency of education spending, priority should unswervingly be given to education and the layout for use of education funds should be optimized. The document requires greater investments in education in the government's budgetary spending, saying that input in the education sector should maintain a level of no less than 4 percent of the country's GDP.

http://swissinnovation.org/newsChina/web/2018/02-180902-c2

China Bans Illegal Fundraising in Universities

(China Daily, September 05)

China has launched a nationwide campaign to crack down on illegal fundraising activities in universities as students returned to campus to start a new school year. Higher education institutions are required to take measures to raise the faculty and student awareness of fundraising risks and develop rational concepts of financial management, said the circular. Regular checks on activities will be conducted to prevent illegal fundraisers, including checks of flyers handed out on campus and the use of social media networks such as WeChat and Weibo to spread relative information, it added. China has taken a harsh stance toward "illegal fundraising" -- a term used to describe taking deposits from the public by people without licenses to do so -- by mapping out regulations and strengthening supervision on financial markets since the 1990s.

http://swissinnovation.org/newsChina/web/2018/02-180905-b3

China to Make National Law on Pre-school Education

(China Daily, September 09)

China's top legislature will begin making a law on pre-school education to regulate the fast-growing sector that has drawn increasing public concern. The process will be initiated in the five years starting from 2018 within the term of the sitting Standing Committee of the 13th National People's Congress (NPC), according to the NPC legislative agenda released this week. China has specific laws governing both mandatory and higher education, which cover from elementary schools to universities of higher

learning. The calls for a similar law for pre-school education have mounted in recent years as the sector has grown.

http://swissinnovation.org/newsChina/web/2018/02-180909-95

Building China into Education Powerhouse

(China Daily, September 11)

President Xi Jinping called recently for the importance of stepping up efforts in educational modernization in a bid to build China into an educational power. Xi made the comment at a national education conference marking China's 34th Teachers' Day. Calling education a foundation for national revitalization and social progress, Xi said educational undertakings are of decisive significance in promoting people's overall development, strengthening the nation's innovation capability and realizing the rejuvenation of the Chinese nation. He stressed enhancing the political, social and professional status of teachers so that they will have the social prestige due them and will make greater contributions to the cause of the Party and the people by imparting knowledge. Xi called for reforms in educational systems and mechanisms, saying opening-up must be upheld in education, and international cooperation should be intensified.

http://swissinnovation.org/newsChina/web/2018/02-180911-dc

Emphasis on STEM Education

(China Daily, September 20)

Experts at the World Conference on Science Literacy called for building a comprehensive science, technology, engineering and mathematics (STEM) education system to inspire Chinese primary and middle school students and foster a critical thinking mindset. Hu Weiping, professor and director of the key lab of Modern Teaching Technology at Shaanxi Normal University, said an increasing number of companies and schools have been engaged in STEM activities but they tend to focus more on products rather than the young talent. STEM education in China also faces a major challenge with a shortage of both professional science teachers and proper science training for existing teachers. About 80.5%t of teachers involved in STEM subjects received no serious science education, and many were at a middle or high school education level.

http://swissinnovation.org/newsChina/web/2018/02-180920-8a

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3. Life Sciences / Health Care

Chinese Patients to Have Access of Cheaper Cancer Drugs

(Xinhua, September 01)

Chinese patients are expected to be able to buy 14 kinds of cancer drugs at a lower price from September, according to China's state medical insurance administration. The National Healthcare Security Administration has lowered the procurement prices of 14 cancer drugs, asking pharmaceutical companies to submit price adjustment applications to provincial-level drug procurement offices, according to a recent circular issued by the administration. The administration has also selected a range of drugs for further negotiation to be included on the country's medical insurance reimbursement list. The drugs are all crucial in dealing with hematological neoplasms and solid tumors, and have great clinical value and huge benefits for patients, the administration said.
http://swissinnovation.org/newsChina/web/2018/03-180901-0f

Sidekicks Mediate Architecture of Cell-Cell Adhesion In Situ

(Chinese Academy of Sciences, September 04)

Cell adhesion is important for the survival of living organisms and plays important roles in cell growth and migration, tissue and organ development, and the formation of neural network. Over the past decades, hundreds of cell adhesion molecules have been identified and the structures of many have been solved by crystallography. In a recent study scientists at Shanghai Institute of Biochemistry and Cell Biology of Chinese Academy of Sciences found that although cell adhesion molecules can be very long with highly flexible conformations, they could mediate compact and stable adhesion interfaces, and different types of domains are playing different roles in forming adhesion interfaces.
http://swissinnovation.org/newsChina/web/2018/03-180904-80

China to Release Updated Essential Medicine List

(Xinhua, September 05)

China's National Health Commission on Wednesday announced its recent plan to publish the 2018 National Essential Medicines List, which will cover 165 more medicines than the prior edition. The updated list will have 685 medicines, made up of 417 Western medicines and 268 Chinese-patented medicines, Zeng Yixin, vice director of the commission, said at a press conference. The new edition of the list, focusing on cancer as well as pediatric and chronic diseases, has added 12 antitumor drugs, 22 medicines for children, and a new hepatitis C drug, Zeng said. The latest edition of the list was published in 2012, covering 520 medicines.
http://swissinnovation.org/newsChina/web/2018/03-180905-5d

High-precision Transcriptome Map for Human Spermatogenesis

Researchers from Peking University, PKU Third Hospital and Southern Medical University jointly conducted a study. It is the first study to have elucidated the gene expression regulatory network and cell fate transition pathway in human spermatogenesis from a single-cell system, to have mapped high-precision single-cell transcriptomes of human spermatogenesis, to have analyzed all types of germ cells and their key molecular markers in adult males, and to have preliminarily explored the application of single-cell transcriptome technology in the study and diagnosis of human nonobstructive azoospermia. The study provides a new perspective for the study of human spermatogenesis and meiosis regulation mechanism, and for the molecular diagnosis and clinical treatment of azoospermia.

http://swissinnovation.org/newsChina/web/2018/03-180911-7b
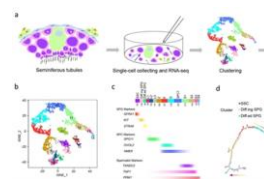
Zebrafish Research Highlights Role of Locus Coeruleus in Anesthesia

The application of general anesthesia in clinical therapy has been an indispensable part of modern medicine for more than a century. However, due to the complexity of the brain and the extensive actions of general anesthetic drugs, neural mechanisms underlying general anesthesia have remained unclear. Research, using a larval zebrafish model, conducted at the Institute of Neuroscience of the Chinese Academy of Sciences and at Zunyi Medical College revealed that two commonly used intravenous anesthetic drugs, propofol and etomidate, suppress the excitability of locus coeruleus (LC) neurons via synergic mechanisms, thus inhibiting presynaptic excitatory inputs and inducing membrane hyperpolarization of these cells. The study showed that the locus coeruleus-norepinephrine (LC-NE) system plays a modulatory role in both the induction of and emergence from intravenous general anesthesia.

http://swissinnovation.org/newsChina/web/2018/03-180919-61

4. Engineering / IT / Computer Science

AI Helps Assess Brain Injury Patients

Severe brain injury can lead to disorders of consciousness (DOC). Some patients can recover from an acute brain injury, but others fall into chronic DOC (vegetative state). They cannot communicate or act consciously. Most doctors assess the chances of recovery according to three main indicators: the patient's age, the cause and the duration of the disorder. They also observe patients' actions to find

any evidence of awareness. However, behavioral assessments are vulnerable to personal interpretation. Researchers from the Chinese Academy of Sciences, along with doctors from PLA Army General Hospital and General Hospital of Guangzhou Military Command, developed an AI model, which can make an assessment based on images of brain functional networks. The model diagnosed patients who would recover consciousness and those who would not with an accuracy of 88% in 100 cases.
http://swissinnovation.org/newsChina/web/2018/04-180902-18

Chinese Private Company Launches Satellites

(China Daily, September 05)

The Beijing-based private company i-Space used its own carrier rocket to place three satellites into space on Wednesday, marking China's first satellite launch by a privately built rocket. Wednesday's launch has been the third time for Chinese private enterprises to carry out space mission and also the second flight by the i-Space rocket family. The company performed its debut launch in April at a research rocket testing site in the island province of Hainan, verifying the design and equipment of the firm's first product, the indigenously developed SQX-1S.
http://swissinnovation.org/newsChina/web/2018/04-180905-db

Chinese City Leads IoT develoment

(China Daily, September 10)

As the hub of China's internet of things sector, Wuxi, Jiangsu province, has prioritized development to lead the city's emerging strategic industries. By the end of last year, the city's IoT sector employed more than 180,000 people, according to the local government. The 2,000-plus IoT companies generated combined income of more than 243 billion yuan ($35.5 billion) for the city last year, equal to 50 percent of the income made by IoT companies in the province, and 25 percent of the national total. The annual growth rate of Wuxi's IoT industry has been higher than 20 percent in the five years ending in 2017.
http://swissinnovation.org/newsChina/web/2018/04-180910-02

China Develops New Generation of Intelligent Subway

(China Daily, September 10)

China's leading train maker released its next-generation subway train that is more intelligent and energy-saving at a just-concluded expo in Changchun City, capital of northeast China's Jilin province. Equipped with an unmanned operating system, the train is fully automatic in all functions including self-maintenance, starting and stopping and traveling, said Wang Zhonghai, a technical expert with

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CRRC Changchun Railway Vehicles Co. Ltd. The intelligent system can monitor the train's operating state, and the safety equipment installed on the train can detect roadblocks and derailment to significantly increase its safety, Wang said during the rail traffic expo that concluded Sunday in Changchun.

http://swissinnovation.org/newsChina/web/2018/04-180910-f4

Submersible Sets National Ocean Depth Record at 5630m

(China Daily, September 11)

China's unmanned submersible Hailong 1100 (also known as Sea Dragon 11000) recently set a national depth record for a Chinese robotic submersible, according to the Ministry of Natural Resources. The ministry said in a statement that the record was set during a test dive in the northwestern Pacific Ocean when the submersible reached a depth of 5,630 meters. Hailong 11000 is a remotely operated underwater vehicle designed by a team headed by Shanghai Jiao Tong University's Institute of Underwater Engineering. It is designed to work at a maximum depth of 11,000 meters and is mainly tasked with deep-sea scientific observation. In the operation Hailong 11000 stayed underwater for 13 hours and conducted four hours of high-definition observation of the sea floor. The operation also verified the vehicle's capabilities and reliability.

http://swissinnovation.org/newsChina/web/2018/04-180911-eb

Breaking Arctic Ice with New Research Vessel

(South China Morning Post, September 12)

China has launched its first home-made icebreaking vessel, a further step towards strengthening its exploration and research around the earth's poles. The Xuelong 2, or Snow Dragon II, was jointly designed by Finland's Aker Arctic Technology and a China State Shipbuilding Corporation (CSSC) institute. Construction began in 2016 at CSSC's Jiangnan Shipyard in Shanghai. The vessel features powerful propellers on both prow and rear, making it the world's only polar research boat vessel that can break ice while going forwards or backwards. Its power, speed, and on-board research equipment add up to a significant upgrade on the original Xuelong, which was bought from Ukraine in 1994 and upgraded in 2013, after a refit in 2007.

http://swissinnovation.org/newsChina/web/2018/04-180912-b8

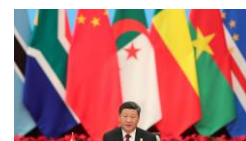## AI Plots Future of Smart Cities

(Xinhua, September 13)

An ambulance rushes through the streets of Hangzhou and reaches the scene of an emergency without meeting any obstacles for almost 7 km and no red lights. The ambulance was assisted by "City Brain," an artificial intelligence (AI) platform that improves city management. It works on the city's 128 crossroads. The AI technology of City Brain is being promoted in five other Chinese cities, and in Singapore and Malaysia. The trials show it can almost halve ambulances and fire engine journey times. City Brain will be able to process power and water supply data in order to save resources and improve efficiency, according to Alibaba. China started piloting national smart city development in 2012 to encourage use of new technologies, such as AI and Internet-of-Things (IoT), to help traffic flows, improve law enforcement and make public buildings more energy efficient.

http://swissinnovation.org/newsChina/web/2018/04-180913-29

Leaders Are Softening Their Stance on AI

(MIT Technology Review, September 18)

A year after announcing an aggressive plan to dominate AI, China's vice premier Liu He has called for international collaboration. At the World Artificial Intelligence Conference, he said that AI would depend heavily on international cooperation. President Xi Jinping delivered a similar message in a letter presented at the same conference. This new, softer approach to AI comes just over a year after the government announced an ambitious and aggressive AI plan. China's ambitions and progress to date have led to talk of an artificial-intelligence arms race with the US. In fact, the technology is largely a product of collaboration among researchers from around the world. In the future, the impact of AI could indeed be defined by rivalries between big US and Chinese companies. The influence of China's tech industry is growing internationally as its companies export AI to other parts of the world through cloud computing services.

http://swissinnovation.org/newsChina/web/2018/04-180918-85

Cybersecurity in Digital Era Requires Technological Innovation

(Xinhua, September 18)

Maintaining cybersecurity in the era of the digital economy requires more technological innovation, according to experts at a summit on cybersecurity technologies recently held in Chengdu. Old measures like antivirus software, firewalls, and intrusion detection systems are no longer equal to handling targeted attacks, and can easily be manipulated by attackers, said Shen Changxiang, a researcher at the Chinese Academy of Engineering. "We should proactively stay immune and resort to trusted computing, using codes as the genes to timely identify the elements in the network," he said. "It's like raising the immunity of the network information system, which is our only way out." According

to Zheng Junfang, chief risk officer at Alibaba, new approaches and technologies should be applied to "defend by attacking," as Alibaba is exploring cutting-edge security technologies such as algorithmic defense and artificial intelligence.

http://swissinnovation.org/newsChina/web/2018/04-180918-aa

Beipanjiang Set Guinness Record as Highest Bridge Worldwide

(China Daily, September 20)

Beipanjiang Bridge, located on the border of the two provinces Guizhou and Yunnan, was recognized by the Guinness World Records as world's highest bridge. The bridge soars 565.4 meters above the Beipanjiang Grand Valley, the height equivalent to a 200-floor skyscraper. The cable-stayed suspension bridge has a largest span of 720 meters, the second-largest in the world. The complicated geological conditions made it difficult to build the bridge but gave birth to technological advancements during the construction, including four patents for invention and seven patents for utility model. In May, the Beipanjiang Bridge won the Gustav Lindenthal Medal, dubbed "Nobel Prize in the bridge construction", at the 35th International Bridge Conference held in Maryland, US.

http://swissinnovation.org/newsChina/web/2018/04-180920-6a

Launch of Twin BeiDou-3 Satellites

(China Daily, September 20)

Recently, twin BeiDou-3 navigation satellites were successfully sent into space on a single carrier rocket. The Long March-3B carrier rocket lifted off from the Xichang Satellite Launch Center at 10:07 pm. It was the 285th mission of the Long March rocket series. The twin satellites are the 37th and 38th editions of the BeiDou navigation system. After a series of tests and evaluations, they will work together with 12 BeiDou-3 satellites already in orbit. The twin satellites will provide danger alerts and navigation services for global users. A basic system with 18 orbiting BeiDou-3 satellites will be in place by the end of the year, which will serve countries participating in the Belt and Road Initiative.

http://swissinnovation.org/newsChina/web/2018/04-180920-a9

5. Energy / Environment

Degradable Plastic

Scientists have developed a plastic that degrades in seawater and could help curb the increasingly serious plastic pollution in the oceans. The new polyester composite material can decompose in seawater over a period ranging from a few days to several hundred days, leaving small molecules that cause no pollution, said Wang Gexia, a senior engineer at the Technical Institute of Physics and Chemistry of the Chinese Academy of Sciences. "For a long time, people focused on 'white pollution' on land. Plastic pollution in the seas only caught people's attention when more and more reports about marine animals dying from it appeared in recent years," said Wang. The scientists combined non-enzymic hydrolysis, water dissolution and biodegradation processes to design and invent the new material.
http://swissinnovation.org/newsChina/web/2018/05-180905-d4

New Fungi Species

More than 2,000 new species of fungi were discovered in 2017, but more than 2 million are still unknown to science. That is according to the first ever report on the state of the world's fungi compiled by Royal Botanic Gardens Kew in the United Kingdom, highlighting the importance of fungi to life on earth. "China is leading in the discovery of new fungal species with 362 found in 2017," said Rui Fang, research scientist at Kew and lead author on the China focus chapter. The report found that there are 1,789 edible and 798 medicinal fungi from China. The country is the largest edible mushroom producer in the world, producing 38.42 million metric tons annually, 75% of the global output.
http://swissinnovation.org/newsChina/web/2018/05-180912-16

China to Further Promote Non-fossil Fuel Energy

China, which already has the world's largest installed capacity of wind and solar power, should continue decreasing its reliance on coal and increasing investments in clean energy toward a low-carbon world, said Lin Boqiang, director of the China Center for Energy Economics Research at Xiamen University, during the Summer Davos Forum in Tianjin on Wednesday. China has launched the world's largest carbon market. The concept of ecological civilization has become the core tenet of China's development strategy and it is believed this will inspire a new wave of environmental leadership across the globe.
http://swissinnovation.org/newsChina/web/2018/05-180919-bd

Ambitious Plan Against Air Pollution in Beijing

(China Daily, September 19)

Authorities in Beijing have released an ambitious plan for reducing days with heavy air pollution by 2020 - at least 25 percent from 2015 levels - by increasing green transportation and curbing kicked-up dust. While generally lauding the plan, which is tailor-made for the capital based on its major air polluting sources, experts warned of the difficulties of achieving further air quality improvements in the city because of the change in major pollution contributors to more challenging types. The capital plans to reduce the average concentration of PM 2.5 particulate matter, which poses health dangers, in its urban areas to 52 micrograms per cubic meter by 2020.

http://swissinnovation.org/newsChina/web/2018/05-180919-40

World's First AP1000 Nuclear Reactor Ready in China

(South China Morning Post, September 20)

China will soon be ready to start commercial operations of the world's first next-generation AP1000 nuclear reactor, possibly setting off a renewed push by the country into atomic power after years of delays and billion-dollar cost blowouts. The No 1 reactor at the Sanmen power plant, designed by Westinghouse Electric Company, is expected to be ready for commercial operations on Friday after completing a 168-hour test run, Shanghai-listed China National Nuclear Power Company said in a statement to the stock exchange Thursday. It did not say when the unit, in east China's Zhejiang province, will officially enter commercial power production.

http://swissinnovation.org/newsChina/web/2018/05-180920-28

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

New Wound Dressing Material

(Xinhua, September 03)

A wound dressing is essential for skin wound healing, and designing wound dressing materials with antibacterial properties, therapeutic effects and suitable mechanical properties has practical significance in health care. Hydrogel wound dressings have gained popularity in recent years, but they have shortcomings such as an inability to fit the skin and a lack of antibacterial properties. Researchers with Xi'an Jiaotong University have designed a self-healing, injectable hydrogel that has multiple functions as a wound dressing, especially for joint skin damage. With high adhesion, the hydrogel can quickly seal wounds of any shape and bonds with the wound's edge, providing a physical barrier against contaminants while simulating moist skin conditions. The hydrogel can help stop bleeding and

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prevent wound infection, promoting rapid healing of the wound. Also, the skin-like material exhibits stretchable and compressible properties, which significantly reduce the discomfort associated with traditional wound dressings.

http://swissinnovation.org/newsChina/web/2018/06-180903-c0

Challenging Classical Photoconductor Gain Theory

(Shanghai Jiao Tong University, September 10)

The classical photoconductor gain theory is challenged with newly-discovered mistakes, according research findings from the University of Michigan-Shanghai Jiao Tong University Joint Institute. The classical photoconductor gain theory has been written in the standard semiconductor physics textbooks and widely accepted by the science community since 1950s. The researchers not only pointed out what is wrong with the classical gain theory (two assumptions are invalid), but also strictly derived the correct gain theory following Ohm's Law. They found that a perfect photoconductor has no gain or at least no high gain. This research work will rewrite the related sections in the classical textbooks on semiconductor physics and devices.

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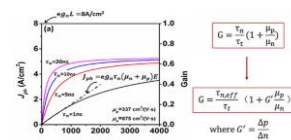
Rare Earth Sector Upgrade

(China Daily, September 11)

Two to three of China's six rare earth groups are to take the lead in evolving into major deep-processing companies, as the nation promotes efforts to raise the overall quality of its rare earth industry, said the Vice-Minister of Industry and Information Technology. China's rare earth industry is on a healthy development track, but continuous efforts are still required to optimize the industry's structure, and realize high tech-driven development. Rare earths are a group of minerals that have many uses in high-tech sectors such as defense and renewable energy. China is the world's largest rare earth producer and exporter, but the industry is beset by problems including illegal mining, smuggling and its lack of ability to produce high value-added products. The authorities have imposed rare earth output quotas since 2010 to protect the limited resources and reduce the environmental costs of production.

http://swissinnovation.org/newsChina/web/2018/06-180911-ee
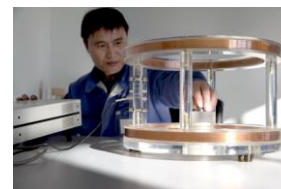
Mechanism and Dynamics of Hydrodynamic-Acoustic Cavitation

(Chinese Academy of Sciences, September 17)

Cavitation usually refers to the generation of cavities and the subsequent dynamic behaviors when a liquid suffers from a sufficient pressure drop. According to the mode of production, cavitation can usually be divided into acoustic cavitation, hydrodynamic cavitation, light cavitation and particle cavitation. The method of combining the ultrasonic cavitation and hydrodynamic cavitation taking place simultaneously in the same space, named hydrodynamic-acoustic-cavitation (HAC), can make full use of the advantages of the two kinds of cavitation to maximize the extent of hydroxyl radial generation. Researchers from the Institute of Acoustics of the Chinese Academy of Sciences explored the mechanism and dynamics of hydrodynamic-acoustic cavitation systematically. They found that compared with hydrodynamic cavitation or acoustic cavitation individually, HAC has significantly widened the range and enhanced the strength of cavitation, which may overcome the shortcomings of scale limitation of ultrasonic cavitation and low intensity of hydrodynamic cavitation.

http://swissinnovation.org/newsChina/web/2018/06-180917-eb

7. Economy, Social Sciences & Humanities

Digital Innovation Adds Vitality to Cultural Heritage

(Xinhua, September 15)

By wearing virtual reality glasses and operating hand-held controllers, visitors can "walk" into the Mogao Grottoes and get a dynamic 360-degree panorama image of the sculptures and murals inside. This system is based on a high-definition virtual reconstruction of the current state of Cave 159 of the Mogao Grottoes in Dunhuang. It is part of the projects on show in the exhibition "Renaissance of Traditional Culture" held at Tsinghua University recently. The exhibition features digital innovations of Chinese cultural heritage conducted by teachers and students from the Academy of Arts and Design, Tsinghua University. Lu Xiaobo from Tsinghua University said the digital representation of the Mogao Grottoes is also part of a national-level research project. The project involves large-scale historical research as well as on-the-spot investigation.

http://swissinnovation.org/newsChina/web/2018/07-180915-4e

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8. Corporates / Startups / Technology Transfer

World's Most Powerful Telescope

(South China Morning Post, September 06)

China is keen to play a bigger role in a multinational project to create the world's largest radio telescope, which it is hoped will provide scientists with a greater understanding of the universe and clues to its origins. The Square Kilometre Array (SKA) is being developed as a collaborative project involving hundreds of scientists from around the world. Set to be developed in two stages, once completed it will feature about 3,000 massive dishes – located in dual sites in Australia and South Africa – and have a combined collecting area of more than a square kilometer. China is one of 12 members of the SKA Organisation – which coordinates the project from its headquarters at the Jodrell Bank Observatory in northern England – and is leading the design and construction of many of the components for the South African array.

http://swissinnovation.org/newsChina/web/2018/08-180906-42

DeepBlue Technology and Luxembourg LHoFT Set up Joint AI Labs

(Xinhua, September 13)

DeepBlue Technology, a leading artificial intelligence firm in China, and Luxembourg LHoFT, a fintech hub, recently signed an agreement open three joint labs in Luxembourg. The joint labs will focus on mutual openness and cooperation between China and Europe in the fields of basic research and application of AI. Anderson Chen, founder and CEO of DeepBlue Technology, said he is looking forward to establishing more partnership with other European countries in the near future. DeepBlue Technology also signed an agreement with its four strategic partners, PwC, KPMG, Farvest and Telindus to enhance cooperation and innovation of AI in China and Europe.

http://swissinnovation.org/newsChina/web/2018/08-180913-13

International Tech Giants to Establish AI Centers in Shanghai

(China Daily, September 18)

Microsoft, Amazon, Alibaba, and several other international tech giants announced to establish AI-related innovation centers and research institutes in Shanghai at the on-going World Artificial Intelligence Conference 2018. Chinese tech companies including Alibaba and Baidu also announced plans to establish AI innovation centers in Shanghai. Baidu will establish its Shanghai innovation center, developing over 110 AI projects. Sense Time Group, a Chinese AI company, is developing its new supercomputing center in Shanghai, which will have a computation power of more than 500 petaflops (a petaflop is 1,000 trillion) per second. Shanghai has been accelerating the development of the AI

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industry. AI-related industries in Shanghai have scaled up to 70 billion yuan (10.3 billion US dollars) by July this year, according to Shanghai's Municipal Commission of Economy and Information.
http://swissinnovation.org/newsChina/web/2018/08-180918-62

Alibaba Sets up Company to Make Customized AI Chip

(Yahoo Finance, September 20)

Alibaba is reportedly setting up its own company to make a customized artificial intelligence chip for its fast-growing cloud and internet businesses. The e-commerce giant aims to launch its first self-developed AI inference chip in the second half of 2019. It could be used for autonomous driving, smart cities and logistics, Alibaba announced recently, according to Reuters. Alibaba is in "a unique position to lead real technology breakthroughs in disruptive areas, such as quantum and chip technology" due to its advantages in algorithms and data, Alibaba Chief Technology Officer Jeff Zhang said, according to CNN..
http://swissinnovation.org/newsChina/web/2018/08-180920-04

Acoustics Tech Startup SoundAI Unveils AI Sound Box Lamp

(Xinhua, September 20)

Acoustics technology start-up SoundAI has teamed up with Internet giant Baidu to roll out a smart sound box solution built on AI technologies. Equipped with the company's smart voice interaction system, the AI sound box is also an intelligent lamp capable of offering a wide range of shades and light colors. The gadget integrates Baidu's AI voice control system DuerOS, enabling smart services such as playing music, reading audio books and turning on or off home appliances, with a voice interaction process that takes less than two seconds. Founded in 2016, SoundAI develops sonic technologies focusing on acoustics, including far-field voice interaction and real-time communication technologies, to support AI technology applications. The company's technology has been used in Alibaba's Magic Box, Qihoo 360's smart camera and Baidu's and Xiaomi's AI speakers.
http://swissinnovation.org/newsChina/web/2018/08-180920-90

Western Brands Need to Adopt New Strategies

(CNN Money, September 25)

Where American or European companies could once expect to find an enormous market hungry for their products, changing tastes and the challenge from new Chinese rivals are forcing them to adopt new strategies to succeed in the world's second biggest economy. Coca-Cola is one of the top companies that's having to adapt to this new reality. Coke has launched more than 30 new drink brands in China in the past six months and now has about 275. They range from regular Coke to more

exotic varieties with flavorings like yellow bean and apple fiber. Coke even has its own line of teas in China. Starbucks learned the difficulties of shifting Chinese consumer habits the hard way, global car makers are scrambling to keep pace with changes in China's auto market and also Apple is facing fierce competition from Chinese players.

http://swissinnovation.org/newsChina/web/2018/08-180925-cb

9. Bilateral News

Increased Exchange Opportunities

(University of Zurich, September 10)

Ties between the University of Zurich and Shanghai Jiao Tong University in China have become stronger with the signing of a university-wide agreement. The agreement in particular supports student exchanges between the two universities. Michael Hengartner, President of the University of Zurich, and Lin Zhongqin, President of Shanghai Jiao Tong University, met at swissnex China in Shanghai on 7 September to sign a new exchange agreement. The agreement extends the already existing cooperation between the University of Zurich Institute of Banking and Finance and the Shanghai Advanced Institute of Finance to a university-wide level. The signing ceremony was attended by Swiss education minister Johann Schneider-Ammann as well as an official delegation of the Swiss State Secretariat for Education, Research and Innovation and representatives of the two universities.

http://swissinnovation.org/newsChina/web/2018/09-180910-de
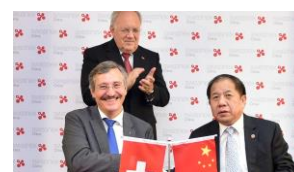
Doctorate of Advanced Professional Studies

(University of Geneva, September 25)

The University of Geneva has joined forces with Tsinghua University, one of China's most prestigious universities, to create a doctorate of advanced professional studies in finance in the field of wealth management, for which it assumes scientific responsibility. This pilot project is designed primarily for Chinese entrepreneurs or company directors with a master's degree and at least five years' professional experience, but it is also open to candidates coming from Switzerland. The ten course modules take place in Beijing with half of the teachers coming from University of Geneva and half from Tsinghua University, they are given in English with simultaneous translation into Mandarin, and supported by bilingual materials. They are part of a three-year curriculum, during which the doctoral student's professional thesis is systematically co-directed by a University of Geneva professor and a Tsinghua University professor.

http://swissinnovation.org/newsChina/web/2018/09-180925-79

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1st China-Europe Talent Forum Held in Zurich

(Xinhua, September 26)

The first China-Europe Talent Forum was recently held in Zurich. It was jointly hosted by the Chinese embassy in Switzerland and the Swiss Adecco Group. Geng Wenbing, Chinese ambassador to Switzerland, said at the forum that since the beginning of the 21st century, talent has become the key factor for the development of all countries and business. After 40 years of reform and opening up, China's economy, now shifting from high-speed growth to high-quality development, is at a key phase of changing patterns, optimizing economic structure, and transforming growth momentum. The forum aims to promote the exchange and integration of all talent by building an open, pragmatic and future-oriented Sino-European talent exchange platform that will help Chinese enterprises operating in Europe actively participate in international cooperation.

http://swissinnovation.org/newsChina/web/2018/09-180926-8f

10. Calls for Grants/Awards

Call: The Robert H. N. Ho Family Foundation Greater China Research Grant 2018

(Asia Art Archieve, September 30)

Asia Art Archive is calling for proposals for The Robert H. N. Ho Family Foundation Greater China Research Grant. With support from The Robert H. N. Ho Family Foundation, the grant offers one-year fellowships to study AAA's Collection and develop historical research projects on topics relating to contemporary art in Chinese communities worldwide. Applicants can develop research proposals that explore specific periods of time, themes, or phenomena in contemporary art from a broad Chinese context, and propose their own topics. Eligible Applicants are postgraduates (including pre-doctoral fellows) with a research focus on contemporary art or Greater China studies, and independent scholars and writers with solid research and publication track records. The selected projects are expected to begin in March 2019 and conclude by March 2020. Application deadline is November 18, 2018

http://swissinnovation.org/newsChina/web/2018/10-180930-22
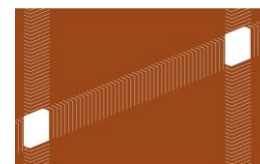
Upcoming Science and Technology Related Events

Huawei Connect 2018

October 10-12, 2018

https://is.gd/KWyvW1

AI, Strategies, Solutions, Challenges

Shanghai

Sino-Swiss Talk – Higher Vocational Education Forum

October 13, 2018

https://is.gd/mcnYmb

Vocational Education

Shanghai

CEIBS Insights 2018 | The 4th Europe Forum

October 24, 2018

https://is.gd/iaR7tB

Smart Healthcare

Zurich

ICBDR 2018

October 27-29, 2018

http://icbdr.org/

International Conference on Big Data Research

Weihai

Swiss Pavilion, China International Import Expo CIIE

November 5-10, 2018

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

International Import Exhibition

Shanghai

Money 20/20

November 14-16, 2018

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

FinTech, Future of Money

Hangzhou

OpenTech Summit

November 30-December 2, 2018

https://opentechsummit.cn/

Startups, OpenTech, AI, Blockchain

Shenzhen

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