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Science China Newsletter, October 2018

Trends in education, research, innovation and policy

Beijing, China

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Swiss Spotlight

Scientist: Biodiversity–Ecosystem Functioning Relationships

(Bernhard Schmid, October 31)

Bernhard Schmid received his PhD at the Institute of Systematic Botany at University of Zurich and later worked at Harvard University (Cambridge), the University of Basel and University of Zurich. He used to be a member of the Research Council, Division III, at the Swiss National Foundation. Bernhard Schmid was several times a visiting professor at different foreign universities and is a guest professor at Peking University since 2009. He was Vice Dean and then Dean of the Faculty of Science at University of Zurich. Currently, he spends most time at the Department of Geography of the University of Zurich or with colleagues in China, working on topics of Global Change, Biodiversity and Ecosystem Science. Major recent contributions from his side concern the relationship between plant species richness and ecosystem functioning. Recently, an international research team he is part of published two papers showing that species-rich forest ecosystems are more productive and can store more carbon than less diverse ones. The new results imply that mixed-species afforestations would be twice as effective as the currently planted monocultures in combating global warming.

http://swissinnovation.org/newsChina/web/2018/00-181031-d9

Startup: Addressing Unmet Medical Need in Cancer Treatment

(Cellestia, October 31)

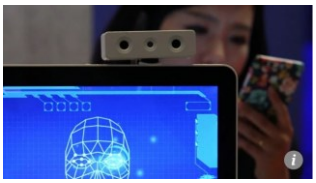
Cellestia is a privately-owned clinical stage biopharmaceutical company located in Basel and Lausanne developing innovative first-in-class anti-cancer drugs originated from its unique discovery platform. Their clinical stage lead compound CB-103 is an oral small molecule protein-protein interaction inhibitor, acting as selective oncogene transcription factor inhibitor for therapy of NOTCH positive cancers. CB-103 combines exceptional potency, selectivity, safety and expectation of clinical efficacy based on previous NOTCH targeting agents, while overcoming the limitations of these due to its unique Mode of Action. The development is accompanied by a diagnostic program for patient selection. The Cellestia Management Team brings a unique blend of research, pharma drug development and business expertise. In addition, high-profile strategic advisors have been engaged. Cellestia cooperates with leading scientists and internationally recognized clinical oncologists from renowned oncology hospitals. This year Cellestia's CSO, Dr. Rajwinder Lehal, was part of the Venture Leaders China 2018, which offers 10 startups exposure and insight into the Chinese market.

http://swissinnovation.org/newsChina/web/2018/00-181031-04

1. Policy

Need for Cooperation in the AI Development Plan

(South China Morning Post, October 01)



Although the US had a head start, AI has assumed a key role in Beijing's 'Made in China 2025' master plan, which promises to lift the country's industries up the value chain, replacing imports with local products and building global champions able to take on Western giants in cutting-edge technologies. But An Hui, director of Information Industry Research Institute at CCID Wise, cautions against blind optimism and hype. "AI is borderless, whether it's research, investment or industry collaboration," said An. "Mentioning the US in our AI development plans does not mean it's a direct rival – instead, we must learn from the US, from each other."

http://swissinnovation.org/newsChina/web/2018/01-181001-09

China Issues Guideline on Improving Infrastructure

(Xinhua, October 31)

The State Council has released a guideline on strengthening the country's infrastructure. "The country should further improve infrastructure and public services, raise infrastructure quality and make better use of the key role of effective investment in optimizing supply structure," according to the guideline made public Wednesday on the government's website. Focus should be put on major areas of weakness including poverty relief, railways, roads, waterways, airports and energy, and existing planned projects should be stepped up, it said. The country will enlarge its list of important infrastructure projects in key fields that need to be improved, step up preparatory work and the start of such projects and ensure projects under construction can be completed.

http://swissinnovation.org/newsChina/web/2018/01-181031-b6

Xi Values the Country's New Generation of AI

(Xinhua, October 31)

Xi Jinping, general secretary of the Communist Party of China (CPC) Central Committee, has stressed boosting the development of the country's new generation of artificial intelligence (AI). Presiding over a group study session of the Political Bureau of the CPC Central Committee on Wednesday, Xi spoke of the need to strengthen leadership, make good plans, clearly define tasks and consolidate the foundation to promote deep integration of AI with economic and social development. Xi said accelerating the development of new-generation AI is a strategic issue, key for China to seize the opportunities in the new round of technological revolution and industrial transformation.

http://swissinnovation.org/newsChina/web/2018/01-181031-ae

2. Education

Tsinghua Cooperates With Five Global Universities

(China Daily, October 18)

Tsinghua University signed strategic academic cooperation agreements with five top international universities on Thursday; a move aimed at further exploring innovative research and education collaborations across borders. The partnership program, which officially started in 2016, has included 48 projects in the fields of quantum computing, advanced manufacturing, smart city, biomedicine, new energy, international laws, etc. Both Tsinghua and its international partner school of each project provide seed grants for their projects. Joint lecturers are available to their students and academic papers are also co-written. Last year, about 36 joint papers were published and eight co-developed patents were issued in the first 29 projects.

http://swissinnovation.org/newsChina/web/2018/02-181018-11

Establishment of Westlake Univercity Marks New Model

(China Daily, October 22)

The founding of Westlake University, China's first private university aimed at cultivating high-level talent in advanced technology, marks a significant step in efforts to reform the higher-education sector and foster innovation, the Ministry of Education said. In a congratulatory letter sent for a founding ceremony on Saturday, the ministry said it hopes the university will focus on basic advanced scientific research and become a top higher-education institution with Chinese characteristics. The presidents of more than 50 universities attended the ceremony in Hangzhou, Zhejiang province, along with Nobel laureates Yang Zhenning, James Watson, Jean-Marie Lehn, Brian Kobilka and Fraser Stoddart. Shi Yigong, president of Westlake University, said the university aspires to become a pioneer in China's higher-education reform and a cradle of innovative talent in advanced science and technology.

http://swissinnovation.org/newsChina/web/2018/02-181022-c8

3. Life Sciences / Health Care

Mapping of Chinese Brains

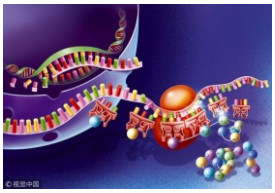
(China Daily, October 02)

Scientists are mapping Chinese people's brains to get a better understanding of how the influence of the Chinese language affects cognitive performance, as well as to learn more about the mechanisms behind cerebral disorders. Hospitals and universities in Shanghai and Shenzhen are the main participants in the joint study commissioned by the Shanghai Research Center for Brain Science and Brain-Inspired Intelligence. They will carry out clinical studies into brain development, cognitive learning processes and brain-related diseases, said Zhang Xu, vice-president of the Shanghai branch of the Chinese Academy of Sciences and executive director of the research center. Zhang said there has been scientific research demonstrating that the functional areas of the brain stimulated when speaking Chinese and English are different.

http://swissinnovation.org/newsChina/web/2018/03-181002-73

Gene Associated with Twin Pregnancy

(China Daily, October 12)



A genome study of more than 140,000 Chinese has found a gene locus associated with twin pregnancy. The largest of its kind for the Chinese population to date, the study was conducted by the Beijing Genomics Institute. The researchers analyzed two traits, maternal age and twin pregnancy, and found a mutation locus on gene NRG1 that is significantly related with twin pregnancy, meaning a woman has more probability to conceive twins if she carries a mutation on gene NRG1. Everyone has gene NRG1, but some people have mutation on a specific location on this gene, said Liu Siyang. Beijing Genomics Institute said it would invest more on the study and expand the samples to one million from the current 140,000, contributing to birth defects prevention and control, tumor study, and medicine research and development in China.

http://swissinnovation.org/newsChina/web/2018/03-181012-d1

Mice with Two Mothers

(China Daily, October 12)

Researchers at the Institute of Zoology under the Chinese Academy of Sciences produced healthy mice with two mothers that went on to have normal offspring of their own. They used stem cells and targeted gene editing to render same sex reproduction. Mice from two dads were also born but only survived for a

couple of days. In mammals, certain maternal or paternal genes are shut off during germline development by a mechanism called genomic imprinting, so that offsprings that do not receive genetic material from both a mother and a father might experience developmental abnormalities or might not be viable. The researchers managed to delete those imprinted genes from immature eggs to produce bi-maternal mice in the past. "However, the generated mice still showed defective features, and the method itself is very impractical and hard to use," said Zhou Qi.
http://swissinnovation.org/newsChina/web/2018/03-181012-21

Better Treatment for Liver Transplant Rejection

(ChinaDaily, October 15)

Rejection is the biggest problem of organ transplants. Immune suppressive drugs such as tacrolimus are directly administered to patients after their surgery for T-cell inhibition. However, direct oral administration of tacrolimus can result in severe side effects. Researchers at the University of Science and Technology of China and Nanjing Medical University have now developed a new treatment for liver transplant rejection. Cell experiments on rats have shown that tacrolimus encapsulated in two hydrogels when applied to the scar surface of the transplant has a better inhibition effect on the activated T-cells than free drug tacrolimus. Liver transplant experiments indicate that, with the same dose of tacrolimus, rat recipients in the gel group showed a significantly extended median survival time of 22 days, while the rats treated with conventional tacrolimus medication only had a median survival time of 13 days.
http://swissinnovation.org/newsChina/web/2018/03-181015-55

International Alliance on Biodiversity Established in China

(China Daily, October 15)

An international alliance to promote biodiversity and health big data sharing was established in Beijing, according to the Chinese Academy of Sciences (CAS) Monday. The Global Biodiversity and Health Big Data Alliance, based at the Beijing Institute of Genomics under the CAS, is an organization under a framework initiated by the International Union of Biological Sciences. Founding members are academic institutions from China, Pakistan, Russia, Saudi Arabia and Thailand. The alliance aims to construct a world-class biodiversity and health big data center containing a variety of data repositories and knowledge bases that are publicly accessible to worldwide communities.
http://swissinnovation.org/newsChina/web/2018/03-181015-9a

Methionine Supplementation to Enhance Reproductive Performance of Sows

(Chinese Academy of Sciences, October 18)

Fetal growth, survival and development are benchmarks for the production performance of sows. Maternal dietary nutrients during pregnancy, especially during late pregnancy, are found to improve the fetuses and support a higher fetal growth rate. Methionine has been shown to impact fetal protein mass and the transport of nutrients through the uteroplacental vasculature. To validate the hypothesis that different levels of maternal dietary methionine can change antioxidant capacities and thus fetal growth and development during the late gestation period, researchers in the Institute of Subtropical Agriculture of the Chinese Academy of Sciences evaluated the effects of dietary methionine, administered during the late gestation period, on the production performance of sows. The findings developed a reference for dosages of methionine supplements given during late gestation to improve the production performance and maintain the health of sows.

http://swissinnovation.org/newsChina/web/2018/03-181018-70

4. Engineering / IT / Computer Science

Beidou Navigation System Serves Tibet

(Xinhua, October 01)

Beidou, a domestically engineered satellite navigation system of China, started to serve its second largest provincial region of Tibet on Monday. A Beidou-supported information platform made a debut in Lhasa, capital of Tibet Autonomous Region. It is expected to provide services in disaster alert and relief, emergency rescue, transportation, agriculture, forestry, water conservancy, as well as targeted poverty reduction and smart travel. Tibet occupies about one eighth of China's land area with 3.17 million people. Beidou meets the urgent need from the sparsely populated region.

http://swissinnovation.org/newsChina/web/2018/04-181001-20

Large Amphibious Aircraft

(Xinhua, October 02)

A large amphibious aircraft, the AG600, recently completed its first taxiing at high speed on the water, according to China Aviation Industry General Aircraft Co. Ltd (CAIGA). The test at a speed of 145 kilometers per hour was carried out in the city of Jingmen in Hubei Province. CAIGA said that the AG600, codenamed Kunlong, was in stable condition and functioned normally during the test. Designed to be the world's largest amphibious aircraft, the AG600 is powered by four domestically built turboprop engines and has a range of 12 hours. It will be mainly used for maritime rescue,

fighting forest fires and marine monitoring. The aircraft has passed a series of tests since its maiden flight last December. It successfully finished eight taxiing tests on water at a speed of 80 km per hour and 120 km per hour.
http://swissinnovation.org/newsChina/web/2018/04-181002-2f

Lower-Limb Rehabilitative Robot

(Xinhua, October 08)

A lower-limb rehabilitative robot was developed by Avicrobot, a high-tech company focusing on service robot development and a subsidiary of the Aviation Industry Corporation of China. According to He Chen, general manager of Avicrobot, this robot integrates aviation technologies with traditional rehabilitation treatment. It can monitor patients in real time, which helps optimize rehabilitation therapy. It also uses flexible composite materials and 3D printing technology, allowing patients to customize it and use it to sit, stand, and walk. "The robot is about one-fourth cheaper than imported ones," He said. The robot has completely independent intellectual property rights including the appearance, the control method, and the software design. Avicrobot cooperated with Xijing Hospital in Xi'an to develop the robot. They jointly launched a rehabilitative robot research center, aiming to provide more data support for such robots.
http://swissinnovation.org/newsChina/web/2018/04-181008-33

China Launches Blockchain Pilot Zone

(China Daily, October 08)

China's first blockchain pilot zone was launched in South China's Hainan province Monday. Based in Hainan Resort Software Community (RSC), the zone includes a blockchain research institute, which officially opened Monday and was jointly established by RSC and University College Oxford Blockchain Research Centre at Oxford University. A blockchain institutional innovation center will also be launched by RSC in collaboration with Renmin University. The technology now has a wide range of applications in China, including in finance, credit reporting, smart manufacturing and supply-chain management, according to China's Ministry of Industry and Information Technology.
http://swissinnovation.org/newsChina/web/2018/04-181008-a3

3D Printed Origami Makes Expandable Load-Bearing Structures

(physics world, October 11)

Origami has inspired the design of structures with unique properties, finding a huge range of potential uses, including soft robots and stretchable electronics. Researchers from Georgia Institute of Technology and Peking University have found a way of directly building reconfigurable origami assemblages. They used a 3D printing technique to fabricate structures comprised of combinations of individual origami units, without the need for any additional assembly step. The analogous paper structure would require sticking together multiple sheets, and a lengthy and tedious step-by-step construction. The team could design these structures to have different load-bearing capabilities by altering the way the individual origami units are connected. This is crucial for engineering applications. One structure was capable of supporting a load 100 times the weight of the structure itself.

http://swissinnovation.org/newsChina/web/2018/04-181011-09

AI-Powered Lab to Support Aviation Sector

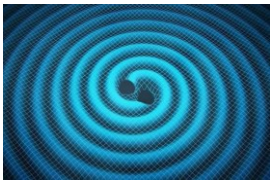
(China Daily, October 12)

The first algorithms laboratory for the aviation sector in China was recently jointly launched by Tongji University and Xiamen Airlines in Shanghai. The two parties expect the lab to play a key role in utilizing artificial intelligence to solve problems and improve the overall efficiency of the industry. The lab, which is situated within the campus of Tongji University, will have about 20 permanent researchers from Tongji University and Xiamen Airlines. "In the past few years, the rapid development of the aviation sector has led to a growing density of flights and an increasingly complex airlines network which makes it more difficult than ever for management by human," said Wang Hongjian, chief information officer of Xiamen Airlines.

http://swissinnovation.org/newsChina/web/2018/04-181012-4b

Satellite for Space-Based Gravitational Wave Detection

(China Daily, October 15)



China plans to launch its first satellite to test the technologies of the space-based gravitational wave detection program "Tianqin" by the end of 2019. The program Tianqin, meaning "harp in sky," was initiated by Sun Yat-sen University in Guangdong province in 2015. It will consist of three satellites forming an equilateral triangle around the earth. "It's like a harp in space. If the gravitational waves come, the 'harp's strings" will be plucked," said Luo Jun, president of the Sun Yat-sen University and an

academician of the Chinese Academy of Sciences. The detection will be based on high-precision laser interferometry technology to measure the changes of the distances and locations of the three satellites.
http://swissinnovation.org/newsChina/web/2018/04-181015-c6

Nanogenerator to Power Wearable Electronics

(China Daily, October 16)

Wearable electronic devices often require frequent charging or replacement of batteries. How to provide environmentally friendly and sustainable electrical energy to these wearable electronic devices has become an urgent problem needing to be solved. At the same time, the flexibility, comfort and washability of wearable power supply devices are also particularly important. Scientists at Zhengzhou University have developed a washable and wearable nanogenerator based on hydrophobic nanofiber. It has a woven structure and can be attached to clothes to convert the mechanical energy generated by human activities into electrical energy. This washable nanogenerator with its woven structure has provided new opportunities for the development of self-powered wearable electronics.
http://swissinnovation.org/newsChina/web/2018/04-181016-4b

Commercial Drone Feihong-98 Completes Test Flight

(China Daily, October 17)

A large commercial drone developed by the China Academy of Aerospace Electronics Technology recently made a successful test flight at Baotou test site in Inner Mongolia autonomous region. Feihong-98 (FH-98) is now the world's largest unmanned transport aircraft, with a maximum payload of up to 1.5 tons. It was adapted from the prototype of the Shifei Y5B, a China-developed transport plane. The FH-98 has a maximum takeoff weight of 5.25 tons, a maximum capacity of 1.5 tons and 15 cubic meters, a flight height of 4,500 meters, a cruising speed of 180 kilometers per hour, and a maximum range of 1,200 kilometers. With a takeoff and landing distance of 150-meters, FH-98 only needs a simple runway to complete takeoffs and landings.
http://swissinnovation.org/newsChina/web/2018/04-181017-ea

Space Telescope to Search for Dark Matter

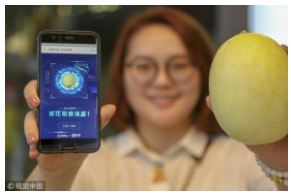
(China Daily, October 18)

Scientists and space engineers from Chinese mainland and Hong Kong are working together on a space telescope to search for the mysterious dark matter in galaxy clusters about 300 million light years away. It is a joint project of the University of Hong Kong (HKU), Nanjing University, Beijing Institute of Space Mechanics and Electricity under the China Academy of Space Technology and two commercial space

companies in Beijing. The space telescope, with a detector like the eye of a lobster, has been named HKU No.1, and is expected to be sent into space in 2019.
http://swissinnovation.org/newsChina/web/2018/04-181018-a4

AI Identifies Sweetness of Melons

(China Daily, October 19)



At a muskmelon store in Hainan Province, customers can use artificial intelligence technology to measure the sweetness of the melons on offer. Each muskmelon on display has its own certificate that indicates its level of sweetness, ranging from 90%, to 70%, to half-ripe. The measure of sweetness listed on the certificate is based on an AI-assisted add-on inside the popular Alipay payment app. Customers can upload a picture of a melon into the Alipay add-on, which then provides a report about its sweetness and ripeness. Developed by Aliyun, Alibaba's cloud computing and AI subsidiary, the Alipay add-on relies on an AI algorithm trained on more than 150,000 pictures of muskmelons with differing levels of ripeness. Its accuracy is said to be above 90%.
http://swissinnovation.org/newsChina/web/2018/04-181019-16

Microsoft's First VR/MR Incubator

(ChinaDaily, October 21)

US tech giant Microsoft recently signed a Memorandum of Understanding (MoU) to locate its incubator project centering on virtual reality (VR) and mixed reality (MR) in Nanchang, east China's Jiangxi Province. The VR/MR incubator, the first of its kind of the company, aims to usher in and nurture innovative enterprises in the fields of VR/MR. Teng Wen, vice president of Microsoft's greater China region, invited global VR/MR firms to join the project. He said VR/MR companies, projects, expertise and investments are congregating in China and in Jiangxi, which has launched an industrial base for VR technologies, the country's first of its kind.
http://swissinnovation.org/newsChina/web/2018/04-181021-f0

Next-Generation Exascale Computer

(ChinaDaily, October 23)

A third prototype exascale computing machine, the next-generation supercomputer, was recently launched according to its developer Dawning Information Industry Co. Ltd. The Shuguang exascale computer is expected to be put into operation in national supercomputing centers in Shanghai and Shenzhen. An exascale computer is able to execute a quintillion calculations per second. In China,

prototypes are being developed by three teams led by the National Research Center of Parallel Computer Engineering and Technology (NRCPC), Dawning Information Industry, and the National University of Defense Technology (NUDT). With Shuguang's launch, the three developers have all launched prototype exascale computing machines, marking a further step toward China's successful development of the next-generation supercomputer.
http://swissinnovation.org/newsChina/web/2018/04-181023-4d

World's Longest Mega Bridge

(South China Morning Post, October 24)

President Xi Jinping opened the world's longest sea crossing recently, holding up the new Hong Kong-Zhuhai-Macau Bridge as a showpiece of Chinese power, ambition and innovation. Xi expressed hope that the mega project would facilitate his Greater Bay Area initiative as he officiated at the opening ceremony for the 55km bridge, which was now opened to public traffic after a two-year delay. The mega bridge, which puts the three cities it links within an hour's drive of one another, is slated to further integrate the two special administrative regions with southern China and boost business. Hong Kong invested US$ 15.4 billion in it.
http://swissinnovation.org/newsChina/web/2018/04-181024-b1

Landspace Fails to Reach Orbit with Milestone Private Chinese Launch

(SpaceNews, October 28)

Landspace suffered an issue with the third stage of its Zhuque-1 solid launch vehicle Saturday as it bid to become the first Chinese private launch company to reach orbit. The launch was China's 30th of 2018 and the first to fail to reach its intended orbit. The previous failure took place in July 2017 with a first-stage engine failure afflicting the second Long March 5, delaying major lunar exploration and space station missions. The Zhuque-1 orbital launch attempt was the first by a Chinese firm, following a government decision in late 2014 to open the space sector to private capital in the spheres of launch vehicles and small satellites.
http://swissinnovation.org/newsChina/web/2018/04-181028-03

5. Energy / Environment

Using Sunlight to Split Water Molecules

(China Daily, October 04)

Hydrogen is used as a fuel for spacecraft and in some ground transport vehicles. The element is abundant on earth in compounds such as water and fossil fuels, however it is rarely found in its pure form. Current industrial methods of hydrogen production have significant drawbacks. Hydrogen can be separated from oxygen via electrolysis, which involves passing an electric current through water, but this process is energy intensive. Researchers from the University of Liverpool, University College London and East China University of Science and Technology have synthesized a new organic material that works with sunlight to separate water into its constituent elements, oxygen and hydrogen. This breakthrough could lead to an abundant clean energy source for the future.
http://swissinnovation.org/newsChina/web/2018/05-181004-22

Manure Application May Lead to Nitrous Oxide Emission Increase

(Chinese Academy of Sciences, October 08)

Nitrous oxide, a major scavenger of stratospheric ozone, is a key member of the greenhouse gas family. It is estimated that 30% of nitrous oxide in the atmosphere is the result of human activity. In a field experiment in northwestern China, researchers from the Xinjiang Institute of Ecology and Geography of the Chinese Academy of Sciences found that manure increased cumulative N2O emission by 30-188%, compared with urea-only and 50/50 mix of urea and manure applications in the test cotton fields. "These results suggest a potential risk of manure application to increase N2O emission for irrigated crop production in soils with low soil organic matter and under dry climate," said Gao Xiaopeng. Greater N2O emission with manure application was mainly attributed to the increased rates of nitrification and denitrification through the manure's increased supply of carbon for associated microbes.
http://swissinnovation.org/newsChina/web/2018/05-181008-eb

Nation Leads World in Decarbonization

(China Daily, October 10)

China registered a higher rate of decarbonization than any of the world's major economies for the second year running, according to a new report published by London-based consultancy PwC. China reduced its carbon intensity by 5.2 percent in 2017, PwC, also known as PricewaterhouseCoopers, found in its annual Low Carbon Economy Index of G20 members. Carbon intensity rates are measured by

comparing greenhouse gas emissions with a nation's energy demand and gross domestic product. While emissions levels in China actually rose by 1.4 percent last year, this increase was low in comparison to a high GDP growth rate of 6.9 percent and an increase in energy demand.
http://swissinnovation.org/newsChina/web/2018/05-181010-39

Chinese Scientists Monitor Tropic State of Global Inland Waters

(China Daily, October 11)

Chinese scientists have developed a new remote sensing approach to assess the trophic state of global inland waters. Scientists from the Key Laboratory of Digital Earth Science under the Chinese Academy of Sciences assessed the trophic states of 2,058 large inland water bodies distributed around the world using remote sensing data in the summer of 2012. In recent decades, the eutrophication of inland waters has become a global environmental issue. Some lakes overly enriched with minerals and nutrients have induced excessive growth of plants and algae, resulting in oxygen depletion of the water body.
http://swissinnovation.org/newsChina/web/2018/05-181011-ea

Beer Threatened by Climate Change

(Quartz, October 15)

A team of researchers led by Peking University modeled the impact that barley-supply shocks in four different climate scenarios would have on the price of beer in some of the world's most notoriously beer-guzzling countries. The study found that, globally, beer prices are likely to rise by 15% during extreme droughts in the best case and 100% in the worst case. But their findings vary widely by country. Ireland, for example, is predicted to be one of the most affected countries; there, beer prices could rise by nearly 300% under the worst conditions. The authors also modeled which countries would cut back their consumption the most in response to global beer shortages. They predict that the sharpest drops would occur in the countries with the highest per-capita beer consumption: Ireland and the Czech Republic.
http://swissinnovation.org/newsChina/web/2018/05-181015-d2

National Strategy of Making Potato as Staple Food

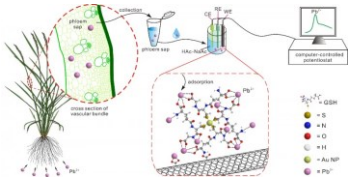
(Shanghai Jiao Tong University, October 18)

The Potato Engineering Technology Center of Shanghai Jiao Tong University has a food processing research team specialized in making photo and coarse cereals as staple food. The team is experienced in the basic theory and industrialization research of the nature,

processing, preservation and storage of potato starch and its functional factors. Since 2015, the center has actively undertaken the technical support work for making potato as staple food in Shanghai and has made significant progress. The team will be also engaged in the research work related to modern processing technology, modern storage and logistics technology and modern packaging technology. In-depth study of post-harvest physiology, packaging, storage and transportation of potatoes and related products will be carried out to improve storage efficiency and safety, and extend product shelf life. The team aims to bring more nutritious and safer foods to the market.
http://swissinnovation.org/newsChina/web/2018/05-181018-6d

Better Detection Technology to Ensure Food Safety

(Chinese Academy of Sciences, October 18)



Heavy metal ions (HMIs) in soil could be absorbed by the roots of rice plants as well as could be transported by the rice phloem sap to the seed and then be accumulated in rice. For food safety, it is crucial to evaluate HMIs in rice phloem sap so that to study the migration, accumulation of HMIs in rice plants. A reserach team in Hefei Institutes of Physical Science developed a useful simple sensor to realize selective electrochemical detection of HMIs in complex rice phloem sap. The team fabricated a more sensitive sensing interface based on the carbon nanotubes for the analysis of Pb2+ in rice phloem sap. Combining the selective capturing ability of glutathione and the electrocatalytic ability of gold nanoparticles toward Pb2+, the carbon nanotubes was sensitive enough to realize detection of the target ions without interference from other small ions.
http://swissinnovation.org/newsChina/web/2018/05-181018-96

New Chemical Pathway of Air Pollution

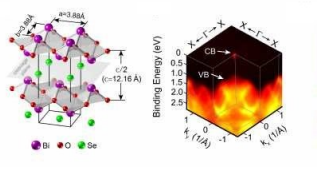
(ChinaDaily, October 19)

Researchers at Harvard University, Tsinghua University, and the Harbin Institute of Technology proposed to bring a new pollutant under control in order to reduce extreme air pollution in China. Their study showed that a key to reducing regular wintertime air pollution in the country was to reduce the formaldehyde emissions. "We show that policies aimed at reducing formaldehyde emissions may be much more effective at reducing extreme wintertime haze than policies aimed at reducing only sulfur dioxide," said Jonathan M. Moch from Harvard. During days in Beijing with especially high particulate air pollution or PM 2.5, the sulfur compounds significantly increased, which tend to be interpreted as sulfate, so China typically focused on reducing sulfur dioxide.
http://swissinnovation.org/newsChina/web/2018/05-181019-c7

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

Semiconductor Discovery

(ShanghaiTech University, October 08)



The search for new materials with superior electronic properties is critical to the development and prosperity of the semiconductor industry. The drawbacks of 2D materials have created a major challenge for the search for semiconductor materials with high carrier mobility, moderate bandgap, and ambient environment stability. Recently, Bi2O2Se, an air-stable layered oxide, has emerged as a promising new semiconductor. Its layered nature makes it ideal for fabricating electronic devices down to few atomic layers with high carrier mobility, superior current on/off ratio and moderate band gap. Moreover, Bi2O2Se is stable in an ambient environment and easily accessible. Researchers at ShanghaiTech University and Peking University combined different experimental techniques, including angle-resolved photoemission spectroscopy (ARPES) and scanning tunnelling microscopy (STM), to fully visualize the electronic structures of this promising semiconductor with key parameters crucial for the device applications.

http://swissinnovation.org/newsChina/web/2018/06-181008-3f

Hybrid Power Devices Based on Fuel Cells and Supercapacitors

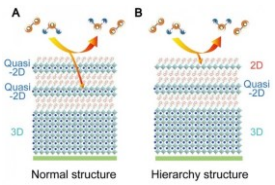
(Chinese Academy of Sciences, October 08)

High power density and high energy density are the key issues for the development of electrochemical power sources to meet the growing demands from a wide range of applications. However, most of the traditional power sources can hardly possess both features. Based on previous studies on key electrode materials, direct alcohol fuel cells and supercapacitors, scientists from Dalian Institute of Chemical Physics of the Chinese Academy of Sciences for the first time coupled the voltage-sensitive PANI with the catalyst layers of direct methanol fuel cells (DMFCs). As a result, the self-charging processes were achieved on the pseudo-capacitor of PANI. The ultra-fast discharging processes remarkably increased the pulse discharge current density of the hybrid power devices, whereas the constant methanol fuel feeding guaranteed the high energy density of the system. This work sheds lights on the development of the next generation power sources for portable and vehicle applications.

http://swissinnovation.org/newsChina/web/2018/06-181008-a6

Highest Power Efficiency of Tin Perovskite Solar Cells

(ShanghaiTech University, October 10)



Solar cell is one effective strategy to meet human's energy demand. Perovskite is an ideal photovoltaic material due to its merits such as high carrier mobility, intense light absorption and low defect density. However, the toxicity of lead perovskite brings certain uncertainty to its application; the exploration of lead free perovskite materials is therefore vital. Among the lead element subsitutes, tin is an ideal candidate owing to a similar shell electron structure and ideal bandgap (1.3 eV) for solar cells. Tin perovskite, however, suffers from high tin vacancy concentration and extremely poor resistance to oxidation. Researchers at ShanghaiTech University developed a 2D-quasi-2D-3D hierarchy structural tin perovskite photovoltaic materials. The tin perovskite solar cells based on this structure achieved a power convention efficiency (PCE) of 9.41%, which is the highest steady-state PCE of lead-free PSCs reported up to now.

http://swissinnovation.org/newsChina/web/2018/06-181010-82

7. Economy, Social Sciences & Humanities

Male Older Siberian Ibexes Prone to Group with Same Sex Community

(Chinese Academy of Sciences, October 08)

According to researchers at the Xinjiang Institute of Ecology and Geography of the Chinese Academy of Sciences, male age plays an important role in this flocking behavior of the Siberian ibex. As males grow older, their segregation from females and younger males becomes stronger. "This behavior, social segregation as it is called, will reach maximum values for males of nine years old and older," said Yang Weikang. Adult Siberian ibex males were socially segregated from females all year round, except during the rutting season, when female and male ibexes spend much more time in mixed-sex groups for mating.

http://swissinnovation.org/newsChina/web/2018/07-181008-63

Central Bank Recrutes Cryptography Experts

(South China Morning Post, October 12)

The Digital Currency Research Institute of the People's Bank of China (PBOC) is seeking talent focused on areas ranging from finance to cryptography, according to job posts made public recently as part of the central bank's annual hiring for 2019. It is seeking to recruit a total of

four employees who specialise in computer science, cryptography or microelectronics, and hold a master's degree or above. The roles include the research and development of software, encryption models, and chips used for digital fiat currency and its trading. Preferred candidates include those who have experience in blockchain and big data. China's central bank is leading the world in the development of a sovereign virtual currency that is cheaper to handle and easier to trace.
http://swissinnovation.org/newsChina/web/2018/07-181012-cd

8. Corporates / Startups / Technology Transfer

Growing its Independence from Foreign Microprocessors

(MIT Technology Review, October 10)

Huawei has recently announced two chips optimized for AI. The chips reflects an important shift in China's tech ambitions as the country seeks to lessen its dependence on foreign microprocessors. Although China has been developing a microchip industry for some time, sanctions introduced recently by the US government highlight how crucial the effort is. By blocking the supply of US chips to the smartphone maker ZTE, the sanctions essentially crippled the company's products, and very nearly forced it to close down. This situation has spurred Chinese companies to accelerate the development of their own AI hardware. The search giant Baidu announced a chip in July, and the e-commerce goliath Alibaba announced an AI chip subsidiary last month. Startups working on the technology include Cambrican, spun out of the Chinese Academy of Sciences, and Bitmain, which previously made chips for cryptocurrency mining.
http://swissinnovation.org/newsChina/web/2018/08-181010-f5

China and US Collaborate on AI

(MIT Technology Review, October 17)

The Partnership on AI, an organization founded by Amazon, Google, Facebook, and others, to explore the technology's risks, announced that Baidu would join its partner network. The nonprofit now has more than 70 partners in 10 different countries. There are couple of reasons why Baidu joined. The first is that Chinese companies, in line with the government, are keen to soften talk of gaining supremacy in AI amid a feisty trade war. The second is that those developing AI, both in the US and in China, do not see themselves in an arms race at all. Chinese AI companies have come under scrutiny recently for supplying technology that is used for government surveillance. The scrutiny is warranted,

but it does not mean Chinese companies, researchers, and consumers are not worried about many of the same issues as their counterparts in the West.
http://swissinnovation.org/newsChina/web/2018/08-181017-60

Microsoft Plans Incubator in Jiangxi

(China Daily, October 21)

US tech giant Microsoft on Saturday signed a Memorandum of Understanding (MoU) to locate its incubator project centering on virtual reality (VR) and mixed reality (MR) in Nanchang, east China's Jiangxi Province. The MoU was signed between Microsoft China and the government of the city's Honggutan New District on the sidelines of the 2018 World Conference on VR Industry being held in Nanchang. So far, Jiangxi has partnered with over 150 enterprises worldwide to invest 63.15 billion yuan ($9.1 billion) in VR industry and its derivative businesses including both hardware and software, and applications, according to the provincial industry and information technology commission.
http://swissinnovation.org/newsChina/web/2018/08-181021-f0

9. Bilateral News

Unique Forest Biodiversity Experiment

(University of Zurich, October 05)

In 2009, BEF-China (BEF stands for Biodiversity-Ecosystem Functioning) began as a unique forest biodiversity experiment in collaboration between institutions in China, Germany and Switzerland. The large-scale project investigated the importance of tree species richness for the good functioning of forest ecosystems. After eight years, such species-rich forest plots stored an average of 32 tons of carbon per hectare in aboveground biomass. By contrast, monocultures averaged only 12 tons of carbon per hectare, less than half as much. During photosynthesis, the plants absorb carbon dioxide from the atmosphere and convert the carbon to biomass. When a forest stores more carbon, this helps reduce greenhouse gases and at the same time also indicates high forest productivity. "These findings have great ecological and economic significance," says Prof. Bernhard Schmid of the University of Zurich, senior author in the more than 60-strong writing team of the current publication in Science.
http://swissinnovation.org/newsChina/web/2018/09-181005-5b

ABB to Build New Robotics Factory in Shanghai

(Xinhua, October 27)

Swiss industrial technology giant ABB on Saturday announced an investment of 150 million U.S. dollars in Shanghai to build a new advanced robotic factory where "robots make robots." The new Kangqiao manufacturing center will be located in Shanghai's Pudong New Area, near ABB's current China robotics campus. The center will combine the company's connected digital technologies, including ABB Ability solutions, state-of-the-art collaborative robotics and innovative artificial intelligence research to create the sophisticated and environmentally sustainable "factory of the future". It is expected to begin operation by the end of 2020 and will become a key part of ABB's global robotics supply system.

http://swissinnovation.org/newsChina/web/2018/09-181027-15

Upcoming Science and Technology Related Events

Swiss Pavilion, China International Import Expo CIIE
November 5-10, 2018
http://www.shanghaiexpo.org.cn/zbh/en/
International Import Exhibition
Shanghai

Ambassador of Switzerland's Briefing
November 8, 2018
https://is.gd/vmtze5
State of Affairs, Bilateral Space
Chengdu

Roundtable: Sino-Swiss Free Trade Agreement
November 13, 2018
https://is.gd/QgsBMD
FTA Application, Challenges
Shanghai

OpenTech Summit
November 30-December 2, 2018
https://opentechsummit.cn/
Startups, OpenTech, AI, Blockchain
Shenzhen

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