Chinese Academy of Sciences to Lead Reform

The Chinese Academy of Sciences (CAS), China's top science think tank, plans to put itself in the vanguard of the reform of scientific research, said BAI Chunli, CAS president on August 21, 2014.

The CAS rolled out a complete restructuring program for more than 100 subordinate institutes just two days before that, sorting them into four functional categories – applied technology for industry; academic research; engineering; and basic research that requires long-term investment.

The changes are not simply a reshuffling of institutes, but an attempt to manage each differently. Different functions require different setups, rules, assessment standards and fundraising, BAI said in an interview with Xinhua.

The goal is efficient management of scientists and research because, compared with the world's leading research institutes, CAS has a number of weaknesses.

"We have tried to make changes before, but none of them really got to the heart of the matter," BAI said. "Research areas of some of our institutes overlap and a number of projects repeat one another unnecessarily. The quality of research is not satisfactory."

The CAS has a staff of more than 50,000, 12 sub-academies, more than 100 institutes directly attached to it, about 100 state labs and 212 field stations.

WAN Gang, minister of science and technology, told Xinhua that, compared with developed countries, China's science sector is poorly managed and inefficient, with less

information sharing and communication; problems that have held back scientific development despite increased investment.

The government hopes more commercial enterprises will work with research institutes, but for that to happen, institutes need to be more open and flexible, WAN said. At least 25 companies listed on China's A-share market are controlled by universities and research institutes with a total market value of about 187.8 billion yuan (30.49 billion US dollars).

On August 18, a report on innovation was discussed at a meeting of the Central Leading Group on Financial and Economic Affairs, headed by President XI Jinping and attended by Premier LI Keqiang.

XI asked for concrete policy on innovation-driven development; national science and technology programs; and breakthroughs in projects that demonstrate the nation's strategic intent. (Xinhua)

China Launches Its First Carbon Fiber Yacht

Zhongke Uni-Asia, China's first carbon fiber yacht, made a successful trial voyage in Shanghai in April 2014. Exhibited on the China (Shanghai) International Boat Show, the yacht is made up of nearly 100% carbon fiber composite materials, making it 30% lighter in weight than traditional yachts, 20% faster in speed, and 20% more efficient in fuel consumption.

The successful development of *Zhongke Uni-Asia* is a major achievement of the Carbon Fiber Action Plan launched by the Chinese Academy of Sciences. Scientists and engineers from the Shanghai Advanced Research Institute (SARI), CAS and Yangfan SeaSky Yacht Manufacturing spent nearly two years working together to develop the prototype of the yacht and special resin composite materials technologies. Compared with glass fiber composite materials, carbon fiber enhanced materials have higher strength and

lower density, and can remarkably reduce the weight of the yacht and improve its anti-striking and safety levels. Low-cost composite carbon fiber manufacturing technology is not only a major research result of CAS, but also one of SARI's technology transfer achievements.

CAS Launches Centers of Excellence and Innovation

In the beginning of 2014, the Chinese Academy of Sciences took another important step towards nurturing world-class researchers: by establishing centers of excellence and innovation (CEIs), it will remarkably increase financial support and management autonomy to facilitate their innovation.

According to CAS President BAI Chunli, the decision was made after a year of planning. "Generally speaking, CAS still has a long way to go to build itself into a first-class science academy. However, in some fields, our scientists are already standing at the forefront of their domains, and they are very promising to achieve innovative breakthroughs." The aim of CEIs is to select such groups and cultivate them with "fertile soil".

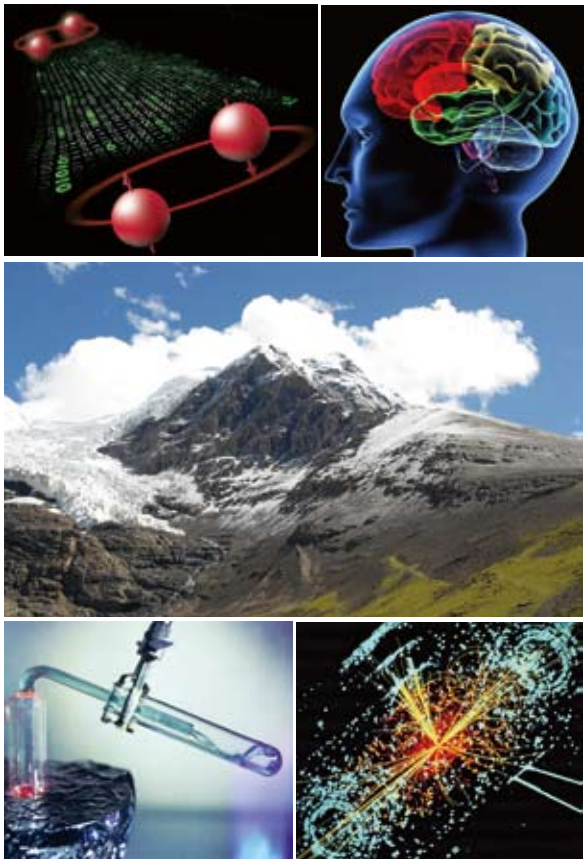
As for the "fertile soil", first of all, every CEI enjoys certain autonomy to decide for its own research directions, resource allocation, personnel management, administrative mechanism and performance incentives. Secondly, for elites, leading scientists working at CEIs, CAS promises them with very attractive research grants and packages. Individual support will also be provided when necessary.

For instance, the CEI in Quantum Information and Quantum Physics, which is based at the University of Science and Technology of China (USTC) in Hefei, will receive about 60 million yuan each year to buy new equipment and fund researchers.

"We hope that CEIs will improve the situation of competitive funding in China", Prof. PAN Jianwei, a quantum physicist from USTC and director of the center, was quoted as saying. "The fields with hopeful major breakthroughs need stable funding to help scientists devote more time and energy into research."

In parallel to favorable terms, CAS has also set up a strict evaluation system for the centers. Every two or three years, an international panel will be responsible for mid-term diagnostic assessment of each CEI. Comprehensive evaluation takes place every five years. Those who failed the comprehensive evaluation will be put on probation or required to stop operation.

The other four centers that were inaugurated in the mid January are the CEI in Tibetan Plateau Earth System Science and the CEI in Particle Physics based in Beijing, the CEI in Brain Science located at the Institute of Neuroscience in Shanghai, and the CEI in Thorium-based Molten Salt Reactor Nuclear System, which is based at the Shanghai Institute of Applied Physics.



"The establishment of these centers is a key move in our S&T reform. Via CEIs, we hope to promote interdisciplinary cooperation across CAS institutes, improve research efficiency, and create a sound atmosphere for innovation," President BAI remarked.

"And they are not just the CEIs of CAS, but of China as a whole. The academy will adopt a more open attitude to work hand in hand with universities, enterprises and other organizations to boost science and technology development", he added.

In the next five years, CAS will actively promote the establishment of more CEIs across China.

Danish Queen Breaks Ground for Sino-Danish Center's New Building

On April 26, 2014, Queen Margrethe II of Denmark attended the groundbreaking ceremony for the main building of the Sino-Danish Research Center for Education and Research (SDC) in suburban Beijing. It was a highlight of her five-day visit to China and an important milestone for the unique Sino-Danish initiative within education and research.

Since SDC opened up for enrollment in 2012, approximately 250 students from China and Denmark have pursued their education at the center.

With over 10,000 square meters of floor space, the building will comprise classrooms, reading rooms, a large lecture hall, a library and space for dining, socializing and relaxing to serve as the central hub for most SDC activities when it is completed.

In her speech, the Queen said that SDC has enhanced mutual understanding and cultural communication between China and Denmark. She thanked all parties that have made contributions to the center.

Research at SDC is going to focus on several fields: nanoscience and nanotechnology, renewable energy, water and environment, life sciences and biomedicine, and innovation and welfare studies. The center will offer opportunities for collaboration between the two countries in student training, scientific and technological innovation as well as technology transfer.

The center was proposed for the first time in May 2008. In 2010, the Chinese and Danish parties signed official agreements, according to which the Danish Industry Foundation would contribute approximately 100 million yuan to the construction of the main building while the University of CAS would be providing the land for the project.

The Danish Minister of Higher Education and Science Ms. Sofie Carsten Nielsen, CAS President BAI Chunli, the Chairman of the Danish Industry Foundation Sten Scheibye and other officials and SDC students attended the event.

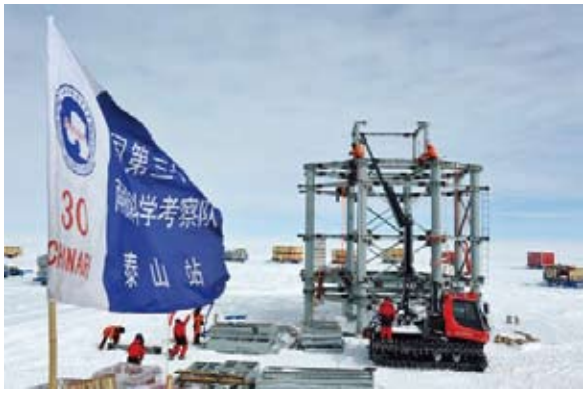
Her Majesty the Queen breaks ground for The House Of The Industry Foundation

Seeing Measurement Successful at Antarctic Taishan Station

In February 2014, the 30th Chinese Antarctic inland expedition team reported that they have successfully conducted the seeing measurement at the Antarctic Taishan Station using a Differential Image Motion Monitor (DIMM) developed by the Nanjing Institute of Astronomical Optic and Technology (NIAOT), Chinese Academy of Sciences.

In astronomy, seeing is a physical parameter that describes the irregular movement and blur of the star image formed by a telescope, which would affect the actual resolving power of the telescope. DIMM has been widely used for site seeing measurement. Researchers from NIAOT have obtained the key technologies of DIMM measurement in Antarctic regions, and begun to measure the seeing at the Kunlun Station since 2011.

In the Antarctica, astronomers have to combat extremely harsh environments including low temperature and low atmosphere pressure for observation. It is even



more difficult to assemble and adjust the DIMM during the polar day as the stars are invisible to the naked eye. Based on an effective upgrade of the NIAOT DIMM system with automatic star finding and guiding function, seeing measurement and data collection at Taishan has worked out satisfactorily.

After the Taishan mission is completed, the DIMM will be shipped to another station in the Antarctica – Zhongshan Station for seeing measurement during the polar night. Ultimately, the seeing data from Kunlun, Taishan and Zhongshan stations will help set up a database and promote the innovative development of Antarctic Astronomy in China.

CAS Physicist Wins Panofsky Prize in Experimental Particle Physics

Dr. WANG Yifang, an outstanding scientist in neutrino physics and director of the Institute of High Energy Physics (IHEP), Chinese Academy of Sciences, received the 2014 W. K. H. Panofsky Prize in Experimental Particle Physics from the American Physical Society (APS) at a special ceremony in April 2014 in Savannah.

Sharing the award with Kam-Biu Luk from Lawrence Berkeley National Laboratory, Dr. WANG, together with Luk, was recognized for "the leadership of the Daya Bay experiment, which produced the first definitive measurement of θ_{13} angle of the neutrino mixing matrix".

The Daya Bay Experiment is a multinational collaboration effort in the field of particle physics. Scientists from China, US, Russia and the Czech Republic worked together to observe and measure neutrino oscillations using antineutrinos produced by the reactors of the Daya Bay Nuclear Power Plant in south China's Guangdong Province. On March 8, 2012, the collaboration announced the discovery of a new type of neutrino oscillation with precision measurement of its oscillation amplitude, which was regarded as a major step forward towards the understanding of matter-antimatter asymmetry in the universe.

Dr. WANG is one of the first to propose the Daya Bay experiment with a detailed detector design and experiment plan. He played a key role in assembling the collaboration and has been working as its co-leader and co-spokesperson.

Born in Jiangsu Province in 1963, WANG graduated from the Department of Physics, Nanjing University and earned his PhD from the University of Florence in 1991. After that, he conducted research at INFN, the Laboratory for Nuclear Science at MIT and Stanford University, and was involved in many world-class nuclear experiments including L3, AMS, Palo Verde and KamLAND. He returned to China and joined IHEP in 2000.

Dr. WANG's research interests range from neutrino physics to collision physics, cosmic-ray physics and astrophysics. Now he is responsible for the design and construction of BESIII detector and the research and development of detectors for long baseline neutrino experiment.

The W. K. H. Panofsky Prize in Experimental Particle Physics was established in 1985 by friends of Panofsky, Director Emeritus of the SLAC National Accelerator Laboratory, and the APS Division of Particles and Fields, Stanford University and SLAC. Awarded annually to recognize and encourage outstanding achievements in experimental particle physics, the prize consists of $10,000, a travel allowance and a certificate.

Flora of China Completed after 25 Years of Compilation

After 25 years of hard work and collaboration, *Flora of China*, the English-language revision of the Chinese masterpiece *Flora Republicae Popularis Sinicae* (FRPS), was completed and published in full in September 2013.

Composed of 25 volumes of text and 25 volumes of illustrations, *Flora of China* is the first modern English-language account of the approximately 31,000 species of vascular plants of China, including about 8,000 species of medicinal and economically important plants, and about 7,500 species of trees and shrubs. Upon completion, it became the world's biggest publication for describing plants native to China.

China is a country with large plant diversity. It is the world's third largest reserve of flora, home to 31,365 species of vascular plants. In 1959, the editorial board of FRPS was set up at the Institute of Botany, Chinese Academy of Sciences. With the efforts of four generations of domestic plant taxonomists, FRPS finally came out in 2004 as 80 volumes in 126 parts, treating 31,180 species (300 families, 3,434 genera) over half of which are endemic to China.

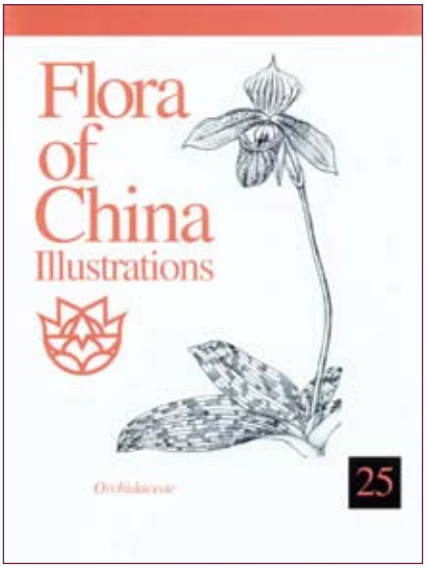
The *Flora of China* project was officially initiated in 1988, when an agreement on joint compilation and publication was signed between China and the US. The translation and revision of such a huge and complex works as FRPS was arduous.

As an international collaboration effort, it represented the collective wisdom of scientists from China, US and Europe, including the Missouri Botanical Garden, the Smithsonian Institution, the California Academy of Sciences, the Harvard University Herbaria, the Royal Botanic Garden Edinburgh, the Royal Botanic Gardens, Kew and the Muséum National d'Histoire Naturelle, Paris.

The *Flora of China* marks a new stage in Sino-US scientific cooperation. The project was supported for almost two decades by the U.S. National Science Foundation and the National Natural Science Foundation of China, and is still supported by the Chinese Academy of Sciences.

The compilation was led by late Prof. WU Zhengyi, the distinguished botanist known as "living encyclopedia of Chinese flora" and editor-in-chief of FRPS, Dr. Peter H. Raven, former President of the Missouri Botanical Garden, and associate editor-in-chief Prof. HONG Deyuan, a renowned taxonomist from the CAS Institute of Botany. The series was jointly published by Science Press (Beijing) and the Missouri Botanical Garden Press (St. Louis).

Botanists gathered in Beijing to celebrate the completion of *Flora of China* and look ahead to the challenges and opportunities for plant diversity research and conservation in post-flora era in China.



Herminium monorchis located in the Hengduan Mountains Region in China. From Volume 25 of *Flora of China* (Credit: Harvard University Herbaria)

UCAS Welcomes New President

DING Zhongli, a distinguished geologist, Member and Vice President of CAS, was named new President of the University of the Chinese Academy of Sciences (UCAS) in Beijing on April 14, 2014.

DING graduated from the Department of Geology, Zhejiang University in 1982. He obtained his PhD from the former CAS Institute of Geology (today's Institute of Geology and Geophysics) in 1988, and served as its director general from 2000 to 2007. He was elected as a CAS Member in 2005 and Chairman of the Chinese National Committee for the International Geosphere-Biosphere Program in 2008.

DING's research focuses on Quaternary climate change and associated mechanisms. He has conducted systematic observation and research into the pedostratigraphic correlation of the loess sequences across the Chinese Loess Plateau, and was the first to establish a 2.6-Ma orbital timescale of stacked grain-size records for Chinese loess, which is highly compatible with marine isotope records.

As new President of UCAS, DING vowed to further promote the integration of scientific research and education, and provide students with the best science and education resources CAS has to offer.

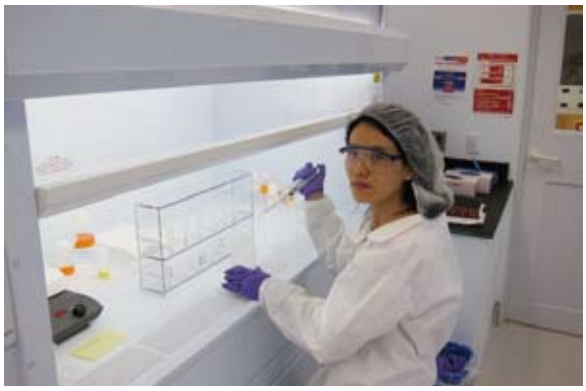
UCAS was founded in 1978 originally as the Graduate School of CAS. In 2012, it was renamed as the University of CAS. Today, UCAS offers PhD programs in 146 fields and master's programs in 170 fields. Its programs primarily focus on natural sciences, engineering, medicine, management and education. So far, UCAS has conferred master's and doctoral degrees on nearly 110,000 postgraduates. This fall, it is going to welcome its first undergraduates.

Geochemist from USTC Receives Houtermans Award

QIN Liping, a professor of geochemistry at the University of Science and Technology of China (USTC), was presented the 2014 Houtermans Medal by the European Association of Geochemistry in Sacramento in June. She is the first Chinese to receive this award.

QIN finished her undergraduate degree at USTC. After earning her PhD from the University of Chicago in 2007, she did her postdoc at the Carnegie Institution for Science in Washington, D.C. under a Carnegie Fellowship. Then she conducted research at the Lawrence Berkeley National Laboratory as a Geological Postdoctoral Fellow. In 2012, QIN was recruited by USTC through China's National Thousand Talent Program.

Her research focuses on understanding planetary formation and differentiation in the early solar system,



as well as the astronomical environments of solar system formation inferred from nucleosynthetic anomalies preserved in meteorites. Her recent research also involves

employing nontraditional isotope systems to trace biological and other surficial processes.

The Houtermans award is bestowed annually to a scientist no more than 35 years of age or within six years of their PhD for a single exceptional contribution to geochemistry, published as a single paper or a series of paper on a single topic. It is named in honor of Friedrich Georg Houtermans, a Dutch-Austrian-German physicist.

China, Nepal Strengthen Scientific Cooperation in Environment

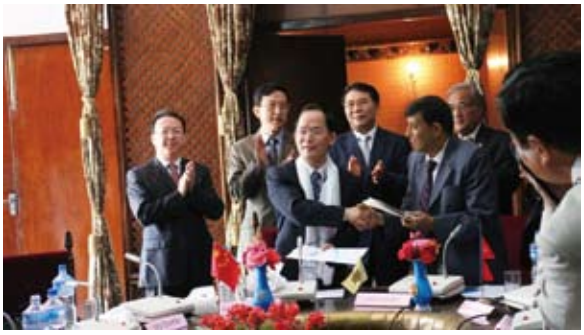
April 2014 witnessed the inauguration of two Sino-Nepal joint centers at Tribhuvan University, Katmandu: the Third Pole Environment Kathmandu Center and the Sino-Nepal Joint Research Center for Geography. As a milestone in the history of scientific cooperation between the two neighboring countries, the new move showed the region's determination to jointly address global challenges ranging from climate change, biodiversity preservation to the monitoring and management of natural hazards.

The Third Pole Environment (TPE) Kathmandu Center was launched On April 7. Launched by CAS, the TPE program is dedicated to the study of the environment of the "Third Pole", a region centered on the Tibetan Plateau that affects surrounding countries and regions. By studying the interactions between water, ice, air, ecosystem and human community in the region, it aims to understand relevant environmental processes and their influences on global change, for better adapting to environmental changes and living more harmoniously with nature.

At the launching ceremony of the TPE Kathmandu Center, CAS President BAI Chunli said that China is willing to work with Nepal to help develop science and technology in the country. He noted that many Nepalese scientists and students are now working and studying at CAS. He pointed out that both sides should take advantage of research platforms such as the TPE program to boost scientific collaboration.

The Sino-Nepal Joint Research Center for Geography was opened on April 28. The center will focus on the study of mountain hazards and ecology, environment monitoring and mountain development in the south and north slopes of the Himalayas. Sponsored by the Chinese Ministry of Science and Technology, it will be jointly built by the Chengdu-based CAS Institute of Mountain Hazards and Environment (IMHE) and Tribhuvan University of Nepal.

In his speech at the unveiling ceremony, IMHE director general DENG Wei hailed the center as a major progress in Sino-Nepal scientific cooperation. He hoped such cooperation would become more active, effective and fruitful in the years to come. Prof. Gunanidhi Neupane, vice chancellor of Tribhuvan University, expressed his gratitude to IMHE for its efforts in donating instruments and equipments and constructing the laboratory. He said the center will greatly facilitate the university's teaching and research in geography sciences and the training of high-caliber talents.



Earlier in April, a memorandum of understanding was signed between the two CAS institutes and Tribhuvan University in Kathmandu to gear up cooperation between China and Nepal in environment.