



November 2011

RESEARCH AND INNOVATION HIGHLIGHTS IN CHINA¹

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EDITORIAL

Dear colleagues,

December welcomed the second anniversary of EURAXESS links China. In two years' time, EURAXESS Links China, an important tool funded by the European Commission helping researchers coming to China and developing research activities between Europe and China, expanded its membership of around 100 two years ago to reach almost 600 today. On 7 December, at the premises of the EU Delegation, a workshop was held by the S&T Section and EURAXESS links China to exchange views on fostering the mobility of EU researchers to China. Participants shared their experiences and views about coming to China, adapting to the Chinese research environment and the implications for their professional development. Mrs. Carmen Cano, Deputy Head of the EU Delegation, launched a brochure on EU-China mobility schemes and a booklet for researchers on IPR issues in China on this occasion.

The 6th EU-China dialogue on agriculture was held in the southwest Province of Guizhou on 1 and 2 December. Co-chaired by DG Agriculture and Chinese Ministry of Agriculture, representatives from DG Research also attended to cover the research aspect in agriculture. Food processing research was identified as one of the topics for the discussions. Further actions will be followed up under the framework of the Task Force on Food, Agriculture and Biotechnologies research launched in June this year.

In this issue of the Highlights, we included news on the statistical report released by China Institute of Scientific and Technological Information. The report showed that China publishes the second largest number of scientific papers in international journals in 2010 and the citation rate for Chinese science papers also goes up, though the average citations per paper remain below the world's average. The most cited papers are focused on the fields of chemistry, material science, engineering and mathematics.

In terms of R&D investment, a report issued by the UN World Intellectual Property Organisation revealed that China has overtaken Japan to become the world's second biggest spender on industrial research and development after the US, R&D investment rising to 12.8% of the world total in 2009. The report also showed that there have also been sharp rises in the number of Chinese applications for patents and trademarks to protect innovations produced by Chinese research.

On innovation, Chinese Ministry of Industry and Information Technology released the 12th five-year plan for industrial technological innovation to enhance the innovative capacities in key industrial sectors and to transform and upgrade the industrial sectors. Four sectors are covered by the plan including raw materials equipment manufacturing, consumer products and information industry.

I hope you will also enjoy reading the thematic activities in this issue. Our next issue of the Highlights will be sent in February to combine December 2011 and January 2012.

With the Christmas and 2012 new year coming soon, I would like to express, on behalf of my S&T team Beijing, our best wishes to you and your families.

Philippe Vialatte
Head of S&T and Environment Section

EU-CHINA S&T EVENTS

DG Research attended the 6th EU-China dialogue on agriculture

The 6th EU-China dialogue on agriculture co-chaired was held in Guiyang on 1 and 2 December. Dr. Philippe Vialatte, Head of S&T and Environment Section of the EU Delegation, together with Mr. Dirk Pottier, Head of Unit in DG Research (Food, Agriculture and Biotechnology) attended the meeting to present the initiatives related to food processing research, one of the topics identified for the discussions between DG Agriculture and the Chinese ministry of Agriculture. Mr Pottier delivered the presentation emphasising EU food processing research (from fork to farm). Dr. Vialatte introduced Chinese participation in FP7, stressed the importance of the on-going work carried out in the field of Food, Agriculture and Biotechnology in the context of the Steering Committee meeting of the Science and Technology Agreement through the co-chaired FAB/CAAS Task Force initiated last March.

EU Delegation S&T Section joined the Beijing Science Tour for Diplomats

The Science Tour on 16 November was organised by the Foreign Affairs Office of Beijing Municipality, Beijing Association for Science & Technology (BAST), and the Government of Tongzhou District. 36 diplomats and foreign experts visited the Tongzhou District and especially the International Agriculture Science and Technology Park in this District. Covering about 912 square kilometer, Tongzhou District is located in the southeast of Beijing with rich science and culture resources. The International Agriculture Science and Technology Park, which will be completed in 2015, will focus on transformation of scientific and technological achievements, and is expected to play a crucial role as the bridge between experts and the government as well as research centres and enterprises. The park mainly comprises of three different function areas: R&D area of agriculture science, demonstration area of agriculture S&T, and the service area of integrated management. Ms. Jessica Michell, S&T Attaché of the EU Delegation, indicated that events like this one provided an excellent opportunity to learn more about S&T strategies in Beijing at the same time, as enabling diplomats to exchange with one another.

European Researchers in China

A workshop to exchange views on fostering the mobility of EU researchers to China took place at the EU Delegation, 7 December. Participants shared their experiences and views about coming to China, adapting to the Chinese research environment and the implications for their professional development. The panel speakers leading the discussions included researchers as well as funding programme managers from both Europe and China and from the public and private sector. The event marked the 2nd anniversary of EURAXESS Links China at which Deputy Head of Delegation, Carmen Cano launched a brochure on EU-China mobility schemes and a booklet for researchers on IPR issues in China.

POLICIES AND PAPERS

Eight Ministries Release Joint Document to Accelerate Independent Innovation

Eight ministries include Ministry of Science and Technology, Ministry of Finance, People's Bank of China, State-owned Assets Supervision and Administration Commission of the State Council, State Administration of Taxation, China Banking Regulatory Commission, China Securities Regulatory Commission and China Insurance Regulatory Commission recently jointly released the Several Opinions on Improving the Combination of Technology and Finance and Accelerating the Implementation of Independent Innovation Strategies (Opinions), to promote

independent innovation, and foster the development of strategic emerging industries. The Opinions proposes to nurture and develop venture capital, develop multi-level capital markets and expand the scale of direct financing. Moreover, the Opinions proposes to set up an incentive system in favour of technological transformation and independent innovation, and to reinforce the establishment of systems for science and technology as well as financial intermediary services. (Source: [central government web](#))

China publishes the second most scientific papers in international journals in 2010: report

A report published revealed that in 2010 the Chinese mainland published 121,500 academic papers on science and technology in major international journals, accounting for 8.6% of the world's total. The statistics are based on a survey of papers indexed by renowned international databases such as the SCI and Ei, according to the report issued by the Institute of Scientific and Technical Information of China (ISTIC) under the Ministry of Science and Technology. Moreover, the number of Chinese theses published in the world's 173 highest-rated publications, including Science and Nature, reached 5,203 last year, the second most in the world, the report said. From 2005 to 2010, this figure has increased at an annual average rate of 23.3%, higher than the growth rate of the sheer volume of the SCI-indexed papers, the report said. These figures indicate that the quality and influence of Chinese scientific papers are rising remarkably, the report said. The report also revealed that last year China published 530,600 papers in about 2,000 domestic science and technology journals. However, the report warned that the number of average citations of each Chinese scientific paper, a benchmark for the merit of research papers, remains at a lower level. In 2011, the average citations per paper is 6.21, an increase by 5.8% on a year-on-year basis, though still far below the world's average of 10.71, the report said. According to the report, Chinese research papers in the fields of chemistry, material science, engineering and mathematics are among the most-cited papers in the world. (Source: [Xinhua net](#))

Citation rate for Chinese science papers goes up

About a tenth of the science and technology papers included in the Science Citation Index, a leading thesis-index system, came from China in 2010, according to the Statistical Data of Chinese (Science & Technology) Papers 2011 released by the Institute of Scientific and Technical Information of China. According to the report, China produced 836,300 papers on science and technology between 2001 and Nov 1, 2011, and they together garnered 5.19 million citations. That gave the country the seventh highest citation rate in the world; it had the eighth highest rate in 2010. This year, each Chinese paper on science and technology garnered an average of 6.21 citations. That was a 5.8 percent increase above what the papers had got the previous year, but was still well below the 10.71 citations that papers throughout the world draw on average, the report said. He Defang, director of the Institute of Scientific and Technical Information of China, said the increasing citation rate shows that scientific research is being better conducted in China. "Beyond the sheer numbers, the quality and the citation rate of our papers have gone up too," he added. "At this rate, our citation rate is likely to become the fifth best in the world by 2014, which is six years ahead of our plan." Britain's national science academy, the Royal Society, published a report in March saying that China, Brazil, India and various other countries are becoming scientific powers that can rival the United States. Sun Song, director of the Chinese Academy of Sciences' institute of oceanology, said scientists should pay more attention to the quality of research papers rather than their quantity. "There are some barriers to the pursuit of quality," Sun said. "For example, when you are bidding for a research project, publishing a certain number of papers is required. So some researchers may take what should have been written into one comprehensive paper and split it up into several different papers just to meet the requirement. That lowers the quality of the work." The number of papers researchers publish is also used as criteria in the awarding of academic degrees or promotions. (Further details in source: [China Daily](#))

Draft rules to protect bidding process

A draft regulation on the implementation of the Tendering and Bidding Law was reviewed and approved at an executive meeting of the State Council, as the government looks to guarantee an open and fair process for procuring public projects. "Passing the draft is dealing with the issues, such as authorities illegally soliciting bids and offering fake invitations to tender, leaders abusing their power to interfere in the process, and bidders colluding (with authorities) to unfairly win projects," read a statement on the gov.cn website. The new regulation forbids applying different standards on qualification checks for bidders. It also stipulates that no specific requirements should be set on patents, brands, suppliers or bidders' earlier performances. As well as protecting the rights and fairness of the tendering process, the draft also clarifies what projects should be subject to public bids, standardizes the bid assessment process and forbids illicit maneuvers between authorities and bidders or among rival bidders. (Further details in source: [China Daily](#))

China to optimise import mix of high-tech products

Li Jinzao, vice minister of the Ministry of Commerce, said that the country will work to optimise the import mix of mechanical and electronic products on the occasion of the forum of the ongoing 13th China Hi-tech Fair in Shenzhen. The remarks echoed a guideline issued in March on promoting the imports of mechanical and electronic products during the 2011-2015 period, in which China pledged efforts to encourage the imports of high-tech products. Li said that China will improve existing policies to attach more importance to the imports of advanced technology, equipment and components to spur innovation. Meanwhile, he said China will organise more trading events to exchange and cooperate with international businesses, and will continue to push the US and European countries to ease restrictions on civil high-tech exports to China. (Source: [China Daily](#))

Open innovation in China: policies and practices

The paper reviews the evolution of policies and practices of open innovation in China under globalisation by combining historical archives and case study approaches covering policies and practices at both the macro- and micro-levels. It is found that Chinese firms have in practice employed a variety of open innovation models since the reform of science and technology systems in the mid-1980s. Policies introduced by the Chinese government with respect to inbound and outbound open innovation, as well as policies encouraging open innovation networks, have encouraged Chinese firms to adopt various open innovation modes and practices. Some critical institutional challenges still need urgent attention and effective efforts to reinforce them. (Further details in source: [Journal of S&T Policy in China](#))

MIIT: Issue of 12th five-year plan for industrial technological innovation

To implement the 12th five-year plan for national economic and social development (2011-2015) and the mid- and long-term plan for national S&T development (2006-2020), and in order to specify the targets and key tasks during the 12th five-year for the industrial and information technology innovation so as to provide guidance and strengthen technological innovation in the key industries and promote industrial transformation and upgrade, on 14 November, the Ministry of Industry and Information Technology (MIIT) released the 12th five-year plan for industrial technological innovation. The plan covers four sectors including raw materials, equipment manufacturing, consumer products and information industry. (Source: MIIT)

Overseas workers' rules

Overseas scholars and experts at non-local enterprises in the city are expected to continue their work until the age of 70 in the near future, five years longer than currently allowed under the present regulations, city officials. Other regulations concerning IPR protection for foreign experts, personal income taxation and education for their children, are being looked at by government authorities in a bid to create a friendlier environment to retain overseas talents. (Source: [Global Times](#))

China seeks to attain balance of development, food safety in new economic zone: NDRC

China is seeking to strike a balance between urbanisation, industrialisation and food safety in the newly launched economic zone, the Central China Economic Zone which is centred in the province of Henan and radiating to its adjacent areas. It is a test field for balanced development of industrialisation, urbanisation and agricultural modernisation without hurting food safety and environment, according to Du Ying, Deputy Director of the National Development and Reform Commission (NDRC). The central government will implement measures to ensure food safety in the economic zone by increasing fiscal transfer payments to Henan, strengthening financial support to farmers, facilitating agricultural infrastructure construction and boosting closer ties between grain producers and consumers. The State Council on October 7 issued a guideline on building Henan into a Central China Economic Zone. The most populated province in the country produces 10% of China's grain, with wheat output accounting for a quarter of the country's total. (Further details in source: [Xinhua net](#))

China's R&D investment 2nd in the world: report

China has overtaken Japan to become the world's second biggest spender on industrial research and development, trailing only the US, said the report by the UN World Intellectual Property Organisation (WIPO). Chinese investment in R&D rose to 12.8% of the world total in 2009, up from just 2.2% in 1993. The report also showed sharp rises in the number of Chinese applications for patents and trademarks, to protect innovations produced by Chinese research. The US held on to the top position in the global R&D rankings, but its share fell 3.4 percentage points to 33.4%, still more two and a half times larger than China's. (Further details in source: [China Daily](#))

VOICES AND OPINIONS

Vice-premier promotes innovation

Unswerving efforts should be made to promote institutional and technological innovation in transforming China's economic growth pattern, Vice-Premier Li Keqiang said. Innovation is the key to stimulating domestic demand, increasing the impetus for growth and coping with risks and difficulties, Li said during his inspection tour in the northern port city of Tianjin. When visiting the Tianjin Institute of Industrial Biotechnology and the Chinese Academy of Sciences, Li said that innovation is vital, in particular in the face of the current complicated and more severe international environment, which holds increasing uncertainties. "We should make great efforts to create a better environment and provide job opportunities for small or tiny companies through innovation funds and risk investments," he added. "We must borrow advanced international technologies and managerial experiences to increase the competitiveness of domestic enterprises, so as to transform China from a big manufacturer that excels only in size to a really strong one," he said. (Further details in source: [China Daily](#))

China to make unending efforts to protect IPR: vice premier

Vice Premier Wang Qishan vowed to make ceaseless efforts to protect Intellectual Property Rights (IPR), as he believes China faces "an arduous and complicated task" in the fight against abusive copyright infringements. Wang urged government authorities to launch regular and long-term campaigns to check the spread of shoddy products and practices that infringe upon copyrights. The vice premier also called for the public to supervise IPR violations and poor practices that violate copyrights. A national campaign started in November last year, aiming to crack down on IPR violations as well as the production and distribution of fraudulent and shoddy products. (Further details in source: [China Daily](#))

PEOPLE OF THE MONTH

Chinese Academy of Sciences elects 51 new academicians

The Chinese Academy of Sciences (CAS) announced on 9 December that it has elected 51 new academicians, 90% of whom have the experience of studying abroad. The dilatation has taken the total number of CAS' academicians to 727. Academician is the highest academic title conferred on Chinese scientists and experts working in scientific and technological fields. The title of academician is a lifelong honour. Nine foreign scientists including three Nobel Laureats, were elected CAS foreign academicians. (Further details in source: [CAS](#))

Name of latest inductees to the Academy of Engineering announced

Sixty new members, including six foreign engineers, have been elected as members of the Chinese Academy of Engineering (CAE) in recognition of their accomplishments, the CAE announced on 8 December. After this year's election, China's top academic institution for engineering sciences has handed out the honour to a total of 783 and 42 foreign engineers from around the world. Xu Rigan, deputy head of the CAE in charge of the election, said that 54 new Chinese members were elected out of 485 candidates after three rounds of selection and with approval from the State Council. The CAE consists of members with the highest honours in engineering and technological sciences. Meanwhile, the Chinese Academy of Sciences is for natural sciences and the Chinese Academy of Social Sciences focuses on philosophy and social sciences. (Further details in source: [People](#))

Museum for father of China's space programme

The Qianxuesen Library and Museum will be opened to the public starting on 11 December to mark the 100th anniversary of the birth of the father of China's space programme. The museum at Shanghai Jiaotong University, where Qian studied, has the most comprehensive collection of his works. Qian, also known as Hsue-Shen Tsien, died in October 2009 at the age of 97. He led the country's missile and aviation programmes and played a significant role in developing China's first man-made earth satellite. Qian is deemed as one of the country's greatest scientists and a patriot. (Further details in source: [China.org](#))

Exhibition held to commemorate late Chinese aerospace scientist

An exhibition opened on 11 November in celebration of the 100th birthday of the late scientist Qian Xuesen, the man known as the father of China's aerospace technology. The exhibition was held in the National Science Library of CAS, China's leading academic institution as well as Qian's workplace. Qian was the founder of China's aerospace technology, a prominent model for

China's scientists and a scientist positively embedded in the mind of the people, said CAS president Bai Chunli at the opening ceremony of the exhibition. Also known as Tsien Hsue-shen, Qian is considered to have led China's missile and aviation programmes, and he played a significant role in developing the nation's first satellite to orbit Earth. Qian died of illness in Beijing on Oct 31 2009 at the age of 98. (Source: [Xinhua net](#))

THEMATIC ACTIVITIES

Health

Technique ensures test-tube baby free of genetic disorder

A woman gave birth to a healthy girl with the aid of a test-tube baby technology that filters the genes of embryos with chromosome problems, used for the first time in Shanghai, said Sun Xiaoxi, deputy director of the reproduction center at the Obstetrics and Gynecology Hospital Affiliated to Fudan University. Earlier reports said sterility now affected 40 million people in China. "Now we see more couples seeking fertility treatment," Sun said, adding that more than 4,000 couples have gone for IVF at his hospital so far this year. The number has increased annually by 10 to 15 percent in the past five years. (Further details in source: [China Daily](#))

Experts: TCM can help to fight AIDS

Traditional Chinese Medicine (TCM) has helped 17,000 HIV carriers and AIDS patients in China since 2004, experts said. "TCM performs as an effective supplement to Western therapy in terms of alleviating patients' symptoms, including fever, cough, asthenia and diarrhea, thus making life easier for them," said Wang Jian, deputy director of the TCM Center for AIDS Prevention and Treatment with the State Administration of Traditional Chinese Medicine. China started to give AIDS patients free TCM therapy in a pilot project carried out among 2,300 patients in five provinces in 2004. By last October, the projects had expanded to 19 provinces. The TCM therapy is usually applied to carriers whose immune system is not too weak to receive the Western medication that is largely known as antiretroviral therapy; or to patients who suffer side effects from the therapies. (Further details in source: [China Daily](#))

TCM provides new remedy for aplastic anemia

Chinese scientists have worked out a new herbal remedy for aplastic anemia, a potentially fatal disease that can significantly reduce patients' risk of infection and bleeding. The herbal granules, jointly developed by specialists from 16 medical institutions in Beijing, Tianjin, Hangzhou and Guangzhou, effectively relieves anemia and enhances patients' immunity, said Dr. Zhou Yuhong, a specialist on blood diseases with Zhejiang Hospital of Traditional Chinese Medicine (TCM). In addition, the new drug has now shown any side-effects that are common in prevalent Western therapies, said Dr. Zhou, head of the research project known as "TCM intervention in chronic aplastic anemia treatment". (Further details in source: [China Daily](#))

China eyes expansion of AIDS interventions

The coverage of effective HIV/AIDS interventions among the nation's high-risk groups should be raised to 90% in five years, vice premier Li Keqiang said at the plenary meeting of the State Council AIDS Working Committee. Counselling and testing services should be available at all county-level-and-above hospitals, and available at grass-roots clinics in high-prevalence regions. The meeting heard a work report by the Ministry of Health on the status quo and future plans of

HIV prevention and control, and endorsed a five-year plan for the 2011-2015 period. (Further details in source: [China Daily](#))

Researchers simulate world's first complete H1N1 influenza virus

Chinese researchers used the Mole-8.5 GPU-accelerated supercomputer to simulate the entire H1N1 influenza virus. Scientists at the Institute of Process Engineering of CAS have successfully produced the first computer simulation of a complete H1N1 influenza virus using NVIDIA Tesla GPUs which could lead to a better understanding of the virus and eventually enhanced treatments. (Further details in source: [CAS](#))

Nervonic acid rich microalgae found

A study team led by Li Fuli, a research fellow at CAS Qingdao Institute of Bioenergy and Bioprocess, harvested a microalgae named Mychonastes afer HSO-3 from natural microbial resources. Having a fat content exceeding 57% and a nervonic acid hitting the level of 6% as a proportion of the total neutral fat, the new microalgae species is the first of its kind found in the world rich in nervonic acid. The finding is important for the growth and development of nervonic acid industry. Previous pharmaceutical studies show that nervonic acid is a key factor in repairing the damaged nerve fibres. (Further details in source: [MOST](#))

New schizophrenia susceptibility gene identified

Scientists have pinpointed a specific gene that increases susceptibility to schizophrenia, researchers at Anhui Medical University said on 11 November. Researchers analysed the genes of around 12,000 individuals with schizophrenia and healthy individuals from two separate cohorts to discover "Tspan-18", a gene located in the eleventh chromosome that increases susceptibility to the mental illness. The Chinese researchers have also validated another schizophrenia-susceptible gene discovered by their foreign counterparts, which is located in the six chromosome. The research was jointly conducted by scientists from Anhui Medical University, the First Hospital affiliated with the University, the National Human Genome Centre and Peking University. (Further details in source: [China Daily](#))

Food, agriculture and fisheries, biotechnology

Paddy papa going strong

Yuan Longping's dream is to have a new hybrid rice that will yield at least 15 tons of grain per hectare, and he is already halfway there. When he turned 80 last year, Yuan, known as "The Father of Hybrid Rice", made a birthday wish for a rice that will yield 13.5 tons a hectare by 2012, and up the production to 15 tons a hectare by 2020. This September, his super rice brought in yields of 13.9 tons per hectare, setting a new world record, and accelerating his ambitions by a year. Yuan started experimenting with rice varieties in the 1970s, and in 1974, he created the first Chinese rice hybrid. Part of the reason that motivated his tireless research into improving rice yields was the hunger he suffered in the 1960s. Yuan's research team achieved the target yields of 10.5 tons a hectare in 2000 and 12 tons a hectare in 2004, setting world records both times. Worldwide, the average yield on a plot of land of the same size is only 3.9 tons. (Further details in source: [China Daily](#))

More balanced GM debate needed to bridge info gap

Although genetically modified foods have been grown and sold in China for some time, the term still makes the public jittery. Debates on genetic modification range from safety concerns, environmental impact, food security, ethics to politics. When all these issues come into play, discussions on GM become complicated. "A lot of online information regarding GM crops in China is sensational and misleading, which causes panic as the public knows little about the technology. We need to deliver information in a more scientific and responsible manner," said Luo Yunbo, a professor with China Agricultural University on food science. Luo acknowledged Chinese scientists have failed to accurately inform the public and needed to debate the issues using simple language. Luo also acknowledged that all scientific conclusions are drawn from existing research, leaving future possibilities open, which is the main argument GM critics use. Luo said put in this context, "non-modified foods are just as risky as we cannot predict what will happen in the future either." But such arguments do not nullify the fears. GM skeptics said scientists should not rush to offer genetically modified food to the public until they can guarantee the foods are completely safe. "More research and tests are needed," said Jiang Gaoming, a researcher at the Chinese Academy of Sciences' Institute of Botany who has long opposed GM foods. The government has taken an open mind on the issue. China has allowed several GM crops to be grown, including cotton, peppers, tomatoes and papayas, and has authorized imports of GM soybeans and corn. In 2008, the government injected 24 billion yuan (\$3.7 billion) into researching and developing GM crops while government officials have voiced support for the technology. Debate heated up when China granted two strains of pest-resistant GM rice safety certificates in 2009, which cleared a major hurdle for further plans of commercialization. Lin Yongjun, professor of Huazhong Agricultural University and also a member on Zhang Qifa's research team, which leads the development of the certified GM rice, said the plantation of GM crops can help cut pesticide use, which in turn lowers production costs and increase yields. Jiang Gaoming disputed Lin's view with his experiments on organic farming in Shandong province. According to him, yields could also improve by adopting current traditional growing methods. Though GM rice has not been approved for commercial sale yet, it has been found on the shelves in many supermarkets in Hubei, Hunan and Jiangxi provinces, prompting concerns over weak market regulations. Luo admitted that loopholes existed in China's supervision over the market, but he denied safety risks as China is much stricter with GM crops than many other countries. (Further details in source: [China Daily](#))

Boosting Global Food Security: A Remote Sensing Approach

Among initiatives to boost food security, one solution is to utilize remote sensing technology for agricultural monitoring at regional and global levels. This technology has been extensively applied to China's agricultural remote sensing monitoring. The CAS (Chinese Academy of Sciences) China CropWatch System (CropWatch) was developed by the Institute of Remote Sensing Applications (IRSA), CAS in 1998, covering China as well as 30 main grain producing countries around the world. It was used to monitor crop growing conditions, crop acreage and crop production, drought, crop plantation structure and multiple cropping indexes. WU Bingfang, head of Lab for Agriculture and Environment at IRSA, is responsible for operating this system. His team publishes 7 monthly bulletins and 20 newsletters every year, which are used by National Statistics Bureau of China to improve agriculture statistics since 2004. CropWatch, as well as USDA Foreign Agricultural Service's Crop Explorer, European Commission's Monitoring of Agriculture with Remote Sensing, and U.N. Food and Agriculture Organization's Global Information and Early Warning System, constitute four systems for global agricultural monitoring. It has integrated into Group on Earth Observations (GEO) international cooperation program on global agricultural remote sensing monitoring. (Further details in source: [CAS](#))

Cuba, China agree to boost biotechnology cooperation

Cuba and China have agreed to strengthen cooperation on biotechnology, Cuban science minister Jose Miyar Barrueco said at the 6th joint work meeting for biotechnological cooperation. Barrueco said there are favourable conditions for the two countries to continue and deepen collaboration in this field, and relevant joint projects have made progress. Zhang Xiaoqiang, vice chairman of China's National Commission for Development and Reform, attended the meeting and praised the development of biotechnological cooperation between China and Cuba in the last two years, and suggested the introduction of research achievements to other countries to improve human health. Biotechnology is now one of the most active fields of cooperation between the two countries. Cuba and China signed an agreement in September on joint development of a preventive vaccine against pertussis or whooping cough. (Source: [China Daily](#))

3D high-yield corn modelling

A study team led by Guo Xinyu, a research fellow at Chinese Academy of Agricultural Sciences Institute of Agricultural Information, proposed the design and framework to build a digital management system for growing corn, based on the relationship between crops, environment and technology. (Further details in source: [MOST](#))

3,000 rice germplasms to resequence

Chinese Academy of Agricultural Sciences, International Rice Research Institute, and Beijing Genomics Institute jointly announced on November 15 in Shenzhen that they will resequence 3,000 core rice germplasms collected from different parts of the world, and release the results to the world in 2012. (Further details in source: [MOST](#))

China starts rice genome molecular breeding

The Chinese Academy of Agricultural Sciences (CAAS) and the Beijing Genomics Institute Shenzhen recently announced the establishment of the CAAS Institute of Innovative Bio-breeding. After its founding, the institute immediately launched a project to sequence 3,000 rice genomes in cooperation with the International Rice Research Institute, marking the start of China's genome molecular breeding project. (Further details in source: [People](#))

China's first institute for tea study to open next year

Construction of China's first higher-education for tea study kicked off in Anxi, hometown of Chinese oolong tea, on 12 November, with authorities aiming to have it ready to welcome students from autumn of 2012. The college, in China's eastern Fujian province, will offer undergraduate courses for tea study majors under Fujian Agriculture and Forestry University. (Further details in source: [People](#))

China steps up campaign on food safety awareness

A campaign that aims to boost the public's role in safeguarding food safety and promote awareness of the issue was launched at the 9th China Food Safety Annual Conference. The new campaign is part of a broader five-year programme (2011-2015) of food safety education announced by the State Council Food Safety Commission in May. The programme aims for more than 80% of the public to be aware of basic food safety by 2015, with the rate for primary and high-school students reaching up to 85% or more. (Further details in source: [Xinhua net](#))

L-arginine or NCG regulates vascular function of pigs

L-arginine and N-carbamylglutamate (NCG) has been found to play a critical role in regulating the function and volume of the umbilical vein, which provide more nutrients and oxygen from the maternal to the fetus tissue for fetal development and survival and enhance the reproductive performance of sows. A team of researchers led by Yin Yulong at the Institute of Subtropical Agriculture of CAS has been able to watch L-arginine or NCG in action as it regulates microRNAs targeting vascular endothelial growth factor A (VEGFA) and endothelial nitric oxide synthase (eNOS) gene expressions in umbilical vein. (Further details in source: [CAS](#))

Information and communication technologies

CAS Supercomputer Hits Top 10 of the New Green 500

Mole-8.5 supercomputer developed by the Institute of Process Engineering, Chinese Academy of Sciences (IPE-CAS) was on the top 10 list according to the latest Green 500 released on Nov. 18. China's supercomputer capacity has grown rapidly over the last decades, the Mole-8.5 is currently the sixth fastest computer in China and yet the only one that hit the top 10 in China. Different from the Top 500 focusing on supercomputer capacity, the Green 500 provides rankings of the most energy-efficient supercomputers in the world. (Further details in source: [CAS](#))

\$103m injected into cloud computing research

China's top economic planner has allocated 660 million yuan (\$103.6 million) of special funds to guide cloud computing research, as part of the government's efforts to boost the sector's development, China Securities Journal reported. The funds, the first batch of their kind, were designated to 15 cloud computing programmes scattered across the country's five cloud-computing pilot cities of Beijing, Shanghai, Shenzhen, Hangzhou and Wuxi. Internet giants Alibaba and Baidu received more than 100 million yuan to lead the projects while several other companies, including Shanghai East-China Computer Co. Ltd. And Beijing Teamsun Technology Co. Ltd, received some 15 million to 20 million yuan. The report also said China's Ministry of Industry and Information Technology (MIIT) has drafted a framework document on the development of cloud computing during the 12th five-year plan period (2011-2015). Tang Gang, an official with the MIIT, said China will see the effects of applying the technology by the end of the 2011-2015 period, but its large-scale application won't emerge till the 13th five-year plan period (2016-2020). (Further details in source: [China Daily](#))

China's first petaflop computer in operation

"Nebula", China's first supercomputer with a physically measured performance exceeding the petaflop level, was put into operation on November 16 at the National Supercomputing Centre in Shenzhen. The supercomputer will find applications in an array of areas, including new energy development, new materials making, natural disaster early warning and analysis, weather forecasting, geological exploration, industrial simulation among many others. (Further details in source: [MOST](#))

China vows to speed up Internet of Things development: MIIT

China is seeking breakthroughs in key technologies of the Internet of Things (IOT), and says it will strengthen the industry over the next five years. The country plans to set up IOT research in its 12th five-year plan period, to build a comprehensive technology system as well as a set of internationally recognised standards, Yang Xueshang, vice minister of industry and information technology said. Yang said the country will work to promote IOT-related manufacturing,

communication and service industries as well as scale up technology application to create an extended value chain. China has mastered a raft of self-developed key IOT technologies, and made preliminary applications in several fields including transportation, logistics, finance, environment protection, healthcare and national defense. (Further details in source: [Xinhua net](#))

China overtakes US as top smartphone market

China has overtaken the United States for the first time to become the world's largest smartphone market by volume, sina.com reported. Smartphone shipments reached 24 million units in China during the third quarter of 2011, up by 58 percent from the second quarter, while smartphone shipments reached just 23 million units in the US, down by 7 percent. China's rapid growth has been driven by aggressive subsidizing by operators of high-end models like the Apple iPhone, and emerging of low-cost Android models from Chinese brands such as ZTE. But China may not lead for long. Demand for smartphones in the US fell because people were expecting the unveiling of the new iPhone, resulting in China's narrow lead. The US is expected to take back the top spot in the fourth quarter, according to Strategy Analytics. (Further details in source: [China Daily](#))

Nanosciences, nanotechnologies, materials and new production technologies

Researchers Fabricate Gas Sensor Using Macroscopic 3-D Graphene Foam Structure

A research team led by Hui-Ming Cheng, a Professor at the Chinese Academy of Sciences' Shenyang National Laboratory for Materials Science, and Nikhil Koratkar, a Professor at Rensselaer Polytechnic Institute, has used graphene foam as a gas sensor to detect harmful explosive chemicals, paving the way for the commercialization of next-generation of gas sensors based on nanostructures. (Further details in source: [CAS](#))

LCoS Micro-Display Chip Developed in IMECAS

Liquid crystal on silicon micro-display chip is the key part of micro-projected display. Except for the micro-projected display, it can be used in large-screen high resolution projected display, 3D (dimensions) display and so on. It is one of the portable devices for large-screen display with the accepted greatest potential in the market. The researchers in Silicon Device and Integration Technology Department (Dept. No.1) of the Institute of Microelectronics of the Chinese Academy of Sciences (IMECAS) had developed liquid crystal on silicon (LCoS) color micro-projected display whose resolution is as high as SVGA (Super Video Graphics Array, 800*600) in late November, 2011. (Further details in source: [CAS](#))

LICP Researchers Make New Discoveries Concerning Field Emission Properties of Graphene-Based Cathodes

Graphene has many excellent properties, such as high electrical conductivity, carrier mobility, high thermal conductivity, chemical stability, high specific surface area, and mechanical stiffness. It shows considerable potential applications in biosensors, supercapacitors and as an ideal cold cathode material for field emission devices. Researchers at the State Key Laboratory of Solid Lubrication of the Lanzhou Institute of Chemical Physics (LICP), CAS, have made some new discoveries concerning the field emission properties of the graphene-based cathodes. It is found that the field emission properties of spray-coated graphene films were dependent on the temperatures. The turn on field and work function decreased with the testing temperature. The graphene film deposited by electrophoresis shows the interesting hysteresis phenomenon, which may be derived from the desorption or adsorption of adsorbed gaseous molecules on

graphene during the risen or fell voltage process. In addition, researchers have fabricated the graphene/SnO₂ composite cathode and improved the field emission of SnO₂ nanostructures by depositing graphene buffer layer. The work has received support from the Natural Science Foundation of China (Nos. 51002161 and 51005225) and the Hundred Talents Program of the CAS. (Further details in source: [CAS](#))

A Novel Strategy to Monofunctionalize Protein Nanocages Developed by SINANO

Proteins are drawing more and more attentions as building blocks and scaffolds to assemble into diverse nanostructures and nanodevices, owing to their intrinsic properties such as homogeneous size and shape, easy manipulation through rational design/genetic engineering and facile scaling-up in large quantity. In particular, protein nanocages, like virus-based nanoparticles (VNPs), ferritins, and heat shock proteins, have been extensively investigated as nanoplatforms for synthesis of nanomaterial, organization of nanoparticles, fabrication of nanodevices, controllable delivery of bioactive molecules, etc. Recently Prof. WANG Qiangbin's group from Suzhou Institute of Nano-Tech & Nano-Bionics (SINANO), CAS, in collaboration with the Nanobiology Lab at Wuhan Institute of Virology, CAS, has developed a novel strategy to monofunctionalize protein nanocages. (Further details in source: [CAS](#))

LICP researchers develop preparation method of magnesium alloy rare-earth conversion coatings for ethylene glycol cooling system

Researchers at the State Key Lab of Solid Lubrication of Lanzhou Institute of Chemical Physics of CAS have developed a preparation method of magnesium alloy rare-earth conversion coatings for ethylene glycol coating system. The method includes a process of pretreatment and activating and chemical conversion coating. The prepared rare-earth conversion coating has even thickness and good surface consistence, good adhesion between the substrate and coating, has good corrosion-resistant performance in ethylene glycol-water cooling liquid, and can solve the problem of the severe corrosion of engine cooling system used magnesium alloy in cooling liquid. (Further details in source: [CAS](#))

Environment (including climate change)

Carbon storage technology ramps up oil production, reduces carbon emissions

Efforts to cope with climate change are often at odds with the practices used to stimulate economic growth. But a new technology being used in an oil field in northeast China may offer the dual benefits of more efficient oil extraction and the reduction of greenhouse gases. Zhang Hui, chief geologist at the Jilin Oil Field Prospecting Institute, said the injected carbon dioxide can dissolve the crude oil and subsequently expand the oil volume, making it easier to retrieve greater quantities of oil. The injection technique and oil retrieval process, referred to collectively as "carbon capture and storage plus enhanced oil recovery" (CCS-EOR), increases oil recovery efficiency rates by as much as 10%, compared to the older technique of using water to displace oil, Zhang said. (Further details in source: [People](#))

Scientists confirm Himalayan glacial melting

Millions of people are under threat from melting of Himalayan glaciers, according to scientists carrying out the most comprehensive ever assessment of climate change in the region. The findings, published in three reports by the Kathmandu-based International Centre for Integrated

Mountain Development, show Nepal's glaciers have shrunk by 21% over 30 years. The reports provide the first authoritative confirmation of the extent of Himalayan glacial melting. (Further details in source: [CAS](#))

China to expand carbon trade after 3-5 years

Su Wei, China's chief climate negotiator, said the country will pilot a carbon trade market for 3 to 5 years before spreading the program to nationwide. China has decided to pilot carbon trade programs in the provinces of Guangdong and Hubei and the cities of Shenzhen, Tianjin, Beijing, Chongqing and Shanghai. The State Council, China's cabinet, has passed a work plan on controlling greenhouse gas emissions during the 12th Five-Year Plan period of 2011-15. It includes provisions aimed at encouraging carbon trade in pilot regions and industrial sectors as well as a plan to set up a national carbon accounting system. (Further details in source: [China Daily](#))

China open to talks on Kyoto extension

The European Union's conditions before signing a second commitment period of Kyoto Protocol are "not fair" for developing countries, but China is open to negotiation, China's leading climate negotiator, Su Wei, said during the Durban summit. The Kyoto Protocol, effective since 1997, is the only international treaty that sets binding greenhouse gas reduction targets for industrialized countries. And its first commitment period expires next year. EU has said it will only extend targets under the protocol provided there will be a timetable for negotiating a single legally binding instrument joined by China and US. "The new conditions are already beyond the mandate agreed in previous talks, namely the Bali Roadmap agreed in 2007," he said. "I think EU is just shifting the goalpost from one place to another," Su said. "This is actually not an efficient way to do things, because we need to accomplish the goals one by one." "But since EU is the group of countries who would seriously consider a second commitment period under the Kyoto Protocol, developing countries are also open and ready to talk to them about how to address that issue," said Su. We hope "to secure a really effective and legally binding second commitment period of Kyoto Protocol," he said, calling the international treaty a "cornerstone" for climate talks. (Further details in source: [China Daily](#))

China Reduced 1.5 Billion Tons of Carbon in Five Years

China Low-Carbon Economic Development Report (2012) recently released by the Chinese Academy of Social Sciences said China is not only the largest carbon emitter in the world, but also the largest carbon emission cutter in the world. During the period of 2005-2010, China reported a reduced GDP per unit of energy use by 19.1%, or 630 million tons of coal equivalent, or 1.5 billion tons of carbon. (Further details in source: [MOST](#))

China backs developing countries' appeal on climate change: official

China will unswervingly back other developing countries' reasonable appeals on climate change, a senior official said. "Developing countries are victims of climate change, and we have moved actively to address the issue," said Xie Zhenhua, deputy director of the National Development and Reform Commission. Xie made the remarks at the opening ceremony of a workshop on climate change adaptation in developing nations, which brought to Beijing over 60 officials from some of the least developed countries, small island nations and Africa. China will lend support to other developing countries to cope with climate change in a variety of areas, including infrastructure construction and technology promotion, Xie said. He said China will step up communications with other developing countries to jointly push for a positive result at the ongoing climate conference in Durban. (Further details in source: [Xinhua net](#))

Climate of public opinion

Public satisfaction will be taken into account in a comprehensive system to assess the performance of local governments on environmental protection, said Bie Tao, deputy director of the policies, laws and regulations department of the Ministry of Environmental Protection. The system will be different from that currently in operation, which focuses on whether local governments have fulfilled preset pollution reduction targets. Under the existing system, officials are not promoted if they miss the preset targets. Consequently, local officials concentrate on figures and are "poorly motivated" to address public concern, Bie said. "Opinions from students, professionals, and non-governmental organizations should be valued as a necessary supplement," Bie said. A string of hazy days in Beijing last month, despite the official "slightly polluted" air-quality rating, aroused widespread public discussion on the difference between official figures and what people were actually experiencing. Sulfur dioxide emissions have been reduced by 14.29 percent from 2005 to 2010, while chemical oxygen demand, a gauge of water pollution, has been cut by 12.45 percent over the same period, according to the National Development and Reform Commission. A researcher explained why people are skeptical of official figures. "Thanks to the efforts spent on improving air quality, the intensity of larger particulates has been reduced significantly, but the number of smaller particulates, which are more closely connected to hazy weather, has been on the rise, and that is why official figures are at odds with public opinion," said Wang Yuesi, a researcher with the Chinese Academy of Sciences. Research conducted over a decade by the academy has shown that the intensity of PM10 - particulate matter smaller than 10 microns - has been declining by 2 to 3 percent annually. However, matter smaller than 2.5 microns has increased 3 to 4 percent every year. Commenting on the reluctance of local governments to shut polluting plants, Bie said it might be due to local governments and plants being "interconnected". (Further details in source: [China Daily](#))

Green industries to add millions of jobs

Greening China's heavily polluting and energy-consuming industries will cause short-term losses but bring huge economic and social benefits in the long run, says a leading environmental think tank. The China Council of International Cooperation on Environment and Development suggested that between now and 2015 the country should spend an estimated 5.77 trillion yuan (\$909 billion) to improve energy efficiency and protect the environment. Nudging out high polluting and energy-intensive industries could cost the country 952,100 jobs and more than 100 billion yuan in economic output by 2015, according to the council's calculations based on its methodology, but in return the country could save 1.43 trillion yuan in its energy expense, said a report by the council. In addition, the growth of the green sector could boost GDP growth by 8.08 trillion yuan while creating 10.58 million jobs. (Further details in source: [China Daily](#))

China starts carbon emission rights trading scheme

China's top economic planner confirmed that it has approved seven provincial regions to start a pilot greenhouse gas emission rights trading scheme in an effort to encourage carbon emission reductions. The municipalities and provinces involved are Beijing, Tianjin, Shanghai, Chongqing, Shenzhen, Hubei and Guangdong, an official with the National Development and Reform Commission told Xinhua under the condition of anonymity. However, the official refused to elaborate on the pilot scheme. Details such as how it will work and how long it will last are not available. (Further details in source: [China Daily](#))

Tighter air quality index proposed from 2016

China's new and tighter air quality index could be fully implemented as soon as 2016, said the environment watchdog amid mounting public criticism of the current air pollution monitoring standard. An unidentified official from the Ministry of Environmental Protection confirmed that the ministry begun soliciting public feedback on the draft of the revised Environmental Air Quality Standards, which includes the measuring of PM 2.5 (particles less than 2.5 microns) and ozone density. The new index standard is scheduled to be fully implemented nationwide in 2016, said the official, adding that the central government may designate certain regions to adapt to the new standard ahead of the national deadline and provincial-level governments could also decide to implement it earlier. (Further details in source: [China Daily](#))

New tech enables use of sandy Yellow River

New filtering technology has allowed water from the sandy Yellow River to bring life to west China's arid farms. Gansu Provincial Bureau of S&T said technology developed by Ruisheng-Yamit High-tech Agriculture Co. Ltd has tackled the problem of using the Yellow River's water for "drip irrigation", a method which allows water to drip slowly to the roots of plants, and which is therefore commonly used where water is scarce. The local authority's appraisal makes way for the roll-out of the technology and makes way for China's sandy ground water to be used for drip irrigation, which otherwise should use clean underground water. (Further details in source: [China.org](#))

UNEP and China launch landmark ecosystem management programme for developing countries

The UNEP and Chinese Academy of Sciences launched the International Ecosystem Management Partnership, a joint programme for promoting ecosystem management in developing countries, particularly in Africa on November 18 in Beijing. The scope of the programme covers both terrestrial and marine ecosystems and its clients include national governments, intergovernmental bodies and programmes, as well as development agencies and the science community. (Further details in source: [CAS](#))

China issues white paper on addressing climate change

The State Council Information Office issued a white paper titled China's Policies and Actions for Addressing Climate Change, highlighting a range of major policy measures to mitigate and adapt to climate change and its remarkable results during the 11th five-year plan period (2006-2010). (Further details in source: [People](#); [Full Text](#))

China to establish climate change think tank

China will establish its first national-level think tank on climate change issues, to focus on strategic research and international cooperation. The new think tank will be established before the UN's Durban Climate Change Conference, scheduled 28 November, said Li Junfeng, deputy director of the Energy Research Institute of the National Development and Reform Commission (NDRC). Under the working title of the National Strategic Research and International Cooperation Centre for Climate Change, the think tank will be affiliated with the NDRC. He said the centre will employ the country's best climate change scientists, researchers and analysts. (Further details in source: [China.org](#))

China to help developing countries cope with climate change

A senior Chinese official said on 21 November that the country will help developing countries cope with global climate change. Xie Zhenhua, deputy director of the National Development and Reform Commission, made the remarks at a seminar attended by 45 officials from 26 developing countries. China will help developing nations that are severely affected by extreme climate to establish weather monitoring systems and weather forecasting stations in order to improve the countries' capabilities of monitoring and forecasting meteorological disasters, Xie said. (Further details in source: [China.org](#))

Central China's Henan to build breeding bases for endangered wildlife

Henan province plans to build seven breeding bases for endangered wildlife over the next five years, provincial forestry authorities said. The breeding bases will mainly take on missions to save endangered wild animals like rhesus monkeys, snow leopards, swans, crested ibis, pronghorns and wild plants like Chinese yew. (Further details in source: [Xinhua net](#))

Carbon capture project deal inked in Daqing

France-based Alstom and the China Datang Corporation recently signed an official feasibility study agreement for a carbon capture and storage demonstration project in Daqing of Heilongjiang Province. Alstom will use its know-how in terms of oxy-firing technology to complete the feasibility study of the 350-megawatt oxy-combustion carbon capture and storage demonstration project in Daqing. It will be the first large-scale demonstration project of its kind in China and Asia, and aims to be the most cost effective demonstration project and set a cost benchmark for the sector. (Further details in source: [People](#))

Green experimental zone planned

The State Council on 16 November decided to establish an experimental zone for ecological protection in Sanjiangyuan on the Qinghai-Tibet Plateau. The experimental zone is expected to explore a mechanism for the ecological development and environment protection. (Further details in source: [Xinhua net](#))

China sea levels rise up to 130 mm in 20 years: report

The Second National Assessment Report on Climate Change, a joint work of the Ministry of Science and Technology, the China Meteorological Administration and the Chinese Academy of Sciences, estimated that China sea levels will rise up to 130 millimetres in the coming two decades, due to global warming. The report noted that rising temperature would lead to continuous rise of sea levels by 80 mm to 130 mm in 2030 compared with 2009. The report also said the average temperature of the land surface in China had increased 1.38 degrees centigrade from 1951 to 2009. China's glaciers have shrunk by 10% over the past 60 years as a result of rising temperatures, the report said. (Further details in source: [People](#))

No evidence that Three Gorges Dam caused climate change: report

A report entitled "Green Book of Climate Change: Annual Report on Actions to Address Climate Change (2011)" published by the Social Sciences Academic Press under the Chinese Academy of Social Sciences said there is no scientific evidence that the Three Gorges Dam has caused change to the climate and is to blame for meteorological disasters in recent years. Research has shown that the radius around the dam within which environmental conditions have

been impacted by the development is less than 20 km. No direct link has been found between the dam and local severe droughts and floods in recent years, according to the report, which instead laid the blame on extreme weather conditions caused by abnormal atmospheric circulation and air temperature mainly incurred by changes in ocean temperature and snow conditions at the Qinghai-Tibet Plateau. The report suggested the authorities strengthen monitoring, evaluation and research of the climate condition in regions around the dam. (Source: [Xinhua net](#))

China objects to EU carbone mission plan

China is urging the EU to drop a plan that would force international airlines to buy special permits for carbon emissions. The Chinese aviation watchdog is one of many to oppose the EU plan to compel non-European airlines to take part in the bloc's Emission Trading Scheme (ETS). The EU says ETS is vital in pushing the aviation sector as a whole to clean up its act. But China and other countries are condemning it as an unreasonable, unilateral demand that will cost airlines tens of millions of dollars every year. But, as Vanessa mock reports from Brussels, the EU seems determined to go ahead. (Further details in source: [China.org](#))

Streamflow simulation by SWAT using different precipitation sources in large arid basins with scarce raingauges

Researchers from Xinjiang Institute of Ecology and Geography taking the Manas River basin as a case study aims at improving the precision of streamflow simulation in large basins on the basis of realising the spatial pattern of precipitation with scarce raingauges. Based on the raingauge data and Tropical Rainfall Measuring Mission (TRMM) data combined with raingauge data, different approaches were explored for spatialising precipitation in this area with scarce raingauges. Spatialised precipitation was then input into soil and water assessment tool (SWAT), a semi-distributed hydrological model, to simulate streamflow. Results of the study indicated that SWAT performed watershed simulations reasonably well using both of the proposed precipitation parameterising methods. (Further details in source: [CAS](#))

Calibration and validation of salt-resistant hyperspectral indices for estimating soil moisture in arid land

Soil moisture plays a very important role in the exchange of mass and energy between the surface and the atmosphere. For this reason, monitoring of soil moisture over extended areas is highly desirable. Conventionally evaluation of soil moisture has been based on local measurements. The microwave domain is currently the privileged spectral region exploited to derive soil moisture. Now hyperspectral remote sensing renders a different approach in image processing techniques. Researchers with Xinjiang Institute of Ecology and Geography of CAS examined the sensitivities of eight different index types of soil moisture hyperspectral indices to salt content based on lab controlled experiments with a wide range of soil moisture content and salt content. (Further details in source: [CAS](#))

Energy

Bill Gates envisions nuclear future for nation

Billionaire philanthropist Bill Gates confirmed that a company he helped found is cooperating on the development of a new type of nuclear reactor in China. "TerraPower is working on what we call Generation-4 nuclear energy. And the idea is to be very low-cost, very safe and generate very little waste," Gates said at a news conference after he discussed cooperation with Ministry of Science and Technology in Beijing. Under discussion is a travelling-wave reactor, or TWR, a

new type of reactor that could reduce the need for the enrichment and reprocessing of uranium. If successful, TWRs would be smaller, cleaner nuclear reactors that would create less nuclear waste and could be used for years without refuelling. (Further details in source: [China Daily](#))

China to boost nuclear power capacity

China will make nuclear energy the foundation of its power-generation system in the next 10 to 20 years. The country will increase generation capacity by 2 billion KWs during that period, with as much as 300 million KW coming from nuclear power, said Shi Lishan, deputy director of the National Energy Administration's new-energy and renewable energy department, at the 21st Century Low-Carbon Development Summit held in Beijing. He said renewable energy will account for a greater proportion of the energy consumed during the 12th five year plan period (2011-2015). (Further details in source: [China.org](#))

China to double wind power generation capacity

China's wind power generation capacity has neared 40 million kilowatts, and it is under way to meet the goal of doubling the figure by 2015, according to an industry report. During the first ten months this year, wind turbines generated 58.3 billion kilowatt-hours, an increase of 57 percent year-on-year, accounting for 1.5 percent of the nation's total electricity output, the State Electricity Regulatory Commission said in a latest report. By the end of the August, 486 wind power stations were in operation across the country, with 39.24 million kilowatts of installed power generation capacity, the world's biggest. The under-constructed capacity was 13.77 million kilowatts. It is estimated that China has exploitable wind power resources equaling 2.38 billion kilowatts on land, and about 200 million kilowatts offshore. (Source: [China Daily](#))

Solar producers fully prepared for US ruling



Chinese photovoltaic (PV) solar companies are well-prepared for the preliminary ruling by the US International Trade Commission (ITC) that these enterprises are harming the US industry. "Now, it is just the beginning of the investigation," said Li Lei of Sidley Austin LLP, who is representing the China-based solar industry. China's Ministry of Commerce expressed its "deep concerns" over the preliminary ITC ruling, saying that the ruling was made without sufficient evidence showing the US solar industry has been harmed. SolarWorld

Industries America and six other undisclosed companies filed a claim with the US Department of Commerce saying that Chinese companies were selling solar panels in the US at unfair discounts and receiving illegal government subsidies. Fourteen Chinese solar panel producers, including Suntech Power Holdings Co and Yingli Green Energy Holdings Co, have decided to jointly raise a plea in response to the US probe. The companies have said that their success in the US lies in having more advanced manufacturing technologies, efficient management and larger production scales. The Department of Commerce will make a final ruling on the anti-subsidy issue by November 2012 and an anti-dumping ruling no later than next July, according to Li. (Further details in source: [China Daily](#))

China becomes biggest investor in renewable energy

China has become the world's biggest investor in renewable energy sources, said a senior environmental official during a forum held in Nanning, the capital of Guangxi Zhuang autonomous region. China invested over 300 billion yuan (\$47.31 billion) in renewable energy sources in 2010, outranking every other country, said Wang Yuqing, deputy director of the Committee of Population, Resources and Environment of the CPPCC National Committee. The official of China's top advisory body estimated that more than 3,000 billion yuan (\$473.1 billion) would be poured into industries related to environmental protection from 2011 to 2015. (Further details in source: [China Daily](#))

China continues safe nuke energy

China will continue to develop nuclear power, the safety of which can be ensured, said Zhang Guobao, advisory board chairman of the National Energy Administration (NEA) at the international capital conference. "No matter what circumstances, it is inevitable to include nuclear power as a significant component of China's effort to resolve energy problems." Zhang's remarks came at a time when uncertainties loom over China's nuclear future. Beijing suspended approvals for new plants and announced a sweeping review of nuclear safety and atomic energy laws and regulations less than a week after Japan's Fukushima disaster in March. China has 14 existing reactors. 27 reactors are under construction in China today, more than 40% of the global total, according to data from the World Nuclear Association. (Further details in source: [China Daily](#))

China-US symposium on biomass gas technology held in Beijing

China-US symposium on biomass gas technology was held in Beijing on October 29. The participants agreed that utilisation of biomass waste is an important way to reduce waste, improve urban environment and develop clean energy. It is also the future trend for processing and utilising household garbage and industrial biomass waste in cities. (Source: [MOST](#))

95% of new buildings in China energy-inefficient: official

More than 95% of new buildings that go up every year are "energy-guzzling", said Tang Kai, chief planner of the Ministry of Housing and Urban-Rural Development, urging the country to promote energy-efficient construction projects. Energy consumption in buildings accounts for 30% of the country's total energy use, he said, adding that the proportion is still rising. (Further details in source: [Xinhua net](#))

China rolls out new homegrown nuclear reactor

The advanced 1,000-megawatt pressurised water nuclear power reactor technology ACPR-1000, which was independently developed by the China Guangdong Nuclear Power Corporation with full intellectual property rights, debuted at the 13th China Hi-tech Fair in Shenzhen. The technology has incorporated the lessons of the Fukushima nuclear accident. It can cope with extreme situations with its all technical and economic indicators meeting the standards of international third-generation nuclear power technology. (Further details in source: [People](#))

Nuclear security training centre planned

In an effort to promote effective nuclear security and safeguards, the Chinese government is planning to build a centre in the suburb of Beijing where personnel from China and other Asian countries would be trained. The Centre of Excellence on Nuclear Security, an idea originally put forward by President Hu Jintao in April 2010 during the Nuclear Security Summit in

Washington, is expected to be built next year in Beijing, said Liu Daming, deputy director of the department of radioactive chemistry, China Institute of Atomic Energy (CIAE). The centre will help meet the training needs of developing countries to strengthen their capabilities of nuclear material accounting and control; the physical protection of nuclear material and nuclear facilities and to promote the best practices in maintaining nuclear security throughout the region, Liu said. During the State visit of President Hu Jintao to Washington in January, China Atomic Energy Authority signed a memorandum of understanding with the US' department of Energy to establish the centre of excellence. (Further details in source: [China Daily](#))

MOST-MICINN joint workshop on renewable energy held in Beijing

During Spanish Minister of Science and Innovation Cristina Garmendia's visit to China, MOST and Spanish Ministry of Science and Innovation (MICINN) co-sponsored the joint workshop on renewable energy in Beijing on October 25. Under the framework of China-Spain Intergovernmental S&T Cooperation, both sides expressed the willingness to promote bilateral cooperation in renewable energy, particularly in solar thermal power and wind power. The two sides also hoped to enhance innovation cooperation among enterprises of the two countries. (Source: [MOST](#))

Nuclear safety simulator

A nuclear safety supervision project was kicked off at the Nuclear and Radiation Safety Centre of the Ministry of Environmental Protection to build a full scope simulator including feasibility study, approval, and bidding. As the first project staged for the national nuclear safety supervision, the simulator will be developed by China Nuclear Power Simulation Corporation under China Guangdong Nuclear Power Group. The system is a platform designed to simulate a range of nuclear safety operations including normal operation, design benchmark accident, and beyond benchmark accident (serious accident) for the advanced second-generation pressurised water reactor moders that are dominating the existing Chinese nuclear power plants. (Further details in source: [MOST](#))

Coal producer to develop alternative energy source

China's largest coal producer, China Shenhua Group, has launched a project to research and develop combustible ice, a kind of natural gas hydrate, in the northwestern Qinghai province. Shenhua Group signed an agreement with the Qinghai provincial government to start the exploration of combustible ice in the province. Combustible ice usually exists in seabed or tundra areas (two mediums having the strong pressure and low temperature necessary to its stability). It can be lit up like solid ethanol, which is why it has the name "combustible ice." As a kind of clean energy, combustible ice is regarded as a potential alternative to coal and oil. China announced the first discovery of the resource under the bed of the South China Sea in May 2007. After it was discovered in Muli prefecture in Qinghai province in 2009, the Ministry of Land Resources announced that China had found combustible ice in the land-based region as well. Experts expect China to experience a period of peak energy demand from 2020 to 2025. With further exploration, the country's prospective volume of natural gas hydrate in frozen earth regions is estimated to reach an equivalent to 35 billion tonnes of oil. (Further details in source: [China Daily](#))

Transport (including aeronautics)

C919 passenger jet starts development phase

China's homegrown C919 large passenger plane has finished its preliminary development review and entered the development phase, a senior executive of Commercial Aircraft Corporation of China Ltd. (COMAC) in Shanghai. An expert team of the C919 project has approved the overall preliminary development review of the passenger jet, said Jin Zhuanglong, president of the Shanghai-based COMAC. It is expected that the manufacturing process for the components of the prototype will begin by the end of 2011. (Further details in source: [China Daily](#))

Deep reforms urged in China's general aviation

Large-scale development in China's general aviation industry requires deep reforms in both regulations and business models, said authorities with the EU-China Civil Aviation Project (EUCCAP) in Zhuhai, a city in South China's Guangdong province. With the country's policy signaling a boost for its general aviation industry, there is an urgent need to readjust its airspace and aviation safety management modes to suit booming social demand, said Frederic Campagnac, EUCCAP team leader. Gaps in specific rules in accordance with general aviation industry standards, such as the construction and management of airports, airstrips and other infrastructures, are still waiting to be filled, he added. Campagnac made the remark at an ongoing workshop which aims to introduce the general aviation sector of the European Union to about 100 of China's aviation specialists from November 22 to December 1 in both Zhuhai and Beijing. EUCCAP is a three-year, 3.7-million-euro project jointly funded by the Ministry of Commerce of the People's Republic of China and the European Union, along with the CAAC. (Further details in source: [China Daily](#))

195 of China's homegrown C919 passenger jets have been ordered

BoCom Leasing signed a deal with Commercial Aircraft Corporation of China, Ltd. (COMAC) to buy 30 of the nation's homegrown C919 large passenger planes. The new order deal brings the total order of C919 passenger jets to 195. COMAC has said it will develop both 168-seat and 156-seat models of the jet, with more models to be developed in the future. It has also said that test flights for the single-aisle C919 are scheduled for 2014, and delivery is slated for 2016. (Further details in source: [Xinhua net](#))

China to further open up low-altitude airspace

China will further relax a ban on the use of low-altitude airspace in 2012 on a trial basis, said the State Air Traffic Control Commission. Starting from January next year, airspace below 1,000 meters in Northeast, Central and South China, as well as six pilot cities, will be open to general aviation flights. The new policy will promote the country's general aviation industry, including the purchase and use of private planes. (Further details in source: [People](#))

Seminar on China-Germany electric vehicle cooperation held in Beijing

The seminar on China-Germany S&T Innovation Cooperation on electric vehicle was held in Beijing on October 24. Minister Wan Gang attended the meeting with nearly 100 representatives from governmental departments, enterprises, universities and research institutes of the two countries. Minister Wan briefed the participants on the development of electric vehicles in China and the major steps taken in following up the joint statement signed by Chinese premier Wen

Jiabao and German Chancellor Merkel. Wan also made detailed proposals on joint research and interactive demonstration. (Further details in source: [MOST](#))

Socioeconomic sciences and the humanities

CASS urges steady policy course in 2012

The government should maintain a stable fiscal policy and prudent monetary policy next year despite expectations for slower economic growth, scholars from a top government think tank said. The expansion of the world's second-largest economy is predicted to slow to 8.9% in 2012, according to the annual economic blue book released by the Chinese Academy of Social Sciences (CASS). The forecast rate is still relatively rapid and stable, and it is higher than the World Bank's outlook of 8.4% for 2012. This year, GDP growth is likely to slump to 9.2%, 1.2% points lower than in 2010, because of the weak world economic recovery and the end of the government's stimulus policy, the academy's report said. (Further details in source: [China Daily](#))

French embassy salutes literary translations

In the symbolic setting of the former Sino-French University, the French embassy recently awarded what it calls the most important literary prize in the Chinese-speaking world, the Fu Lei Translation and Publishing Award. Under the name of the Chinese master translator and writer, this prize has been awarded since the French Nobel Prize Laureate in Literature J.M.G. Le Clézio presented the inaugural award in 2009. Each year, it honors two most outstanding translation works from French to Chinese, one on social science and the other on literature. This year's winners are translations of historian Daniel Roche's multifaceted and cross-disciplinary observation of the Enlightenment, *La France des Lumières*, and award-winning fiction *Dans le café de la jeunesse perdue* by French novelist Patrick Modiano. In addition to this translation award, the French embassy's Fu Lei program has actively supported its unofficial cultural ambassadors over the past two decades, including sponsoring Chinese publication houses on the copyright royalties of French books, providing training to young Chinese translators, and sponsoring translators to temporarily live in Paris for translation. (Further details in source: [China Daily](#))

China reiterates support for non-public economy

China will stick to the support for its non-public businesses by maintaining a fair economic and legal environment, top political advisor Jia Qinglin said. In a meeting with non-public entrepreneurs, Jia, chairman of the Chinese People's Political Consultative Conference (CPPCC) National Committee, said the non-public economy is an indispensable and important part of China's modernization drive. Promoting the healthy development of the non-public economy is a long-term task that needs to be implemented resolutely, he said. The government has stepped up financial support and introduced tax breaks to boost private and small-sized businesses, which contribute to more than half of China's GDP and provide about 80 percent of jobs. (Further details in source: [China Daily](#))

Health system to get shot in the arm

China is set to progressively promote commercial health insurance programs as the country appears to be more determined to tap all resources available to strive for universal and affordable healthcare for its citizens. Vice-Premier Li Keqiang made the remarks while addressing a State Council meeting on deepening the ongoing healthcare reform in China. To date, more than 1.28 billion Chinese people are covered by basic medical insurance programs run by the government,

accounting for nearly 96 percent of the population, according to the latest statistics from the Ministry of Health. In April 2009, the central government accelerated its healthcare reform by unveiling a three-year roadmap with an investment of at least 850 billion yuan (\$133 billion) to provide fair, affordable and quality healthcare services for the public. Major reform measures include expanding the healthcare insurance umbrella, public hospital reform, establishing an essential drug system and improving health equality. Apart from investment by the government, social resources have to be further tapped to achieve that, said Liu Guo'en, a health policy researcher with Peking University. China's total healthcare expenditure in 2010 reached about 2 trillion yuan, or about 1,400 yuan per capita, official statistics said. Meanwhile, government subsidies amounted to 120 yuan per person. "The government is only able to cover a very small share of the medical bills," said Vice-Minister of Health Huang Jiefu. Private health insurance programs will be largely promoted to help with the country's healthcare financing that is now mainly shouldered by the government, Li said. (Further details in source: [China Daily](#))

Debate on class-action plan

Heated debate has arisen over a 50-word article in a draft proposal meant to help the public better protect its interests, particularly in cases involving environmental pollution and food safety. Judges, prosecutors and social organizations have all asked whether the section is short on necessary details or is inconsistent with current legal practices. The article, part of a proposed draft amendment to the Civil Procedure Law, entitles "relevant authorities and social organizations" to file class-action lawsuits to defend public interests, especially from cases of environmental pollution or unsafe food. Luo Dongchuan, deputy director of the Supreme People's Court's research department, said fewer than 20 suits concerning public interests have been filed and heard in the country in the past decade. In those cases, the judicial precedents have concentrated on one point - environmental protection. "A lack of explicit legal regulations is a big obstacle for class-action suits in China," Luo said. In current practice, local courts make their own decisions about what kind of public-interest suits can be filed, as well as how large the fines imposed in such cases can be. The draft amendment, which has been deemed by many as being one of the top legislature's landmark projects, has met with complaints from the public. Many people blame it for falling short of the goals ostensibly behind it. "The draft entitles only 'social groups', not all NGOs in China, to file a class-action suit." In China, a "social group" refers to a particular type of organization, one that has completely different registration and management procedures than social organizations, private non-enterprise entities and other civil societies, according to the country's Regulation on the Registration and Management of Social Groups. Lawmakers read the draft amendment at their bimonthly session in October and are now soliciting opinions about it on the National People's Congress' website. (Further details in source: [China Daily](#))

China to speed up translation of foreign social science classics: publisher

A leading Chinese publisher announced on 19 November a long term plan of translating and publishing about 2,000 foreign classics in social sciences by 2020. The plan was part of the country's largest programme of academic translation and publication in its modern publication era, said Wang Tao, vice president of the state-owned China Publishing Group at a meeting held to mark the release of a special version of those finished translations. Earlier this month, China's Ministry of Education issued a guideline on the development of social sciences and philosophy in higher education and research institutions to support the country's culture strategy. (Further details in source: [Global Times](#))

Senior Chinese leader calls for further development of social sciences, philosophy

Senior Chinese leader Li Changchun urged institutions of higher learning to make more research efforts in the social sciences and philosophy. Li, a member of the Standing Committee of the Communist Party of China Central Committee Political Bureau, made the remarks in a written statement to a national conference on social sciences and philosophy in colleges and universities. Li said college staff should vigorously promote the core value systems of socialist ideology among students, in a bid to help them to foster an appropriate outlook on the world, life and values. Li added that social sciences and philosophy researchers should make theoretical innovations based on the socialist system with Chinese characteristics, focusing on major issues with realistic sensibilities. He called for greater efforts in the development of the social sciences and philosophy, with a goal of making outstanding achievements representative of the country's academic standards with both global influences and Chinese characteristics. (Source: [Xinhua net](#))

China issues white paper on poverty reduction

The Chinese government unveiled a white paper on its poverty reduction efforts in the past decade, highlighting achievements and challenges for China to improve life for its more than 1.3 billion people. The white paper, entitled "new progress in development-oriented poverty reduction programme for rural China", was released by the State Council Information Office. According to the white paper, China's poverty-stricken rural population fell from 94.22 million at the end of 2000 to 26.88 million at the end of 2010, with the proportion of poor people in the country's rural population creased from 10.2% in 2000 to 2.8% in 2010. The white paper stresses China has realised, ahead of schedule, the goal of cutting the poverty-stricken population by half, as listed in the UN Millennium Development Goals, thus making great contributions to the world's poverty reduction efforts. (Further details in source: [China.org](#))

China launches regional poverty-relief pilot scheme

China inaugurated a trans-provincial trial project of poverty relief in the central and western regions in a new initiative to reduce poverty and boost balanced development. Vice Premier Hui Liangyu said the pilot project would pave the way for the implementation of the trans-provincial poverty-relief work in the coming decade. (Further details in source: [central government web](#))

Chinese vice premier calls for deepened health care reform

Vice Premier Li Keqiang has called for deepening health care reform in a bid to build a health care system that benefits the entire population. Li noted that the reform has achieved significant progress and preliminary achievements, since it was started over two years ago. However, more work should be done to promote the reform in an active yet prudent manner based on the principle of "wide coverage and sustainability" Li said. Li also specified a list of urgent issues, including the implementation of full-coverage medical insurance, the reform of government-funded hospitals, and the formulation of a detailed plan for the reform of health care system over the next five years. Li made the remarks in an article in the upcoming issue of Qiushi, or seeking truth, the flagship magazine of the Communist Party of China. (Further details in source: [central government web](#))

China's income gap widening fast

The statistics indicate the finance industry had the highest annual salary of 70,146 yuan in 2010 (\$10,430), while the lowest was in the farming industry with an annual salary of 16,717 yuan. The gap ratio is 4.2:1, while the average ratio in most countries is between 1.5:1 and 2.1:1. There is also a staggering difference between people's pay in cities, rich regions and top posts.

For example, in Shanghai, people working in banks had an average annual income of 357,500 yuan in 2010, tens times that of the average urban worker in China. The report also shows rural families had an average income of 5,919 yuan in 2010, compared with 19,109 yuan at urban level. The region where workers were best paid in 2010 was Shanghai, with an average level of 66,115 yuan, while the lowest paid received was in Heilongjiang province with 27,735 yuan. Managers at listed companies earned on average 668,000 yuan in 2010, 18 times that of the average annual salary in China. (Further details in source: [China Daily](#))

Marxism museum to be launched in China

The China Marxism Museum will open before the end of this year, the museum's sponsor said. Sponsored by the Central Compilation and Translation Bureau (CCTB), the museum will feature collections of Marxist works that have been translated and published in China over the last 100 years. The museum will contain eight sections, each devoted to a different period of Marxist development in China. Photos, sculptures, photographic reproductions of historic documents and archives will be on display, allowing visitors to see how Marxist works were translated and spread throughout China. Yi Junqing, director of the CCTB, said the museum will be the first of its kind in China devoted to the permanent exhibition of Marxism. It will also detail the stories of translators, theorists and ideologists who made contributions to the ideology's prevalence in China. The museum is currently open to the media and will later open to the public, according to the CCTB. (Further details in source: [China Daily](#))

Space

China to launch communication satellite for Turkmenistan

China will launch a communication satellite for Turkmenistan with its Long March-3B carrier rocket in 2014, the Chinese launch contractor said. The satellite will be Turkmenistan's first communications satellite. It will be sent into orbit at Xichang Satellite Launch Centre in Sichuan Province based on the SPCEBUS 4000C2 platform made by Thales Alenia Space France (TASF), according to a contract signed by the French company and the China Great Wall Industry Corporation (CGWIC). Carrying a Ku-band transponder, the satellite is designed to weigh about 4.5 tonnes with a life span of 15 years. As the only Chinese company engaged in international commercial satellite launching services, CGWIC, a subsidiary of China Aerospace Science and Technology Corporation, has launched 38 foreign satellites since 1990. (Source: [Xinhua net](#))

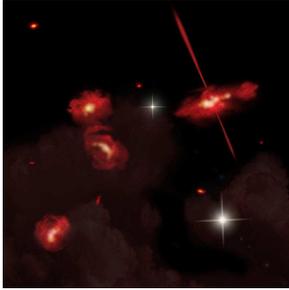
China launches 10th satellite for independent satellite navigation

A Long March-3A carrier rocket lifts off at the Xichang Satellite Launch Centre in southwest China's Sichuan Province, December 2, 2011. China successfully launched into space the 10th orbiter for its independent satellite navigation and positioning network known as Beidou, or Compass System. (Source: [Xinhua net](#))

China to develop 3rd-generation weather satellite

China will develop the third-generation Fengyun series weather satellite to monitor meteorological changes more accurately and persistently to help tackle climate change. The new sets will be able to monitor the meteorological system and different layers of the atmosphere in a long-term and more consistent way to provide scientific evidence for research on climate change, Yu Rucong, deputy director of China Meteorological Administration said at a seminar. (Further details in source: [China Daily](#))

Strange New “Species” of Ultra-Red Galaxy Discovered



It took the revealing power of NASA’s Spitzer Space Telescope to uncover not one, but four remarkably red galaxies. “We’ve had to go to extremes to get the models to match our observations,” said HUANG Jiasheng of the Harvard-Smithsonian Center for Astrophysics (CfA). HUANG is lead author on the paper announcing the find, which was published online by the Astrophysical Journal. Spitzer succeeded where Hubble failed because Spitzer is sensitive to infrared light – light so red that it lies beyond the visible part of the spectrum. The newfound galaxies are more than 60 times brighter in the infrared than they are at the reddest colors Hubble can detect. Galaxies can be very red for several reasons. They might be very dusty. They might contain many old, red stars. Or they might be very distant, in which case the expansion of the universe stretches their light to longer wavelengths and hence redder colors (a process known as redshifting). (Further details in source: [CAS](#))

Two Spacecrafts to Launch Next Year

TONG Xudong, Head of China Aerospace Science and Technology Corporation Manned Space Engineering Office, told reporters that researchers are evaluating the spacecraft and launch vehicle systems after the completion of China’s first docking mission, and will check every details of the entire flight mission, so as to extract more useful information for the coming flight of two target spacecrafts (Shenzhou 9 and Shenzhou 10) in 2012. According to a plan, China will launch Shenzhou-9 in the first half of 2012, and Shenzhou-10 in the second half. In the future, TONG said, Shenzhou spacecraft will mainly work on manned missions, though the daily necessities will mainly be delivered by a cargo ship that is currently under development. In addition, Chinese scientists are developing new generation launch vehicles for future spacecraft and space station launch. (Further details in source: [MOST](#))

China launches remote-sensing satellite Yaogan XIII

China successfully launched the remote-sensing satellite Yaogan XIII from Taiyuan Satellite Launch Center in the northern province of Shanxi, according to a press release from the center. The satellite was carried into space aboard a Long March 2C carrier rocket at 2:50 a.m. Beijing time, according to the center. The satellite will be used to conduct scientific experiments, carry out surveys on land resources, monitor crop yields and help with natural disaster-reduction and prevention. The Long March 2C carrier rocket was produced by China Aerospace Science and Technology Corporation. The flight is the 152th mission of Long-March-series carrier rockets. (Source: [Xinhua net](#))

Craft's loss could boost country's Mars program

The so-far unsuccessful Russian Mars mission - with a Chinese satellite aboard - may instead boost China's own probe of the Red Planet. "It's both regretful and disappointing," said Jiao Weixin, an Earth and space scientist with Peking University. "But the event will help accelerate the country's efforts to carry out deep space exploration independently." Russian news agency Ria Novosti said that attempts to receive a signal from the unmanned Phobos-Grunt had failed, three days after it blasted off from Baikonur in Kazakhstan. It soon encountered engine failure. Jiao said Chinese scientists had hammered out a program for Mars exploration, but it is still awaiting central government approval. (Further details in source: [China Daily](#))

Protein crystallized in space

A black box housing 17 experimental samples aboard Shenzhou VIII spacecraft safely arrived in Beijing on November 18. The blackbox will be delivered to the destined lab within 7.5 hours after being removed from the spacecraft. Experts will assess the samples in the black box before allowing them to be further analysed by individual project teams. It is reported that the space based life science experiments jointly staged by China and Germany involved 33 samples under 17 projects, of which 10 came from China, 6 from Germany and 1 from a joint project, covering four major areas including basic biology, space biotechnology, biology in advanced life support systems, and space radiation biology. Samples tested in the experiments are mainly plants, animals and microorganisms, including blisters snails, nematodes, bacteria, and viruses. (Further details in source: [MOST](#))

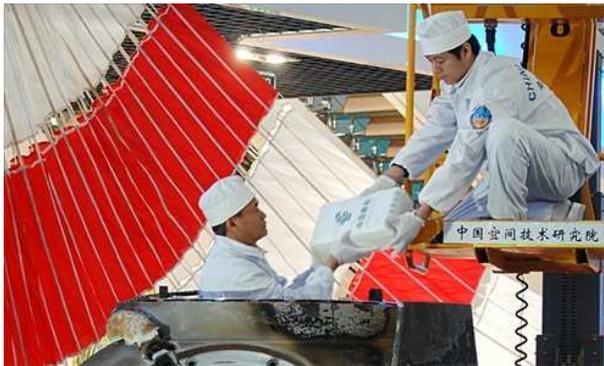
Patent certificates conferred to docking developer

China State Intellectual Property office (SIPO) conferred 15 patent certificates to the Shanghai Academy of Spaceflight Technology (SAST), developer of the docking mechanism for China's first space docking mission. (Further details in source: [China Daily](#))

WAN inaugurated the GEO secretariat in China

Chinese Minister for S&T Wan Gang inaugurated the opening ceremony of the Group on Earth Observation (GEO) Secretariat in China at the National Remote Sensing Centre. The Chinese Secretariat will provide a full support to GEO activities in China, under the leadership of a coordination panel jointly established by Chinese Ministry of Science and Technology and GEO. (Further details in source: [MOST](#))

Shenzhou-8 capsule opened up to public



The re-entry capsule from China's unmanned spacecraft Shenzhou-8 was officially opened on 21 November in Beijing at a ceremony in which some of the onboard items were displayed to the public. A total of 21 packages, wrapped with special China Post packaging, were taken out of the capsule by staff members from the China Academy of Space Technology, where it was designed, and handed over to notaries in two batches before further processing. A number of scientific experiments were conducted during Shenzhou-8's space journey. Thirty-three samples from 17 space biology projects were onboard the spacecraft, 10 of which were carried out by China, six by Germany, and one jointly by both countries, according to China National Radio. Scientists will analyse the data accumulated during the space docking mission in order to make further improvements on the spacecraft, said Pang Zhihao, an aerospace expert. (Further details in source: [Global Times](#))

Tiangong-1 orbiter enters long-term operation management

Chinese orbiter Tiangong-1 has entered into long-term operation management in space after docking twice with the unmanned spacecraft Shenzhou-8. Tiangong-1's shift from short-term in-orbit operation to long-term operation with temporary human attendance is a landmark for

China's manned space programme, the committee for the long-term operation management of Tiangong-1 said. (Further details in source: [Xinhua net](#))

Input welcome in space plan

China's space station plan welcomes outside involvement, said Wang Zhaoyao, vice director of China's manned space engineering office. "The development and operation of China's space station are open to foreign colleagues and experts in the field on the basis of mutual respect, mutual benefit, transparency and openness", he said. China has been steadily progressing toward its goal of building a 60-ton space station around 2020, which will be much smaller than the 390-ton international space station. China has mastered the three basic technologies of manned space flight: transporting astronauts to space and back, extra-vehicular activity, and spacecraft rendezvous and docking. But there is much more to learn before building a space station, including techniques of water and oxygen recovery, large-scale solar energy production, thermal control, large-scale assembly and long-term operation, he said. A space laboratory will be built by 2-16 to test these technologies, he said. (Further details in source: [China Daily](#))

China sends two satellites into space



Two satellites, Chuangxin 1-03 and Shiyao Satellite 4, were launched on 20 November. Chuangxin 1-03, developed by Chinese Academy of Sciences, will be used to collect and relay water conservancy, hydrological and meteorological data and data for power supply and disaster relief from monitoring stations. Shiyao Satellite 4 will be used for experiments on space technologies and environment probe. Developed by Chinese Research Institute of

Space Technology, it is the country's fourth technology experiment satellite. (Further details in source: [Global Times](#))

China announces first space docking mission complete success

Commander-in-chief of China's manned space programme Chang Wanquan announced on 17 November that the nation's first-ever space rendezvous and docking mission was a complete success. Unmanned spacecraft Shenzhou-8 landed safely by parachute on 17 November in China's northern grasslands. The safe return of Shenzhou-8 to earth marked the end of the 49-day space docking mission, which will pave the way for China's establishment of a manned space station around 2020. (Source: [Global Times](#))



China sets up management body for space lab

China has established an operation committee for management of the country's first space lab module, Tiangong-1, during its two-year orbit of earth. The committee will deal with operations planning, technical appraisal and flight control of the target orbiter after the unmanned Shenzhou-8 spacecraft returns to earth after its mission. The operation committee for Tiangong-1 heralds China's manned space programme entering a new phase for lengthy flight missions, Niu Hongguang, director of the operation committee said. The orbiting module management will

include taking care of the space lab, making preparations for any further docking tests and gathering experience for building a future space station, Niu said. (Further details in source: [China Daily](#))

China completes second space docking test

China successfully completed on 14 November the country's second space docking that linked the unmanned spacecraft Shenzhou-8 again with the prototype space lab Tiangong-1, according to the missions' control centre. The Beijing Aerospace Control Centre, which commanded the Shenzhou-8 mission, called the re-docking a success, during which functions of the measuring equipment and docking mechanism were tested in solar light. (Further details in source: [Xinhua net](#))

Enhanced wide-area real-time precise positioning

Wide-area real-time precise positioning technology and associated demonstration is a major project initiated under the National 863 Programme in the area of earth observation and navigation technology for the 11th five-year period (2006-2010). The project is designed to establish an enhanced high-precision satellite navigation demonstration system enjoying advanced real-time data processing, internet, and satellite communication capabilities, based on wide-area differential and precise point positioning technology, and on the existing satellite navigation ground stations in the country. The project team has completed a range of tests in 10 geographic locations. Test results show that the enhanced satellite navigation demonstration system reached a real-time positioning accuracy better than 1 metre, with a real-time navigation satellite orbit determination accuracy at 0.1 metre, and a real-time clock error at 0.2 nanosecond. The system's main technical indicators have reached an internationally advanced level. The development marks China's major breakthroughs in mastering the wide-area real-time precise positioning technology. (Further details in source: [MOST](#))

People & Higher Education

Eight Scientists from Chinese Mainland Elected into TWAS New Fellows

Eight scientists from the Chinese mainland are announced to be new Fellows of the Academy of Sciences for the Developing World (TWAS) at the TWAS 22nd General Meeting held in Trieste, Italy, on November 21. The eight scientists are Profs. ZHAO Guoping, WANG Hongyang, BAO Xinhe, XU Ningsheng, ZHENG Yongfei, SUN Changpu, WANG Shouyang and LIN Wenjuan. Scientific excellence is the only criterion for election of TWAS Members. Only scientists with the highest international standards and significant contributions to the advancement of science can be nominated. TWAS has announced an election of 45 new Members, including 42 Fellows and three Associate Fellows this year. The election of the eight scientists brings the total number of TWAS Members from the Chinese mainland to 161. TWAS is an autonomous international organization founded in 1983 in Trieste, Italy. It represents the best of science in developing countries. Its main mission is to promote scientific excellence and capacity in developing countries for science-based sustainable development. (Further details in source: [CAS](#))

China's schools on the way up

Universities from China's mainland slipped this year in the Times' global rankings. Peking University dropped 10 places from last year to 49th, and Tsinghua University fell to 71th place. Among Asian universities, Peking is ranked No 4 and Tsinghua No 8. China's economic boom has intensified investment in research and development, and the universities' published citations

have increased more than tenfold in eight years. However, the quality of education and research in Chinese academia seems not to have kept pace. The gauge is the number of citations published in highly respected English-language journals, so while many papers are being produced in China, it appears not all are good enough to garner international attention. Still, higher education in China is flourishing, thanks in part to huge government outlays. China spent an amount equal to 3.69 percent of GDP on education last year, according to Ministry of Finance data. China has the largest and one of the fastest growing higher education systems in the world - 2,723 schools catering to 31 million students. Enrollment more than quadrupled from 2001 to 2011. Analysts agree that Chinese universities are strong in natural sciences but traditionally have been weak in social sciences. Baty said universities in China lack academic freedom for scholars to think creatively in their research, and this limits their institutions. Some experts blame China's education system as a whole for keeping higher education below international standards. Tsinghua professor Zhou Zhong said college students "often tend to place too much practical value on their choice of subjects". (Further details in source: [China Daily](#))

China tops the list of overseas students in US

There are more Chinese college students studying in the US than from any other country for the 2010-2011 academic year. China also remains one of the hottest destinations for American students studying abroad, ranking No 1 among Asian countries. The Institute of International Education and the US Department of State's Bureau of Educational and Cultural Affairs released their annual Open Doors report. Chinese student enrollment in the US rose to 157,558, nearly 22 percent of the total international student population, making China the leading sending country for the second consecutive year, followed by India (103,895), South Korea (73,351) and Canada (27,546), according to the report. China sent 23 percent more students to the US compared to the previous academic year. The annual report also proves there is a strong surge of interest by American students to study in China during the past decade, with nearly 14,000 American students in China in 2009-2010 compared to fewer than 3,000 in 1999-2000. (Further details in source: [China Daily](#))

First US-China women chemists workshop in Beijing



The first US-China Women Chemists Workshop was held in the Institute of Chemistry of CAS on October 24-27. 20 women chemists active in China and the US chemistry community were invited to give their presentations over the workshops. The topics ranged from chemical biology to advanced material and displayed the new achievements made by women chemists of the two countries. (Further details in source: [NSFC](#))

12 projects staged to attract talents

Chinese authorities released a detailed plan to implement 12 major talents projects defined by the National Medium and Long Term Talents Development Planning (2010-2020). 1) Innovation Talents Programme led by the Ministry of Science and Technology; 2) Young Talents Development Programme created by the CPC Central Committee Organisation Department; 3) Capacity Building of Business Management Personnel sponsored by the State-owned Assets

Supervision and Administration Commission; 4) High-Quality Educator Training Programme initiated by the Ministry of Education; 5) Famous Cultural Talents Programme led by CPC Publicity Department; 6) Health Talents Programme initiated by the Ministry of Health; 7) High Caliber Overseas Talents Programme sponsored by CPC Central Committee Organisation Department; 8) Professional Knowledge Updating Project established by the Ministry of Human Resources and Social Security; 9) Highly Skilled Personnel Programme created by the Ministry of Human Resources and Social Security; 10) Modern Agriculture Talents Programme initiated by the Ministry of Agriculture; 11) Human Resources Support Programme for Remote, Poverty, Ethnic, and Veteran Revolutionary Areas sponsored by the CPC Central Committee Organisation Department; 12) College Graduates Training at Grass-roots Programme created by the CPC Central Committee Organisation Department. (Further details in source: [MOST](#))

Research infrastructures

China's largest global ocean expedition discovers 16 submarine hydrothermal deposits

Sixteen submarine hydrothermal deposits were discovered during China's largest global ocean expedition, researchers said. The expedition vessel, Ocean No. 1, returned to Qingdao on 11 December. The expedition, the country's 22nd, launched from Guangzhou on 8 December 2010, spent 369 days in the Indian, Atlantic, and Pacific oceans, and was China's longest and most expansive ocean expedition. Over the course of the expedition, 218 experts from 32 institutions engaged in the research. Tao Chunhui, the chief scientist, said that five of the 16 submarine hydrothermal deposits were discovered in the south of the Atlantic Ocean, and the other 11 in the east Pacific Ocean. Hydrothermal sulphide samples, rock samples as well as fish samples were taken by the vessel, researchers said. (Further details in source: [Xinhua net](#))

China needs more research vessels to cater to oceanological demand: expert

China needs to build at least 10 more research vessels in the next five to ten years to cater to the country's rising demand for marine exploration, especially in deep-sea areas, an oceanologist has said. About two-third of China's 15 major research vessels currently in operation – most of which were built in the early 1980s – are outdated and on the verge of being retired, Sun Song, director of the Institute of Oceanology, Chinese Academy of Sciences, said. Sun said China needs to build at least 10 more research vessels in order to maintain a total of no fewer than 15 after the old vessels retire. "China also needs more advanced specialty vessels, such as oil, environmental and engineering vessels, to build up a complete oceanographic surveying system," he said. (Further details in source: [Xinhua net](#))

China pushes to rule the waves



The most sophisticated ship yet to join China's research fleet was launched, marking the latest step in the country's push to boost marine science. Dubbed Kexue (which means 'science'), the 100-metre-long vessel dwarfs research ships operated by some other oceanography powerhouses. It "will be one of China's key research vessels in the next couple of decades," said Ding Zhongli, vice president of the Chinese Academy of Sciences (CAS), at the launch ceremony on 30 November. "It is a state-of-the-art moving laboratory for fundamental research and technological development in marine science, especially deep-sea research." (Further details in source: [Nature](#))

China's newly-designed scientific research vessel sets sail

China's newly-designed scientific research ship, the Kexue, or Science, launched in waters off central Hubei province. The vessel, 99.6 meters long and 17.8 wide, is equipped with a podded electric propulsion system, the first such system for a research ship anywhere in the world, said Yu Jianjun, chief engineer of the project. The ship also features world-class facilities for water body detection, atmospheric exploration, deep-sea environment exploration and remote sensing information research, according to Yu. The cruising capacity of the ship reaches 15,000 nautical miles with a maximum speed 15 knots. Construction of the vessel started last year after approval by the National Development and Reform Commission in 2007. With a total cost of 550 million yuan (86.4 million U.S. dollars), the vessel is expected to be put into use by June 2012, Yu said. (Further details in source: [Xinhua net](#))

China Deploys Marine Seismographs in Antarctica

China's 28th Antarctic expedition team will for the first time deploy two Chinese made marine seismographs in the waters north of Prydz Bay, in an attempt to watch the seismic activities across the Antarctic continent and its surrounding waters. Probing seismic activities in Antarctica and adjacent waters will help scientists to improve their knowledge of the geological structures and associated evolution of deep Antarctic waters. (Further details in source: [MOST](#))

Largest reservoir seismic network established

China has established the world's largest seismological network for monitoring and preventing earthquakes near major reservoirs, said a senior scientist Chen Houqun, a member of the Chinese Academy of Engineering. The network is located in the lower reaches of the Jinsha River, which constitutes part of the upper reaches of the Yangtze River. (Further details in source: [China.org](#))

International S&T relations

UK-China intellectual property forum opens in London

Britain-China Intellectual Property Symposium, the first of its kind between the two countries, opened on 8 December to improve British and Chinese businesses' mutual understanding of the two countries' intellectual property environments. The symposium, jointly organised by China's State Intellectual Property Office, Britain's Intellectual Property Office, UK Trade & Investment, and China-Britain Business Council, attracted over 200 participants including government officials, non-governmental organisations and companies from the two countries. (Further details in source: [Xinhua net](#))

MOST and UNEP Signed MOU

WAN Gang, Chinese Minister of Science and Technology, attended a United Nations Environment Program (UNEP)-Tongji Institute of Environment for Sustainable Development (IESD) board meeting held on November 16, 2011, where WAN and UNEP Executive Director Achim Steiner jointly inked a Memorandum of Understanding between Chinese Ministry of Science and Technology and United Nations Environment Program. The newly signed memorandum of cooperation will stage six cooperation projects during the period of 2011-2013, or the second three-year cooperation phase, covering water resources planning, water resources utilization, water resources related ecological protection, early droughts warning system and

associated adaptation, dry land water saving farming, desertification control among others in Africa. (Further details in source: [MOST](#))

WAN Met with U.S. Secretary of Agriculture

November 18, 2011- WAN Gang, Chinese Minister of Science and Technology, met with visiting U.S. Secretary of Agriculture Tom Vilsack in Beijing. The two sides exchanged views on strengthening S&T cooperation in the area of agriculture, and staging flagship joint research projects. WAN said the bilateral S&T cooperation in the area of agriculture will not only benefit the two peoples, but will also help the international community deal with a range of common issues, including food security, climate change among others. (Further details in source: [MOST](#))

WAN Gang discusses S&T cooperation with Austrian Guests

WAN Gang, Chinese Minister of Science and Technology, met with visiting Austrian Federal Minister of Science and Research Karlheinz Töchterle and Austrian Ambassador to China Martin Sajdik and their party. The two sides exchanged views on strengthening S&T cooperation between the two countries, particularly in the area of energy and environment technologies that are important for the sustainable development. WAN briefed the other side of China's 12th five-year planning (2011-2015) for science and technology development, and welcomed the Austrian side to work with Chinese industry, universities, and research community. Töchterle said Austria is willing to work on technology innovation with China under the framework of intergovernmental S&T cooperation, fostering a stable long-term cooperation tie, and making due contributions to enhancing the bilateral relations and S&T cooperation. (Source: [MOST](#))

New China-Canada joint committee meeting



A new round of China-Canada S&T Joint Committee meeting was held on October 31 in Vancouver. Both sides confirmed the project lists for the third round inter-governmental S&T cooperation, listened to the reports made by three working groups on agriculture, food, and biological products, information and communication technology, and civil aviation, and reached a consensus on staging cooperation in the areas of life sciences and clean technology in the future. (Further details in source: [MOST](#))

China-Ethiopia signed S&T cooperation accord

Zhang Laiwu, Chinese Vice Minister for S&T, and Mohamoud Ahmed Gaas, Ethiopian State Minister of S&T inked an intergovernmental S&T cooperation accord in Addis Ababa to underline S&T cooperation especially in the area of high and application technologies in a bid to promote the common development and respond to common challenges posed by globalisation. (Further details in source: [MOST](#))

China-Italy high-level innovation forum

The 2nd China-Italy high-level innovation forum and the 1st China-Italy innovation steering committee meeting was held on Oct. 31 in Nanjing. Minister Wan briefed on China's innovation policies and major efforts staged in implementing the China-Italy three-year action plan for

strengthening economic cooperation, and proposed a range of specific points for the development of China-Italy technology transfer centre, design innovation centre, and e-government centre, the interface of science and technology parks, and major research collaborations. A framework agreement on establishing a China-Italy e-government centre was inked by MOST Department of International Cooperation, CAS Shenzhen Institute of Advanced Technology, Italian Ministry of Public Administration and Innovation Department of Innovation and Digitization, Italian Innovation Agency, and Turin Polytechnic University, in an effort to provide a framework support for the new centre. (Further details in source: [MOST](#))

Minister Wan attends breakfast meeting on China-Belgium innovation cooperation

On the 40th anniversary of the diplomatic relationship between China and Belgium, Belgium's Crown Prince Philippe visited China. During his visit, MOST, Belgian Embassy to China and Belgian Federation for Technology Industry co-hosted a breakfast meeting with the theme of "innovation cooperation and mutual benefit." Minister Wan briefed on China's 12th five-year S&T plan, and made three proposals on promoting future S&T innovation cooperation and encouraged universities, research institutes and enterprises of the two countries to cooperation in agriculture. Minister Wan and minister Vanackere signed the MOU on promoting the establishment of China-Belgium Agriculture S&T Innovation Park after the meeting. (Further details in source: [MOST](#))