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# NEWSLETTER

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## SPECIAL ISSUES

### Fourth CSLF Ministerial Meeting Held in Beijing

The Fourth Carbon Sequestration Leadership Forum (CSLF) Ministerial Conference, co-sponsored by the Chinese Ministry of Science and Technology and the National Development and Reform Commission, was held September 19-23, 2011 in Beijing. Some 500 participants, including Chinese Minister of Science and Technology WAN Gang, National Development and Reform Commission Vice Minister XIE Zhenhua, U.S. Secretary

of Energy Steven Chu, ministerial officials from CSLF member states, and representatives from international organizations, domestic and overseas industries, universities, research institutions, and other interested parties, attended the meeting.



WAN briefed the audiences of the efforts made by China in preparing CCUS related policies, staging R&D demonstrations, and enhancing the capacity building and international cooperation in the area. WAN pointed out that the coming decade will be a most important period that determines the future of CCUS technology. China is willing to work with all parties, promoting the development of CCUS technology.

The meeting adopted a communiqué and a decision to modify and renew the Forum's Charter. It also kicked off a campaign to enhance the capacity building of carbon sequestration, and plans to finance 12 related projects, including a CCUS website, a CCUS demonstration and experience-sharing seminar, and a CCUS technical standards and regulations seminar, all sponsored by China. The communiqué says it will encourage the earliest possible demonstration and deployment of CCUS projects, including the construction and financing of a number of commercial-scale projects. It will also work on international sharing of project information, the capacity building of developing countries, exploring the mechanisms of funding the CCUS projects, and a global CCUS technology development and demonstration roadmap. It highlights the major role played by the interested parties and international cooperation. It will prepare the needed legislations to address the challenges encountered in implementing the CCUS projects, including the private sector funded projects, strengthening the collaboration in the area of technology and policies, in a bid to reduce the costs, cut down extra energy consumption, and ease

public concerns. It will also launch a range of CCUS Initiatives for industrial sectors. The newly revised Charter is added with the content on the resource oriented utilization of carbon dioxide.

During the meeting, WAN and XIE met with U.S. Secretary of Energy Steven Chu, Australian Resources, Energy and Tourism Minister Martin Ferguson, and British Secretary of State for Energy and Climate Change Bethune on separate occasions. Both sides exchanged views on strengthening bilateral cooperation in the area of climate change, promoting the development of green and low carbon technology, and striving for the positive progresses to be derived from climate change negotiations. After the meeting, WAN, XIE, and Steven Chu attended a joint press conference and answered the questions raised at the scene.

### RMB 1.3 billion for Instruments R&D

The state treasury established an earmark fund earlier this year for developing major research equipment and instruments, in a bid to implement the outlines for national medium and long term scientific and technological development planning (2006-2020). According to an interim by-law for managing the earmark fund, the National Natural Science Foundation will allocate RMB 500 million and the Ministry of Science and Technology RMB 800 million for the fund on an annual basis. The first RMB 1.3 billion earmark fund has been made available for developing major research equipment and instruments.

Not long ago, a meeting, co-sponsored by the Ministry of Science and Technology and Ministry of Finance, was held to discuss the matters concerning the development of major research equipment and instruments and launching the earmark fund. Meanwhile, the first experts panel meeting has been convened by the National Natural Science Foundation to screen and review the candidate projects.

RESEARCH AND DEVELOPMENT

### World's First Quick Acting Humanoid Robot

Two humanoid robots named Wu and Kong made their debut on October 9, 2011 at Zhejiang University Institute for Intelligent Systems and Control. The robots started their ping-pong game at a standard-sized ping-pong table. Experts claimed that the robots, 1.6m tall and 55kg heavy, are the only ones in the world able to act fast in a successive manner.

Facing the rival, the robot is able to capture the ball trajectory at a speed of 120 images per second. The information will be instantly sending back to the robot for a quick processing, allowing the robot to complete the calculation of ball position, velocity, angle, trajectory, impact point, optimal response route, and best fighting back posture in a matter of 50-100 ms. The system will leave the final 0.4 seconds to the robot for swinging its arm, passing the ball to the rival accurately, with an impact point error less than 2.5 cm.

According to XIONG Rong, head of Zhejiang University Robotics Laboratory, the two robots are stemmed from a major project financed by the National 863 Program initiated by the Ministry of Science and Technology. It took researchers four years to have rolled out the third generation humanoid robot that are bearing a shape and weight that is no different from a real human being. Designed with 30 functional and flexible joints, the robots are able to do 7 degrees of freedom of movement using their arms. Furthermore, the robots are applied with China's first international standard for industrial automation technology - Ethernet for Plant Automation (EPA), allowing the robots to enjoy a faster response.

### China's Novel Bird Flu Vaccine

Not long ago, CHEN Hualan and coworkers at the Harbin Veterinary Institute National Avian Influenza Laboratory developed a new vaccine able to prevent the spread of duck plague virus while blocking the spread of H5N1 avian influenza between the ducks. The finding was published in a recent online issue of Journal of Virology. Food and Agriculture Organization of the United Nations (FAO), World Health Organization (WHO), and World Organization for Animal Health (OIE) believed that the vaccine will effectively prevent and curb the outbreak of H5N1s pandemic.

Financed by the National Outstanding Youth Fund and the National 973 Program, researchers bred the new vaccine based on the live attenuated duck plague vaccine. Thanks to five-year painstaking efforts, researchers eventually worked out the recombinant bivalent live vaccine able to inhibit both H5N1 avian influenza and duck plague, achieved the goal of killing two birds with one stone. Furthermore, the new vaccine can easily be accepted by farmers for its low cost. Currently, the vaccine is being tested in the fields, and expects to be massively produced next year.

### Large Capacity Transformer Developed

The world's largest 1000MVA/500kV oil-cooled three-phase auto-transformer at the 500kV level, developed by Hengyang Transformer Co., Ltd., has passed all the required tests staged on October 8, 2011, with all the performance indicators being better than what was required by the technology accord. The tests were designed to allow engineers to assemble the kVA transformer on-site at the Panzihua Substation. It took researchers' painful

efforts to find the right solutions to addressing the on-site assembling of the transformer that claims the largest capacity and highest voltage in the country, including harsh conditions for transport, sophisticated structure, coil removal, on-site short circuit resistance, electromagnetic energy, on-site drying process, and shipping the gigantic transformer to the remote mountainous areas. The successful on-site assembly of the transformer marks a major breakthrough China has achieved in localizing the manufacture of super high pressure and high-capacity transformer.

## NEWS BRIEFS

### China Launched a French Satellite

At 16:21 October 7, 2011, China blasted off a W3C communication satellite made by Thales Alenia Space aboard a CZIIIB launch vehicle, from the Xi'chang Satellite Launch Center. 26 minutes after lifting off, the Xi'an ground control confirmed that the satellite was separated from the carrier rocket, and entered a geosynchronous transfer orbit with a perigee of 206 km, an apogee of 35973, and an orbit inclination angle at 26.1 degree. The launch claimed a complete success.

As a high-power broadcast and communication satellite developed by Thales Alenia Space for a European communication satellite company, W3C is designed with a mass of 5.4 tons, and a 15-year work life, with both Ku and Ka-band transponders onboard. It will provide a range of services, including television broadcast, broadband, video, data transmission, internet among others.

### Spectral Probe of Earth

ZHANG Shancong, deputy chief designer of China's manned spaceflight application system, said recently that Tiangong I will soon be allowed to work on three space experiments, including space materials, space environment, and Earth observation. The target spacecraft will make a spectral probe of the Earth through an onboard high-resolution spectrum camera.

In a circular orbit some 354 km away from the Earth, Tiangong I is currently working on in-orbit tests. According to a briefing, the target spacecraft will probe the Earth using the onboard short-wave infrared spectroscopy. Unlike the earth observation equipment aboard a remote-sensing satellite that is technically mature and proven for direct applications, the one worked on by Tiangong I is more of an experiment in nature, suggesting that the equipment has to pass through the preset tests, before becoming a valid satellite payload.

ZHANG added that China's manned space station to be launched in the future will be a national manned space laboratory with long term human presence, supporting dozens or even hundreds of space experiments.

### Tiangong-I Starts Life Support System

It is reported from China Astronaut Center that Tiangong-I, a Chinese made target spacecraft, started the onboard environmental control and life support systems on October 1, 2011, allowing them to work on their own. Up to date, a range of indicators, including oxygen, carbon dioxide, humidity, temperature, and air pressure, have been tended to and monitored in an automatic manner. According to the specialists who are part of the mission, stringent indicators have been defined for the microbes and particulate matters allowed in the capsule. The Chinese made spacecraft has for the first time made a microbe-purification equipment an onboard payload, in a bid to build a highly purified living environment for the astronauts who will stay in the capsule in the future.

### China's Spallation Neutron Source Project

It is reported that a spallation neutron source project, jointly initiated by Chinese Academy of Sciences and Guangdong Provincial Government, will soon break ground, after a range of preparations, including site selection, feasibility study, design, and equipment development/tests. Physically sitting in the Dongguan City, Guangdong Province, the project will take 400 mu (1mu=0.0667 ha.) of land for phase I amid the planned 1,000 mu for the entire project. The project will be completed around 2017. Of the estimated total investment worth RMB 2.2 billion, the state treasury will contribute RMB 1.7 billion, and Guangdong Province RMB 500 million.

In the course of preparation, Chinese Academy of Sciences High Energy Institute established a joint lab with Dongguan Institute of Technology for the construction of the Spallation Neutron Source. CAS High Energy Institute also created a joint neutron lab in collaboration with the Dalang Township, where the project is physically located, in an attempt to strengthen the docking between the spallation neutron source and the civic nuclear industrial park. The spallation neutron source is built to promote the upgrading of traditional industries on the one hand, and facilitate the rise and leaping development of emerging industries on the other. The project will eventually make the surrounding area a Science Town of a size of 30 square kilometers.

### Polar Icebreaker Seeking a Name

The State Oceanic Administration Polar Expedition Office recently told reporters that having been officially approved by the National Development and Reform Commission, its

new polar icebreaker project has entered the implementation phase, and will soon be opened to both domestic and overseas bidders for design. The boat will be built by China on its own. According to the plan, the State Oceanic Administration will officially release a name seeking plan to the public in November.

According to the design plan, the icebreaker will be accommodated with an internationally advanced ship design, an electric propulsion system, a PC3 icebreaking capability (for the ice thickness not less than 1.5 meters plus 0.2m thick snow), and a continuous ice-breaking speed at 2-3 knots. The boat, 100-120 meters long and 20-24m wide, enjoys a maximum draft up to 9m, a light-load displacement of 8000 tons, an endurance of 20,000 sea miles, and a holding capability for 60 days for an onboard contingent of 90 persons. The new icebreaker will, in the future, work with the "Snow Dragon" polar expedition boat on multidisciplinary polar studies. The two icebreakers can also be realigned with other ocean survey boats to constitute a modern fleet for polar scientific investigations.

## Speech and Language Lab Inaugurated

A national speech and language engineering laboratory was recently inaugurated at the University of Science and Technology of China. The new lab is made up of 11 core divisions, including speech synthesis, speech recognition, natural language processing, intelligent human-machine speech interaction among others. It will also build a range of new platforms for design and development, test and verification, and major technology application and demonstration, based on the University's existing speech and language technology R&D platform, in an attempt to consolidate the core technical resources, generate advanced S&T findings urgently needed by the industrial sector, and enhance the core competitiveness of China's intelligent speech industry. As the sole national research platform in the area of intelligent speech, and the first national engineering laboratory in Hefei, the new lab will be built into a strategic emerging industry platform for speech and language in the coming 2-3 years, in an effort to raise China's proprietary innovation capability and core competitiveness in the area of speech and language technology.

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Comments or inquiries on editorial matters or Newsletter content should be directed to:

Department of International Cooperation, MOST  
15B, Fuxing Road, Beijing 100862, PR China  
Tel: (8610)58881360 Fax: (8610) 58881364  
<http://www.most.gov.cn>