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# NEWSLETTER

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## INTERNATIONAL COOPERATION

### WAN Met German Guests

October 15, WAN Gang, Chinese Minister of Science and Technology, met with Peter Ramsauer, German Minister of Transport, Building and Urban Development, and his party in Beijing. WAN said the two countries have achieved a pragmatic and efficient cooperation in the area of science and technology, thanks to the concerted efforts, especially in the area of new energy transportation, which promotes the economic and

social development and improves people's life. MOST and German Federal Ministry of Transport have worked together to demonstrate the applications of electric automobiles, one of four major collaboration projects under China-Germany platform for alternative power system.

China is willing to enhance collaborations with its German counterparts in the area, jointly developing "smart transportation systems ", and rendering greater contributions to the well-being of two peoples.

Ramsauer responded to WAN's remarks positively, and spoke highly of the collaborations between the two countries in the area of fuel cells, wishing an enhanced collaboration in the area of battery-powered and fuel cell technology. He suggested that two countries should expand two regional demonstration projects based on the Wuhan -North Rhine-Westphalia project, while enhancing collaborations in the areas of toll roads, high-speed maglev, and building energy efficiency.

### WAN Met ITER Director-General

October 18, WAN Gang, Chinese Minister of Science and Technology, met with Osamu Motojima, Director-General of International Fusion Energy Organization (ITER), in Beijing. WAN said China will continue to support ITER's activities, fulfilling the obligations and commitments made by the Chinese side. Chinese side is pleased to see the changes and progresses made in the management of the ITER organization, hoping ITER will complete the reform of its high level management soon, under the principle of one deputy director-general from each side, allowing the management to be transferred smoothly, and projects implemented in a consistent manner. Meanwhile, the ITER organization should strive to raise the efficiency of management, reducing managerial and implementation costs. He added that the signatory parties shall work together to secure the smooth implementation of ITER's plan, enhancing mutual understanding and reciprocal support.

### China-New Zealand Exchange Scientists

A scientists exchange program for 2010, co-sponsored by Chinese Ministry of Science and Technology and New Zealand Ministry of Research, Science & Technology, was kicked off October 18, 2010 in Beijing. This year, New Zealand side has selected five scientists from University of Auckland, Auckland University of Technology, University of Canberra, and AgResearch to work with their counterparts in the target Chinese institutes, including Tsinghua University, China Agricultural University, Zhejiang University, Huazhong S&T University, Zhejiang Academy of Agricultural Sciences, and Chinese Academy of Sciences Shenzhen Institute of Advanced Technologies, covering the areas of vaccine agents, ruminant nutrition, sophisticated medical instruments, digital imaging, and data mining.

The Program is an exchange activity defined under an accord jointly signed in February 2009 by CAO Jianlin, Chinese Vice-Minister of Science and Technology, and Helen Anderson, New Zealand Minister of Research, Science & Technology, in New Zealand, in an effort to start exchanging scientists between the two countries. According to the Program, each side will select five outstanding young and middle aged scientists on an annual basis to work at the counterpart institutions for 4-6 weeks. The Program is designed to promote young scientists exchanges between the two countries, encouraging them to be part of bilateral cooperation, deepening the friendship, and laying a foundation for the long-term S&T cooperation between the two countries.

### China-OECD Roundtable

A China-OECD Innovation Strategy Roundtable, jointly sponsored by the Chinese Ministry of Science and Technology (MOST) and the Organization for Economic Cooperation and Development (OECD), was held on October 19, 2010 in Beijing. WANG Zhixue, MOST Deputy Secretary-General, and Richard Boucher, OECD Deputy Secretary-General, made their respective remarks at the opening ceremony. Some 60 participants from MOST, State Development and Reform Commission, Chinese Academy of Engineering, and OECD attended the meeting.

Participants had an in-depth discussion of a range of topics, including OECD innovation strategies: key conclusions and policy principles, OECD innovation policy country studies, and evaluation of China's innovation policies. CHEN Linhao, MOST Deputy Director of Science and Technology Cooperation, and Andrew Wyckoff, OECD Director for Science, Technology and Industry, held talks in the afternoon of October 18, exchanged views on numerous issues, including China's deep involvement in the working group meetings and projects under OECD Science and Technology Policy Committee (including innovation strategy manual, innovation measurement, green growth, etc.), co-sponsoring seminars, establishing OECD S&T policy focal point in China, China sending trainees to OECD, and celebrating the 10<sup>th</sup> anniversary of China's accession to OECD CSTP10 in 2011.

## RESEARCH AND DEVELOPMENT

### Genomes Project Reveals Human Variations

1000 Genomes project, a large international cooperation project co-sponsored by the scientists from China, the United States, and the UK, reported its detailed findings as a cover story in the journal *Nature* published on October 28, 2010. Scientists involved in

the project also reported their findings on the techniques employed in studying human genomes in the journal of *Science*.

The project has produced two major results: 1) scientists have found more than 10 million gene variants, 8 million of which had never been observed before. The large-scale initiative has identified 95% of the 1% variation found across the human genome, and come up with a most detailed polymorphism map of genome so far revealed. The findings are highly valuable for medical studies, as scientists may easily sort out pathogenic gene variants by comparing notes; and 2) scientists have tested the feasibility of using combined sequence techniques in a large genome study like this. Scientists believe that the practice may significantly bring down the sequence costs, if some genes are studied at a high level of accuracy, while others at a fairly low level of accuracy.

In the first leg of the project, scientists only studied the genetic data of several hundred individuals. The project plans to expand its sequencing efforts further to 2,500 individuals, from Europe, Asia, America, and Africa. It is expected that the final results to be published in 2012 will cover 99% of the variants.

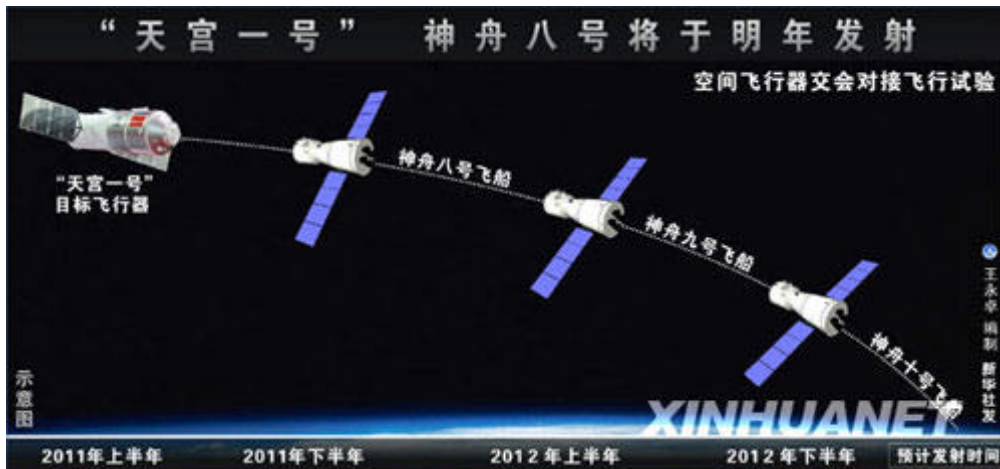
## Enhanced Sea-mud Cells

Not long ago, a research team, led by Associate Prof. FU Yubin, at Ocean University of China Institute of Materials Science and Engineering, has developed a system able to generate electricity by simply plugging two electrodes in seabed mud. The 'sea-mud cells' are built entirely with sea mud and seawater, without any additives. When using regular carbon/graphite as electrodes, the cell produces a low power, undesirable for applications. To address the deficiency, researchers worked out a range of solutions to improve electrode surface and shape, cell structure, and test methods. The cell output has now reached several hundred milliwatts, much higher than the biofuel cells reported so far. In the laboratory, the innovative cells have successfully made radio, calculator, watch, and small toys run smoothly.

Biofuel cells can be used for diverse purposes, including power supply for submarine instruments, marine environmental pollution control, sea mud microorganism screening, and marine geological deposits probe. The research team is currently optimizing the structure design, and preparing applications in a real marine environment.

## NEWS BRIEFS

### China Starts Manned Space Station



Tiangong-1 and Shenzhou 8 capsule be launched in 2011.



Tiangong-1 space lab (experiment capsule).

China has kicked off its manned space station project, said a spokesman of China manned space station project on October 27, 2010. China will have a large space lab tended by humans for long-term operation around 2010.

China will build its manned space station in phased manner. Prior to 2016, China will develop and launch a space lab, mastering the key technologies allowing astronauts to live and work in a space station for a long time, with some substantive space

applications. China will develop and launch the core capsule and experiment capsule around 2020, mastering a range of technologies and techniques for assembling a manned space station, and carrying out near-earth long term manned flights and large scale space applications. According to a plan, China will launch the target spacecraft named Tiangong-1 and Shenzhou 8 capsule in 2011, making them docked in the space.

## China Launches Mars Probe in 2013

Ouyang Ziyuan, a CAS academician, said recently that China plans to launch its first Mars probe in 2013, based on its lunar probe efforts. Probes to Venus and other asteroids are also under plan. Chinese scientists say they may send a rover to Mars, if they accomplish the rover cruising mission on the moon surface, which means if the lunar sample collector can safely return to the earth in 2017, Chinese scientists will make a same probe to Mars in 2019.

China's Mars probe is designed to accomplish the following goals: establishing a proprietary engineering system for Mars probe; collecting first-hand data on Mars, and strengthening China's planet studies; mastering key deep space probe technologies, and realizing the technical leap from lunar probe to Mars probe; and improving the proven lunar probe technologies, ensuring the development cycle and reliability, and making China the 4<sup>th</sup> country in the world able to probe Mars.

The planned Mars missions will be: sending the probe directly into the Earth-Mars transfer orbit. The probe will make a 10-month interplanetary flight in the transfer orbit. The probe will be captured by the Mars orbit, after two to four orbital corrections. Once captured, the probe will travel in Mars' elliptical orbit. The ground control will further correct the probe's orbit in next 1-2 months, making it work in the desired orbit. The probe will work in the orbit for 1-2 years.

Built on Chang'e-I satellite platform, Mars probe will have a launch weight of 2350 kg, and a dry weight of 1040 kg, with 110 kg worth payloads. It will make scientific investigations in an elliptical orbit surrounding Mars.

## Chang'e II Entered Orbit 15 km from Moon

At 21:27 October 26, 2010, the Ground Control in Beijing sent out instructions to reduce the orbital height of Chang'e II satellite. 18 minutes later, the satellite entered the lunar Rainbow Bay area, 15 km from the Moon, poised to shoot the pictures of the Rainbow Bay area. This time the orbital control has to be made in an extremely precise manner, as it is highly possible that the satellite may experience an orbital drift, when descending quickly approaching the perilune, under the effect of lunar gravitation. Furthermore, the satellite was facing the back of the moon, when started to ignite its

engine, making the satellite out of the control most of the time, which increased difficulties and risks. The ground control in Beijing addressed the difficulties and risks using an asymmetric orbital control technique, enhanced the precision of control.

## Nuclear Reactors' Nerve Center

Beijing Guanglihe Engineering Co., Ltd. announced on October 24, 2010 in Beijing that it has rolled out a proprietary digital nuclear security control platform. The event indicates that China has achieved a major breakthrough in developing a proprietary nerve center for nuclear power stations. The platform can directly be employed as a security protection system not only to the G2 pressurized water reactors, such as CPR1000, but also to more advanced models, such as AP1000 and EPR. It will also serve as a springboard for developing the nuclear security system applicable to 4G HTGR and fast neutron reactors.

## China's First 5-MW Offshore Wind Turbine



China's first 5-MW offshore direct-driven permanent magnet wind turbine, developed by Xiangtan Electric Motor, rolled off the assembly line on October 21, 2010. On the same day, a national key lab for offshore wind turbine technology and associated tests under the Ministry of Science and Technology was also inaugurated at the compound of Xiangtan Electric Motor.

Researchers worked very hard to master the technologies and techniques for building a 5-megawatt offshore wind turbine, including turbine integration, proprietary single-axis synchronous permanent magnet generator, cooling system, corrosion/tide resistance, and composite blades among others. Comparing with the wind turbines at different power levels running on a trial basis in Europe, the Chinese made wind turbine enjoys

numerous merits, including optimized structure, enhanced reliability, light weight, and easy maintenance. The 2 units that have been rolled off the assembly line will be delivered to Chinese and European clients.

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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

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