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INTERNATIONAL COOPERATION

WAN Attended City Informatization Forum

WAN Gang, Chinese Minister of Science and Technology made a keynote speech at a global city informatization forum held on September 25, 2010 in Shanghai. The forum was jointly sponsored by a range of international organizations and government agencies, including the United Nations Department of Economic and Social Affairs, UNDP, UN-Habitat, UNIDO, ITU, UNITAR, Chinese Ministry of Science and Technology, and Shanghai Municipal Government.

A city informatization declaration was adopted at the forum, along with the opening of an official website for the forum: www.globalcityinfo.org. A themed meeting was also

held on the occasion to discuss the application of scientific data in achieving millennium development goals. During the forum, a show was staged to celebrate the 30th anniversary of China South-South cooperation with the United Nations. An environment technology assistance project, jointly sponsored by Chinese Ministry of Science and Technology and the United Nations Environment Program, was part of the show.



WAN Met with American Guests

WAN Gang, Chinese Minister of Science and Technology, met with visiting U.S. guests Dr. Issacs, Director of Argonne National Laboratory, and his party on September 17, 2010. WAN and his guests exchanged views on a range of issues, including collaborations in the areas of basic research and clean energy.

WAN thought highly of the efforts made by Argonne National Laboratory in sponsoring and organizing the 2nd China-US Electric Vehicle Forum. He briefed the other side of the latest activities carried out at China-US Clean Energy Research Centre, pointing out that energy technology has long been a focus of China-US bilateral cooperation, and basic research is extremely important for addressing energy and environmental issues. WAN believed that a long lasting and stable cooperative relation shall be established between Chinese and U.S. national labs, especially under the new China-US energy cooperation mechanism. Chinese Ministry of Science and Technology will secure the needed support for such cooperation. He also stressed that bilateral efforts shall be made to further strengthen exchanges and cooperation between the scientists, especially the young scientists of two countries.

Dr. Issacs briefed WAN of the R&D cooperative activities carried out between Argonne

National Laboratory and Chinese universities and research institutes. He expressed that his lab is willing to strengthen technology cooperation with China, especially in the areas of electric vehicles, pollution control, clean energy, and basic sciences.



RESEARCH AND DEVELOPMENT

New Lunar Probe Launched

China launched Chang'e II, its second lunar satellite at 18:59:57 October 1st, 2010 aboard a CZIII-C carrier rocket from the Xichang Satellite Launch Center. The satellite made a successful separation from the rocket, and entered the earth-moon transfer orbit as planned. A solar energetic particle detector aboard the satellite was put into operation at 20:37 October 2, 2010. The detector, one of the seven scientific instruments aboard the satellite, is the first one to be put into operation. Two more onboard scientific instruments: γ -ray spectrometer and solar wind ion detector, started to work on October 4, 2010. At 7:00 October 5, 2010, Chang'e II sent back the first collection of scientific data (1.6G) to the ground control. Scientists said the data, mainly derived from solar energetic particle detector, γ -ray spectrometer, and solar wind ion detector, are presented in a correct and valid format. The probe results so far received are in line with the anticipated results, though scientists will further study the data in the future.

Orbital corrections were made to the lunar probe, when it had been flying for 112 hours since the first scientific instrument was put into operation on October 2. A near moon brake was also performed when the satellite approached a desired position, allowing it to

be positioned at a perilune of 100km, an elliptical lunar orbit that takes 12 hours to make a cycle. Two more perilune brakes put the satellite into a 100km lunar polar orbit. After a range of in-orbit tests and corrections, Chang'e II entered a 100 km × 15 km elliptical orbit circling the moon, taking the pictures of candidate landing areas selected for Chang'e III missions, and testing a range of techniques, including quick orbit measuring techniques. The satellite will be back to the 100-km orbit in a day or two, working on its regular probe missions.



Chang'e II into Moon Circling Orbit

After a range of operations: separation from the carrier rocket, entering the orbit, and orbital correction, the new lunar satellite was instructed to make a near moon brake on

October 6, 2010, after a 112-hour flight. The ground control in Beijing sent a near moon brake instruction to the satellite at 11:06:35. 30 minutes later, the onboard engine started to ignite. A light blue beam appeared on the large screen at the ground control, pushing the lunar probe to approach the moon. Suddenly, Chang'e II made a 180-degree turn, allowing itself into an orbit that is closer to the working orbit. At 11:40, the first near moon brake was completed, and the red orbital line was gradually melted into the green target orbit on the large screen. An official at the ground control announced: "Chang'e II has successfully entered the elliptical lunar orbit that will take 12 hours to make a cycle".

Lunar Probe Landed Technical Breakthroughs

Scientists who have been operating Chang'e II satellite told reporters on October 3, 2010 that they have landed a range of technology breakthroughs in monitoring and tracking down the new lunar satellite:

1. X-band was employed for the first time to monitor and track the satellite.

Scientists have mastered the technologies and techniques for high-precision large antenna control, large antenna performance testing/calibration, and antenna reflector adjustment, and rolled out X-band ground monitoring equipment that can be used for this and follow-up missions.

2. Scientists performed a test to understand the impact of lunar noises on satellite monitoring and tracking, and to verify the accuracy and validity of the satellite-ground link. They prepared lunar noise test plans for the Kashi Station and Qingdao Station that are part of lunar satellite monitoring and tracking links.

3. New coding techniques, namely low-density parity-check codes (LDPC), were employed in the lunar missions. The Chinese made LDPC codec has passed ground tests, with its functions and performance up to the desired technical indicators.

4. DOR based very long baseline interferometry was tested during the lunar missions. Chang'e III satellite and follow-up missions will be measured and tracked using the new international standards.

Stem Cell Research and Clinical Translation

The 3rd Stem Cell Forum, co-sponsored by stem cell repositories in Beijing, east China, south China, and Chinese Academy of Sciences, was recently held in Beijing, in an attempt to promote the healthy and rapid development of China's stem cell research, under major stem cell and tissue engineering initiatives of national 863 and 973 programs. Some 20 renowned specialists from Peking University, Chinese Academy of Military Medical Sciences, Chinese Academy of Sciences Institute of Zoology, and more than 200 representatives from other institutions, attended the meeting. The Forum discussed four major issues: embryonic stem cells and iPS cell, cell differentiation and transplantation, model animals and animal models, and tissue engineering/regenerative medicine, reporting the progresses that China has achieved in the fields of stem cells, clinical translation, drug screening, and other non-human primates modeling.

Earpiece with Smallest Radiation

ZHU Aidao, a Chinese specialist in radiation protection has recently been granted with an invention patent issued by both Chinese and German authorities for a mobile phone earpiece with much reduced radiation. According to international treaties, the patent granted by WIPO International Bureau guarantees the patent protection under more than 150 countries and regions. Both the National Telephone Switch Quality Supervision Center and a third-party testing organization have confirmed that the earpiece is able to effectively cut down radiation in mobile communication. Test reports show that a regular mobile phone earpiece would produce 63MG radiation, and a Bluetooth earpiece 19.8MG. The novel earpiece produces a radiation only up to 1.2MG, suggesting a drastically reduced radiation by 1/52.5 compared with a regular mobile phone earpiece, and 1/16.5 compared with a Bluetooth earpiece.

The new earpiece has combined a range of radiation protection technologies, with a changed structure that separates the earpiece from the speaker, and sets up an insulation wall between the earpiece and radiation sources. It works with a unique acoustic channel technology, making the acoustic channel free from metal wires, which also contributes to a greatly reduced radiation. The new mobile phone earpiece has been put into bulk production.

NEWS BRIEFS

Two Satellites Launched



At 08:49, October 6, 2010, two space environment probe satellites in the Practice VI-04 Group were blasted off aboard a CZIV-B carrier rocket from the Taiyuan Satellite Launch Center. 11 minutes later, the ground control in Xi'an confirmed that satellite A was separated from the carrier rocket, and satellite B made the same operation one minute later. Both satellites have entered the preset orbit. The two satellites are designed with a work life for 2 years or more, attempting to help scientists deepen their understanding of a range of space environment issues, including space environment, space radiation environment and associated effects, space physical environment among others.

China's First Pico-Satellites

At 10:42, September 22, 2010, China blasted off a remote sensing satellite, Yaogan-11, and two pico-satellites, Pixing I-A, developed by Zhejiang University, aboard a CZII-D launch vehicle from the Jiuquan Satellite Launch Center. As of September 30, 2010, the two pico-satellites have worked smoothly for 8 days, circling the earth every 96 minutes, and completed all the prescribed technical missions.

Pixing I-A, the smallest satellite weighing 3.5 kg made by Chinese scientists, looks like a cube with side length at 15 cm. It takes only 3.5 watts to drive the mini satellite into operation. Scientists tested its basic functional units, including power supply, control, thermal control, and structure, and its adaptability to environment. Data analysis shows that the pico-satellites have completed their attitude measurement and control, with onboard instruments, including an optical panoramic hemisphere imaging camera, MEMS acceleration sensor, and angular rate sensor, working smoothly. The pico-satellites have sent the images of the earth to the ground.

Highest Multimedia Environment Lab

Everest Atmosphere and Environment Observing Station under Chinese Academy of Sciences, in collaboration with Hewlett-Packard, inaugurated on September 28, 2010 a CAS-HP environment lab at the foot of Mount Everest, the highest multimedia environment laboratory in the world. As a major sub-project under 2010 Everest Action, the lab, equipped with the state-of-the-art technologies developed by Hewlett-Packard, is designed to understand the local climate and environment. It will collect and analyze local environment data, and sponsor international seminars for the purpose. It will also serve as a popular science center for Mount Everest, and provide real-time weather and climate information for mountain travelers and climbers.



Water Found in Water Deficiency Area

Scientists at Qinghai Geological Engineering Institute found a section relatively rich in water in a plain area in front of the Altun Mountain, based on a survey carried out across the Tibetan Autonomous Prefecture in Qinghai Province. The water rich section is able to produce 2,000 to 3,000 cubic meters of water a day.

Geologists completed hydrogeological and groundwater surveys and drillings in 4-odd month field operations, starting from April, 2010. They extracted water from four selected sites. Analysis results show that the section is covered by two major layers of water, with the upper part containing fresh water, and the lower one slightly salty water or salty water, with a demarcation line running up to 80-90 meters. The layer running from 1.59 to 2.045 m produces 758.94-1,264.05 cubic meters of water a day, or 5,184 cubic meters for the maximum. Geologists believe that the finding makes a major breakthrough for the area in front of the Altun Mountain deploring for serious water shortage, providing a powerful support for easing the water shortage, and for the development of local industry.

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