

N0.585

CHINA SCIENCE AND TECHNOLOGY

NEWSLETTER

The Ministry of Science and Technology
People's Republic of China

N0.585

June 10, 2010

IN THIS ISSUE

- * WAN Attended Finland Pavilion Day
 - * WAN Attended Trilateral Summit Meeting
 - * Protein Able to Eliminate Pathogenic Organisms
 - * Faster Express Train
 - * Quantum State Teleportation for 16 Kilometers
 - * Chinese Made Humidity Sounder Work Smoothly
 - * New Navigation Satellite Launched
-

SPECIAL ISSUES

WAN Attended Finland Pavilion Day



WAN Gang, Vice-Chairman of Chinese People's Political Consultative Conference, and Minister of Science and Technology, attended on May 27, 2010 a ceremony presided over by Finnish President Tarja Halonen to open the Finland Pavilion Day at the Expo Center. WAN sent his warmest congratulations to the opening of the Finland Pavilion Day on behalf of the Chinese government and Shanghai 2010 World Expo National Organizing Committee. WAN briefed the visitors of the accomplishments made by China and Finland in S&T cooperation, and fine exhibitions of S&T findings at the Expo. Both Halonen and WAN thought highly of the smooth development of the relations between the two countries. Both

sides believe that when celebrating the 60th anniversary of establishing diplomatic relations between China and Finland, the Expo would serve as a new platform for the two people to enhance their friendship and exchange. Halonen and WAN visited both China and Finland Pavilions.

WAN Attended Trilateral Summit Meeting

WAN Gang, Chinese Minister of Science and Technology, attended the third trilateral summit meeting held May 29-30, 2010 between the leaders of China, Japan and South Korea. S&T cooperation makes an important agenda item of the meeting. Under the proposal of Chinese side, the summit meeting issued a joint statement on strengthening cooperation among the three countries in the area of science, technology, and innovation, the first of its kind since the opening of the trilateral summit meetings. During the meeting, a young scientists' forum, co-sponsored by the Chinese Ministry of Science and Technology, the Korean Ministry of Education, Science and Technology Development, and the Japan Ministry of Education, Culture, Sports, Science and Technology, was held. Some 60 young scientists from three countries discussed the technological and policy issues concerning the green development. WAN was present at an event where Chinese Premier WEN Jiabao and the leaders of Japan and South Korea met with the young scientists who participated in the forum.

During the meeting, the leaders of three countries issued a Trilateral Cooperation Vision 2020, in a move to map out future cooperation among the three countries. In the Vision, a research program, jointly established by the Chinese Ministry of Science and Technology, the Korean Ministry of Education, Science and Technology Development, and the Japan Ministry of Education, Culture, Sports, Science and Technology, was asked to be strengthened. The parties agreed to expand the scale of collaborations, supporting substantive collaborative researches in the three countries.

RESEARCH AND DEVELOPMENT

Weather Rocket Launched

A weather rocket, developed under the Meridian Space Weather Monitoring Project (Meridian Project), was blasted off at 4:00 am, June 3, 2010 from a deep space probe rocket launching site in Hainan. Applied with GPS technology, the rocket is able to collect high precision near space temperature, pressure, and wind field parameters across low latitudes at a height stretching from 20 to 60 kilometers.

The Meridian Project is a large space environment watch system, designed to monitor the

middle and upper levels of atmosphere, ionosphere, and magnetosphere in a range from 20 kilometers to several hundred kilometers above the ground in a consecutive manner, using diverse means, including geomagnetism, radio, optics, and space probe rockets. It also collects geomagnetic and electric fields data in an inter-planetary space environment that is a dozen of earth radii away from the earth system.

The project will establish 15 near space environment watch stations on the ground along the line of 120 degrees east longitude and 30 degrees north latitude. The station, sitting in the Yaxing Township, Hainan Province, is a comprehensive watch site equipped with most needed functions. The station is also designed to launch space probe rockets to collect meteorological and ionosphere data for the project.

Protein Able to Eliminate Pathogenic Organisms

A study team, led by CAO Xuetao, a Chinese Academy of Sciences academician working at Second Military Medical University Institute of Immunology, reported their findings on LRRFIP1, a cytosolic nucleic acid sensor that can detect microbial RNA and DNA, and trigger the production of type I interferon. A commentary accompanying the paper said the finding pointed out a new direction for people to understand how human immune systems work on pathogenic organisms, and for designing new anti-infection immune drugs as well.

Researchers showed that LRRFIP1 bound exogenous nucleic acids and increased the expression of IFN- β induced by both double-stranded RNA and double-stranded DNA. LRRFIP1 interacted with β -catenin and promoted the activation of β -catenin, which increased IFN- β expression by binding to the C-terminal domain of the transcription factor IRF3 and recruiting the acetyltransferase p300 to the IFN- β enhanceosome via IRF3. Therefore, LRRFIP1 and its downstream partner β -catenin constitute another coactivator pathway for IRF3-mediated production of type I interferon. The finding makes a new target for designing anti-infection drugs.

Faster Express Train

Hexie 380A, a proprietary new generation express train developed by Changchun Railway Vehicles to run at a speed of 380 kilometers per hour, rolled off the assembly line on May 27, 2010. Designed to run at a speed up to 380 kilometers per hour, or 350 kilometers in a row, the new locomotive makes the fastest train in the world, with best quality, most desired functions, and enhanced safety. The high speed train is able to provide the needed comfortableness to passengers, with a reduced noise level and enhanced steadiness. The train compartment is equipped with an automated air pressure regulating system, allowing passengers to have a comfortable stay. The novel locomotive also enjoys a range of merits, including low-resistant and renewable braking, green dynamic system with zero emission,

enhanced safety and reliability, automated monitoring and control, and redundancy design. The entire locomotive is characterized with ten major technical innovations, including low-resistant streamlined head, improved body vibration module, air tight body, enhanced safe bogie, advanced sound insulation and shock resistance, powerful green traction, positive dual-pantograph current collection with low disturbance, enhanced safe low-abrasion braking, individualized service facilities, and intelligent diagnosing and monitoring.

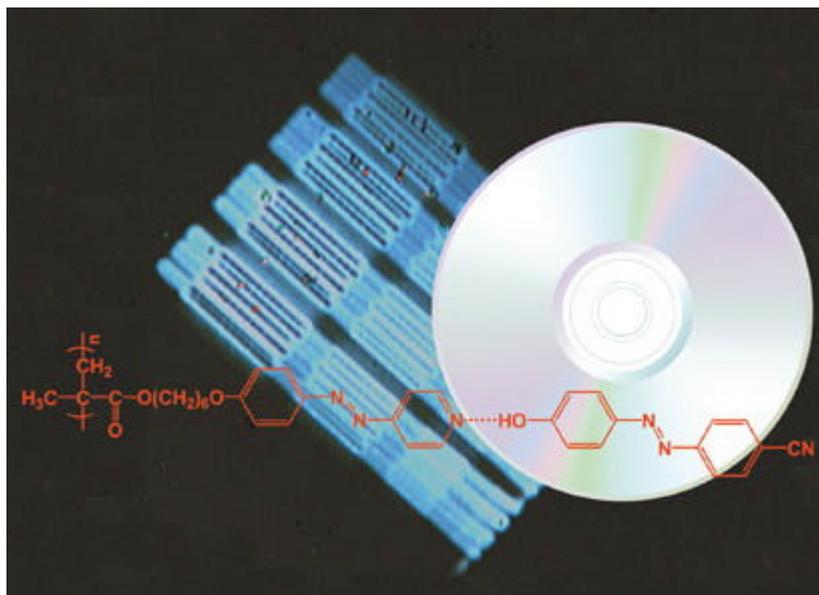
Quantum State Teleportation for 16 Kilometers

A joint research team, made up of the scientists from the University of Science and Technology of China and Tsinghua University, has successfully realized a free-space teleportation of quantum states over 16 kilometers, or 20 times the range registered in the preceding world record. The finding, reported in the June 1, 2010 issue of *Nature Photonics* as a cover story, confirmed for the first time the feasibility of free-space teleportation of quantum states over a long distance that is required for the deployment of quantum information network on a global scale.

In 2007, the team started to work on free-space quantum teleportation of the state of a photon over a 16 km open-air link between Beijing and Huailai in the Hebei province, and has achieved a range of key technical breakthroughs, before realizing the teleportation of quantum state over the longest distance in the world in 2009. Researchers proved the feasibility of the teleportation of quantum state through the atmosphere, and created a reliable ground for the future deployment of a quantum information network on a global scale relying on the relay of satellites.

The study was financed by a range of research programs initiated by Chinese Ministry of Science and Technology, Chinese Academy of Sciences, and National Natural Science Foundation. The finding has attracted the attention of international academic communities, and was reported in numerous international journals, including *New Scientist*, *Physics Today*, and the news portal of the American Physical Society.

Polymers Let DVD Store More



Not long ago, two labs at the University of Science and Technology of China worked together to roll out a supramolecular azopolymer system that shows good optical performance and stability for use as a high density optical information storage, based on the light-responsive nature of the polymers. Researchers believe that a 20-fold increase in information density over conventional DVDs is now possible. Researchers are currently working on the multiple level structures for the polymers, in an attempt to realize super high density information storage using applicable technologies.

The study was financed by National Natural Science Foundation, Ministry of Science and Technology, and Chinese Academy of Sciences. The finding was published in the May 26, 2010 issue of *J. Mater. Chem.*

Chinese Made Humidity Sounder Work Smoothly

A FY-3 weather satellite was launched on May 27, 2008 from the Taiyuan Satellite Launch Center. The Microwave Humidity Sounder (MWS) aboard the satellite was put into operation on June 4, 2008. As of June 4, 2010, the humidity sounder has worked smoothly in orbit for two years. Equipped with two frequencies (150GHz and 183GHz) and 5 channels, the humidity sounder is mainly employed to collect global atmospheric humidity profiles and heavy rain data. The sounder was designed to work three years, with a two-year orbital operation capability. In the past two years, it has worked smoothly, and collected abundant water vapor and heavy rain data, with clearly defined images and rich information.

Comparing with similar sounders manufactured overseas, the Chinese made humidity sounder is applied with a range of innovative technologies: 1) 150GHz polarized separation

using quasi-optic techniques, the first instance in the world; 2) flexible scanning capability in three modes, including scanning at different speeds, balanced scanning, and scanning at a fixed angle, allowing scanning at any angles; 3) broadband and high linear reception, with a raised scaling precision and enhanced qualitative applications; and 4) dual sounding frequencies with dual antenna configuration for expanded functions.

Possible Pathogenesis for Parkinson's Disease

A team, led by WANG Zhizhen, a Chinese Academy of Sciences academician at Institute of Biophysics, in collaboration with another team headed by JIAO Renjie, has found through a PD model study that HDAC6 plays a regulating role in triggering up the occurrence of Parkinson's disease. Researchers found that in a PD model with mutated HDAC6, the model would show noticeably aggregated symptoms of Parkinson's disease, including dying of dopamine neurons, retina deterioration, and dyskinesia. Meanwhile, the symbolic cytorrhcytes came down in number noticeably, while the soluble oligomer went up in number due to the missing HDAC6. The study unveils that HDAC6 has a noticeable inhibitory effect on the occurrence of Parkinson's disease, and that cytorrhcytes has a protection effect, with oligomer being the real cause for the disease. The finding, to be published in the July 1, 2010 issue of *Molecular Biology of the Cell*, provides a new potential target for preventing and treating Parkinson's disease.

NEWS BRIEFS

New Navigation Satellite Launched



At 23:58, June 2, 2010 (Beijing time), China successfully blasted off another satellite in the Compass navigation series aboard a CZIIIC launch vehicle, from the Xi'chang Satellite Launch Center. At 18:30, June 7, the ground control in Xi'an successfully captured the satellite, and made it sit in a geostationary orbit at 84.6° east longitude above the equator. The ground control also opened up the effective payloads, including 1st and 2nd generation navigation equipment aboard the new satellite, the fourth of its kind so far deployed by China in the geostationary orbit. The development marks a step closer to the full operation of China's own satellite navigation system.

Solar Battery Charger for World Cup

A solar battery charger for mobile phones, developed by Yingli Solar in Baoding, China, will be presented as an official gift of FIFA at the opening ceremony of the 2010 FIFA World Cup to be opened on June 11, 2010. It takes some 6 hours for the charger to get its built-in lithium cell (1450MAH) fully charged in a fine day. The charger can charge mobile phones of major brands through a flexible connector. With a weight of 150g, and a compact size at 153x70x16, the charger's active area of silicone battery may reach 120cm^2 when stretching out, with a total power up to 1.6W. According to a briefing, 1000 Yingli solar chargers will be sent to the lucky audiences who are present at the World Cup as a gift.

Nabulae Ranked 2nd in TOP500

According to the updated TOP500 list for supercomputers in the world, Chinese made

Nabulae ranked 2nd. As the first Chinese made supercomputer with a measured speed exceeding the petaflop level, Nabulae sat in 2nd place with a measured Linpack performance at 1271 trillion floating-point operations per second. Tianhe-1, another Chinese made supercomputer sat in 7th place.

Nabulae is the first commercial supercomputer able to offer a speed exceeding the petaflop level in China, with a theoretical peak speed up to 3,000 trillion floating-point operations per second, and a measured Linpack performance at 1,271 trillion floating-point operations per second. In addition to its super computation capability, the machine enjoys a super high cost/effect ratio, low power consumption, and broad application perspectives.

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 E-mail:hzs_dydc@most.cn Fax: (8610) 58881364

<http://www.most.gov.cn>