CHINA SCIENCE AND TECHNOLOGY NEWSLETTER

Department of International Cooperation
Ministry of Science and Technology(MOST), P.R.China

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- **2012 National Science and Technology Awards Presented**
- **2013 National Science and Technology Work Conference Held**
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Headline news

2012 National Science and Technology Awards Presented

According to *the Regulations on National Science and Technology Awards*, subject to the evaluation of the Review Committee, and as finalized by the National Science and Technology Awards Committee, verified by the Ministry of Science and Technology, and approved by the State Council, recipients of 2012 National Science and Technology Awards have been selected. Recipients of Top National Science and Technology Award, signed by President Hu Jintao in person, are academicians Zheng Zhemin and Wang Xiaomo. 41 research outcomes, including the one on molecular genetic regulation mechanism of complex quantitative traits of rice, have received Second Prizes of National Natural Science Award. 3 research results, including the one on laser forming technology for large, complex aircraft-worthy titanium alloy components; and 74, including the one on new technologies for repair of peripheral nerve defects and their applications, have respectively obtained First and Second Prizes of National Technological Invention Award.

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3 research results, including the one on Chang-e 2 Lunar Probe; 22, including the one on key technologies for shield equipment manufacturing and commercialization; and another 187, including the one on germplasm resources of distinctive tropical plants and their innovative utilization, have respectively obtained Special, First and Second Prizes of National Science and Technology Progress Award. 5 foreign experts, including Amecian chemist Richard N.Zare, have won China International Science and Technology Cooperation Award.

On January 18, National Science and Technology Awards Ceremony, chaired by General Secretary and Chairman of Central Military Commission Xi Jinping, was held in the Great Hall of the People in Beijing. China's top leaders, including President Hu Jintao, General Secretary Xi Jinping, Premier Wen Jiabao, Vice-Premier Li Keqiang, member of Politburo Standing Committee Liu Yunshan attended and presented the awards. Premier Wen Jiabao delivered a speech. Member of Standing Committee of the Politburo and Vice-premier Li Keqiang announced *the Decisions of the State Council on 2012 National Science and Technology Awards*.

(Source: Ministry of Science and Technology, January 18, 2013)

2013 National Science and Technology Work Conference Held

-innovation-driven strategy will be pursued

On January 19, 2013 National Science and Technology Work Conference, chaired by Wang Zhigang,Party Chief and Vice-Minister of the Ministry of Science and Technology, was held in Beijing. Wan Gang, Vice-Chairman of CPPCC National Committee and Minister of Science and Technology delivered work report.

Minister Wan reviewed what the Ministry of Science and Technology has done over the past year, summed up the successes and experiences in the reform of science and technology sector over the past five years, and mapped out plans for the new year. He said that 2013 marks the beginning for carrying out the 18th CPC National Congress, and is a crucial year for breaking new ground in the 12th Five-year Plan period. Innovation-driven strategy must be pursued in fulfilling tasks set forth by National Science and Technology Innovation Conference, in an effort to deepen the reform of scientific and technological system and improve innovation capacity. The role of science and technology must be brought into full play in boosting economic performance

and improving people's livelihood.

Wan set out 10 priorities for 2013: fulfil tasks in deepening the reform of scientific and technological system as required by National Science and Technology Innovation Conference and Document No.6 of the Central Government; highlight the dominant role of businesses in technological innovation; speed up the fostering of strategic, emerging industries in key national R&D projects; develop cutting-edge technologies to command heights in future competition; emphasize the integrated demonstration and commercialization of high-tech to spur industrial restructuring; strengthen basic research to boost sustained innovation capacity in science and technology; enhance S&T innovation and entrepreneurship in agriculture, and facilitate urban-rural integration; bring more benefits of science and technology to the public, to the culture, society, and environment; underline science and technology work at the grassroots level, so as to promote regional innovation; further open up in science and technology and highlight international cooperation.

According to Wan, science agencies at all levels should improve work style, build up capacities, and be corrupt-free, following the requirements of the 18th CPC National Congress.

(Source: Ministry of Science and Technology, January 21, 2013)

S&T Management Information

National Medium- and Long-term Construction Plan for Major R&D Infrastructure Adopted

On January 16, the State Council executive meeting, presided over by Premier Wen Jiabao, adopted *National Medium- and Long-term Construction Plan for Major R&D Infrastructure (2012-2030)*.

The Plan defines the direction for the developing China's major R&D infrastructure in the coming 2 decades and the focuses during the 12th Five-year Plan period. Aiming to boost its original innovation capacity and underpinning major R&D breakthroughs and socio-economic development, China will, in light of frontier research areas and strategic national needs, focus on 7 fields, namely energy, life, earth system and environment, materials, particle physics and nuclear physics, space and astronomy, and engineering technology in the 20 years to come. During the 12th Five-year Plan period, China will give priority to 16 R&D infrastructure projects in well-equipped areas of urgent need, such as seabed scientific observation network and precise gravity survey infrastructure. Collaborative innovation and sharing mechanism will be strengthened, investment will be stepped up, and management will be improved to increase the operating efficiency of the major R&D infrastructure projects.

(Source: Science and Technology Daily, January 17, 2013)

Research on Risk Mechanism and Safety Control Theory for Cascade Reservoirs Launched

The project on studying risk mechanism and safety control theory for cascade reservoirs was launched recently under 973 Program. With the focus on cascade reservoirs in the Yangtze River Delta area, it aims to study the risk mechanism, disaster-chain effect, safety prevention and control, risk early-warning and emergency response, so as to lay scientific basis for warding off and controlling risks. Led by the China Institute of Water Resources and Hydropower Research (IWHR),the project team will be composed of brilliant researchers from universities, research institutes and enterprises in hydrological cycle, hydro-structure and hydraulic materials. The project will lay a foundation for developing China's reservoir system optimization and regulation theories and methods.

(Source: Ministry of Science and Technology, January 18, 2013)

Research on High-performance Acoustic Materials Launched

The project on high-performance acoustic materials and their integration in high-end ultrasonic transducers was launched recently under 973 Program. Overall, China's ultrasonic equipment industry, though large in scale, is low in technological level. High-end products in this field are dominated by developed countries, largely because China is lagging far behind in the ultrasonic transducer, a core component of ultrasonic detection equipment. In light of this, the project aims to study the impact of relaxor ferroelectric single crystal of giant piezoelectricity, regulation mechanism for developing large-scale relaxor ferroelectric single crystal, mechanism for wide-band acoustic transmission and absorption of ultrasonic composite materials, structured coordination gain of the integration of three different acoustic materials. This will be a basis for advancing China's high-end ultrasonic detection system.

(Source: Ministry of Science and Technology, January 18, 2013)

Scientific Research Progress and Achievements

NUDT Creates Ultra-precision Machining Miracle

Ultra-precision machining is an advanced manufacturing technology featuring high precision. Despite of the plight situation in making optical parts, the research team of the National University of Defence Technology (NUDT), under the leadership of Prof. Li Shengyi, skipped the 1st and 2nd generation technology

to focus on the 3rd generation flexible manufacturing technology. With hard efforts, they developed, for the first time in China, magnetorheological and ion beam ultra-precision polishing equipments with proprietary intellectual property, making China world No. 3 in the ultra-precision optical field after the US and Germany and the only nation capable of both magnetorheological and ion beam polishing equipments.

Over the past three years, the team worked with CAS, China Aerospace Science & Technology Corporation and the Aviation Industry Corporation of China to accelerate China's space optics and high-end equipment manufacturing. The seven different types of magnetorheological and ion beam polishing machine developed by the team are providing strong solutions for several national major sci-tech projects including "large scale integrated circuit manufacturing equipments and process" and "high resolution earth observation system".

(Source: Science & Technology Daily, January 22, 2013)

World's First Quantum Router Developed by China

Quantum router is a major unit in the all quantum networks. The world's first quantum router has been developed and tested in China under the 973 Program, signifying a major breakthrough in all quantum networks. The research team is headed by Prof. Yao Qizhi, a renowned computer expert from the Institute of Interdisciplinary Information Sciences of Tsinghua University and recipient of Turing awards. The team tested the all quantum router in the experiment and realized quantum signal control of the routes. 《Wired》 said "Physicists foretell quantum internet with entangled photon router..... and university in China have built what they call the world's first quantum router."

(Source: Science & Technology Daily, January 24, 2013)

China Masters Temperature Difference Power Generation Technology

The 15KW temperature difference generator project of the 11th Five-Year Key Technologies R&D Program, implemented by researcher Liu Weimin from the First Institute of Oceanography, State Oceanic Administration, passed the evaluation test recently, indicating remarkable progress in ocean energy utilization.

Compared to those of the US and Japan, the technology developed by Liu Weimin's team is much more efficient. The generation efficiency of the US Rankine Cycle stands at 3%, the Japanese Uehara Cycle stands at 4.9% and the Guohai Cycle of China achieves a rate of 5.1%, which means that with equal investment, the plant using Chinese technology can generate the same amount of electricity of 2-3 plants using the US or Japanese technology, thus cutting the cost dramatically.

(Source: Science & Technology Daily, January 23, 2013)

First Ocean Tide Generation Facilities Developed in Jiaozhou

The new type of direct drive permanent magnet generator, the first of its kind using ocean tide in China, was developed by Qingdao Histro Co., in Jiaozhou. However, the ocean tide generation technology isn't novel, introduced Mr. Wang, assistant to the General Manager of Histro. A group of small-and-medium size tidal plant was built along the east coast of China since 1980s, such as the Jiangxia tidal plant in Zhejiang Province.

In 2010, Histro began to work with the Ocean University of China and Harbin Institute of Technology at Weihai to develop ocean tide direct drive permanent magnet generator. Based on European experience and up-to-date technologies, the project realized indigenous production of generation parts and overall units, and achieved a system energy transfer efficiency of 30%. With direct drive permanent magnet--the mainstream turbine technology around the world, the energy consumption of the system is low and generation efficiency is 5-10% higher than conventional gearbox generators.

"The system is like putting the wind turbine generator into the sea," said Mr. Wang, , "the turbine is 7 meters in diameter and the wings are made of carbon fibre nano-material. The researchers resolved key technical problems such as sealing and anti-corrosion, so the system can be operated for over 1 year without failure. The equipments are put into the offshore area 16-40 meters from the coast, and can start operation as long as the tide runs at 0.6-1.3m per second."

(Source: Science & Technology Daily, January 4, 2013)

International Scientific and Technological Cooperation

ZGC Deploys Big Data Industry

The Zhongguancun Science Park is vigorously taking developing opportunities to deploy the big data industry, and an industrial chain is taking shape.

The newly founded Zhongguancun Data Industry Alliance, initiated by Lofter, Cloud Valley, China Unicom, Lenovo, Peking University and Alibaba, will set up Zhongguancun big data engineering center to issue annual report on big data development and accelerate ecosystem building for the industry.

The Alliance released the Cloud Angle Fund, China Cloud Blend Fund and Big Data Lab Incubation Fund to keep a close eye on the startups and their technologies as well as commercial operation in the field of big data, cloud computing and mobile internet, so as to discover and support creative ideas, technologies and teams.

Zhongguancun is endowed with China's largest and most valuable data assets, along with high-value and high density data institutes. Based on the resources, it is

taking the lead in the interdisciplinary and multi-industry study combining data science and engineering practice. By far, the big data industry is listed in the 2013-2015 Zhongguancun Strategic Emerging Industrial Clusters Innovation Project.

(Source: Economic Daily, January 8, 2013)

National Technology Translation Base Launched in Nanning

On January 7, 2013, the launching ceremony of national technology translation demonstration base was held in Nanning. As a priority agenda on the working conference between Guangxi Science and Technology Department and Nanning city government, the demonstration base has won RMB4.76 million financial support from the two agencies at its construction phase.

The Nanning demonstration base will, through technology translation and utilizing the data resources of national sci-tech achievements network, build itself into an information platform for biotechnology, modern agriculture and equipment manufacturing technology, a technology transfer platform for ASEAN member countries, and a service platform for IP and technology contract registration. It will also organize matchmaking events for major technological achievements, nurture competent enterprises to demonstrate key technology results and put in place a technology translation layout based in Nanning, targeted at the Beibu Gulf and radiated to ASEAN, so as to provide robust support for socioeconomic advancement of the region.

(Source: MOST, January 17, 2013)

China's First Nano Industrial Complex in Use

Nanopolis Suzhou--China's first nano industrial complex with a floor area of 100 hectares and planned construction area of 1.5 million m^2, has just put into use the first phase 100,000 m^2. 140,000 m^2 of the second phase and 56,000 m^2 of the Jiangsu Nano Industry Technology Research Institute will be completed by September, 2013.

Nanopolis Suzhou is focusing on micro-nano manufacturing, novel nano materials, energy and clean technology as well as nano biotechnology to concentrate innovation and industrial resources at home and abroad to the city. By far, 18 companies, including J&L and Suzhou Boshi Robotics Technology Co., have the intent to settle in the Nanopolis with 10 contracts already signed. The 10 contracted companies will take up 14,000 m^2 of the park. In addition, the Nanopolis has also reached agreement with such companies as Wather, Raytek and Nano-Micro.

(Source: Science & Technology Daily, January 21, 2013)

China Successfully Develops Flexible DC Converter Valve and Valve Base Controller

The ±320kV/1000MWC flexible DC converter valve passed all type tests specified in IEC62501 under the witness of DNV KEMA, -EPRI Electric Power Engineering Co., Ltd Purell. This marks the successful development of the flexible DC converter valve and valve controller with the highest voltage and capacity rating in the world.

As an optimal solution for offshore wind power connection with the grid, island power supply and urban power distribution, flexible DC transmission is a frontier grid technology attracting worldwide attention over the past years. China has signed framework agreements with several developed countries to jointly develop offshore wind energy. The above-mentioned technology is another high-end grid equipment successfully developed by State Grid Corporation of China after ultra-high-voltage DC converter valve.

The ±320kV/1000MWC flexible DC converter valve, developed under Dalian Cross-sea Flexible DC Transmission Demonstration Project. The flow rate of the converter is said to reach the practical limit, presenting unprecedented challenges to the voltage and current level of the valve sub-module and controllability of the valve controller. No successful development of similar equipment has been reported by other countries.

(Source: Science and Technology Daily, January 18, 2013)

(Editor's Note: All news in the issue are translated from Chinese texts for your reference. They are subject to checks and changes against official release of original Chinese or English texts.)