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**CHINA SCIENCE AND TECHNOLOGY**

# **NEWSLETTER**

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**SPECIAL ISSUES**

### **More Money for Popular Science**

According to popular science statistics release by Chinese Ministry of Science and Technology on 29 December 2011, China has enjoyed in 2010 a sustained increase of investment in popular science activities at a sum worth of RMB 9.952 billion, or 14.22% up over 2009. Per capita money spend on popular science activities

reached RMB 2.61, or RMB 0.51 more compared with RMB 2.10 in 2009, claiming an increase exceeding 24%.

Statistics also show that China has built more S&T activity centers in the same year. As of the end of 2010, there were 1,511 popular science activity centers (500 square meters or larger) in the country, or 107 more in number compared with 2009. Of the money invested in building popular science activity centers, the one allocated by the government accounted for RMB 6.8 billion, or 68.42% of the money raised for the purpose, with RMB 137 million contributed by other sources, or 40.23% more against 2009.

Of the popular science activity centers, 335 are S&T activity centers, 555 science and technology museums, 621 teenagers S&T activity centers (stations), or 26, 50, and 31 respectively more in number compared with 2009.

China has currently had 237,300 popular science galleries, with an increase of 11.67% compared with 2009; 73,200 community popular science sites in the urban areas, or 7.70% up compared with 2009; 414,600 popular science sites in the rural areas, with an annual increase of 12.05% over 2009; and 1,919 vehicles dedicated to popular science activities, or 350 more in number compared with 2009, with an increase of 22.31%.

In 2010, 65 million popular science books had been published, accounting for 0.91% of the total books published in the country. Popular science journals published in the same year reached 155 million in number, accounted for 4.82% of the total journals published in the country. Meanwhile, the circulation of science and technology newspapers reached 340 million in number, or 1.10% of the nation's total newspaper circulations.

At present, China has a popular science contingent made up of 1.7514 million people. Of them, 223,400 work full-time and 1.5280 million part time, which means 13.06 popular science workers available for every 10,000 people. Meanwhile, there are 10,981 popular science writers in the country, or 0.63% of the total population working on popular science activities. China has 2.3885 million registered popular science volunteers, or 54.69% up compared with 2009.

### Largest R&D Contingent in the World

China enjoys an increasingly boosted contingent of scientific and technological personnel. In 2010, China's R&D population reached 2.55 million people in full-time equivalent, ranking first in the world, said ZHANG Ping, head of National

Development and Reform Commission on 28 December 2011.

According to ZHANG, China secured RMB 706.3 billion for R&D expenditure in 2010, 1.53 times the expenditure reported in 2008, or 1.76% as a proportion of GDP. Of the expenditures, the one spent by industry reached RMB 518.6 billion, or 73.4% of the total R&D expenditure in the country. A range of large science and technology infrastructures, including Shanghai Synchrotron Radiation Facility and Beijing Electron Positron Collider, have been completed. During the 11<sup>th</sup> Five-year period (2006-2010), China has established 327 national key laboratories and 91 national engineering laboratories.

Zhang added that efforts have been made to speed up a range of major S&T projects, including large aircraft and new drugs projects. Meanwhile, more innovation demonstration cities have been built, and a market-oriented technological innovation system with industry as the mainstay, supported by universities and research institutes, has been further enhanced. Some 140 national engineering research centers have been established at major industrial enterprises. Industrial technical centers certified by authorities concerned reached 729 in number. 56 industrial technology innovation alliances have been created for auto, steel, and others.

## RESEARCH AND DEVELOPMENT

### Test Train Runs at 500 km

China made the debut of a novel speedy test train able to hit the cornerstone speed of 500 km or more an hour on 25 December 2011 at the compound of China South Locomotive in Qingdao. According to a briefing, the test train is applied with a newly developed high-power traction system with a traction capability up to 22,800 kilowatts. Built on the CRH380A model, the test train is designed with an enhanced capability for critical speed, towing capacity, and reduced resistance, along with improved system integration, head type, body, bogies, traction, and braking systems, striving for a safer and more reliable operation. Meanwhile, the proprietary key technologies developed to build the new high speed train have been industrialized.

The test train is also applied with a range of network technologies, including the Ethernet network, the Internet of things, and wireless network, allowing the test train to be well informed of the changes in environment and weather. The train

driver can access to the needed weather elements as desired, including wind, rain, frost, snow, lightning, and earthquake in an automatic manner, and determine the speed of the train in line with the changing environment and weather elements for an enhanced safety.

### Smart Positioning System for Blind People

A smart positioning service system developed by CAS Institute of Computing Technology to facilitate disabled persons' travel recently made its debut. Built on a smart phone, the new system makes up what a traditional positioning system cannot do: facilitate the travel of blind people. The system is able to make a seamless indoor and outdoor transition between the mobile phone and the service system, taking advantage of increasingly enhanced WIFI applications, created a novel communication tool for blind people and their families.

Under the system, the family or friends of a blind person with a mobile device equipped with the system can tell the current position of the blind person, and access to the moving tracks and stay information of the blind person within a selected period of time. Meanwhile, the blind person can automatically submit the tracks of his or her movement, without doing anything to the device, though he or she is allowed to know its own location and to access the needed services through a push-button voice mechanism. Enjoying a high positioning precision, the system is able to secure an indoor or outdoor positioning precision at 2-5 meters, without changing the hardware of mobile phone and associated environment.

### Scientific Drilling Rig for 10,000 m

A proprietary scientific drilling rig able to hit the depth of 10,000 m, designed by Jilin University School of Engineering and manufactured by Sichuan Honghua Group, rolled off on 20 December 2011 from the factory in Chengdu. With a height of 60 meters and a weight of 1,000 tons, the drilling rig will be installed in early 2012 on a site of 10,000 square meters at the Daqing Oil Field. Chinese scientists will collect the data from the drilling up to a depth of 6,600 meters in the Songliao Basin, under the International Continental Drilling Program (ICDP). The data will, together with the data gathered from another scientific drilling rig in the same area, constitute the world's first Cretaceous continental sedimentary database, allowing scientists to access to high-resolution climate and environment records on East Asia during the Cretaceous period, and providing scientific evidence for predicting the future trends of global climate change. The drilling project has reported major breakthroughs in design and manufacturing a full hydraulic drilling machine and associated supporting drilling equipment, digital design, intelligent functions, and

automated drilling equipment.

## NEWS BRIEFS

### Ho Leung Ho Lee Foundation Awards for 2011



A conferring ceremony was recently held in Beijing to grant Ho Leung Ho Lee Foundation awards to the winners selected for 2011. Prof. YANG Xuejun, a renowned Chinese scientist on high-performance computer at National Defense University was honored with a "Science and Technology Achievement Award". DING Weiyue and other 34 winners were granted with a "Science and Technology Progress Award". WU Zhaohui and other 14 people are the winners of a "Science and Technology Innovation Award". SANG Guowei, NPC Vice Chairman, and Wan Gang, CPPCC Vice Chairman, conferred the awards to the winners at the ceremony.

According to a briefing, the winners are 52.7 years for the average age, or 3 years younger compared with the winners of the previous year. The winners who are aged between 40 to 60 years accounted for 86.3% of the total, and the proportion

of non-academician winners reached 82.4%, demonstrating an enhanced S&T personnel contingent with a more rationalized structure.



### New Resource Satellite Launched



At 1126, 22 December 2011, China blasted off a new resource satellite (Resource-I02C) aboard a CZIVB launch vehicle, from the Taiyuan Satellite Launch Center. 13 minutes after lifting off, the ground control in Xi'an received the data showing that the satellite was separated from the carrier rocket, and entered a sun-synchronous circular orbit at an altitude of 770 km, with an inclination of 98.55 degrees.

With a weight of 2,100 kilograms and a design life for 3 years, the newly launched satellite is a high-resolution remote sensing data collector, equipped with multi-spectral panchromatic camera and high-resolution panchromatic camera. It will be mainly be employed to gather panchromatic and multi-spectral data for land resource survey and monitoring, disaster prevention and mitigation, agriculture, forestry, water conservancy, ecological environment protection, major construction projects among others.

### China's GPS System into Trial Operation

RAN Chengqi, spokesman of China's Compass Satellite Navigation System and head of China Satellite Navigation Management Office, announced on 27 December 2011 that a proprietary Compass satellite navigation system developed by Chinese engineers would start to provide continuous navigation and timing services to China and its neighbors. He said the navigation system will be put into official operation at the end of next year when it is completed. By that time, the system will offer a positioning precision up to 10 meters.

Compass system is a satellite based navigation platform independently built and operated by China, though compatible to other satellite navigation systems currently in use in the world. Designed with a short-message communication capability, it is able to provide high-precision and highly reliable positioning, navigation, and timing services to global users in an all-weather and round-the-clock manner. Up to date, China has deployed 10 Compass satellites to build the infrastructure network, retaining the active positioning and short message communication capabilities developed at the experimental stage. China will launch 6 more Compass satellites in 2012, in a bid to enhance the system's coverage and service performance, allowing it to serve most parts of the Asia-Pacific region.

### Top Ten Campus S&T Progresses

Top Ten S&T Progresses at Chinese Universities, a survey initiated by the Science and Technology Committee under the Chinese Ministry of Education, unveiled its

results on 12 December 2011 in Beijing. The selected top ten events are: a GS5 gene cloning study aiming at the positive regulation of rice seeds, grain weight, and yield conducted by Huazhong Agricultural University; studies working on the structure and function of a AAA + molecular machine, iron-selenium based superconducting thin films, and silicon's low-field non-uniformity of giant magnetoresistance by Tsinghua University; studies conducted by Shanghai Jiaotong University to treat acute monocytic leukemia and hyperthyroidism through genomics, and to develop a ROV system able to make observation and collect samples at a depth of 3500 m in oceans; a study led by Sichuan University to develop novel chiral catalyst and selective asymmetric catalytic reactions; a study made by Xi'an University of Architecture and Technology to perfect the theory and technology of solid-gas suspension preheating decomposition (XDL cement clinker making); a project led by the Northwestern University to study the lost distant ancestor of the fossilized arthropods found in Chengjiang, China; and a high-yield transgenic cotton study conducted by the Southwest University.

### "Broadband China"

China will enhance the implementation of "Broadband China" strategy under favored policy and financial support, in a bid to accelerate the development of 3G and fiber-optic broadband network and expand their coverage, said MIAO Wei, Chinese Minister of Industry and Information Technology at a national working meeting on industry and information technology. He said by the end of 2015, China will secure a bandwidth of 20 megabytes or more for urban residents, and 4 megabytes for the rural one. People who live in the capital city of eastern provinces will enjoy an even faster bandwidth up to 100 megabytes.

MIAO added that China will make the bandwidth speedier in 2012, striving for a faster internet access and a wider coverage that will benefit more people for a reduced price. At the same time, China will work to establish a universal service fund, allowing the rural areas to benefit from the same efforts. China will continue to promote the development of TD-LTE technology and associated industrialization and scale tests. Small-scale commercial applications of next-generation Internet, or IPv6, are also on the agenda to develop the proven technology and associated commercial applications.

### E-waterway Map for the Yangtze River

The Yangtze River Waterway Authority, part of the Chinese Ministry of Communications, announced on 22 December 2011 that it has developed and put into operation an electronic map for the 2687.8 km waterway of the Yangtze River.

The electronic waterway map is prepared in line with international norms, enjoying numerous merits, including high positioning precision, rich channel information, automatic identification and positioning, navigation and decision support, automatic matching and display applications, and dynamic channel information search and warning. The electronic map has been granted with a range of awards issued by China Surveying and Mapping Society in 2010 and 2011 respectively.

Researchers had prepared the electronic map starting from 2007. In 2008, China's first digital waterway map covering a 369.5 km long section south of the lower Yangtze River was rolled off and put into use. In 2009, an electronic map running through the entire trunk waterway of the Yangtze River (2687.8 km) was completed of preparation, and has been put into trial operation since March 2010.

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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>