CHINA SCIENCE AND TECHNOLOGY

NEWSLETTER

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IN THIS ISSUE

SPECIAL ISSUES

China Builds World Class S&T Parks

The Chinese Ministry of Science and Technology will strive to establish two to three world-class S&T parks in China by 2010, the second pioneering phase for national high-tech industrial parks, said CAO Jianlin, Chinese Vice Minister of Science and Technology, at an international forum on world-class S&T parks held on June 7, 2007 in Shenzhen.

According to a briefing, the Xi'an High-Tech Industrial Park is built with 19 incubators, including international business incubators, national special incubators, and national campus S&T parks, over its premises of 1.01

million square meters. The high-tech park has registered a business revenue of RMB 137.9 billion in 2006. It has become the home to more than 40 enterprises and research centers created by world top 500 businesses, including Applied Materials, Micron Technology Inc., IBM, Intel, Honeywell, Infineon Technologies, and FUJITSU. Foreign funded businesses stationed in the Park have reached 797 in number.

The Shenzhen High-Tech Industrial Park, a pilot project striving to establish a regional system for proprietary innovations, is also working hard to turn itself in a world-class S&T park, integrating innovative elements and resources, and gathering proprietary intellectual properties and high tech products in the area of electronics and information, biopharmaceutical and medical instruments, and optic-machinery-electronic integration. The Park has produced an industrial output worth RMB 160.1 billion in 2006, mainly made by telecommunication, computer, software, and pharmaceuticals. It also collaborates with Hong Kong in human resources and R&D, in an attempt to create an innovative alliance for both Shenzhen and Hong Kong, and foster information, biotechnology, and FLASH related industries, taking advantage of the S&T, education, and industrial strength of Hong Kong. In addition, it has secured a long term partnership with government departments, research institutes, and enterprises in a dozen of countries, including the United States, Italy, Korea, Egypt, and Australia. A Shenzhen international S&T business platform has also attracted the participation of 25 overseas organizations.

Compass Program to Implement

China will implement a Compass Program in the future 8 years, in an effort to tap up scientific values created by ancient China, and protect proprietary innovations and cultural heritages. The State Administration of Cultural Heritages formally kicked off on June 1, 2007 a range of feasibility studies for 10 projects, covering agriculture, medical science, and water resources, under the Compass Program.

According to a science and technology based cultural heritage protection plan for the 11th Five-Year period (2006-2010), the Compass Program will put together expertise from different disciplines, areas, and departments, to validate major ancient inventions with solid evidences, using modern technologies. It will cover cultural heritages in the area of agriculture, medical science, diseases diagnosis, health instruments, water resources management, transport facilities and tools, human habitat construction, materials and processing, and textiles and associated tools. Researchers will consolidate and study the results of ancient inventions and creations, and improve the theories and techniques for museum displays and demonstrations.

The Program will be implemented in three phases, with a general goal to producing a systematic map of major ancient inventions and creations by 2015, staging a range of shows or exhibitions to reflect China's ancient inventions and creations with models, virtual presentations, popular science monographs, and digital audio-video works. The Program will also establish a national catalog, portal, and education center for China's ancient inventions and creations, and build up a number of original ecological protection zones for cultural heritages and traditional techniques, in an effort to raise people's awareness of the scientific values of cultural heritages, and enhance the overall level of scientific research and display in the area.

INTERNATIONAL COOPERATION

Yinghuo I for Mars Probe

Officials from the Chinese Academy of Sciences recently told reporters that a review meeting had been convened to discuss the scientific objectives and

payloads of China-Russia joint probe to Mars. According to a briefing, the probe satellite has a temporary name called Yinghuo I (firebug).

According to an accord reached between China and Russia, two countries will launch a joint probe to Mars and its Phobos in 2009. Chinese side will be responsible for the design, and manufacturing of the satellite. The review committee, organized by the Chinese Academy of Sciences, believe that Yinghuo I is an innovative and scientific expedition accompanying the probe of Russia's Phobos-Soil to Mars. The joint probe will allow China to have first look at the planet, improve its payload making expertise, and enhance its planet probe capability.

The Chinese made satellite will be launched by the Russian side, and it will independently complete its probe of Mars environment. During the period, satellite Phobos will land on the surface of Phobos-I, collecting soils from there, and returning to the earth with it. Chinese satellite will join its Russian counterpart in exploring the environment of Mars.

Black Wheat Breeding Improved

The Institute of Crop Germplasm Resources, part of the Chinese Academy of Agricultural Sciences, in collaboration with UTAD, has bred out a string of specific black wheat materials with high yield and high quality, from the 38 black wheat species imported from Portugal. As hybrid breeds mixed with China's black wheat species, the 39 new species carry their own distinctive features. The effort has also resulted in a gene database for the wheat.

Of the new wheat species, eight enjoy an increased yield by 10%-35%, and a raised protein by 9%～16%, compared with the control group. They are immune to powdery mildew, and leave, stripe, and stem rusts, with enhanced acid and alkaline resistance. So far three species have entered the pilot experiment. The black wheat gene database, established using MS2

sterility, has played an important role in raising the efficiency of black wheat breeding and shortening the breeding cycle. The MS2 technique developed by the project makes China a world leader in the area.

The cooperative project has enriched the fine genetic properties of China s black wheat, which is important to improving the genetic diversity of China s black wheat, and associated breeding process.

Non-Ni Sintering Steel

China s Central Iron and Steel Research Institute has recently rolled out environment friendly and high performance powder metallurgical parts, using the sintering steel powder (containing only Cr, Mo, and Mn) imported from Hogarms AB. The innovative powder shaping and sintering technique developed by the Institute has found extensive applications in the country.

The new technique has greatly enhanced the resistance to bending, allowing the Non-Ni sintering steel to be directly processed by machine. Meanwhile, adhesives are used to improve the lubricating and adhesive properties of sintering steel powder. Researchers also made improvements to the home made press that produces low density products, using the new techniques imported from Sweden.

International collaboration has greatly advanced China s research and development of Non-Ni sintering steel, with high performance products. It brings up a promising perspective for producing environment friendly non-Ni products for the country.

RESEARCH AND DEVELOPMENT

New Mechanism for Genetic Development

A research team led by HAN Min and XU Rener, with the Institute of Developmental Biology and Molecular Medicine and School of Life Science, Fudan University, has reported a new mechanism for genetic development in the June 4, 2007 issue of journal *Developmental Cell*. As a major progress achieved in studying the formation of regenerative cells, the paper is also recommended by the recent issue of *Science* for readers 'attention.

In the 4-year long study, Chinese researchers have found that the inner nuclear membrane protein SUN1 specifically associates with telomeres between the leptotene and diplotene stages during meiotic prophase I. Disruption of Sun1 in mice prevents telomere attachment to the nuclear envelope, efficient homolog pairing, and synapsis formation in meiosis. Massive apoptotic events are induced in the mutant gonads, leading to the abolishment of both spermatogenesis and oogenesis. The study provides genetic evidence that SUN1-telomere interaction is essential for telomere dynamic movement and is required for efficient homologous chromosome pairing/synapsis during mammalian gametogenesis.

Intelligent Housekeeping Robot

Housekeeping robot and associated built-in intelligent control system, developed by the Computer School of Harbin Institute of Technology, has recently passed an approval review. The housekeeping robot is able to find and connect to a charger on its own, in addition to other improvements, including working along a prescribed route, raised cleaning efficiency, and repetition avoidance.

The new robot is designed with simplified hardware components, but with advanced programs, for a high cost/effect result. To ensure a raised cleaning efficiency and evenness, the robot works with an advanced route planning technique. User can pre-set the area to be cleaned. The route planning technique

ensures cleaning missions without repetition. To cut down the costs, researchers have used default algorithms for low-cost infrared sensors that ensure the accuracy of navigation and connecting, instead of expensive visionary sensors and laser ranger.

Key Technologies for Public Information Platform

Home made software and hardware based key technologies R&D and applications for public information platforms, a key technology project contracted to AHEAD Group, passed an approval check on June 4, 2007. Under the joint sponsorship of both Ministry of Science and Technology and Ministry of Information Industry, AHEAD has, starting from 2002, worked together with a number of home software and hardware makers to produce a fully localized e-government system, based on home made database, operating system, mediumware, and office package.

Under the arrangement of the Ministry of Information Industry and Ministry of Science and Technology, a hundred government departments have used the system developed by the project, since 2005, with some 700,000 terminal users. The project has become a core application platform for home made software and hardware based full e-government solution, published by the Ministry of Information Industry, and an only domestic solution listed in the national catalog for recommended software products to be procured by government.

NEWS BRIEFS

China Obtains Natural Combustible Ice

The Chinese Ministry of Land and Resources announced on June 5, 2007 that China Geological Survey has successfully collected on May 1, 2007 specimens of natural gas hydrate from the northern

part of South China Sea. The expedition has confirmed that the area is of a rich gas hydrate resource. The development not only marks China's internationally advanced level in studying natural gas hydrates, but also makes it the fourth countries in the world able to collect specimens of combustible ice, following the United States, Japan, and India.

The Ministry of Land and Resources launched the combustible ice expedition in 1999. Thanks to the painstaking efforts of more than a hundred scientists for nine years, China has collected an array of solid geophysical, geochemical, geological, and biological evidences of combustible ice. According to a preliminary estimate, the northern slope of South China Sea has stored a combustible ice resource worth 10 billion tons of oil equivalent. The specimens collected have shown an abundance of 20%-43%, with a thickness ranging from 18m to 34m, and methane content as high as 99.7%-99.8%.

China's First 800 KV Transformer

China's first DSP-260megavolt/ampere/800KV transformer, developed by Hebei Baoding Tianweibao Transformer Co. Ltd., called a success on June 1, 2007, with both its performance and technical indicators reaching an internationally advanced level. According to a briefing, 14 similar proprietary 800KV transformers will be manufactured in the following years.

The transformer is a key component of single-phased hydro generators, claiming the transformer with highest voltage in the country, or a transformer installed at the highest sea-level in the world. With an installed capacity of 3900 megavolt/ampere, the project has secured a contract worth RMB 180 million.

China's Paper Ranking in 2006

China Science Abstracts announced recently that a statistic survey made to 414 S&T journals shows that

universities and research institutes have remained the major sources for scientific papers. The following institutional authors are ranked top 10 for most citations: Zhejiang University, Tsinghua University, Huazhong S&T University, Shanghai Jiaotong University, Peking University, South China Polytechnic University, China Agriculture University, Jilin University, Zhongnan University, and Sun Yat-sen University.

China Science Abstracts, run by the China Association for Science and Technology, is the only S&T journal search engine in the country. In 2006, it had collected 42,243 citation data for 414 selected core S&T journals, covering extensive research areas in five major disciplines, including natural science, pharmaceuticals, agriculture, engineering and technology, and humanitarian and social sciences. China Science Abstracts also published a list of top 100 institutes that have produced most citations.

Comments or inquiries on editorial matters or Newsletter content should be directed to:

Mr. Mao Zhongying, Department of International Cooperation, MOST 15B, Fuxing Road Beijing 100862, PR China Tel: (8610)58881360 Fax: (8610) 58881364
http://www.most.gov.cn