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## SPECIAL ISSUES

### China Aims at Deep Space Probes

China State Commission of Science, Technology and Industry for National Defense published on October 18, 2007 a space development plan for the 11th Five-Year period. During the 11th Five-Year period, China will work on a range of key technologies for deep space probes, developing more key space technologies and equipment, raising the proportion of proprietary products, and increasing its annual space related patents by 30%. China will develop the following technologies:

1) Launch vehicle: advanced upper stage technology, and key technologies for heavy duty launch vehicle;
2) Satellite system and platform: optimized system design, satellite networking, advanced control technology, and near space vehicle platform;
3) Payloads: telecommunication, remote sensing, spatial and temporal measurement, and terrestrial observation.
4) Deep space probes: deep space vehicle, energy, electromagnetic wave sounding, measurement, landing, surface probe, robot, returning, and inter-planetary probe.
5) Satellite applications: quantitative and operational applications, high speed digital data broadcasting and transmission, network control, emergency telecommunication, space electromagnetic environment monitoring, design and integration of ground systems, multifunction ground control, data processing, data storage/management, and data sharing/dissemination.

### Largest Agriculture R&D System

Thanks to many-year reform and development, China's agriculture has made laudable accomplishments, with a 48% contribution rendered by S&T advancement in the area of agriculture, said WEI Chao'an, Chinese Vice Minister of Agriculture. China is a leader in a number of research fields, including super hybrid rice, GM cotton, dwarf-male-sterile wheat, and bird flu vaccine. China's agriculture is an active importer of advanced agricultural techniques, with a noticeably enhanced equipment level and an agricultural mechanization level of 38%. China has some 1,200 research institutes engaged in agriculture related research activities, the largest of its kind in the world.

ZHANG Lijian, Vice President of the Chinese Academy of Agricultural Sciences said that its academy has established S&T and economic cooperation ties with research institutes and universities in 66 countries and regions, in addition to its cooperation ties international organizations and international agriculture research centers. It has also inked S&T cooperation accords with 27 countries and 14 international organizations, in an effort to promote cooperation and exchanges in the area of germplasm resources, rice quality, biodiversity, food safety, environment and resources, and molecular biology.

### 30 Satellites for Compass Navigation System

During the 11th Five-Year period, China will turn its Compass navigation system into a large family consisting of 30 satellites, said SUN Laiyan, China Space Administrator at a high tech show opened on October 12, 2007 in Shenzhen.

According to a briefing, China will work on five major space projects:

1) Manned space flight: astronaut spacewalks, spacecraft docking, and establishing a space lab able to run on its own for a long period of time, with short-term human attendance;
2) Moon probes: during the 11th Five-Year period, China will stage moon probes, studying the space environment between earth and moon. After launching of

Chang' e I, the moon probe project will work on phase II and phase III activities. China will launch a moon rover around 2013, for soft landing and probes. After that, a small sample collecting re-entry capsule will be launched to collect samples from the moon for further analysis.

3) High resolution terrestrial observing system: An advanced satellite, aircraft, and stratosphere vehicle based high resolution terrestrial observing system will be constructed in a time frame of 10-15 years, to meet the needs of different economic sectors.
4) Second generation satellite navigation system: China will establish a regional satellite navigation system, with an enhanced telecommunication capability, anti-interference capability, and global expansion. Efforts will be made to turn the Compass navigation system into a large family made up of 30 satellites, with a greatly enhanced precision.
5) New generation heavy duty launch vehicles. China plans to develop a 5-m launch vehicle in 6-8 years. The new launch vehicle will enjoy numerous improvements, including toxicants and pollution free, low cost, high reliability, and strong adaptations.

## INTERNATIONAL COOPERATION

### China-US Stroke Prevention and Treatment Collaboration

China and US medical experts officially established on October 12, 2007 a stroke research center in Beijing, in an effort to improve China' s stroke prevention and control. The center will establish an integrated system for stroke prevention, screening, and treatment, reducing the occurrence and disability of strokes in the country.

Physically located in Beijing Jiangong Hospital, the center will introduce the proven methodologies and techniques of stroke treatment from the United States, and establish a stroke prevention and control system and standard in line with China' s situation. The center plans to establish a world-class stroke treatment network, and train more Chinese medical workers, allowing them to master advanced techniques and skills of stroke prevention and treatment.

The center will initiate a "red-storm action" to screen a million Chinese stroke patients, sorting out untreated population among 7 million stroke patients in the country. Researchers will also perform surgery on right candidate, preventing recurrences.

### China and WFF Protect Yellow River

WFF and China Yellow River Committee inked on October 15, 2007 a cooperation framework for the period of 2007-2011 in Dongying City, Shandong Province. The accord states that in the coming 5 years, both sides will work on a range of missions, including protecting the biodiversity of Yellow River Basin, promoting the comprehensive management of the basin, and ensuring the harmony between human and water and the sustainable economic and social development.

According to the accord, both sides will jointly sponsor an international forum on Yellow River, initiating an EU project for the basin management, facilitating the revision of Yellow River Management Plan, and ensuring the water security of Yellow River.

WWF, Australian Agency for International Development, CAS Institute of Policy and Management, and Yellow River Committee jointly published a report on strategic study of China' s basin management on the same day in the same city. The report presents for the first time a detailed analysis of existing problems and future priorities in the management of the Yangtze River, Yellow River, and Lancang River, with a string of suggestions on legislations and planning.

### China-Singapore Digital Media Cooperation

The Chinese Academy of Sciences Institute of Automation signed on October 13, 2007 an accord with Media Development Authority of Singapore, to establish a joint institute to develop digital media, with focus on interactive digital media. The Headquarters of the Institute will be located near the National University of Singapore. Chinese side will dispatch 40 researchers to work there. Both sides will initiate a range of collaborations on interactive language learning, virtual reality, interactive game, video, and analysis. Collaborations will be made in diverse forms, including exchanges of personnel, industrial technology cooperation, intellectual property sharing, and joint paper publication.

In the course of establishing the Institute, CAS Institute of Automation has inked a framework agreement with Singapore S&T Electronics, jointly working on the management of digital contents. To take full advantage of its strength in digital media, the Institute of Automation has established an R&D center for digital contents, in an attempt to develop generic technologies for supporting the industry.

## RESEARCH AND DEVELOPMENT

### Chinese Man' s First Genetic Map

Chinese scientists announced on October 11, 2007 that they have successfully produced a complete genetic map for Chinese man. Named Yanhuang No. 1, the map is also the first of its kind for Asians. This is the first genetic map made up of 100% Chinese man' s genes, sequenced by Chinese scientists, using new generation sequencing techniques. Before this, Chinese scientists have been part of 1% sequencing mission for the international genome project, and 10% for the international human genome haplotype map. Chinese researchers told reporters that this genetic map makes a milestone in the area of genetics, and it plays an important role in studying DNA, hidden disease causing genes, and epidemic prediction for Chinese or even Asians.

The project was jointly sponsored and implemented by Beijing Genomics Institute (Shenzhen), National Engineering Research Center for Bioinformatics, and CAS Beijing Institute of Genomics. Dr. WANG Jun, executive head of the project, told reporters that they have completed the sequence of first Chinese man' s genetic map in early October, and will analyze several hundreds of individual genomes, in an attempt to discover the mysteries behind the genomic polymorphisms of Asians.

## Loongson Chip into Bulk Production

Loongson chip has realized a new leaping forward. Not long ago, STMicroelectronics kicked off the bulk production of Loongson 2F chip at a million unit level, in line with an accord signed, said LI Guojie, an academician, and head of Institute of Computing Technology under the Chinese Academy of Sciences.

LI said two months ago, Chinese researchers have rolled out an upgrade of Loongson 2 series, or 2F SoC. The two-month strict test has found no design errors.

Loongson 2F is a system-on-a-chip featured with low power consumption, low cost, and high performance. Made by 90nm techniques, it has integrated CPU, DDR2, PCI/PCIX, Local I/O, and other key IPs, on a board of 51 million transistors. Comparing with Loongson 2E produced last year, the upgrade has a reduced power consumption by 40%, or 3-5 watts under a frequency of 1GHz, with a raised main frequency by 20% and a doubled visiting, storing, input and output capability, which will greatly reduce the cost of hardware, making the chip more competitive. The upgrade can be used in a broad range of areas, including industrial control, budget PC, digital household appliances, and network application.

Loongson chip has also achieved breakthroughs in desktop applications for national security and special industries, a most competitive area it has working hard to win. Some brand computers installed with Loongson chip have found more applications. For example, Loongson chip has been installed in desktop systems for trial use in Jiangsu Province.

## Ultraviolet Lamp Decompose Stink Odor

Prof. HOU Huiqi, head of Fudan University Institute of Environmental Science, has recently filed two patent applications for the inventions derived from the project studying microwave plasma ultraviolet radiation and its application in decomposing stink matters. Prof. HOU and his team have published 4 papers collected by *SCI*.

The ultraviolet lamp, developed by Prof. HOU and his team, releases electric charges under a microwave of 2.45GHz, producing an ultraviolet light of 200 nm wavelength that decomposes stink odors. Decomposition experiments on carbon disulfide and hydrogen sulfide have shown that the ultraviolet lamp has enhanced the decomposition rate by 50%, compared with traditional methods. Based on the findings, researchers proposed to decompose stink odors using dual-plasma medium, and achieved a better result.

According to a briefing, the ultraviolet lamp is featured with no mercury and no electrode. It has achieved a range of improvements, including an enhanced illumination, no pollution, long work life, and low energy consumption, compared with traditional products. Thanks to its electrode free design, the lamp tube has a greatly prolonged work life from several thousand hours to hundred and thousand hours. In addition, inert gases such as Krypton can be used to fill up the tube, instead of mercury, avoiding the secondary pollution caused by the latter. The electrode free ultraviolet lamp has an illumination of 200 watts or more, much more powerful than the ultraviolet lamps sold in the market for disinfection purpose.

The novel ultraviolet lamp is promising for broad applications in garbage piling ground, human wastes relay station, sewage treatment plants, perfume plants, leather plants, public toilet, and bakery.

## New Bare Rice Varieties

Based on the bare hybrid rice developed by American researchers, Chinese scientists have bred out brand new rice germplasm resources, using both genetic improvement and traditional breeding techniques. In 2003, Chinese scientists for the first time worked out bare hybrid rice and associated parental varieties of Guangxiang A, B, and R, or A series. The effort has created a new approach for utilizing the strength of Chinese hybrid rice. Based on the findings, they further rolled out Guangxiang 7A bare series.

Test results published by Ministry of Agriculture Rice Quality Testing Center show that the grain quality of new varieties has reached grade I standard, in terms of 10 indicators, including coarse grain rate, brown grain rate, grain length, length-width ratio, white grain rate, transparency, alkali spreading value, underlying gel consistency, and protein, with its brown grain rate reaching grade II standard, and starch content grade IV.

# NEWS BRIEF

## Energy Saving GPS Chip

Not long ago, Chinese Academy of Sciences Institute of Microelectronics has rolled out China's first GPS chip featured with energy saving and low cost, using proprietary technologies. Developed by the lab of telecommunication and SOC, chaired by CHEN Jie, a research fellow and part of the "hundred talents" program, the chip is built on a proprietary novel structure and circuit, allowing a power consumption that is only half of overseas products, and a competitive cost.

The Institute is now working with other companies to develop a GPS positioning module and associated built-in software, in an effort to provide complete GPS solutions for mobile phone users both at home and abroad.

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