

N0.616

CHINA SCIENCE AND TECHNOLOGY

# NEWSLETTER

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

N0.616

April 20, 2011

## IN THIS ISSUE

---

- \* Returned Students Encouraged to Build Businesses
  - \* Crested Ibis Sequenced
  - \* Human Lactoferrin Producing Goat Cloned
  - \* High Definition 3D Display Chip
  - \* First Superconducting Substation in World
  - \* Earth System Simulator
  - \* Another Compass Navigation Satellite Launched
- 

SPECIAL ISSUE

## Returned Students Encouraged to Build Businesses

It was learned from the Ministry of Human Resources and Social Security on April 14, 2011 that China has publicized a range of policies to support returned overseas Chinese students establishing their own businesses. The said business is defined as a business created by

returned overseas Chinese students taking advantage of their own patents, research findings, or proprietary technologies. Such business shall either be headed by the returned overseas Chinese student as a legal representative, or financed by the student's proprietary fund (including technology shares), or by an overseas venture capital at a sum of no less than 30% as a proportion of the total stock holding. China is currently implementing the plan to support returned overseas Chinese students to establish their own businesses, with priority on the start-up phase of a business featured with strong innovation capability, promising potentials, and fine market perspectives. Some competent localities will make funds available for pioneering efforts, providing to the returned overseas Chinese students who may become a leader in the business some money for settling down or renting house.

As far as the needed banking service is concerned, China will further improve the loan management for such businesses, calling for innovative financial products and services, and exploring the lending model of "bank + guarantee + extra risk compensation mechanism". Guarantee and re-guarantee firms will be encouraged to provide loan guarantees or re-guarantee for returned overseas Chinese students establishing their own businesses.

Such businesses will also enjoy a range of tax incentives. For example, the high-tech businesses established to accommodate major national needs will have a 15% income tax reduction. The R&D expenditures incurred in developing new technologies, new products, and new techniques can be deducted from the taxable business income by 150% as a proportion of the total sum incurred. Business income derived from agriculture, forestry, animal husbandry, and fishery businesses, or stemmed from the public infrastructure investments supported by the state, or from the qualified environment protection, energy efficiency, and water conservation projects, may enjoy corporate income tax exemption or reduction.

RESEARCH AND DEVELOPMENT

## Crested Ibis Sequenced

It was announced on April 15, 2011 at a news conference jointly held by Xi'an Jiaotong University and Beijing Genomics that the two institutions have completed the genome wide sequence of Crested Ibis. The development marks the completion of fourth bird genome sequence, important for rescuing and protecting the animal, and understanding its life activities.

Crested Ibis genome was sequenced using the state-of-the-art whole-genome shotgun (WGS) strategy, and assembled with the help of SOAPdenovo, a proprietary computer program. Crested Ibis genome has a size of 1.37Gb, with the length of Contig N50 reaching 22.2kb, and Scaffold N50 exceeding 5.09Mb. Ibis genome map makes basics available for studying the animal's genome, allowing people to pick out major genes that regulate the animal's evolution. Researchers have established a database and an analysis platform for studying the animal's genomic and biological information, addressing a range of puzzles, including the low reproductive capacity and high mortality rates of ibis chicks. In addition, the map can be applied to screen wild populations and sort out their genetic markers, developing new techniques for early disease warning and efficient breeding. Meanwhile, the finding can be borrowed to understand the phenomenon of animal extinctions, protecting plant and animal genetic resources, and creating a forensic basis for rare animals and plants protection.

## Human Lactoferrin Producing Goat Cloned

XinXin, a goat cloned to produce human lactoferrin, the first of its kind in the country, was born on April 9, 2011 in Wulidun, Cao County, Shandong. The healthy baby goat had a smooth birth at 1 a.m., with a birth weight at 2.75 kg. Researchers said the baby goat is a dairy goat judged by its physical appearance. 10 minutes after the birth, the baby goat stood on its feet assisted by researchers, and got its first suck of milk from its mother. The work of cloning identification will be followed at a Nanjing Agricultural University laboratory. Five receptor ewes will give birth to other baby goats in the coming days.

Under a project jointly initiated by the Nanjing Agricultural University and Shandong Yinxiang Weiye to breed high yield GM goats, researchers screened out 10 dairy goat cell strains desirable for carrying human lactoferrin. The strains were borrowed to conceive the embryos that would produce the milk containing human Ferritin. 152 receptor goats have been implanted with the embryos in a period starting from last November to this April. Six receptor ewes are expected to give birth in April, with others under observation.

## High Definition 3D Display Chip

Not long ago, the Xi'an Jiaotong University SoC Design Center rolled out an HMD100, a 3.5 million line high-definition 3D display chip. The proprietary chip, developed by Xi'an Jiaotong University, is designed to accommodate the needs of video products, including 3D TV headset, micro-projector, and 3D TV.

The chip is embedded with high-performance five-channel video AFE (2 standard channels and 3 high-definition channels), 2D/3D adaptive analog video decoder, and stereo display processing engine, supporting HD input up to 1080P, with a scalability to 120 Hz frame rate, two-way independent high-definition stereo video play, and high quality image display. Free from color strings and noises, it allows a 3D high-definition display without flicker at 60 Hz for both left and right eyes.

The chip is designed with numerous merits, including small size, low power consumption, large field of view (60 to 70 inches), strong sense of immersion among others, enjoying a broad application perspective in consumer electronics, virtual reality, defense, health care, and distance education. Researchers have created a patent pool ridden with some 30 invention patents on digital television and new display processing technology. Financed by the National 863 Program, the technologies derived from the efforts have found applications in the "personal portable cinema" developed Sichuan Rainbow.

## Home Made PCRAM Chip

CAS Shanghai Institute of Microsystem and Information Technology has recently rolled out a proprietary phase-change memory (PCRAM) chip. The novel chip combines the strength of mainstream memory gadgets, including DRAM, SRAM and FLASH, enjoying numerous merits, including super miniature performance, non-volatile, long cycle life, fine data stability, and low power consumption. It is believed an optimal solution for the next generation non-volatile memory technology.

The Institute has so far developed a PCRAM chip with a storage capacity up to 8Mb. The memory chips on an 8-inch silicon wafer have reached generated a 99% finished product rate. Having passed voice tests, the chip is versatile for reading, writing, and erasing. As of the end of 2010, the new chip has been granted with more than 50 invention patents. More than 150 patent applications have been publicized, covering materials, structures, design, and test. Experts said the novel chip will eventually replace traditional memory chips, such as NOR FLASH, commonly seen in consumer electronic products, including mobile phone and RFID.

## First Superconducting Substation in World

A Chinese made superconducting substation, the first of its kind in the world, was officially put into grid operation on April 19, 2011 in the Baiyin City, Gansu Province. Stationed at a national hi-tech industrial park in the city, the substation is designed with an operating voltage of 10.5kV, housing an array of superconducting power devices, including

1MJ/0.5MVA high-temperature superconducting energy storage system, 1.5kA three-phase high temperature superconducting current limiter, 630kVA high temperature superconducting transformer, and 75-meter long 1.5kA three-phase AC HTS cable. The new system has noticeably enhanced the reliability and safety of the grid network, with an improved power supply and reduced system losses/floor space.

According to a briefing, the 1MJ/0.5MVA superconducting energy storage system is currently the first and only of its kind in the world that has been put into grid operation. High-temperature superconducting magnet, a core component in the system, is also the largest in today's world. The system stores electromagnetic energy, and is able to generate high power output in a short period of time, thanks to its fast response capability. It enjoys a noticeably enhanced strength in addressing the transient stability issue of new energy power generation/grids and associated quality control. The 10.5kV/1.5kA three-phase high-temperature superconducting current limiter is the first of its kind in the country enjoying a major innovation in the working principle, though the fourth of its kind in the world. The 630kVA/10.5kV/0.4kV HTS transformer is the first such platform in the country, or the second of its kind in the world, or the largest amorphous alloy transformer in the world, having numerous merits, including light weight, small size, high efficiency, fire hazards free, environmental pollution free, and current limiting capability. The 75-meter long 10.5kV/1.5kA three-phase AC HTS cable is the longest three-phase AC HTS cable so far developed in the world. It was designed and manufactured segment by segment, before becoming an integrated one. The development laid a technical ground for manufacturing long-distance high-temperature superconducting cable in the future.

## Earth System Simulator

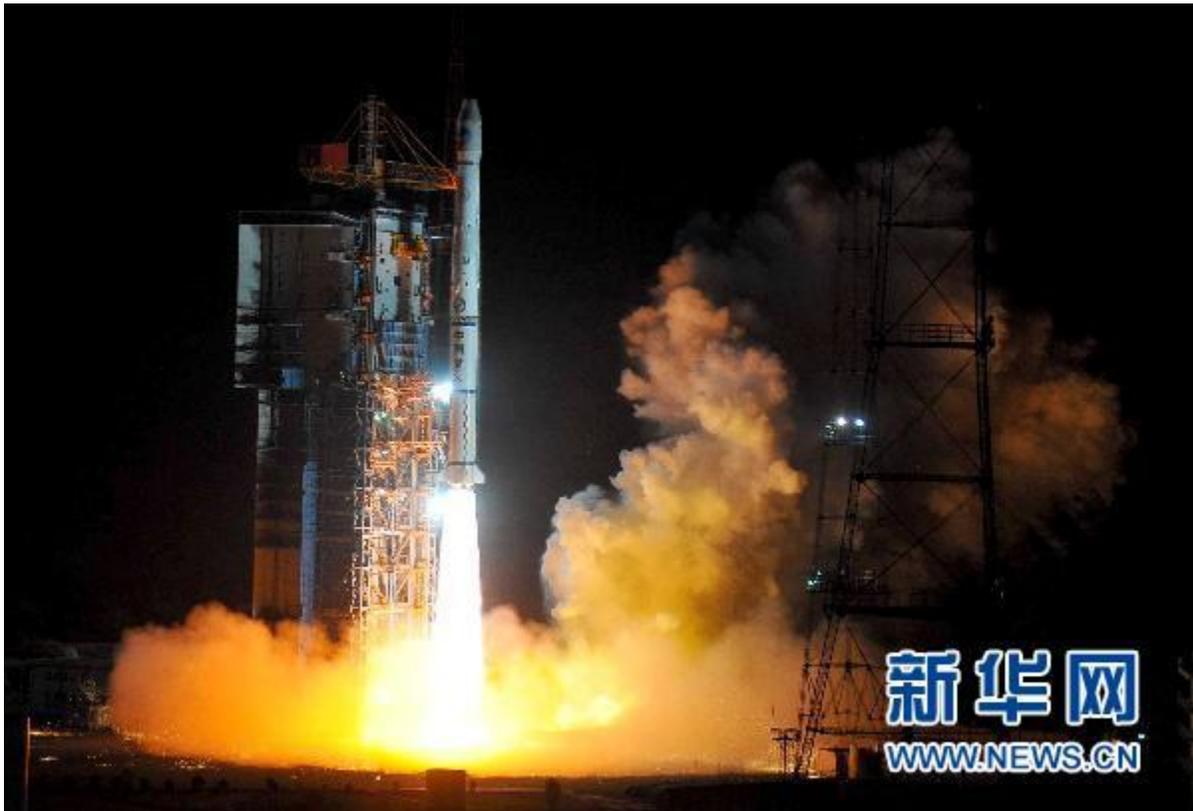
A supercomputer capable of a hundred trillion floating-point operations per second, jointly developed by Tsinghua University and Inspur, was put into official operation on April 15, 2011. The new system is the highest performance computing platform operating at a higher learning institution, or the fastest supercomputer applied in modeling the Earth system in the country. The two parties inked on the same day an accord to jointly develop an Earth system simulator.

The supercomputer housing the Earth system simulator is built on an ultra-scalable heterogeneous parallel architecture, enjoying 172 trillion floating-point operations per second. The system is applied with a range of innovative designs, including high-density modular computing, hierarchical aggregate high-speed network switching, PB-class scalable mass storage system, and adaptive intelligent liquid cooling system. At present, the system has been assigned to work on the computational tasks of climate modeling, prediction, and evaluation for the Fifth Assessment Report of the United Nations

Intergovernmental Panel on Climate Change (IPCC-AR5).

NEWS BRIEFS

## Another Compass Navigation Satellite Launched



At 4:47, April 10, 2011, China blasted off another Compass navigation satellite aboard a CZIIIA launch vehicle, from the Xi'chang Satellite Launch Center. The new launch is an inclined geosynchronous satellite.

The launch makes a regional navigation system made up of Compass series operational, prompting China's satellite navigation on to a new development stage. The newly launched satellite makes up a "3+3" system together with five other navigation satellites launched in 2010 (2 GEO satellites and three IGSO satellites). The system will be able to provide initial services to most parts of the country, after in-orbit tests and system alignment.

China will launch more navigation satellites this and next year, completing the construction of a regional navigation system made up of Compass satellites, and accommodating the application needs of mapping, fishery, transportation, meteorology, telecommunication, water resources, and personal use.

## Institute for Engineering Strategies

An Institute of Engineering Development Strategy, co-founded by the Chinese Academy of Engineering and Tsinghua University, to study and provide strategic solutions for engineering development, was inaugurated on April 18, 2011 in Beijing. According to a briefing, the Institute is designed to be high-level, open, and visionary, supporting the decision-making processes of major national engineering projects. It combines academic leadership, strategic consultation, technical service and personnel training, striving to produce high level, high quality, and high caliber strategic findings, and supporting the future development of engineering technologies and high level academic activities in the area.

Focusing on major national economic and social development strategies, the Institute will serve as a platform for major S&T projects, technological innovation projects, and strategic emerging industries. With the concerted support of the Chinese Academy of Engineering and Tsinghua University, it will provide general, strategic, and visionary advice and suggestions to engineering innovation activities in the country, taking advantage of the strength of small entity, large coalition, and network enabling.

GU Binglin, President of Tsinghua University, told reporters that the newly established Institute will enhance the capacity building of disciplines, while strengthening personnel training, promoting the cross-disciplinary development of engineering education and strategic management, fostering a contingent of high caliber researchers working on engineering strategies and associated S&T policies, and nurturing engineering professionals with global and strategic vision.

---

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>