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**SPECIAL ISSUES**

**Industrial Proprietary Innovation Promoted**

Not long ago, LI Xueyong, Chinese Vice-Minister of Science and Technology, had a working meeting with his counterpart SHAO Ning, Vice-Chairman of the State-owned Assets Supervision and Administration Commission (SASAC), a part of the State Council,

discussing the matters concerning proprietary innovation activities of major state enterprises. Both sides agreed to strengthen cooperation and coordination, consolidate the strength of both sides, and adopt the following measures to promote the proprietary innovation capacity building of major state enterprises: 1) implementing a series of projects to guide state enterprises to be active part of technology innovation. This will lead to an experimental effort to establish innovation oriented state enterprises, in an attempt to guide them embark on the road of innovative development. 2) Preparing implementation by-laws for the National Outline for Medium and Long Term S&T Development Planning, and perfecting the track records examination system for S&T innovation activities at state enterprises. Introducing an incentive mechanism involving real options at state S&T enterprises and research institutes with an industrial R&D system in the Zhongguancun S&T Park. 3) Encouraging major state enterprises to enhance their S&T oriented investment, and to be part of national and industrial R&D activities, through enhanced support and input from national S&T programs, and associated guidance. 4) Supporting major state enterprises to strengthen the capacity building of R&D centers, enhancing strategic cooperation of industry-universities-research institutes, and nurturing innovation oriented R&D personnel. 5) Accelerating the establishment of a technology innovation system led by industry, in collaboration with universities and research institutes, in an attempt to further promote the reform and development in the direction of turning selected research institutes into S&T enterprises, taking full advantage of the roles played by the converted research institutes in technology innovations. 6) Launching a joint survey to secure an in-depth understanding of the innovation status of state enterprises, and associated problems and policy related requirements.

### Rejuvenating Land Use with S&T

The Chinese Ministry of Land and Resources has

recently put forward a strategy to rejuvenate the use of lands with the support of science and technology, aiming at the following major objectives:

- 1) Developing land resources survey and monitoring technology, and associated land science theories; accelerating the establishment of a technical system for land survey and monitoring; strengthening theoretical and methodological study of land use assessment and planning, with intensive, rational, and sustainable utilization as the core; and developing methods and technologies for efficient and intensive land use.
- 2) Developing technologies to address major problems involving major mineral resources and belts, and other important geological issues; strengthening the technological development of coal mine prospecting and major oil-gas basins; strengthening the study of the formation of major non-energy minerals; proprietary development capacity building for core technologies and associated key facilities involving mineral resources prospecting; developing assessing and mining techniques for non-regular oil-gas resources and natural gas hydrates; developing comprehensive utilization technologies for low-grade and difficult-to-use mineral resources and tailing resources.
- 3) Establishing a technical and theoretical system for geological environmental protection, and geological disaster monitoring and prevention; developing technologies for groundwater survey and monitoring; developing key technologies for monitoring geological disasters; strengthening investigation and assessment of geological disasters in major vulnerable cities, project construction sites, traffic trunk lines, and basins, and associated risk assessment and zoning.
- 4) Accelerating the information process of land resources; establishing a range of national monitoring and control systems for arable land, mineral resource safety, geological disaster prevention and preparedness, and associated

rescue; accelerating the mainstream information process of basic geological survey, land survey and associated assessment; perfecting the information based technology standard system; and accelerating the cumulation of information resources.

Strengthening the study of major basic issues and the development of cutting-edge technologies; joining nationwide and regional efforts to address key geological issues; and promoting a range of related scientific researches, including ground observation, in-depth earth exploration, and scientific testing.

## INTERNATIONAL COOPERATION

### China-Germany Joint S&T Meeting

The 19th session of China-Germany joint committee meeting for science and technology was held on April 5, 2006. SHANG Yong, the Chinese Vice-Minister of Science and Technology and Professor Dr. Frieder Meyer – Kraemer, State Secretary in the Federal Ministry of Education and Research attended the meeting. SHANG made a briefing of the Chinese National Outline for Medium and Long Term S&T Development Planning ( 2006-2020 ) , and a development strategy for building an innovation oriented country. He also elaborated the possible implications of implementing the Outline on cooperation between China and Germany. Project steering committees reported to the meeting the latest progresses made in a range of fields, including laser technology, telecommunication and information technology, earth science, marine studies, ecological studies, environmental protection technology, biotechnology, and protection of cultural relics. Both sides agreed that future cooperation activities will be conducted in line with the national S&T development programs of both nations, and collaborations will be further extended to a number of new fields, including

clean energy, renewable energy, and life sciences.

During his visit, Vice-Minister SHANG also held talks with Dr. Annette Schavan, German Federal Minister for Education and Research. Both sides stressed the importance of forging a long-term cooperation tie in diversified collaborating forms. Both sides also reached consensus on adding new elements in cooperation, including clean energy, renewable energy, and life science. SHANG briefed Dr. Annette Schavan of the Chinese National Outline for Medium and Long Term S&T Development Planning, and a development strategy for building an innovation oriented country. He said China would further strengthen its cooperation with Germany in the fields of energy, environmental protection, and high technologies, in addition to intellectual property protection for a win-win result.

SHANG also had talks with Herr Jorg Hennerkes, the German State Secretary in the Federal Ministry for Transport, Construction and Housing, and Matthias Machnig, State Secretary in the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety. Both sides exchanged views on initiating cooperation in the fields of the Galileo Project, levitated train, renewable energy utilization in transport, and R&D of renewable energy, and clean development mechanism (CDM).

### China-US Unveils Composition of Oldest Solar Matter

Not long ago, Chinese and US scientists have found an opaque assemblage, the oldest matter believed in the solar system, on the Chinese territories. Scientists made an original site isotope analysis of the matter, and unveiled the mysterious composition of the assemblage. The finding was published in the recent issue of *Planet Science Newsletter*. It is believed that the discovery may change the history of origin and evolution of the solar system.

XU Weibiao, a Chinese scientist who is part of the study, said that the assemblage does not contain any

trace of original solar nebula, though there are clear traces of water erosions that usually can be found in asteroids. Along with the mineralogical observation of the adjacent areas, researchers concluded that the opaque assemblage was not the oldest matter so believed in the solar system, but rather the metal residues of water erosion in the later development phase of asteroids.

The opaque assemblage, since its first discovery, has been deemed the oldest matter in the solar system. As it might be the result of the direct condensation of original solar nebula, and possibly carry the celestial matters in the pre-solar system, it is deemed as a rarity for studying the origin and evolution of the solar system.

## RESEARCH AND DEVELOPMENT

### Software Incubator Established in Shanghai

On April 4, 2006, a ceremony was held in Shanghai to celebrate the official operation of the 863 software incubator (Shanghai) facility, where MA Songde, the Chinese Vice-Minister of Science and Technology, cut off the ribbon for the event. Occupying an area of 500 mu (1 mu = 0.0667 hectare), the new facility is physically located in the Pujiang Township, Minhang District, Shanghai. The facility is equipped with well-functioned public technical support services and corresponding infrastructures. More than 50 software vendors have found their home at the facility.

According to a briefing, there are thirteen 863 software incubator facilities in the country. As a project initiated in the 10th Five-year period (2001-2005), a line of key technology incubator facilities have been established in the major cities along the Bohai Gulf, the Yangtze River Delta, and the Pearl River Delta, taking advantage of the local economic development and associated resource strength. In the meantime, software export incubator facilities were created in the open cities

along the coastal and border areas, and in the middle section of the country. In addition, a number of development oriented incubator facilities have been established in western cities that are of a development capability, in an effort to spur up the development of adjacent areas. Software incubator facilities are established in economically developed regions to spur up the development of the west section.

### Major Progress for GaN Light Source

A project to develop the key technologies for silicon based solid-state GaN light source, undertaken by Nanchang University under an advanced material component of the National 863 Program, recently passed an approval review. The research team has successfully rolled out a 3rd generation gallium nitride based blue LED, based on 1st generation semiconductor silicon base, and made the first limited scale production in the world.

Research team at the University has successfully found solutions to a range of thorny issues concerning chapping of silicon based GaN materials, low illumination, high work voltage, and poor reliability, and rolled out the materials and components taking a lead among its international counterparts. For example, its 6-9 milliwatt silicon based blue light LED has reached an intermediate grade level of sapphire in the market, or silicon carbide GaN blue light LED, with an electric performance and reliability that can match with the world top class sapphire or silicon carbide GaN OEL device. The research team has developed a production capacity of 400,000 piece/day, enjoying a noticeable strength in manufacturing costs and reliability.

### Industrialized SPM Production

The study of scanner probe microscope (SPM) and associated integration, a project initiated under the advanced material part of the National 863 Program for the 10th Five-year period, has successfully worked out an integrated SPM system able to perform near-field

and far-field optic test on a simultaneous basis. Developed by the Institute of Chemistry, a part of the Chinese Academy of Sciences, the new system enjoys an enhanced comprehensive test capability for gathering more information, using diverse work modes, including reflection, transmission, and fluorescence. The system expands the existing technical application scope, and becomes a new tool for studying material structures and properties at a micro and nano scale. The CSPM3000/4000 system produced by the Institute has integrated all the testing and imaging functions possessed by a scanning tunneling microscope and scanning force microscope, enjoying the best level that a domestic counterpart can reach. The Institute has so far sold out several sets of the new microscope, and won the acknowledgement of users.

### Changchun Dinosaur

Chinese scientists have recently confirmed that they have unearthed a new dinosaur species, featured with bird-like feet at the middle section of Jilin Province. The dinosaur fossil is 1 meter long, with a head bone of 115 mm, a short mouth, and an eye socket measured one third of the head bone length. The fossil is also featured with five upper jaw teeth, a small eye socket hole, a missing external lower jaw hole, and a strong front teeth bone. Tests have confirmed that it is a bird-feet dinosaur, and it is a new dinosaur species, judged with its head features.

Researchers explain that the dinosaur makes a small combination of original and derivative bird-feet dinosaurs, or the first original bird-feet dinosaur unearthed in the Cretaceous sediments of the Song-Liao basin. The discovery of the dinosaur fossil is of importance to studying the evolution of bird-feet dinosaurs, origin of ceratops, and composition of vertebrates and ecological environment in the Cretaceous sediments of the Song-Liao basin.

The fossil, one of some 400 ancient fossils unearthed over Changchun and adjacent areas since 2003, has

been basically restored to its original shape, after a 3-year repairing. Researchers named it "Changchun Dinosaur", in honor of the place where it is unearthed and preserved. The new dinosaur is a small adult dinosaur having the habit of eating leaves with the help of its front legs, as it is light in structure, with shorter front legs but beautiful long hind legs.

### Trandermal Peptides for Large Molecule Delivery

A research team, led by Prof. WEN Longping at the University of Science and Technology of China, has successfully screened out a trandermal peptide, using biotechnology. The new peptide is able to deliver insulin into human body through skin, rendering an immediate therapeutic effect. The finding was published in the March 27 issue of the journal *Natural Biotechnology*.

Researchers applied a molecular biotechnique called phage-display in vivo in the trandermal study, and screened out a peptide made up of 11 amino acids, capable of delivering protein drugs through skin. A simple combination of the peptide and insulin in physiological saline produces a quick blood glucose reduction, after an application on the skin of the rats that have diabetes. Experiments show that the peptide is also able to carry human growth hormone through skin. The pitied has a high specific amino acids sequence that can stimulate the activity of trandermal insulin, breaking up the skin barrier for a short period of time.

Prof. WEN said it is still unknown if the peptide can produce the same effect in humans, as the experiment was initially performed on rats. His team is currently making a pre-clinical study, in collaboration with a pharmaceutical company, in an attempt to shift the finding to humans as soon as possible.

### Fast Biochemical Kidney Analyzer

China's first mini sized fast biochemical kidney analyzer, jointly developed by the Changchun Institute

of Optics, Fine Mechanics, and Physics under the Chinese Academy of Sciences, and Xiamen Ouda Keyi Co. Ltd., has been recently granted with a production permit for its key component: mini spectrograph. The project, initiated by a major component concerning fast test of typical diseases under the National 863 Program, produces the mini instruments on a limited basis.

According to a briefing, researchers have landed major breakthroughs in some key technologies, including micro-processing techniques, silicon based chip heating which helps the bulk production of key components, and a simplified optic path with the symmetric structure. All these improvements has led to a reduced size of the instrument, a greatly enhanced performance, and reduced terminal costs and production cycle.

Up to date, the mini analyzing system has found applications in 700 clinical trials in 4 domestic hospitals. Test results show that the instrument can produce a valid judgment of the phases where a patient's kidney disease has reached, through measuring the Scr and BuN level, providing major evidences for selecting appropriate therapeutic solutions.

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