

# Content

Science News from Chinese Media in December 2007  
 Collected and Compiled by the Helmholtz Beijing Office

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## Helmholtz News Concerning China

The second round of Helmholtz-CSC programme has already approached its application deadline for the Chinese students to submit their application to Helmholtz scientists. Only in exceptional cases, as some colleagues are not informed about this programme in time, we will still allow some days of delay for submitting applications. At present we have 59 calls formally announced in the website, including 2 in Energy, 16 calls in Earth and Environment; 10 in Key-Technologies, 19 in Health and Biosciences, 11 in Structure of Matter and 1 in Transport and Space. If we number these positions to the respective Helmholtz Centres, then these are: AWI 1, DKFZ 3, DLR 1, FZJ 14, FZK 8, GFZ 4, GKSS 7, GSF 14, GSI 3, HMI 2, HZI 1, UFZ 1. All these calls could be download and checkup up by the individual scientists or their colleagues from the Helmholtz Chinese website:

[http://www.helmholtz.cn/Helmholtz\\_China/positions/Helmholtz\\_CSC2007en.htm](http://www.helmholtz.cn/Helmholtz_China/positions/Helmholtz_CSC2007en.htm).

So far we know, there are also several more Helmholtz scientists have had found at least one suitable candidate. Some other colleagues make still have some time to identify a better candidate before we forward a formally approved student name list to our partner CSC for its review. So far as we know, this Helmholtz-CSC programme is ideal for Chinese outstanding students looking for a position in Helmholtz institute; it provides the easiest way to access a scholarship for Germany. It is a very good instrument to establish or reinforce collaboration with a Chinese group. If any of our colleagues still have interest on Chinese students, or looking for cooperation partners, please contact us any time.

In the preface of the last issue of *Science News*, a journal of CAS, some statistical data about Chinese R&D spending are given for the year 2006. It is referred that according to the most official announcement, Chinas social R&D spending accounts 300 billion RMB (about 30 billion Euro), a net increase of 55.3 billion RMB which corresponds to 22.6% increase in comparison to the previous year. This is 1.43% of Chinese total GDP, the highest investment in the history. The number of Chinese publications in science and engineering ranks already the second place in the world, the newly recruited postgraduates and PhD students are 424,000, an increase of 6% to 2005. Even a British science journal gives a title paper: [China among fastest-growing research supporter](#)

But it is generally admitted that, the real Chinese research and development level is still low. If not the total number of publication, but the SCI publication and the referring index are seen as indicators, then China stays at 5<sup>th</sup> and 13<sup>th</sup> position. Therefore, just like everything in the other fields, progress and challenge are coexisting for Chinas science development. Certainly it demonstrates an interesting tendency. The Chinese high ranking officials all know that a sustainable development for China will have to rely on the technological advancement and innovation. It has to overcome the big challenge on steadily increasing energy demand and environmental problems.

The interesting fact is that, under the Chinese system whatever the top leadership wants to do, as the total society could be motivated and investment is also not a problem at all, as the government income is increasing steadily for over 25% per year, it can also take a state-loan to do it. The again and again reported news concerning the Chinese lunar probe and the manned space programme, as also in this edition of *China Highlights* are also just a good example.

### Helmholtz Representative Office Beijing

## 1 Science News

### 1.1 Energy

#### **Six major bases for wind-power generation to be built**

**(People's Daily, 2007-12-04)**

Six major bases for wind-power generation will be built in Xinjiang Uygur Autonomous Region, Gansu Province, Inner Mongolia Autonomous Region, Hebei Province, the Northeast, and Southeastern Coastal areas, according to China's State Power Group.

Once this large-scale wind-power development strategy is executed, the total installed capacity of wind power from the State Power Group, by the end of 2010, will amount to 6 million kilowatts: approximately 40% of China's total installed capacity.

Statistics from the power sector show that at the end of 2006, China's installed wind-power capacity reached 2.6 million kilowatts; ranked sixth in the world; and accounted for 3.5% of the world's capacity.

With the enactment and enforcement of the Renewable Resources Act, and the initiation of policies on energy conservation and emissions reduction, China's wind-power development has stepped into a new phase of cleanness and zero-pollution.

According to the Mid- and long-term Development Plans for Renewable Resources recently released, China will make wind-power a top priority in developing renewable resources in the days to come. By 2020, wind-power generation will climb to 30 million kilowatts.

#### **China turns to clean biomass solution for emission cuts**

**(Xinhua Net, 2007-12-04)**

China has launched eight biomass plants in five leading grain-producing provinces to cut carbon dioxide emissions in electricity generation amid growing global concerns over greenhouse gas and climate change.

The plants, with a total installed capacity of 200,000 kilowatts, are expected to burn 1.6 million tons of stalks annually. They will generate 1.4 billion kw hours of electricity, said Cui Mengshan, the manager in charge of planning and business development at the National Bio Energy Co., Ltd, a subsidiary of the State Grid Corporation of China.

"Compared with coal-fired power plants, these biomass projects are expected to cut carbon dioxide emissions by 800,000 tons annually," he said.

China has been turning stalks into clean energy since last December when the State Grid Corporation launched the first biomass plant in the eastern Shandong Province.

The project, which burns 200,000 tons of stalks annually, has enabled local farmers to profit out of what was traditionally waste.

Figures provided by the local government said the biomass project had brought a total annual income increase of 40 million yuan (5.33 million U.S. dollars) for nearly 50,000 local families.

Similar projects have been launched over the past year in four other grain-producing provinces, including Hebei, Jiangsu, Henan and Heilongjiang.

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China's installed capacity of bio-energy electricity is forecast to reach 5.5 million kilowatts by 2010, according to the country's 11th Five-Year Plan 2006 to 2010.

"This means China's carbon dioxide emissions will be reduced by 2,200 tons by then," Cui added.

China produces about 660 million tons of stalks from its annual grain production, about 200 million tons of which can be used as clean energy. The stalks were previously burned at the end of the harvest, letting off pollutants that delayed air flights and reduced highway visibility.

### **Beijing Solicits Designs for Asia's First Solar Power Plant Tower** **(CRI, 2007-12-05)**

The Institute of Electrical Engineering (IEE) of the Chinese Academy of Sciences (CAS) has recently launched an international design competition for a tower building, the key architecture of its planned first-ever solar thermal power plant to be built near the foot of the Badaling Great Wall in northern suburb of Beijing.

The IEE solar thermal power plant which will work as a model for China's upcoming other new solar power plants around the country will also be the first such project in Asia.

The landmark solar power plant tower, which will be built up to over 100 meters tall, will work to receive focused solar energy that will be reflected onto its top solar receiver by an array of thousands of sun-tracking mirrors, or heliostats, installed in front of the foot of the tower.

According to [iee.ac.cn](http://iee.ac.cn), the official website of IEE, the solar power plant tower design competition began to accept worldwide design entries from November 23rd, and will wind up on January 15th.

The design competition will produce one first prize winner, two second prize winners and three third prize winners. The first prize winner will get a 30,000 yuan award, second prize winners will get 20,000 yuan each, and third prize winners will get 5,000 yuan each. Six more excellent award recipients will also enjoy a 1,000 yuan award for each.

A key scientific project under China's 11th Five-Year Development Plan, the IEE solar power plant project is jointly financed by China's Ministry of Science and Technology, the CAS and Beijing's Municipal Commission for Science and Technology.

### **New plant R&D center to address energy issues** **(CAS, 2007-12-11)**

The joint launching ceremony for the Research and Development Center for Energy Plants, the CAS Institute of Botany (IOB), and the R&D Laboratory for Sweet Sorghum, which is to be co-established by IOB and the Temasek Life Sciences Laboratory (TLL) in Singapore, was held on 10 December at IOB in Beijing.

Present at the ceremony were high-profile officials and scholars from CAS, Peking University, the National Development and Reform Commission (NDRC), ChemChina International, BP Group, and Xinjiang Agricultural Science Academy.

At the ceremony, speeches were made by CAS Vice President LI Jiayang, Peking University President XU Zhihong, Director-general of CAS Bureau of Life Science and Biotechnology KANG Le, Deputy Section Chief of Renewable Energy Sources of NDRC LIANG Zhipeng, and TLL Chief Operating Officer Tan Kok Keng. President of the National Natural Science Foundation of China CHEN Yiyu sent his congratulatory messages.

The nameplate of the new Center was jointly revealed by Prof. LI Jiayang, and Chairman of TLL

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Strategic Research Management Committee Prof Nam Hai Chua, Prof. KANG Le, and IOB Director MA Keping, and that of the IOB-TLL R&D Laboratory for Sweet Sorghum by Prof. XU Zhihong, Prof. KUANG Tingyun from IOB, Dr. Tan Kok Keng, and TLL Deputy Chief Operating Officer Mr. Peter Chia.

The agreement on co-establishing R&D Laboratory for Sweet Sorghum was signed by KANG Le and MA Keping from CAS and Tan Kok Keng and Peter Chia from TLL.

The new Center strives to offer S&T support to the country's energy strategy by conducting integrative research into important energy crops from interdisciplinary approaches, including photosynthesis, physiology, biochemistry, cell and molecular biology, and ecology and environment, according to Prof. ZHONG Kang, vice director of IOB and director of the new Center.

Its central tasks are to develop molecular breeding technology and related theories for high-yield, anti-adversity plants by using high-biomass energy crops such as sweet sorghum and *Dioscorea opposita* Thunb. It is aimed at breeding new energy crop varieties suitable for growing in marginal lands.

The ceremony was followed by a symposium entitled R&D Strategy for Energy Plants. Prof. Nam Hai Chua, who is also Head of the Laboratory of Plant Molecular Biology, Rockefeller University in US, and Prof. KUANG Tingyun, also a CAS Member, were invited to give talks on "Biofuel Plants: Opportunities and Challenges," and "Development Strategy for Biomass Energy Sources in China," respectively.

### **China Vows to Develop Clean Energies**

**(CRI, 2007-12-26)**

China promised Wednesday to develop renewable energy for its fast-growing economy, stepping up efforts to promote hydroelectric, nuclear, solar and wind energy, as well natural gas extracted from garbage dumps and coal mines.

In the country's first ever white paper on its energy conditions and policies, Beijing pledged to give top priority to developing renewable energy.

"China's energy development emphasizes thrift, cleanness and safety," says the white paper titled "China's Energy Conditions and Policies".

The share of renewable sources and nuclear power in China's energy consumption rose from 4 percent in 1980 to 7.2 percent last year, according to the white paper.

However, it notes that the energy structure with coal playing the main role will remain unchanged for a long time to come.

China will develop the coal industry in an orderly way, actively developing electric power, expediting the development of oil and gas and improving energy development in rural areas.

"China will pay more attention to the clean utilization of energy resources, especially coal, and make it a focus of environmental protection," it said.

#### **Greenhouse Gases Emissions**

It also says that China takes greenhouse gases seriously and will take more measures to reduce its emissions.

"As a responsible developing country, China attaches great importance to environmental protection and prevention of global climate change," it says.

"China aims to achieve the goal of basically curbing the trend of ecological deterioration, reducing

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total emissions of major pollutants by 10 percent and gain visible results in the control of greenhouse gas emissions," it adds.

It will also push forward structural adjustment, improve energy conservation in industry, launch energy-saving projects and advocate energy conservation in society in effort to promote all-round energy conservation.

China is accelerating its development of a modern energy industry, taking resource conservation and environmental protection as two basic state policies, it adds.

### No Threat To The World

The white paper emphasizes that China's energy development will make positive contributions to the world's energy security and stability.

"China did not, does not and will not pose any threat to the world's energy security," it says.

As the world's second biggest energy producer, China has a relatively strong foundation for energy production and supply.

"For a long time China has relied largely on domestic energy resources to develop its economy. The rate of self-sufficiency has been above 90 percent, much higher than that in most developed countries," the paper says.

It notes that with a large population, the per-capita average of energy resources is very low.

The per-capita average of both coal and hydropower resources in China is 50 percent of the world's average, while the per-capita average of both oil and natural gas resources is only about 1/15 the world's average. The per-capita average of arable land is less than 30 percent of the world's average, something which has hindered the development of biomass energy.

## 1.2 Earth and Environment

### Sea level rises by 9 cm in China

(China News, 2007-12-02)

China's sea level has risen 9 centimeters due to the climate change in the past three decades. By 2050, the sea level will rise by 13 to 22 centimeters compared with that in 2000, said a source with State Oceanic Administration.

A recent survey shows the rate of the rise in sea level is higher in northern China than in the south. Tianjin, a port city in northern China, is experiencing the fastest rise -- over 20 centimeters so far -- followed by Shanghai, with 12 centimeters, reported Beijing Morning Post, a local media outlet on Sunday.

The water levels in Liaoning, Shandong and Zhejiang have also risen more than 10 centimeters, while Guangdong and Fujian are less affected, with an increase of only 5 to 6 centimeters at sea level.

According to the forecast, sea levels at coastal cities will only continue to creep up.

Along with the rise of sea level, Chinese ice sheets are gradually melting away. The sea ice has become much thinner in the Bohai Sea; by the late 1980's, ice sheet area had already shrunk by 20 percent. By 1990, the icing period had been reduced from 120 days to only 80 days.

Analysis indicates the reduction of Bohai ice sheets is in consistent with the temperature rise in the sea.

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Studies show sea temperature has risen an average of 0.7 degrees Celsius in the past 43 years and often hit 1 degree Celsius in winter, a figure far higher than the world average.

### **Scientists meet to address environment change on the Tibetan Plateau**

**(CAS, 2007-12-06)**

Under the theme of the "environment change, impact and regional development strategy," the 315th Session of the Xiangshan Science Conferences opened on 4 December in Beijing.

More than 40 Chinese experts and scholars from research institutes, universities and government departments have been invited to hold discussions on such issues as the environmental changes and impact on the Plateau, strategic objectives, approaches and countermeasures for its sustainable development, and coordination between regional environment and development.

The joint executive chairs of the three-day conference are Prof. SUN Honglie from the CAS Institute of Geological Sciences and Resources Research, Prof. DING Yihui from the National Climate Centre, Prof. Duo Jie from Tibet Bureau of Geology and Minerals Prospecting and Development, and Prof. ZHENG Du from the CAS Institute of Geological Sciences and Resources Research.

With its rich and varied natural landscapes and unique cultural and historical legacies, the Qinghai-Tibet Plateau, known as the roof the world, catches world-wide attention. Therefore, it is an important issue to protect the ethnical heritage, traditional culture and natural environment when promoting economic growth in the region, so as to achieve a balanced development between human beings and nature and between the environment and development.

The symposium has focused on such issues as environmental change of the Qinghai-Tibet Plateau in the scenario of global warming and its effects on neighboring regions, Impacts of human activities on the environment of the Plateau, division of ecological functions of the Plateau, and the environmental protection and development strategy in the Plateau.

### **Xuelong Passes West Wind Belt to Zhongshan Station**

**(CRI, 2007-12-06)**

The Chinese polar expedition ship, Xuelong, or "Snow Dragon", successfully passed through the westerly belt, or west wind belt on Wednesday, further making its sail tour towards China's Zhongshan Station on the Antarctica.

Xinhuanet reported that the icebreaker, carrying 91 expedition team members and 40 crew members, arrived at the 60 degrees south latitude around 14:20 (Beijing Time, GMT+8) on Wednesday.

From there, the Xuelong sailed out of the west wind belt of the Southern Hemisphere which extends between 40 and 60 degrees south latitude.

The team's leader, Wei Wenliang, who has been to Antarctica 10 times and passed through the west wind belt over 30 times, said that it was the most peaceful time for them to pass through the westerly belt, where a lot low pressure atmospherical turmoils produce, possibly causing cyclones.

Shen Quan, captain of the Xuelong, said that their ship with 3800 tons of materials on board will arrive at Zhongshang Station on December 10.

The Xuelong left Shanghai on November 12 on the country's 24th scientific expedition to Antarctica. The expedition will last for more than 5 months.

Chinese researchers taking part in the 24th expedition will renovate China's third scientific research station at the South Pole with a planned observatory, including seven telescopes and one acoustic

radar at Dome A, the highest point on the ice continent at 4,093 meters above sea level.

**China to launch its first environment monitoring satellite****(Xinhua Net, 2007-12-07)**

China is to launch its first satellite to monitor the environment in the first half of next year, the State Environmental Protection Administration (SEPA) said on Friday.

The satellite will be used to monitor the environment and report on natural disasters, said Wu Xiaoqing, the SEPA deputy director, at a press conference.

"Our capability to manage the environment and forecast natural disasters will improve considerably with the operation of the satellite," Wu said.

So far, China has set up more than 2,000 stations on the ground to monitor the air, rivers and lakes, and the overall ecosystem.

But the ground network still can not meet the demand of timely and dynamic monitoring on the fast-changing environment, Wu said.

Wu did not elaborate on the details of how the satellite will operate.

**Scientists complete mapping "sea of death" in NW China desert****(Xinhua Net, 2007-12-07)**

Chinese scientists have completed a survey of the Lop Nur Desert in Xinjiang Uygur Autonomous Region and sketched 49 relief maps of the former lake area, now known as "the sea of death".

They are the first standard topographical maps, with a 1:50,000 scale, of the Lop Nur, a 20,000-square-km area rich in oil, gas, coal and mineral resources.

Cartographers from six western Chinese localities, including Xinjiang, Gansu and Qinghai, began surveying the Lop Nur in early October and spent more than two months collecting topographic data and images for the mapping, said Pu Xingtao, a scientist with the Gansu Bureau of Surveying and Mapping.

The mapping covers the Lop Nur Depression, Kumtag Desert and Altun Mountain in southeastern Xinjiang, he said.

Pu said the project has drawn a clear picture of the region's natural resources and a valuable road map for hikers and geologists to walk out of its desert alive.

In 1980, Peng Jiamu, a noted Chinese scientist, went missing in his fourth expedition to the Lop Nur and was never found.

Last year, four tourists died of sunstroke in the same region.

"With maps of the Lop Nur to be published soon, we hope such tragedies will not happen again," said Pu.

Lop Nur used to be the largest lake in northwestern China before it dried up in 1972 as a result of desertification and environmental degradation.

It once nurtured the civilization of Loulan (Kroraina). The ancient city was one of the pivotal stops along the famous Silk Road, but mysteriously disappeared around the third century AD.

Due to its typical geology, geography and historical values, Lop Nur has attracted the attention of scientists from home and abroad since the mid 19th century.

China launched an ambitious project last year to map all its 2.02 million square kilometers of unmapped areas, largely in the deserts of southern Xinjiang and the Qinghai-Tibet Plateau. These

regions make up about 20 percent of the country's territory.

**Three Gorges Dam alleviates drought****(China News, 2007-12-07)**

The Three Gorges Dam has increased water discharge to maintain normal shipping along China's longest river, the Yangtze, which is suffering its worst drought in 50 years.

The discharge speed reached 5,500 cu m per second Thursday, 300 cu m more than Tuesday, when the dam started to alleviate the effects of the drought, according to the China Three Gorges Project Corporation (CTGPC), builder of the world's largest hydropower project.

Lower rainfall on the river's upper reaches has reduced water levels in the middle reaches by up to 2 m. The average water level has decreased by 1.5 m.

In the past month, at least 26 cargo ships have been stranded in the sections around Yichang, Wuhan and Jingzhou of Hubei Province, and Jiujiang, Hukou of the neighboring Jiangxi Province, according to the Yangtze River Maritime Administration.

By Thursday afternoon, water levels in the Yichang section, near the start of the middle reaches, had gone up 0.5 m.

The discharge program is scheduled to last until Tuesday, when the CTGPC will decide to carry on or reduce water discharge volumes.

According to an order issued by the Yichang maritime bureau, every cargo ship must undergo weight checks at eight harbors in the city of Yichang and unload excess goods before continuing.

An average of 170 cargo ships uses the route every day. More than 1,000 workers, 100 boats and 18 dredgers are digging out silt in the river to maintain the route.

The Yangtze, which is 6,300 km long, experiences a dry season between November and April. This is often followed by spring flooding.

**China starts year-long atmospheric study in Qinghai-Tibet Plateau****(Xinhua Net, 2007-12-11)**

Chinese meteorologists have begun a year-long atmospheric experiment in the Qinghai-Tibet Plateau, which is regarded as a barometer of the global climate, in a bid to improve weather forecasts.

The experiment, launched Monday by the China Meteorological Administration (CMA), will mainly take place in the east part of the Qinghai-Tibet Plateau, China News Service reported. The report didn't mention the cost.

"The east part of the Plateau has complicated geographic features and is a key region for meteorological study," said Li Yueqing, the deputy director of the Chengdu Institute of Plateau Meteorology under the CMA.

Li said that by studying and collecting more data from the atmospheric boundary layers in the area, scientists will have a better understanding of the meteorological impact of the plateau and can thus improve weather forecasts.

Atmospheric detection is considered the foundation of meteorological study. Experts said that the atmospheric environment on the Qinghai-Tibet Plateau has great influence on the Chinese and global climates.

China conducted two rounds of atmospheric experiments on the plateau in 1979 and 1998.

The Qinghai-Tibet Plateau in western and southwestern China is the highest plateau in the world. It

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covers all of Tibet and Qinghai, western Sichuan and southwestern Gansu -- an area of 2.3 million square kilometers at an elevation of 3,000-5,000 meters.

### **CAS to set up an outpost for blown-sand disaster control**

**(CAS, 2007-12-12)**



An agreement to establish an experimental station against desertification has been reached preliminarily by the CAS Cold and Arid Regions Environmental and Engineering Research Institute and the S&T Administration of Dunhuang City, home to the world-renowned Mogao Grottoes in Northwest China's Gansu Province. It is going to be the first comprehensive monitoring lab for blown-sand disasters in extremely dry areas.

Focusing on such issues as eco-system rehabilitation in decertified areas, comprehensive sand prevention at Mogao Grottoes, optimal distribution of water-soil resources, environmental monitoring of blown-sand disasters, the station will examine the impacts of the disasters on the industrial and agricultural sectors, and historical remains, and offer suggestions on technical countermeasures against decertification.

### **Survey: Glaciers in west China shrink 7 to 18% in five years**

**(Xinhua Net, 2007-12-14)**

Glaciers in China's high-altitude western areas have shrunk seven to 18 percent over the past five years, according to a new survey by Chinese scientists.

A second research that started in May this year on the country's glaciers indicated an average shrinking of 7.4 percent compared with the results of the first survey completed in 2002.

A total area of nearly 20,000 square kilometers, or around one-third of the country's total, has been surveyed in the new project.

The yet-to-be-completed survey was launched by experts from the Ministry of Science and Technology and the Chinese Academy of Sciences (CAS). It was the second nationwide survey undertaken and would be finished in five years. The first survey was conducted from 1978 to 2002.

Glaciers in the Junggar Basin and Ili River areas in northern Xinjiang and the upper reaches of the Yarlung Zangbo River in Tibet had the most evident shrinkage of 18 percent or more, the survey showed.

In Qilian Mountain in the northwest and the Lancang River area in the southwest shank the glaciers shrank by about 10 percent on average.

"The change of glaciers is in fact a manifestation of the pressure upon China's environment by global warming," said Ding Yongjian, a CAS research fellow.

Global warming has led to an increase in the average temperature in the western area of China over the past few decades. This has caused the glacial shrinking, a thawing of frozen earth and worsening arid conditions, said the scholar.

Qin Dahe, a CAS academician and head of the panel of experts for the survey, said the project would provide basic data for the study on the effects of climate change upon Chinese glaciers in the past 20

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years. It would also provide information about the use of water resources in the arid western areas. China has about 46,000 glaciers covering a total area of nearly 60,000 sq km. These accounted for more than 50 percent of the glaciers in the middle and low latitude areas of the Earth.

### **China's 5,158-m-deep well to help forecast earthquake (Xinhua Net, 2007-12-16)**

A 5,158-meter-deep well China drilled to get to know about the earth's crust could contribute to forecast earthquakes, said scientists.

"Researchers will be able to record the movements of liquid and gas which lies five kilometers underground. While drilling the well they have found abnormal movements related to earthquakes," said Xu Zhiqin, the chief scientist of the China Continental Scientific Drilling Engineering Center and member of the Chinese Academy of Sciences.

The well is at Maobei Village of Donghai, a county in the proximity of the port city of Lianyungang in northern Jiangsu Province, east China. The drilling operation started in 2001 and was completed in 2005. The exploration program cost a total of 166 million yuan (about 22 million US dollars).

Maobei village was selected as an ideal location of the well drilling as it is situated on the world's largest ultra-high-pressure metamorphic belt, known as the "Dabie-Sulu Mountain fracture belt" and described by geologists as "a natural research lab for the formation of plates and global geological changes".

According to Wang Da, chief commander for the continental scientific drilling program, an observation stand was built in the well, with a diameter of 156 millimeters, to facilitate long-term studies on the earth's in-depth secrets.

"We analyzed the gas data collected about 4,000 km underground before and after the great Sumatra Earthquake happened on Dec. 26, 2004. There were significant differences. It is possible that one day we could predict an earthquake by observations on underground gas," said Xu.

The island of Sumatra is more than 4,000 km away from Jiangsu Province.

Xu said workers had installed detectors in different depths during the drilling operation, which could not only help forecast earthquakes but facilitate life science studies by observing microorganism deep down in the earth's crust.

Researchers would also be able to acquire data useful for studies on continental plate boundaries and substances in the layer of the earth between the crust and the core, she said.

The chief scientist said the continental scientific drilling program had passed national examinations. A five-km-deep well free of ground intruders is left for future research.

"We have set up the first long-term integrated geophysics research base in Asia. I hope it could serve the human being," said Xu.

Because of their devastating potential, there is great interest in predicting the location and time of large earthquakes. Although a great deal is known about where earthquakes are likely, there is currently no reliable way to predict the days or months when an event will occur in any specific location.

The Sumatra Earthquake, the greatest in 40 years, killed about 300,000 people after triggering a large tsunami which spread outward from off the Sumatran coast.

Earthquakes around the world killed about 1.2 million people in the 20th century, including 590,000 in China. The biggest disaster in the country is a 1976 quake that killed more than 242,000 in

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Tangshan, Hebei Province.

Statistics show 35 percent of earthquakes measuring seven and above on the Richter Scale in the world's continents occurred in China in the last century.

China will build an earthquake-proof system to correspond with the development of its cities, according to its 2006-2020 earthquake proof and relief plan.

Under the plan, the system will enable all areas in China to basically have the capability to cope with earthquakes measuring around six on the Richter Scale by 2020. Measures will also be taken to equip rural areas with both earthquake-proof facilities and knowledge in relief procedures.

Currently in rural areas earthquakes usually cause heavy economic loss and casualties due to a lack of earthquake-proof facilities and relief knowledge.

According to the plan, publicity of earthquake-proof and relief knowledge shall cover 40 percent of the population and 200,000 volunteers will be enrolled to work for earthquake-proof and relief efforts by 2010.

Material storage systems for disaster relief will be built and earthquake victims will be ensured of basic living and medical assistance within 24 hours of an earthquake.

### **The Key Project “4,500m Grade Deep-ocean Operation System” Approved in Feasibility Demonstration**

**(MOST, 2007-12-17)**

Recently, the Oceanic Techniques Office of the 863 Program for the 11th Five-Year Plan held a feasibility demonstration for the key project “4,500m Deep-ocean Operation System” in Beijing.

All the panel experts held the opinion that the project, being strategic, forward looking, pioneering and scientific, had clear overall targets. Its research and key technology were appropriately selected. The panel unanimously approved the implementation proposal and suggested the project be launched as soon as possible after improvement.

### **China to build permanent observation station monitoring glacial melt**

**(Xinhua Net, 2007-12-25)**

China is to build a standing observation station to monitor melting of its longest glacier range at the edge of the world's top plateau.

The Chinese Academy of Sciences (CAS) planned to construct the scientific station at the foot of the Qilianshan Mountains, at the north rim of the Qinghai-Tibet plateau, the Science Times reported on Tuesday.

A recent scientific survey by the CAS Institute of Cold and Arid Regions Environment and Engineering showed the glaciers were significantly receding with global warming. Building a standing observation station was in response to the urgent need for constantly monitoring the speed of the glacial melt.

Qin Xiang, a senior researcher at the CAS institute who was recently named to head the proposed station, said the west section of the Qilianshan Mountains was an ideal place to observe ecological and environmental systems of the glaciers.

Previously, China organized three large-scale scientific surveys on the glaciers in the late 1950s, 1984 and earlier this year.

The latest survey revealed the worst glacial recession appeared at the Yanglonghe glacier No. 1 at the

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Qilianshan Mountains. It had receded 260 meters when compared with the data obtained from a similar survey 23 years ago, Liu Shiyin, a principal investigator from the same CAS institute, said.

Liu and his research team have completed the latest survey on China's glaciers and their change in a wide frozen area covering more than 20,000 square kilometers.

After using radar to measure the thickness of the Qiyi Glacier in the Qilianshan Mountains, he said the mass had been sliced by an average of 19.6 meters, with a thickness reduction of at least 50 meters, the newspaper reported.

As data gained from the latest survey was primarily processed, Liu said the glaciers in this region, the best studied glacial area in China, had receded 7.4 percent compared with the 1984 measurements.

The Ili River Valley, the Junggar Basin and the upper reaches of the Yarlung Zangbu River saw the most rapid glacial recession, 18 percent less than those measured in 1984, the newspaper said.

"The glaciers were significantly reduced by global warming resulting from continuous human-activity-related climate change," Liu said. He added that the glacial recession would affect farming irrigation and therefore people's livelihood in a vast area of north and central China.

The glaciers were also important water sources for many hydropower plants built on major rivers in north China.

The observation station was expected to monitor atmospheric conditions, glaciers melting, tundra, frozen earth plants and hydrological conditions near the Qilianshan Mountains, senior researcher Qin said.

### **Freshwater discovery a boost for China's outlying islands**

**(Xinhua Net, 2007-12-25)**

Chinese geologists have for the first time tapped into a fresh drinking water source from a 300-meter-deep seabed near the coastline of east China's Zhejiang Province.

In a freshwater exploration program costing nearly 20 million yuan (2.74 million U.S. dollars) in Shengsi County of the Zhoushan Islands, one of China's biggest fishery ports, a team of 20 geologists retrieved freshwater from three water-containing layers under the seabed, the China Land and Resources News reported on Tuesday.

The freshwater ascertained could easily supply residents living on islands surrounding Shengsi, the newspaper said.

A geologist estimated the first water-containing layer could produce at least 10,000 cubic meters of drinking water daily. An even bigger resource was in the third layer, with a daily supply of 80,000 cubic meters. The water could be consumed after processing, the newspaper said.

Scientific data indicated the Shengsi Islands chain was a stretch of the mainland that might have underground rivers.

"This first success in digging for freshwater from the seabed has encouraged us to find other supplies from under other offshore islands," a scientist told the newspaper.

China has 18,000 kilometers of coastline and more than 5,000 islands. Freshwater supply for those islands, particularly the smaller ones with tiny populations, was usually transported from the mainland, a costly process that was constantly affected by weather conditions.

### **China opens 1st air-sea interaction lab to analyze climate change**

**(Xinhua Net, 2007-12-27)**

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China opened its first air-sea interaction and climate change laboratory in Qingdao, Shandong Province, to closely observe climate change on the sea and to provide scientific solutions.

The newly-built lab in the eastern coastal province, funded and run by the State Oceanic Administration (SOA) First Institute of Oceanography (FIO), would conduct research on climate influencing phenomena of mass, energy, momentum and radiation fluxes across the sea, FIO head Ma Deyi said in the China Ocean News on Thursday.

The lab's research topics mainly included the study of concentration of size distribution of marine aerosol in the boundary layer over the sea surface and in the coastal zone. It would also study atmospheric optical depth over coastal zones and open sea, and modeling of the light field in the atmosphere and ocean, Ma said.

The lab would also act as a nerve center for an underway oceanic monitoring network. This was expected to be completed next year for observing climate change in the Bohai Sea, the South China Sea and sea areas, said vice SOA chief Wang Fei.

"We'll strengthen our capability in forecasting weather and analyzing air-sea interactions in deep seas," he said.

The U.N. Intergovernmental Panel on Climate Change (IPCC) issued a new report on the phenomenon earlier this year. It warned the world's average temperature, if left unchecked, could rise by as much as two to four degrees centigrade by 2080. This would probably trigger more natural disasters endangering human beings.

Representatives from 180 countries convened earlier this month in Bali, Indonesia, agreeing on a clear agenda for the key climate change issues to be negotiated up to 2009. These included actions for adapting to the negative consequences of climate change, methods to reduce greenhouse gas emissions, methods to deploy climate-friendly technologies and financing both adaptation and mitigation measures.

Sea-weather observation and air-sea interactions analysis were effective in monitoring global climate change.

World-leading organizations, such as the National Aeronautics and Space Administration, and top universities, including Massachusetts Institute of Technology and California Institute of Technology, have already focused on air-sea interaction to know more about climate change.

### **Tibet reports higher than normal winter temperatures**

**(Xinhua Net, 2007-12-31)**

Tibet, a high-altitude region in southwest China seen as sensitive to global warming, has been experiencing temperatures one to five degrees Celsius higher than normal since the beginning of the winter.

The average temperatures in the last ten days of December were three to five degrees Celsius higher than the same period in previous years, the Tibet Regional Meteorological Observatory said.

The highest temperature on Dec. 26 hit 17.7 degrees Celsius, the second highest for the same period in half a century after the highest 17.8 degrees Celsius recorded in 1980, the observatory said.

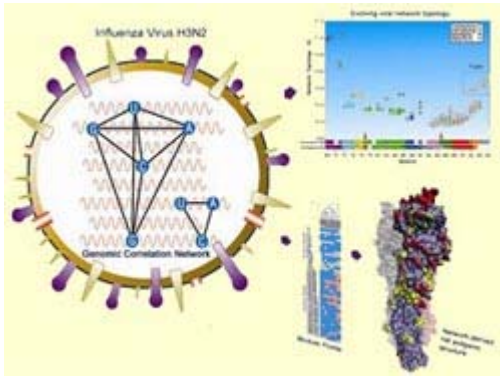
"Less rainfall, higher temperatures and dry and windy weather have featured the region's winter this year," said Ma Yanxian, a senior engineer at the observatory.

The region's rainfall totals were also about half a normal year's, according to the observatory.

## 1.3 Health

### A new model for simulating evolution of influenza virus

(CAS, 2007-12-05)



Understanding the evolution of influenza A virus, which poses a global challenge to public health, is of special significance for its control and prevention. Although the genome structure of the virus is seemingly simple, their evolution patterns and molecular mechanisms are difficult to reveal.

The recent availability of full genomic sequence data for a large number of human influenza A (H3N2) virus isolates over many years provides an opportunity to analyze its evolution by considering all gene segments

simultaneously. However, such analysis requires development of new computational models that can capture the complex evolutionary features over the entire genome.

As being reported online by Genome Research on 21 November, a research group headed by Prof. JIANG Taijiao with the CAS Institute of Biophysics has set up a new computational model to picture many epidemiological characteristics of human influenza A (H3N2) virus.

By analyzing the co-occurrence of the nucleotides in the entire genome of the virus, Prof. Jiang and colleagues have developed a network model to describe its evolutionary pattern and dynamics. They also succeeded in introducing several parameters for the network such as the linkage degree  $K$ , its change  $R$  and the coordinated evolution's characterization between two sections  $C$ . The model is able to quantitatively depict many of the characteristics in the evolutionary course, including the antigen's evolution and its structural basis, functional association between different sections and recombination. In addition, the network model can effectively identify the antigenic features of the virus at the whole-genome level and accurately distinguish the complex patterns in the viral evolution between different gene segments. An analysis by the researchers shows that the co-occurring nucleotide modules apparently underpin the dynamics of the H3N2 viral evolution and that the amino acid substitutions corresponding to the nucleotide co-changes the cluster preferentially in a known antigenic region. The study demonstrates that the network of nucleotide co-occurrences presents a promising method for tracking down the route of the viral evolution.

The novel approach of the network model, according to a reviewer of the paper, is a brand new method for probing a viral strain's all-sequence evolution and is of vital importance in demystifying the molecular mechanism governing the influenza's evolutionary course. As a matter of facts, this is a remarkable progress in the methodology of the research topic.

### China's 2nd AIDS Vaccine Undergoes Clinical Trials

(CRI, 2007-12-05)

The first phase of clinical trials on China's second homemade HIV/AIDS vaccine began at Peking Union Medical College Hospital in Beijing last weekend.

The vaccine, jointly created by the National Center for Disease Control and Prevention and the

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National Vaccine & Serum Institute, will be tested on 36 volunteers, said Shao Yiming, chief professor of the project.

According to Shao, the vaccine marks a new approach to fighting the virus. The volunteers have been divided into two groups, one with smallpox vaccines and one without.

"We use the smallpox vaccine as the carrier of this new AIDS vaccine. We put the HIV virus gene into the smallpox vaccine and let it produce antibodies inside human bodies," Shao told the China Central TV (CCTV).

Different from other vaccines which have failed in previous tests, the new vaccine has a replicative vector, meaning it is designed to kill the HIV virus by replicating itself.

Early trials on mice and monkeys indicate the vaccine is safe and effective in stimulating the immunity of cells and body fluids.

"The results of the first-phase trial are expected to come out in about two months," Shao said.

In August, 2006, the country's first homemade AIDS vaccine, jointly created by Changchun Baike Pharmaceutical Company and Jilin University Vaccine Research Center, successfully passed the first phase of clinical trials.

Zhang Zhe, assistant manager of Baike, said the vaccine had not entered the second phase of the trial yet, but refused to elaborate on when that was likely to happen.

There is still no effective HIV/AIDS vaccine in the world and two vaccines have failed after the third phase of clinical trials.

China's research into HIV/AIDS vaccines has been going on for 16 years but the country did not own intellectual property rights to its vaccines until 2006, according to a report released that year by the Chinese Academy of Sciences (CAS).

Wei Liang, an official with the State Food and Drug Administration, confirmed Tuesday that the two vaccines were both undergoing trials but declined to comment further.

The vaccine must undergo three phases of clinical trials before going into production. The first phase is focused on safety. The second phase will assess both safety and the immunity nature of the vaccine while the third will assess the protection it offers for high-risk groups.

Statistics from CAS show that up until August 2006, there have been 120 AIDS vaccine tests on humans throughout the world.

An estimated 700,000 people are believed to be infected with HIV/AIDS in China, according to new figures released by the government.

### **Chinese scientists: Cloned bamboo genes may mean more food for people (Xinhua Net, 2007-12-06)**

Scientists in east China said that they had succeeded in copying some genes of the bamboo plant, a development that they said could lead to better food supplies for people.

Genetic material extracted last week from bamboo plants could delay the flowering and seeding phases of paddy rice, which could improve the crop yields and pest-resistance of a staple food for China's 1.3 billion people, the researchers said.

The experiment was the culmination of 10 years of research by Lin Xinchun, associate professor of Zhejiang Forestry College, and his colleagues.

The trigger for bamboo flowering, which occurs as part of the plant's natural life cycle every 60 to 120 years, has long confounded scientists. "Even if a scientist starts studying bamboo the moment he is

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born, the chance is rare for him to observe bamboo flowering," said Lin.

Bamboo plants are the sole food for China's endangered giant pandas. After flowering, the bamboo dies. Unless there is another species of bamboo nearby that the pandas will eat, the animals face starvation.

Lin and his team have built up a database of DNA related to bamboo flowering, which they are trying to decode. This information could be used to cultivate new types of bamboo with predictable flowering periods, taking the uncertainty out of the pandas' food supply.

"If we achieve the goal, it would be a real blessing for our giant pandas," said Lin.

### **The first transgenic rabbit cloned in China**

**(China News, 2007-12-14)**

China announced that the first cloned transgenic rabbit in the world had survived for more than three months. According to the identification result published in Shanghai, exogenous green fluorescent protein has been found in the cells of the rabbit, which proves that it is a cloned transgenic rabbit.

The researchers of Shanghai Xinhua Hospital have spent a year to build transgenic rabbit cells and to clone a complete individual rabbit according to the modified genetic information in such cells. The cloned baby rabbit was born on September 14, 2007. It will serve as a model for the cloning of rabbits.

The next goal of the researchers will be the combination of different exogenous genes, and the transfiguration of functional genes.

### **Artificial skin developed in China for patients**

**(Xinhua Net, 2007-12-18)**

Chinese scientists have developed a new kind of artificial skin which has significant clinical benefits for patients in need of a skin transplant.

Doctors have long dreamed that one day they could take out a piece of artificial skin stored in the refrigerator and cure patients with large areas of damaged skin. Now, that dream has come true.

Professor Jin Yan from China's Fourth Military Medical University told Xi'an Evening Post on Monday that the university has developed such a kind of artificial skin.

At an exhibition on Monday, Chinese experts carefully showed people the milky white adhesive film, with a diameter of 20 centimeters, contained within a cultivation dish.

The United States was the only country with the technology to produce artificial skin before the university is able to assist the nations own burn victims.

Professor Jin Yan touted that the artificial skin has two layers, the epidermis and dermis, with active cells, which can grow quickly along with the original human skin without the immune system rejecting it.

China's State Food and Drug Administration has ratified certificates for the development of the new artificial skin.

The professor said that there are over 15 million people afflicted with burnt skin and ulcers every year in China, with an estimated 3.5 million people already needing a skin transplant.

Before the advent of artificial skins, in most cases, a skin donor was needed, otherwise, doctors had to transplant the patients' own skin from one area to another.

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### **World's 1st cloned GM rabbit may reproduce in 3 months**

**(Xinhua Net, 2007-12-19)**

Chinese scientists expect the world's first rabbit cloned by using a biological process that takes cells from a fetus will be able to reproduce in three months.

The genetically-modified cloned rabbit glows green under a fluoroscope, a result of being injected with special genes. Scientists hope this special trait will be transferred to the rabbit's offspring.

The unnamed female rabbit, born in a hospital affiliated to Shanghai Jiaotong University's medical school on September 14, weighed 1.4 kilograms when three months old, the average age for rabbits to enter puberty, said Chen Xuejin, an associated professor with Jiaotong University's medical school.

For safety considerations, he said the rabbit would not start mating until it was six months old.

The rabbit is the world's first to be cloned using "fibroblast" cells from a fetal rabbit and will be used to research causes of human diseases, said Chen, head of the research team.

Chen and his colleagues began the test by extracting glowing protein genes from a jellyfish. The gene was transplanted into the rabbit's fiber cells before the genetically-modified cell was injected into a rabbit embryo.

They then placed the reconstructed embryo into the uterus of a female rabbit. After 30 days of gestation, the cloned creation was born through caesarean section.

Researchers found a rabbit which had just given birth and put the cloned bunny in the same cage as her and the other newborns. The clone rabbit ate radish and green vegetables like its peers.

Chen said his research team had produced other rabbits using the same technology, but most of them had died shortly after being born.

"Even the longest surviving cloned bunny didn't outlive the weaning age, around the fifth week," he said.

As rabbits share similar genes with humans, the genetically-modified clone rabbit is expected to be used for research into cardiovascular and eye diseases as well as some genetic ailments, said Dr. Li Shangang with the Chinese Academy of Agricultural Sciences.

Scientists have cloned mice, cattle and other animals since the first cloned sheep, Dolly, was born in 1996. Malaysia is trying to clone some of its threatened leatherback turtles to save them from extinction.

But it was only in 2002 that French scientists produced the world's first cloned rabbit using cells from an adult female rabbit.

### **Human-use Bird Flu Vaccine "Safe", "Effective": China**

**(CRI, 2007-12-24)**

China announced Monday that its human-use bird flu vaccine proves "safe" and "effective" during the second phase of clinical tests.

The vaccine was jointly developed by the Beijing-based vaccine producer Sinovac Biotech, the first in the world to develop SARS vaccine, and the Chinese Center for Disease Control and Prevention. The program was also under support of the Ministry of Science and Technology and the Ministry of Health.

Zhang Jiansan, vice-general manager of the Sinovac Biotech, said the second phase of clinical tests was carried out from September to November with approval of the Chinese State Food and Drug Administration. A total of 402 people aged from 18 to 60 took the test.

Test results showed that the major index of the vaccine all reached international standard and performed well in human body. None of the test takers were found with serious negative reaction, which proved that the vaccine was safe.

Zhang said test takers of different ages were given different dosage of vaccine, and the result was also positive. "It means the vaccine could give multiple choices in treating flu infected people."

"We were able to control the dosage and immunization procedure during the second phase of clinical tests, which also provided us scientific and effective methods to combat highly infective influenza," Zhang said.

Observers said China has completed its technological preparation to combat influenza with the success of human-use bird flu vaccine research and clinical tests.

"China is also capable to produce human-use bird flu vaccine in appropriate quantity," Zhang stressed.

**Green tea may protect brain cells against Parkinson's**  
(CAS, 2007-12-26)

A signal pathway with protective effects of green tea polyphenols for 6-OHDA-induced Parkinson's disease

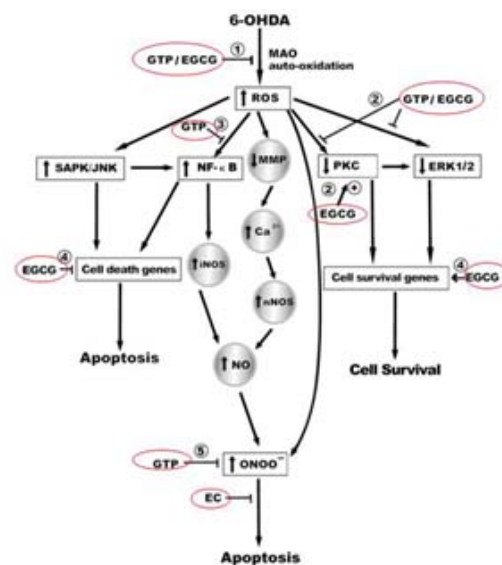
Does the consumption of green tea, widely touted to have beneficial effects on health, also protect brain cells? As reported in the 15 December issue of Biological Psychiatry, studies by CAS researchers indicate this may be the case.

A research team led by Prof. ZHAO Baolu from the State Key Laboratory of Brain & Cognitive Science affiliated to the CAS Institute of Biophysics, investigated the effects of green tea polyphenols, a group of naturally occurring chemical substances found in plants that have antioxidant properties, in an animal model of Parkinson's disease.

Parkinson's disease is a progressive, degenerative disorder of the central nervous system, resulting from the loss of dopamine-producing brain cells, and there is presently no cure. According to Zhao, corresponding and senior author of the article, entitled Protective Effects of Green Tea Polyphenols in the 6-OHDA Rat Model of Parkinson's Disease Through Inhibition of ROS-NO Pathway, current treatments for Parkinson's are associated with serious and important side effects. Their previous research has indicated that green tea possesses neuroprotective effects, leading the CAS team and collaborators to examine its effects specifically in Parkinson's.

The researchers discovered that green tea polyphenols protect dopamine neurons that increases with the amount consumed. They also show that this protective effect is mediated by inhibition of the ROS-NO pathway, a pathway that may contribute to cell death in Parkinson's.

Considering the popularity of green tea beverages worldwide, there is enormous public interest in the health effects of its consumption. John H. Krystal, M.D., Editor of Biological Psychiatry and affiliated with both Yale University School of Medicine and the VA Connecticut Healthcare System, reminds us that "many health-related claims have been made for a wide variety of naturally-occurring substances and many of these claims, as in the case of St. John's Wort and Ginko Biloba, have not held up in



rigorous clinical studies. Thus, it is extremely important to identify the putative neuroprotective mechanisms in animal models, as the CAS researchers have begun to do for Parkinson's disease."

Prof. Zhao's hope is that eventually "green tea polyphenols may be developed into a safe and easily administrable drug for Parkinson's disease." Dr. Krystal agrees, that "if green tea consumption can be shown to have meaningful neuroprotective actions in patients, this would be an extremely important advance."

### **Florescent cloned pigs become pregnant**

**(China News, 2007-12-26)**

Three florescent cloned pigs, born last year, are all pregnant now and will deliver their babies in January next year, according to information released from the School of Biological Science at the Northeast Agricultural University, a body responsible for China's transgenic cloning pig program.

A year ago, China's first three green florescent protein transgenic cloning pigs were born at the Northeast Agricultural University. This is the fourth case of florescent cloning pigs produced with body cell nuclear transfer method. Previously, the United States, South Korea and Japan had produced florescent cloning pigs with similar methods.

The three pigs have been growing over the past year and their weights have reached the required standards. They became pregnant after mating with ordinary boars and are expected to deliver piglets in January next year. The research team wants to find out whether the piglets still carry the florescent feature after the mother pigs mating with ordinary male pigs. Researchers will select piglets with florescent feature to mate with other ordinary pigs to test the result.

The research will help scientists to find out how to apply transgenic method to domestic pigs and how to use pigs to set up a medical treatment model for human beings as well as to deepen scientists' study in using pigs for human organ transplantation tests. It will also promote animal husbandry development and open a new way for related medical research.

### **Tianjin has largest umbilical cord stem-cell storage**

**(Xinhua Net, 2007-12-31)**

Tianjin now has the largest umbilical cord blood stem-cell storage in the world.

The number of stored stem cells derived from umbilical cord blood has reached 100,000 specimens, twice the amount stored in the New York Cord Blood Bank that previously had the largest number of stem cell samples.

The umbilical cord blood bank in Tianjin is among the first batch of blood banks that have passed the state health watchdog's examination. And it is also among the first batch of blood banks accepted by an organization on Asian cord blood banks, according to a report in the Tianjin-based Tonight Paper on Sunday.

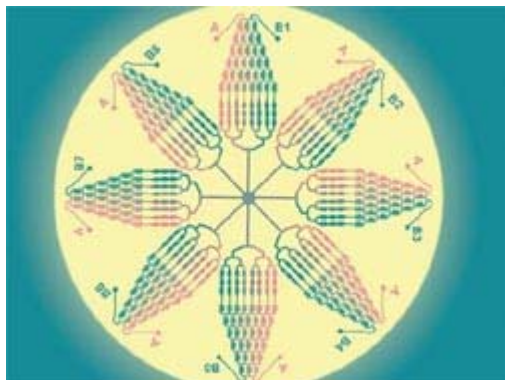
Many diseases are treated with stem cells, including Parkinson's disease, Alzheimer's disease, damaged livers and malignant tumors. Stem cells are increasingly being used in many other clinical treatments.

The stem cell bank in Tianjin has received about 1,000 domestic and international medical inquires for type matching. It has provided stem cells for 150 medical cases so far.

## 1.4 Key Technologies

### Novel progress in microfluidic chip development

(CAS, 007-12-04)



A research team led by QIN Jianhua and LIN Bingcheng from the CAS Dalian Institute of Chemical Physics has made remarkable progress in fluidic chip development.

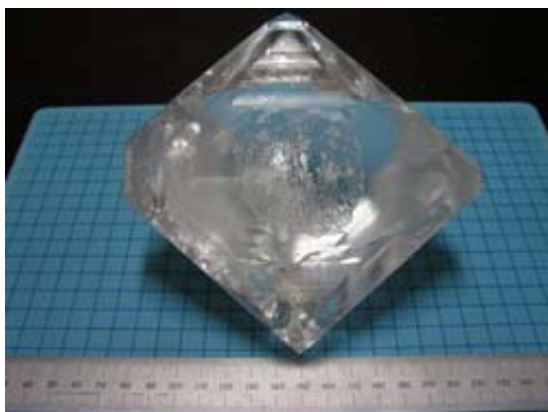
Recently they have published three papers in the *Lab on a Chip*, a journal run by the British Royal Society of Chemistry.

Among them, the paper entitled "Cell-based High Content Screening Using Microfluidic Device," authored by YE Nannan, was reported as a cover story.

This series of studies is aimed at constructing a high-flux and high-content platform for screening medicines at the level of stem cells and using medicine-induced decaying of cancer cells as a model. Processes such as cell activation and cell response can all be integrated in a chip of a few square centimeters, signifying the unique features of microfluidic chips which are able to combine flexibly multi-technical unit processes in a small chip.

### Heaviest yet LBO monocrystal grown at CAS

(CAS, 2007-12-05)



After three-year hard work, a research team led by Prof. HU Zhanggui with the CAS Technical Institute of Physics and Chemistry has made breakthrough progress in the studies of lithium triborate (LBO), a nonlinear optical crystal.

With a novel technique and cosolvent series, the team has overcome some key difficulties in grow large-size and high-quality LBO. At present, the scientists are able to fabricate a LBO monocrystal as large as  $146 \times 145 \times 62 \text{ mm}^3$  with a weight up to 1116.8g, about 500 g heavier than the largest ever

reported in the world.

LBO is a key material for the development of all solid state laser technology. The new feat will actively promote the growth of relevant industries and offer new options of materials and devices of frequency conversion for the development of large-caliber, high-energy and high-power laser technology.

### Studies on GaN-based laser devices make progress

(CAS, 2007-12-10)



A research team led by Profs. YANG Hui and CHEN Lianghai with the CAS Institute of Semiconductors (ISCAS) has made breakthrough progress in addressing key technological problems for the GaN-based laser diodes development. The research results were spoken highly at a panel meeting of experts held on 26 November in Beijing.

As the third-generation semiconductor materials after silicon and GaAs, the GaN is noted for its wide band gap, and outstanding chemical and physical properties. It has a wide-range of application perspectives and high research value. The GaN-based laser devices are applicable to a variety of sectors, such as storage of optical information, full-color laser display, laser printing, atmospheric monitoring, underwater communications, two-color detection.

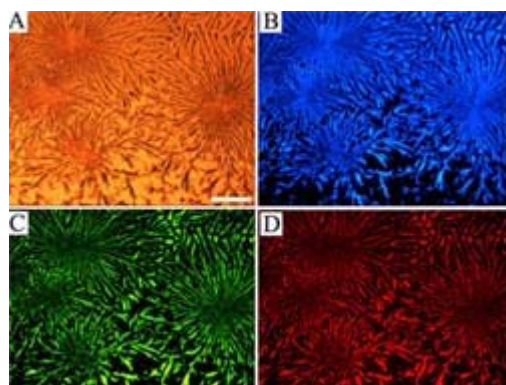
With the support of CAS, Prof. Yang and his co-workers started the studies on the subject in April 2005. Thanks to the two-year-long hard work, they have made encouraging progress in dealing with a number of technical posers in the crystal growth, device processing and debugging. The background electron concentration of their materials is less than  $5 \times 10^{16}/\text{cm}^3$  while the room-temperature electron mobility is kept at more than  $900 \text{cm}^2/\text{v-s}$ , reaching the advanced international level. The hole concentration of P-type GaN reaches  $5 \times 10^{17}/\text{cm}^3$  with its resistance rate less than one  $\Omega \cdot \text{cm}$ .

The ISCAS researchers took the lead in developing a GaN-based laser device capable of continuous wave operation at the room temperature with stripe width and length reaching  $2.5 \mu\text{m}$  and  $800 \mu\text{m}$  separately. The wavelength of the laser beam is  $410 \text{nm}$  with the threshold current down to  $110 \text{mA}$  and its density  $5.5 \text{kA}/\text{cm}^2$ . When the working current is  $150 \text{mA}$ , the device has an output power up to  $9.5 \text{mW}$ , laying a solid foundation for the development of practical laser devices.

The researchers have filed innovation patents for the design of the device's structure, crystal growth and the processing of the new laser elements. They have also published a dozen of research papers on the major journals both at home and abroad. At present, they are making efforts to develop a practical prototype of a  $405 \text{nm}$  blue-violet laser devices and a  $450 \text{nm}$  blue-green laser device in next three years.

### **Tunable and multicolor emissions from crystalline organic 1D nanomaterials**

(CAS, 2007-12-20)



The unique optical and optoelectronic properties and their prospective applications in nanoscale devices have sparked a wide arrange of investigation activities on organic nanomaterials. Much of the work, however, has been focused on zero-dimensional (0D) organic nanoparticles with amorphous structures. Compared with their 0D counterparts, one-dimensional (1D) nanomaterials are more suitable for the construction of active nanodevices and interconnect. In their research, Prof. YAO Jiannian and co-workers from the CAS

Bright-field image and fluorescence microscopy images of the PPCP nanoribbon assemblies excited with different wavelengths. Scale bar is  $10 \mu\text{m}$ .

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Institute of Chemistry have developed an adsorbent-assisted physical vapor deposition (PVD) method for the fabrication of crystalline organic nanowires with single composition, in which the introduction of adsorbents was proven to be indispensable for improving the uniformity of the products (Chem. Mater. 2006, 18, 2302-2306; Adv. Funct. Mater. 2006, 16, 1985-1991).

Recently, with support of the National Natural Science Foundation of China and CAS, they prepared the crystalline 1D nanomaterials and their hierarchical assemblies based on a low-molecular-weight organic compound, 1,2,3,4,5-pentaphenyl-1,3-cyclopentadiene (PPCP). After being fabricated to crystalline nanoribbon assemblies, PPCP displayed multicolor emission property, i.e., blue, green, and red emissions will be achieved respectively by exciting the same sample with appropriate wavelengths (Adv. Mater. 2007, 19, 3554-3558).

They also extended the adsorbent-assisted PVD method to doped binary organic systems. Uniformly doped crystalline nanorods and nanowires were prepared with 1,3,5-triphenyl-2-pyrazole (TPP) as energy donor and rubrene as energy acceptor. Intermolecular fluorescence resonance energy transfer was observed in the doping system, based on which the emission color of the binary nanomaterials can be readily tuned by modulating the molar ratio of the two compounds. White-light emission was obtained when proper TPP:rubrene molar ratio was adopted. (Adv. Mater. 2007, 19, published online, Adv. Mater. 2007, 19, 3554-3558)

### Novel progress in laser welding of dissimilar materials (CAS, 2007-12-21)



As the most widely used thermal power machine, the diesel engine plays a key role in today's social and economic development. Its dynamic performance could effectively be upgraded by one of its core components, the turbocharger, whose quality largely depends on welding technology for dissimilar materials.

A research team led by Prof. Yu Gang from the CAS Institute of Mechanics has made encouraging progress in laser welding technology of dissimilar metals. Besides meeting the critical requirements of mechanical strength, the novel approach could greatly improve the welding efficiency, offering an important technical support for the development of diesel engine.

The rotor, a key part of the turbocharger, is usually manufactured in China by welding a turbine disk, which is made of cast Ni-based superalloy K418, to a shaft, which is made of tempered middle carbon alloy steels 42CrMo. Because of the high content of Al and Ti in K418 and high carbon equivalent of the 42CrMo, there is a strong tendency of hardenability. In addition, the welding ability is rather poor. The conventional welding methods of these two materials are either electronic-beam method or friction welding method. However, building a large vacuum chamber to contain a huge component in order to carry on the electronic beam welding is not practicable. As for the friction welding method, low-stress destruction often occurs and welding defects are usually detected near the fusion zone and results in lower production efficiency. Therefore, this welding process is quite challenging.

As the result of pioneering in-depth research into laser welding of dissimilar materials, Prof. Yu and his colleagues have come up with a solution to prevent hot cracks based on an analysis of their

inherent mechanism. In addition, they have solved a series of difficulties. For instance, via the optimization of process indices and post welding heat treatments, they have succeeded in avoiding the formation of laves phase noted for low melting points and hard-brittleness. On the basis of the interaction mechanism between laser and dissimilar materials, they creatively put forward an associated heating resource to simulate the welding process. Experiments show that the optimal welding technique could ensure the strength of the welding seam higher than that of the base materials.



### **Realization of Shor's algorithm on an optical quantum computer (CAS, 2007-12-27)**

In a special section devoted to China's science and technology on 16 November, New Scientist reported achievements of Pan's group on quantum computing entitled "The people's quantum computer."

A research team led by Prof. PAN Jianwei with the University of Science and Technology of China (USTC), CAS, has been successful in performing Shor's algorithm, a quantum algorithm for factorization, on an optical quantum computer. The feat is also accomplished independently by another team led by Andrew White from the University of Queensland in Brisbane, Australia. Both results were

published in the 19 December Physics Review Newsletters.

Well-known in quantum computing field, the algorithm is first proposed by US mathematician Peter Shor in the mid-1990s. He theoretically demonstrated that, by taking advantage of the parallelism of quantum computing, the algorithm is able to quickly factor a large number, which could make a quantum computer rapidly crack such widely-used cryptographic codes as the RSA public key system, posing a serious threat to information security in business transactions on the Internet, such as e-commerce. As a result, the algorithm has rekindled a worldwide concern, triggering an upsurge of investments in the studies of quantum computation. It is expected to exert a far-reaching and enduring impact on the business operation and national security in today's world.

However, it is no picnic to perform the algorithm on a quantum computer. In 2001, researchers from IBM and Stanford University demonstrated the factorization of the number 15 using nuclear magnetic resonance technology (NMR). Because of the inherent pitfalls of NMR itself, the experiment failed to exhibit the algorithm's quantum characteristics and be scaled up, hindering its further application.

In order to realize a true state of the Shor algorithm with quantum characteristics, Prof. Pan and his colleagues in Hefei National Laboratory for Physical Sciences at the Microscale under USTC, including LU Chaoyang, Daniel E. Browne and YANG Tao, experimentally showed a compiled version of Shor's algorithm using four photonic qubits. They chose the simplest instance of this algorithm, that is, factorization of "N=15" and exploit a simplified linear optical network to coherently implement the quantum circuits of the modular exponential execution and semi-classical quantum Fourier transformation. During this computation, genuine multiparticle entanglement is observed which well supports its quantum nature. This experiment represents an essential step toward full realization of Shor's algorithm and scalable linear optics quantum computation.

The achievement has received world-wide concern and interest. It was a necessary step toward

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photon-based quantum computers, says Prof. Seth Lloyd from MIT. The achievement appears to be "the first experimental demonstrations of true (though rudimentary) quantum mechanical computations," comments Innovation Report, a German website on science and technology.

To find the prime factor of 15 is a simple mathematical question, however, the work is significant as we have done it by manipulating the quantum states of photons, says Prof. Pan. Although the current form of the quantum computer is quite primitive, just like a toddler. When it is well developed, Pan believes, the performance of a quantum computer is bound to excel all kinds of the classical computers now in operation.

### **Experts call for nano-information technology development**

**(CAS, 2007-12-29)**

Although nano-materials are currently high on research agenda, efforts should be made to promote nano-information technology in China because nano-electronics is the nano-technology with most market potentials, says Prof. HU Weiwu from the CAS Institute of Computing Technology.

Hu made the appeal at the 317th Session of the Xiangshan Science Conferences held from 18 to 20 December in Beijing.

Under the theme of scientific issues concerning the system of nano-scale information functional devices and its development trend, the Xiangshan meeting was jointly chaired by FAN Shoushan and XUE Qikun, both from Tsinghua University, and GUO Wanlin from Nanjing University of Aeronautics and Astronautics.

According to experts, the current investment of China's major programs in nano-science and technology is focusing on nano-materials and quantum information technology, scoring a batch of results in preparation and characterization of low-dimensional nano-structures and physical properties, quantum cryptography and quantum optics. But China's efforts to integrate with the existing framework of silicon-based information technology so as develop more realistic nano-electronics and molecules technology have largely been constrained by the slower pace of lithography technology development when compared with the industrialized countries.

Although the number of China's S&T workers ranks first in the world, about 70% of them are working at research institutions. In such scenario, it will be an important task for the government and researchers alike to further promote the studies in the fields of nano-device systems and make breakthroughs in micro-silicon technology, say participants of the meeting.

## **1.5 Structure of Matter**

### **Scientists convene to deal with physics in space**

**(CAS, 2007-12-14)**

Under the theme of Physics in Space, the 316th session of the Xiangshan Science Conferences took place from 11 to 13 December in Beijing, bringing together Chinese experts and scholars in the fields of theoretical physics, cosmology, fluid physics, condensed matter physics, atom cooling and space technology to discuss the long-term development of space physics.

Co-executive chairs of the meeting were Prof. HU Wenrui from the CAS Institute of Mechanics, Prof.

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ZHANG Fenggan from China Aerospace Science and Technology Corporation, Prof. WANG Yuzhu from the CAS Shanghai Institute of Optics and Fine Mechanics, Prof. ZHANG Yuanzhong from the CAS Institute of Theoretical Physics, and Prof. LU Jun from the Huazhong University of Science and Technology

Prof. HU Wenrui made a general background report on the status quo and development of physics in space.

Central topics of the meeting included relativity and the principle of equivalence; cool atoms and atomic clocks; materials; fluids; condensed state; and biophysics.

### **Proposal for spallation neutron source accepted by expert panel**

**(CAS, 2007-12-14)**

The CAS proposal for Chinese Spallation Neutron Source (CSNS) has passed the scrutiny of a panel of experts at a meeting held at the CAS Institute of High Energy Physics from 2 to 4 December in Beijing.

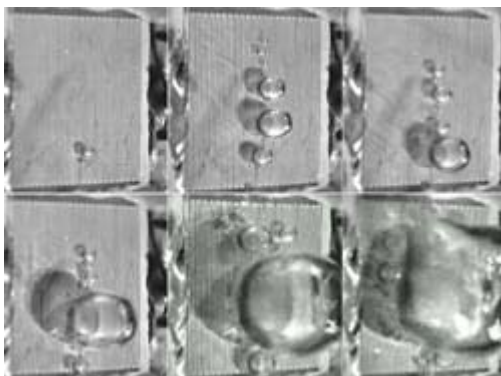
Under the auspices of the National Development and Reform Commission, the panel is made up of 14 specialists from China International Engineering Consulting Corporation, CAS, Chinese Institute of Atomic Energy, China Academy of Engineering Physics and Tsinghua University.

The establishment of CSNS will be of strategic importance for promoting scientific and technological development in China, concluded the experts after a scrutiny of the proposal. They suggested the project be started as soon as possible.

According to the blueprint, CAS is to join hands with South China's Guangdong Province in making a proposal to jointly construct CSNS in Dongwan, a booming city in province. The facility will take seven years to complete with financial support from the State. Guangdong will provide the construction site, as well as matching funds for its operation and for the establishment of a national laboratory for such a research subject.

### **Exploring the limits in microgravity**

**(CAS, 2007-12-24)**



The opportunity to carry out experiments in the absence of gravity has always interested CAS scientists. Studies have been implemented via, for instance, Russian Mir Space Station and China's space flights ever since the establishment of the National Microgravity Laboratory (NML) at the CAS Institute of Mechanics (IMECH) in the late 1990s. In addition to concern about the effects of the weightlessness on humans sent into space, they are also interested in its effects on the reproductive and developmental cycles

of plants and animals as well as other physical and chemical phenomena.

Of late, CAS scientists have scored rich results through a project entitled microgravity research platform onboard orbital module of seeding satellite, which was spoken highly by a panel of experts at an appraisal meeting held on 9 December in Beijing.

Headed by Prof. HU Wenrui, NML director and leading scientist in charging of the experiment,

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researchers successfully conducted a number of scientific experiments in a microgravity environment onboard the orbiter capsule of the Shijian-8, a Chinese scientific satellite launched on Sept. 9, 2006. Important results have already been attained from the 18 day experiment in the orbital capsule.

The major component of the microgravity experiment included: studies on accelerometers, smoldering, pool boiling heat transfer, diffusion coefficients, motion behaviors of granular matter, the impact of space environment on the embryonic development of transgenic stem cells, the growth of higher plants in a closed environmental system in space, and surface oscillation and volume effects of thermocapillary convection.

This experiments involved researchers from a number of CAS institutes (such as IMECH, Institute of Physics, Institute of Zoology, Shanghai Institute of Plant and Ecology, Institute of Engineering Thermophysics, Shanghai Institute of Technical Physics, Academy of Opto-electronics) and Huazhong University of Science and Technology.

The renovation of the orbiter capsule was made with the backing of several governmental departments, including the State Commission for Science, Technology and Industry for National Defense, the National Development and Reform Commission and Ministry of Finance. CAS rendered support to the scientific research, equipment development, overall coordination, tests in space, data receiving and processing of the project. The overall coordination is carried out by the CAS Institute of Mechanics and the General Establishment of Space Science and Application under the CAS Academy of Opto-electronics.

### Shanghai Synchrotron Radiation Facility sees its first light (CAS, 2007-12-29)



First synchrotron radiation beam line  
(visible light) observed

After three years of hard work, CAS researchers were successful in realizing the 3GeV electron beam storage at the Shanghai Synchrotron Radiation Facility (dubbed Shanghai Light Source Project or SSRF), a third-generation synchrotron radiation light source. They are able to see the long-awaited synchrotron radiation beam line.

Kicked off on 25 December, 2004, the construction of the 1.2 billion yuan Project has been implemented by researchers from CAS Shanghai Institute of Applied Physics and their co-workers under the sponsorship of CAS, Shanghai municipal government with support from the State Council.

When completed in 2009, SSRF is expected serve a group of various academic disciplines, providing a platform for upgrading China's capacities in original innovation and key technological development.

## 1.6 Transport and Space

### **Data from Chinese lunar orbiter available to all**

**(Xinhua Net, 2007-12-02)**

Scientists and astronomy enthusiasts all over the country all have access to data sent back from China's first lunar orbiter Chang'e-I, a leading scientist in the program said here Sunday.

Ouyang Ziyuan, academician of the Chinese Academy of Sciences (CAS) and chief scientist of the lunar exploration program, said at present the scientific instruments on board Chang'e-I have all gone into operation and the satellite is sending back 3 trillion of data per second. The total data volume will reach 28 T (1 T is equivalent to 1,000 G) next year.

"The money used for the Chang'e project comes from the taxpayers and, therefore, the data should also be made public. Any scientist or astronomy lover can apply to the state in accordance with certain procedures to obtain data he needs," Ouyang said.

He also refuted rumors spread by some Chinese netizens that the first image sent back by Chang'e-I "copied the picture from the United States".

"Because China and the United States took the images in the same region, it's natural the two pictures look alike. But through careful observation you will see there are some nuances," he said.

He further explained that scientist have already learned a lot of information from the first image. "We can see many craters on the lunar surface, some are of bowl's shape, some are center conical pits, and most of all, there are multi-loop pits. These craters show that the moon has experienced different disasters."

China published the first picture of the moon captured by Chang'e-1 last Monday, marking the success of the country's first lunar probe project. The image showed a rough moon surface with scattered round craters both big and small.

### **China to launch manned spacecraft Shenzhou VII in 2008**

**(People's Daily, 2007-12-04)**

China will launch the manned spacecraft Shenzhou VII next year and its comprehensive whole-craft test has started with numerous major breakthroughs having made for its new-generation carrier rockets, according to Ma Xingrui, deputy chief of the Chang'e-1 lunar orbiting project and vice-president of the China Aerospace Science Group.

China is set to launch the Shenzhou VII spacecraft in 2008 and, by then, Chinese astronauts will, for the first time, conduct outer-cabin spacewalk, Ma said, adding that knotty problems relating to air brake and other key technologies have overcome, and the whole craft has undergone a comprehensive, whole-craft test phase, and that the general assembly of the rocket which is to carry Shenzhou VII spacecraft in the vast space is expected to be completed by late December.

### **China to launch its Mars orbiter in 2009**

**(China News, 2007-12-04)**

After the first success of the Chang'e Lunar Probe Project, China is planning to launch Yinghuo-1, its first Mars orbiter, in 2009.

Yinghuo-1 will be launched by a Russian rocket in October, 2009, and it will reach the Mars in

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September, 2010, when it will send pictures of the Mars back to earth.

Currently, the prototype of the orbiter is under test, and it will be docked with Russian rocket in next May.

The Yinghuo-1 will run at an orbit that is 800 km – 80,000 km above the surface of the Mars, and its mission will last for a year.

So far, several other Mars orbiters have been launched, and Yinghuo-1 is ready to join them.

### **Official: China will soon have its own moon globe (Xinhua Net, 2007-12-04)**

China will make its own lunar globe soon, using pictures and data collected by its own moon orbiter, said an official in charge of the country's moon exploration mission on Tuesday.

"I believe that China will soon come up with a full map of the moon," said Hu Hao, head of the lunar exploration center under the Commission of Science Technology and Industry of National Defense (COSTIND).

"The map will help us make our own lunar globe and there may be more places on the moon that will be given names familiar to Chinese people," Hu said while addressing an online forum at [www.gov.cn](http://www.gov.cn).

The moon globe currently used in China is made with pictures and information sent back by probes from other countries. Most of the moon's places have borrowed titles from the Earth and some are named in memory of the early days of space exploration which was carried out by the Soviet Union and the United States.

China published its first picture of the moon, captured by lunar orbiter Chang'e-1 on Nov. 26, marking the success of the country's first lunar probe project.

The black-and-white image, covering the area of 54 to 70 degrees south latitude and 57 to 83 degrees east longitude on the moon, showed a grey and rough surface with scattered round craters both big and small.

The CCD camera carried by Chang'e-1 will take a month to finish scanning the entire surface of the moon.

"The first photo showed us the moon in its real color and people can base their imagination about the planet on the photo," Hu said.

Luan Enjie, chief commander of China's lunar orbiter project, again reassured netizens about the authenticity of the picture.

"It is from our lunar probing project," Luan said.

"Some say the picture looks the same as the one taken by the United States, which I consider a compliment, since we have reached the U.S. level at the first attempt," Luan said.

"Some say there are one or two nuances, which I think deserve future studies," Luan said.

While talking about international space cooperation, Chen Qiufa, vice minister of the COSTIND, revealed that China is now discussing with Europe about exploring micro-gravity, moon orbiting and remote controlling fields as part of cooperation plans with the European Galileo Project.

So far, China has signed cooperation agreements and memorandums of understanding with 13 countries, including Brazil, France, Russia and Ukraine, on space cooperation.

"China's space industry, still at a developing stage, is in need of concerns and assistance from the international community," Chen said.

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"China will adhere to its principle of peaceful use of space and will never be involved in any kind of space race with any other country," Chen stressed.

He also emphasized the Chinese government's persistent stance against an arms race in outer space.

"China's lunar probing project has no military goals and there is no military equipment aboard Chang'e-1" he said.

### **China-made satellite navigation system to serve Olympics**

**(Xinhua Net, 2007-12-06)**

A leading engineer for China's indigenous satellite navigation system said the new system would be used in guiding traffic and monitoring sports venues during the Beijing Olympics in summer 2008.

Ran Chengqi, deputy director of China Satellite Navigation Engineering Center, said the Compass Navigation Satellite System, which consists of five positioning satellites orbiting the Earth, will help alleviate traffic problems during the Olympics by providing detailed positioning information to individual drivers.

The home-grown navigation system, coded as Beidou in the Chinese pronunciation for the compass, can not only pinpoint precise locations of moving vehicles, but also tell drivers real-time traffic on routes to their destinations, Ran said at an international navigation industry forum in Shanghai.

In working for the Olympics, Ran said, the Beidou system would be compatible to the prevailing global positioning system (GPS), which was developed by the U.S. military and is now in pervasive civilian use worldwide.

China had primarily constructed the experimental satellite navigation web by May 2003, via launching three Beidou satellites into space. In February and April 2007, another two satellites were separately sent into orbit. The cluster of five Beidou satellites are comprised of the main infrastructure of the Chinese satellite navigation network.

China is going to launch more navigation satellites in 2008, the Shanghai-based Wenhui Daily quoted Ran as saying.

Besides the specific employment for the Beijing Olympics, Ran said, the Beidou system would also benefit wider applications from transportation, fishery, mining, to wildfire surveillance, Ran said.

In addition to the GPS and GLONASS, which was funded and constructed by the Russian military, the European Union invested in 2003 roughly 3.6 billion euros in developing an ambitious project, Galileo, which is planned to group 30 navigation satellites. The Galileo project does not run smoothly because of fund shortage.

### **Electronic Gizmo to Flag Traffic Jams**

**(CRI, 2007-12-06)**

A new on-board navigation device, which can pinpoint traffic congestion and warn drivers, is set to enter the local market, a national satellite official said Wednesday.

"The device will help drivers avoid congestions and find the quickest route," said Ran Chengqi, deputy director of the China Satellite Navigation Project Center.

He made the comments in the news briefing of an international navigation forum, called 2007 Shanghai Naviforum, which started Wednesday.

He said China had created software which combines Global Positioning System (GPS) technology with ground traffic information.

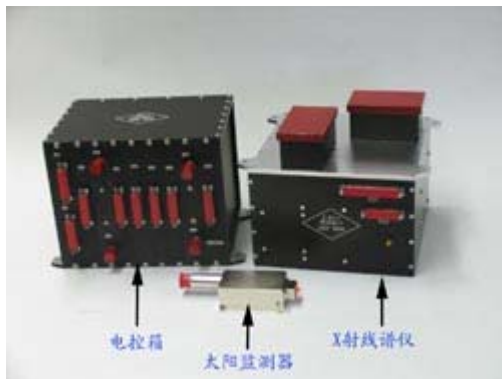
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By receiving traffic information through radio waves, the device displays pinpoint areas of high traffic congestion at different locations.

The traffic information is upgraded every five minutes, he said. Ran said the Beijing government had devised a system to support the device. It is expected to be in use there and some other Chinese cities before the Olympic Games.

The device sells for about 3,000 yuan (US\$405).

### **X-Ray Spectrometer aboard Chang'e-1 Works Well (CAS, 2007-12-11)**



The X-Ray Spectrometer aboard the Chang'e-1 moon orbiter started to work on 28 November. The spectrometer was designed and constructed by the Moon Probing Group with the Astroparticle Physics Center of the CAS Institute of High Energy Physics.

The X-ray Spectrometer, composed of an X-ray detector, a solar monitor and an electric-control box, will probe the distribution and contents of useful elements on the moon by analyzing the fluorescent X-ray excited by solar and cosmic rays. Based on the

data received through the earth control system of the Beijing Aerospace Control Center, it proves to be working well.

### **China foresees arduous future tasks in space probe (Xinhua Net, 2007-12-12)**

Chinese scientists have pledged to seize time to start the plan and implementation for the second-phase of China's lunar probe program at a red-carpet ceremony opened on Wednesday morning to mark the country's initial success in deep space exploration.

Zhang Qingwei, Minister in charge of the Commission of Science, Technology and Industry for National Defence, said the immediate tasks facing Chinese scientists and technicians were to secure the proper operation of Chang'e-1, the country's first lunar probe, on its final working orbit, data transmission and process, scientific analysis and application of lunar data.

"We will make full use of our research and development resources and the first-hand lunar exploration data so as to bring out the first-class fruits in scientific and technical innovation," he said.

Ye Peijian, chief commander and designer in charge of the satellite system, said Chinese scientists had long been aiming at the technical forefront in the world's deep space explorations and grasped a slew of core technologies in orbit design, control and guide of the probe, long-distance communication and satellite thermal control.

"The Chinese have gained their own leverage in pushing ahead with deep space exploration," he said. He advocated the "zero-defect" working concept and precise and prudent work style prevalent among scientists and technicians whose average age was less than 35 years old.

The China National Space Administration (CNSA) released the first picture of the moon captured by Chang'e-1 on Nov. 26, marking the full success of the first stage of the country's lunar probe program. The launch of Chang'e-1 kicks off the first step of China's three-stage moon mission, which will lead

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to a moon landing and launch of a moon rover at around 2012. In the third phase, another rover will land on the moon and return to earth with lunar soil and stone samples for scientific research at around 2017.

### **Participants in China's lunar probe program sign agreement to manage satellite (Xinhua Net, 2007-12-17)**

Participants in China's lunar probe program signed a management agreement on Monday to define their division of work to ensure smooth operation of the Chang'e-1 satellite in the coming year.

The head office of the lunar probe program will coordinate the functions of all the participants and approve major positioning adjustments and important experiments for the satellite, according to the agreement.

The control system is responsible for remote control, sensing and monitoring, the ground application system will draw up plans for experiments and receive and process data, while the satellite system will provide technical support and assist in monitoring.

The agreement was signed between the moon exploration center under the Commission of Science, Technology and Industry for National Defense, Beijing Aerospace Control Center, the fifth research institute affiliated to China Aerospace Science and Technology Corp. and National Astronomical Observatories.

An unnamed spokesman with the moon exploration center said that China would bring all scientific resources available into full play to attain "internationally influential" achievements in its research of the data sent back by the probe.

Chang'e-1, named after a mythical Chinese goddess who, according to legend, flew to the moon, blasted off on a Long March3A carrier rocket on Oct. 24 from the Xichang Satellite Launch Center in the southwestern province of Sichuan.

The satellite traveled nearly two million kilometers in its 15-day flight to the moon and reached its final working orbit with a fixed altitude of 200 kilometers on Nov. 7.

The China National Space Administration released the first picture of the moon captured by Chang'e-1 on Nov. 26, marking the full success of the first stage of the country's lunar probe program.

### **Satellite almost ready to relay pictures (People's Daily, 2007-12-18)**

CBERS-2B, the third Sino-Brazilian Earth resources satellite, will soon be fully operational and ready to relay pictures back to ground control, a top scientist said yesterday.

Launched on September 19, the monitoring satellite has passed its in-orbit tests, Tong Qingxi, head of the Institute of Digital China under Peking University, said.

He did not reveal the exact date when the satellite would start its operations.

The satellite can provide 2.3-m-resolution images of objects on Earth, the highest capability of any civil satellite in China, Tong said at the three-day Digital China Development Forum 2007, which ends today.

"Along with the development of Earth-observing technology and its application, the country has developed a certain level of emergency response capability to important incidents at home and abroad," he said.

Resources monitoring satellites, especially high-resolution ones, are used to help monitor natural

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disasters and large-scale incidents, Tong said.

The two Sino-Brazilian resources monitoring satellites, launched in 1999 and 2003, have already demonstrated their value in recent years.

CBERS-1 provided valuable information in June and July this year when flooding occurred in the Huaihe River Valley, enabling the government to draft flood-fighting measures, a report by the Beijing-based China Space News, said.

The CBERS satellites and another small monitoring satellite, Beijing-1, also monitored the blue-green algae outbreak on Taihu Lake this year, providing data on the degree of pollution over time.

The newspaper quoted a government official as saying that with "the eye in the sky", scientists can get a clearer picture of an incident and plan ahead for future outbreaks.

China and Brazil plan to launch two more monitoring satellites under the China-Brazil Earth Resources Satellite program, the next in 2009.

### **Chinese Scientists Work on Moon Landing**

**(CRI, 2007-12-23)**

Scientists are working on the second stage of the country's lunar exploration project, but China's space agency has no plans to put a human on the moon, a senior scientist involved in the moon exploration project said.

The news web site chinanews.com.cn reported on Sunday that Ye Peijian, general director and commander-in-chief of China's moon exploration project, made the remarks during a recent speech at Zhejiang Sci-Tech University in Hangzhou City, where he spoke about the country's first lunar orbiter Chang'e I and its deep space exploration program.

During his speech, Ye also said after Chang'e I completes its mission of circling the moon, the country will launch a Chang'e series of satellites to land on the moon during the second stage of China's moon exploration project.

China will send lunar landers directly to the moon's transfer trajectory, unlike it did with Chang'e I's flight. The lunar satellite successfully flew into lunar orbit in October, after changing tracks several times.

Scientists involved in the lunar exploration program also are researching soft-landing technologies and detector survival on the moon at night as well as inspecting the moon's surface, Ye said.

Before 2015, China will launch a lander with a detector and a lunar rover and build an exploration station during the second stage of the moon exploration mission. These devices will probe lunar geological structures and terrain, explore element distribution and usable resources on the moon's surface, conduct research on the moon's interior structure and examine the sun-earth-moon space environment.

The Chinese exploration project would involve three stages: orbiting the Moon; landing an unmanned rover on the Moon; returning lunar soil and rock samples from the Moon.

### **Beijing-1 Micro-Satellite Operates Well**

**(MOST, 2007-12-26)**

The Beijing-1 micro-satellite and its operation system are part of the research achievements of the 863 Program and the National Key Technologies R&D Program in the 10th Five-Year Plan. They are also developed within the framework of the Digital Beijing Project and the Action Plan on 2008 Hi-tech

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Olympic Games.

Since its successful launch on October 27th of 2005, the Beijing-1 micro-satellite has brought into full play its ground station. Over the two years, it has obtained 4-meter panchromatic images covering over 3 million square meters of China's territory, completed 32-meter multi-spectral cloud-free images of the country for three times, and carried out intensive observations on key regions.

### **Low Altitude Remote Sensing System on Ultra-light Aircraft Wins 2007 First-class Mapping Technology Award**

**(MOST, 2007-12-28)**

The low altitude remote sensing system on ultra-light aircraft is the application research project undertaken by the data service department, the National Remote Sensing Center. After two years of study, test and engineering application, it was reviewed by Science & Technology Award Committee, Chinese Society of Geodesy Photogrammetry and Cartography and won 2007 first-class Mapping Technology Award.

The low altitude remote sensing system on ultra-light aircraft is a product with China's full proprietary IPR. In the past two years, it was used to do remote sensing for archaeology at Ju Yan site, Inner Mongolia and make aerial photograph for urban planning over small cities such as Mancheng and Hengshui, Hebei Province and Guang'an, Sichuan Province.

## **2 News from Universities**

### **Survey: More than 80% Chinese university students want to study abroad**

**(People's Daily, 2007-12-07)**

More than 80 percent of university students in China want to study abroad, according to a new online survey.

The survey, conducted by the China Youth Daily and involving 2,400 university students, revealed that 42 percent of respondents believe an overseas education will be beneficial to their future career development.

It also showed 66 percent felt students with an education background overseas were more competitive than graduates from domestic universities when it came to job hunting.

"The CEOs of Nasdaq-listed Baidu and Sohu both received an overseas education," said He He, a student at Sichuan University, adding that the variety of majors offered by universities abroad was a significant factor.

Liang Ke, a senior student at Tsinghua Journalism School, plans to study social work via an AIDS education internship in India, explaining that universities at home rarely offer these kind of courses.

Mao Tingting, who works for an agency that arranges overseas study for Chinese students, said students were attracted by the handsome scholarships on offer and better job prospects.

China's present five to ten percent growth in university enrolment makes graduates' job prospects gloomier, Mao added.

The survey also showed the favorite destinations for overseas study were the United States, Britain, France, Australia and Canada.

Statistics from the Ministry of Education showed that in 2006 more than 130,000 Chinese went

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abroad for further study.

To cope with the trend, China's National Education Examinations Authority recently announced it would offer 100,000 online TOEFL (Test of English as a Foreign Language) seats in 2008 to residents of the Chinese mainland, up 80 percent on the figure in 2007.

### **Chinese University Produced New Dancing Robot (CRI, 2007-12-25)**

Harbin Institute of Technology announced on Tuesday that a ten-member research team consisting of teachers and students in the university has made a new intelligent robot that can conduct standard gymnastic moves practiced in Chinese schools.

The new robot, named Xiaoluobotou, which means a small radish, is about 31centimeters high and weighs about 1.6 kilograms.

The robot is powered by 16 electric motors, with a control panel on its back. Using computers, controllers can send commands to the robot through Bluetooth devices on the robot.

A doctoral student Zhong Qiubo said that the research team first decomposed the exercises into sub-actions and gestures to input into the robot.

Now, the robot can do most actions of current standard gymnastic moves, except jumping actions because of its less powerful torque motors.

## **3 Innovation Management**

### **CAS sets up a materials research institute in Ningbo (CAS, 2007-12-03)**



The inaugural ceremony for the Ningbo Institute of Materials Technology and Engineering (NIMTE), a joint venture of CAS, Zhejiang Province and the local city government, was held on 30 November in Ningbo city, an economic powerhouse of the Yangtze River Delta.

The ceremony was attended by senior officials, including CAS President LU Yongxiang, CAS Vice President SHI Erwei, Secretary of CPC Ningbo Committee Bayin Chaolu and Mayor of Ningbo MAO

Guanglie.

The establishment of the Ningbo institute has accumulated a wealth of valuable experience and provides a good example for the new around of S&T arrangement and structural and organizational adjustment at CAS, says Prof. Lu.

Lu said that it should not only work on the most advanced material technologies, but also furnish regional companies with an easily-accessible platform for technological upgrade and innovation.

According to an agreement and the relevant memorandum jointly signed by CAS, Zhejiang Province and Ningbo City in April 2004, the mission of NIMTE is to engage in applied research and technical services to accelerate the engineering development of peripheral region of Ningbo and in Yangtze

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estuary; to develop key, forward-looking technologies to meet engineering needs and strengthen industrial competitiveness; to transfer research results to the industrial section in an appropriate manner; and to foster the technology development of small and medium-sized businesses, and training industrial technology human for the benefit of the nation.

Thanks to the past three-year preparation, the institute has employed five leading materials scientists from labs across the world and 17 outstanding principal investigators, and forged technological and industrial alliances with the most competitive companies in the region.

### **Science journal: China among fastest-growing research supporter (Xinhua Net, 2007-12-07)**

As one of the world's fastest-growing economies, China is also the world's fastest-growing supporter of scientific research and development (R&D), the Science journal said in an editorial to be published on Saturday.

China's national R&D funding has taken the third place in the world, just behind the United States and Japan, according to the publication obtained by Xinhua.

China sees a rapid increase in R&D investment, with an annual growth rate of 18 percent over the past five years. By contrast, the United States, Japan and the European Union grew at a combined average rate of about 2.9 percent, the editorial said.

"This reflects a clear understanding by China's top political leadership that science and technology (S&T) are critical to their nation's future," said the authors of the editorial, Alan Leshner, who is chief executive officer of the American Association for the Advancement of Science and Executive Publisher of Science, and Vaughan Turekian, chief international officer of the science organization.

This is not surprising because so many Chinese leaders are scientists and engineers by training, the editorial noted.

There are also concerns that China's continuing rise may be at the expense of broader global societal issues such as environmental protection, natural resource use and research integrity, the editorial said.

But overall, the rapid rise in Chinese science is good for China and the rest of the world, and the global scientific enterprise should do all it can to help, the editorial added.

It views China's integration into the world scientific community as a key to the country's future success, holding that Chinese science leaders clearly welcome partnerships to ease this integration process.

"This progress is good for China and for the rest of the world," said both authors of the editorial.

### **China: innovative technology co-op to be stepped up (Xinhua Net, 2007-12-11)**

China will strengthen innovative technological cooperation with foreign countries for mutual benefit, Vice-Minister of Science and Technology Li Xueyong said yesterday.

Addressing the China-U.S. Innovation Conference in Beijing, Li said: "We hope to provide more policies and standards to encourage innovative technology that conform to international rules."

An efficient international innovation cooperation platform needs to be set up since China is trying to shift the base of its economic development mode from investment to technology, he said.

"China will cooperate more actively with other countries to share the fruits of technological advancement and protect intellectual property rights (IPR)."

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IPR protection and setting international standards are among the key issues in building an innovative society, U.S. Secretary of Commerce Carlos Gutierrez said. "The cooperation between China and the U.S. is quite important because 40 percent of the world's economic growth comes from the two countries."

"We can benefit greatly from international collaboration and global standards - a common language for innovation."

The weeklong conference's aim is to help share innovation experiences, and promote technological cooperation between the two countries' governments, enterprises and research institutes.

That China has a good innovation and development environment is borne out by Microsoft's decision to choose it as its R&D center in the Asia-Pacific region.

Asserting the fact, Microsoft Vice-President and Microsoft Asia Research Director Ya-Qin Zhang said: "Bill Gates visited a number of countries and universities. And he was quite impressed with the quality and talents of the students and the enthusiasm and passion of the people here."

China is the largest investment market for Microsoft after the U.S., he said. The company spends 100 million U.S. dollars a year in China-related R&D activities, and plans to increase the amount in the next three to five years.

"We have established innovative collaboration with more than a dozen universities in China and formed close partnerships with several Chinese IT companies, such as Digital China and Inspur (the country's leading computing solutions provider)," Zhang said.

Inspur Group expects to see greater cooperation with the world's leading IT firms, company CEO Sun Pishu said.

"We consider technology innovation as the core power for achieving high speed and sustainable development," he said.

### **Step up efforts in technology transfer**

**(CAS, 2007-12-24)**

It is of importance for CAS to join forces with local governments and enterprises to set up technology transfer centers so as to convert scientific findings from research laboratories into productivity, said CAS President LU Yongxiang.

He made the remarks during a CAS meeting on technology transfer centers held on 17 and 18 December in Beijing.

The move will serve the nation's objectives of establishing an innovative country and upgrading its proprietary innovation capacity. It also grows out of the needs of the reform and development of CAS per se, stressed the CAS president, who is also vice chairman of the Standing Committee of China's top legislature, the National People's Congress.

Apart from China's top academic body, CAS is also a comprehensive center for natural sciences and high-tech research and development, noted Lu. In spite of being a world-class S&T innovation center, CAS strives to be an incubator for high-caliber innovators, a base for China's high and new-tech development, and a think tank for science undertakings.

In the new historical period, Lu emphasized, CAS should strengthen its cooperation with the business sectors, industries and local governments by opening new channels for sharing knowledge, technology, research achievements, and personnel with them. It should promote technology transfer and incubation, encourage innovation and entrepreneurship, and facilitate the industrialization with

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enterprises as the key players, so as to provide S&T backing to the regional growth, industrial restructuring, changes in economic growth mode, and the scientific concept of development. Since 2003, CAS has established nine technology transfer centers in various regions. They have played a role as a platform for communication and transmission of CAS technologies.

### **China patent applications reach 4 mln (Xinhua Net, 2007-12-25)**

China has accepted over one million patent applications in the past 18 months, bringing the total to four million since 1985 when the country's Patent Law took effect, patent authorities announced here on Tuesday.

Statistics from the State Intellectual Property Office (SIPO) showed that patent applications accepted by SIPO reached one million after 15 years. It took 50 months for the figure to reach two million, and only 27 months for three million.

"It shows that the capability of China to accept patent application has been improved and Chinese people's awareness of patent application has been enhanced," said Wang Xiaohu, a SIPO official.

Of the latest one million patent applications accepted, about 60.8 percent were made by Chinese applicants, the SIPO said.

"Among the first one million patent applications, only 47.8 percent were made by Chinese applicants," Wang said.

Last year, Chinese applications were up 30.8 percent over 2005, 20 percentage points higher than foreign applicants at the same period of time.

"It shows the self-innovation capability of China is increasing. The patent mechanism is playing a positive role in encouraging invention and promoting technical innovation in China," Wang said.

### **CAS announces new academicians (CAS, 2007-12-28)**

Twenty-nine prominent Chinese scientists have been elected as CAS Members and five of their colleagues from US, France and Russia as CAS Foreign Members in 2007. The announcement was made by CAS Vice President LI Jinghai at a press conference held on 27 December in Beijing. CAS President LU Yongxiang was present at the meeting.

The CAS membership is the highest academic title and an honor of life tenure conferred by the State in science and technology circles in China. The election of CAS members is held biennially, and each time the total number of new members will not exceed 60, according to the Bylaws for CAS members. At present, CAS has a total of 710 Members.

The new CAS Members, elected from 287 candidates, included six from the Division of Mathematics and Physics, six from Division of chemistry, seven from Division of Life sciences and Medicine, four from Division of Earth Sciences, one from Division of Information technical Sciences and five from Technological Sciences. Sixty-nine percent of the new CAS Members are under 60. The oldest is 69 and the youngest 41. The average age of the newly elected is 53.7, the lowest since 1991.

According to the Bylaws of CAS Members, Foreign Members of CAS are elected for their distinguished achievements in scientific research and valuable contributions to China's S&T development. A candidate for the foreign membership becomes eligible only when nominated by not less than five CAS members. The election takes place biennially at the General Assembly of the CAS

via secret ballot. Now there are 53 Foreign Members at CAS.

**China revises law to encourage scientists for innovation****(Xinhua Net, 2007-12-29)**

China's top legislature on Saturday adopted an amendment to the Law on Science and Technology Progress, which aims to create a better environment for making innovations.

The law, for the first time, allows scientists to report failures during the process of innovation without harming their records in future funding applications.

"The country encourages scientists and technicians to freely explore innovation and bravely shoulder risks," reads the bill.

Scientists and technicians, who can provide evidence that they have tried their best, will be tolerated if they fail to achieve their goals in high-risk researches, says the law.

"It is known to all that failure is the mother of success." Li Yuan, an official with the NPC Law Committee said at a press conference after the adoption. "It will help create a relaxed academic atmosphere enabling scientists and technicians to take scientific risks."

While showing tolerance to scientific failures, the law brooks no scientific fraud.

The law says scientists and technicians should observe academic regulations and ethics, improve their research capability and should not make fabrication in academic activities, or practice superstition or pseudo-science.

In addition, a credit database shall be established for scientists and technicians who participate in state-funded research projects. The data will act as an important criterion for new fund application, according to the revised law.

The bill also holds the heads of state-owned enterprises responsible for the technical innovation by incorporating the innovation-oriented investments, innovative capacity and efficiency into the rating of their performances.

President Hu Jintao outlined major strategic tasks for building an innovation-oriented country in January. He said innovation-oriented laws, regulations and scientific and technological development plans should be improved to create "a favorable mechanism" for innovation.

The revised law regulates that researchers should own the patent rights of government-sponsored scientific programs -- except for those which concern major public interests, national security and benefits.

In addition, the government will offer favorable policies on taxation and fund-raising to enterprises, especially high-tech ones, as a practice to underscore their "principal role in the country's science and technology innovation".

The amendment, which is to take effect on July 1, 2008, was approved at the seven-day 31th session of the Standing Committee of the National People's Congress (NPC) which ended on Saturday.

## 4 China's International Science Cooperation

### **China, Belgium jointly develop software on pulsed magnetic fields**

**(Xinhua Net, 2007-12-27)**

The Ministry of Science and Technology (MOST) said here on Thursday that Chinese and Belgian scientists are cooperating in developing computer software for designing a high-pulsed magnetic field facility in China.

The Huazhong University of Science and Technology in Wuhan, capital of central China's Hubei Province, and Belgium's University of Leuven are working on the software. The patent is shared by both Chinese and Belgian scientists.

The software has been used for designing a big European-funded high-pulsed magnetic field experimental facility, or DeNUF, the ministry said on its website ([www.most.gov.cn](http://www.most.gov.cn)).

In high magnetic fields research, scientists attempted to study matter at the molecular level. Improvement in understanding structures and functions of materials in magnetic fields had led to a range of enhanced modern technologies, including computers, motors, plastics, high-speed trains, high-temperature superconductors and magnetic resonance imaging, experts said.

Many developed countries had set up high-pulsed magnetic fields laboratories for finding new features of existing materials or making new materials.

One of the leading laboratories in the field was the U.S. Department of Energy lab at Los Alamos, New Mexico. It could produce the world's most powerful-pulsed electromagnets, or 60 teslas (600,000 gauss) in magnetic measurement.

In 2003, the Ministry of Education endorsed funds to build China's first high-pulsed magnetic fields facility at the Wuhan-based university. Current research at the lab was sponsored by both the Chinese and Belgian governments, the website said.

The Earth's magnetic field was only one-quarter or a half gauss, depending on where people were in the world. The 60 tesla gauss magnet could deliver more than one times the magnetic field found naturally on Earth.

Pan Yuan, a principal investigator for the Chinese program, said within five years his team expected to increase the long-pulsed fields from 50 to 80 teslas (one million gauss).

High stress and abnormal heating have caused problems within powerful magnets. Thus, wise designing of a magnetic fields facility was vitally important, Pan said.

With the powerful homegrown facility, Pan and his team have studied the electron state of metals with heavy electron compounds. This was believed to be very useful for understanding the superconducting traits of metal.

## 5 Miscellaneous

### **China becomes biggest online search market**

**(China News, 2007-12-01)**

Chinese netizens have broken another world record by generating the biggest online search market. According to iResearch Group, Chinese netizens have sent more online search requests than their American counterparts since last September, making China the first country with the monthly search counts of more than 10 billion.

Currently there are 172 million netizens in China, 96% of them using online search engine regularly.

### **China to expand nature reserves for biodiversity conservation**

**(Xinhua Net, 2007-12-04)**

China will establish more nature reserves in an effort to preserve its rich natural resources and biodiversity, said Zhu Lieke, deputy director of the State Forestry Administration (SFA) on Tuesday.

By 2020, the SFA will directed 2,300 nature reserves specially for the protection of forest, wild animals and other natural resources, with a combined area of 140 million hectares, or 14.5 percent of China's total land area, Zhu told a Beijing press conference.

These nature reserves will protect 95 percent of the country's total plant types and wild animal species under state key protection and all the country's typical ecological systems, Zhu said.

The country will have more than 600 wetland nature reserves by 2020, protecting more than 60 percent of its total natural wetlands, he said.

China has planted 53.3 million hectares of forests in the past 58 years, more than any other country in the world, with forestry coverage rate rising from 8.6 percent to 18.2 percent, according to the administration.

China also aims to raise forestry coverage to 20 percent by 2010 and 23 percent by 2020, said Zhu.

The SFA figures show that the current number of nature reserves directed by the administration stands at about 1,740, accounting for 12.6 percent of the country's total land area.

China has established 470 wetland nature reserves and more than 30 pieces of wetland were designated as "Wetlands of International Importance" in the Ramsar Convention on Wetlands, an intergovernmental treaty signed in Ramsar, Iran, in 1971.

The treaty provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources.

### **Arctic trip to raise student awareness of climate change**

**(Xinhua Net, 2007-12-10)**

China launched a nationwide campaign on Monday to select 10 college students for an Arctic visit next year. The trip aims to arouse greater public attention to China's Arctic research.

The "Embrace the First Ray of Sunshine in the Arctic" trip will provide the opportunity for the students to visit a number of landmarks, including the Svalbard Islands in northern Norway, the Chinese Arctic Yellow River Station and the Norwegian Polar Institute.

"This activity, the first of its kind in China, aims to drive home the message that the public, especially college students, should be more concerned with the relationship between the Arctic, global climate change and human beings," said Yang Huigen, deputy director of the Polar Research Institute of

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China.

The exploration, co-sponsored by the International Polar Year (IPY) Chinese committee and the Royal Norwegian Ministry of Foreign Affairs, was among the international cooperation and exchange activities of The China Program for IPY 2007-2008. It was officially launched in March. It is also the fourth IPY and the first time China has taken part.

The 10 students will be selected after a national on-line knowledge contest about the polar region and a series of tests for their English proficiency and physical and psychological condition.

IPY is an international event during which scientists carry out large-scale, joint scientific activities.

During IPY, thousands of scientists from more than 60 countries and regions and a wide range of research disciplines, will carry out 220 science and outreach projects.

China has undertaken extensive exploration in the Antarctic over the years with 23 expeditions since 1984. It had also built two permanent exploration stations, Changcheng (Great Wall) and Zhongshan.

The country has almost 10,000 Antarctic aerolites, or meteorite stones, including priceless Lunar and Martian aerolites, the third largest collection of its type in the world.

### **Intelligent Transportation Technologies Successfully Applied in BRT Lines (MOST, 2007-12-21)**

With the support of the National Key Technologies R&D Program of the 10th Five-Year Plan, the Beijing Municipal Public Transportation Institute has achieved technological accomplishments in bus rapid transit intelligent system and has tested and demonstrated them on the nation's first large capacity BRT line. The technologies have been improved and perfected during the one-year operation. The BRT intelligent system has realized integrated management for passengers, vehicles, stations and roads, bringing into full play the priority of public transportation, reasonable dispatching, streamlined getting-on-and-off system, safety and easiness and human-centered services.

As the 1st large capacity BRT line in China, the southern axis road of Beijing starts from the city center and runs southward for about 16 kilometers. It receives an average of 130,000 passengers every day, 220,000 during holidays and is 30 minutes quicker than common bus lines.

The successful operation of the line will provide experience for the building and operation management of the BRT systems in Beijing and other big and middle-sized cities of China.

### **China unveils new 300-km-per-hour bullet train (Xinhua Net, 2007-12-22)**



The first bullet train designed and manufactured in China with a speed of 300 kilometers per hour rolled off the production line on Saturday morning.

The train was the latest model in the country's China Railway High-speed (CRH) Series.

"This marks that China has joined an elite world club after Japan, France and Germany to become the fourth country capable of turning out such high speed trains," said Wang Yongping, Ministry of

Railways spokesman.

Previously, China's fastest self-developed trains ran at a service speed of up to 250 km per hour.

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Those trains, which debuted on April 18, serve the Beijing-Harbin, Beijing-Shanghai and Beijing-Guangzhou routes.

The new train, by comparison, excelled in its air tightness, driving force and smoothness of traveling, according to Wang.

The streamlined train was made of aluminum alloy, weighing about seven tons.



"The train body was the lightest of its kind in the world," said Ma Yunshuang, vice director with the technical center of China Southern Locomotive and Rolling Stock Industry (Group) Corporation. "Such a design was for the sake of energy economization."

He noted the train's per capita power was 12.7 kilowatts, lower than other high-speed trains, which was normally about 15 kilowatts.

Sifang Locomotive, a subsidiary of China Southern Locomotive and Rolling Stock

Industry (Group) Corporation, planned to deliver 10 such trains to the Ministry of Railways in the first half of next year, said Jiang Jing, CEO of the company.

The trains with eight carriages could seat about 600 passengers. They were expected to run on the 115-km Beijing-Tianjin route starting from August before the Beijing Olympic Games. It would reduce the journey time from the current 80 minutes to around 30 minutes.

### **China's sole satellite conglomerate beams into operation**

**(Xinhua Net, 2007-12-25)**

China Satellite Communications Corporation (China Satcom), Sino Satellite Communications Company Ltd. (Sinosat) and China Orient Telecommunications Satellite Company Ltd. (China Orient) announced the start of their joint-venture here on Tuesday.

Named China Direct Broadcast Satellite Company (China DBSAT), it was founded last December to merge all satellite-related assets, businesses and professionals of the three companies into the country's sole satellite operation conglomerate.

Currently, China DBSAT operated and managed four geo-stationary satellites. Another three were under construction and would be launched in succession to provide a wider array of more reliable services to clients in China and other Asia-Pacific countries and regions, said the company.

China Satcom was one of the country's six major basic telecom operators. Headquartered in Beijing, its main businesses encompassed satellite, mobile communications, Internet and network services. China Orient was one of its member enterprises.

Sinosat, a Beijing-based state-owned telecommunications satellite operator, main business scope covered the marketing and leasing of its satellite transponders, development, operation and management of the satellite telecommunications systems.

### **China promises public hearings on environmental issues for major projects**

**(Xinhua Net, 2007-12-28)**

China's environmental regulator promised that public hearings will become part of the approval

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process for major projects. The decision was reached after residents' protests forced the suspension of the controversial Xiamen city PX plant project.

"Major projects in the public interest will undergo hearing procedures, with timely responses to public feedback and media coverage," said Zhou Shengxian, head of the State Environmental Protection Administration, on Thursday.

"The right to know is given to every citizen," said Zhou, who added that environmental agencies should release information on environmental quality and management and industrial activity that affects the environment.

"A multi-channel platform for public reporting, supervision and litigation will be built," Zhou commented. "Grassroots efforts can not be overlooked as people air their views on worrying toxic substances moving in next door."

China's new regulations on the release of environmental information take effect in May 2008. The rules mandate a reply from the government within 15 days after the public inquiry is submitted.

### **Abbreviations**

- CAS** - Chinese Academy of Sciences
- MOST** - Ministry of Science and Technology
- CRI** - China Radio International