

# Content

Science News from Chinese Media in September 2006  
Collected and Compiled by the Helmholtz Beijing Office

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## Helmholtz News Concerning China

In September, two delegations from the China Scholarship Council have visited Helmholtz headquarter in Berlin on the 14<sup>th</sup> and 22<sup>nd</sup> of October. Ms. ZHANG Xiuqin, Secretary General of CSC has signed a student exchange agreement together with Prof. J. Mlynek, Helmholtz president. The Agreement concerns the joint selection and funding of up to 50 Chinese PhD (including Sandwich Students) and postdoctoral students per year in the Helmholtz Association. Generally speaking, the first year cost of individual students will be carried out by CSC, and Helmholtz takes over the rest responsibility after the students have demonstrated their capability of further study and research in Germany. The second delegation led by Ms. YANG Xinyu, Vice Secretary General of CSC, has discussed the technical issues, such as the selection procedure and funding scheme with the Helmholtz colleagues. This Agreement will be announced this year and the first group of the Chinese students will be arriving Germany in September 2007.

It is believed that this programme will give a good push to the existing cooperation and facilitate many new ones. Those Helmholtz researches, who are keen in looking for Chinese students in their groups, should submit their wishes to the foreign affairs office of their own centre or inform the Helmholtz Beijing office about their interest or criterion for the upcoming students. We can contact Chinese institutions and try to make sure we get the best candidates out of China.

On the 13<sup>th</sup> of October, the day of Helmholtz Annual Conference, an extension of another 3 years for both the Helmholtz Office in Beijing and Moscow has been approved by the Helmholtz Members Meeting. We all hope, with the experiences collected in the recent years and the newly installed instruments for promoting cooperation, the importance of these two offices will be more evident.

At the end of this short report, we would distribute a good news: invitation letters issued by our office could be used for visa application. This is especially important if some colleagues without a established connection would like to come to China looking for partners. We have also the experience to help German friends to extend their visa in China.

Helmholtz Beijing Office

## **1 Science News**

### **1.1 Energy**

#### **China to develop coal bed gas**

**(China News, 2006-09-13)**

According to the latest information, China now has 36.7 trillion cubic meters of coal bed gas, equivalent to its natural gas reserves. During the eleventh five-year period, China will exploit coal bed gas resources on a large scale.

The information was released at the on-going Sino-US Oil and Natural Gas Industrial Forum.

Fan Zhiqiang, director of the Technological Management Department of the China United Coal bed Methane Corporation, said at the forum that in 2003, consumption of natural gas exceeded its supply for the first time. It is expected that by 2010, China will need to import 30 billion cubic meters of natural gas and by 2015, the import amount will hit 40 billion cubic meters. Exploitation of coal bed gas will be an ideal way to solve natural gas shortage problem.

China's coal bed gas reserves rank third in the world, next to Russia and Canada.

Coal bed gas is popularly known as gas, and its basic element is methane, same as natural gas.

Exploitation of coal bed gas will not only reduce gas explosions inside coalmines, it will also reduce the green effect problem caused by methane. It will also serve as an alternative energy resource.

The Chinese government has issued a series of preferential policies to promote the exploitation of coal bed gas with regard to the tax issue, import duty, and fees for the exploitation license and the usage of mining area. In addition, the government will provide subsidies or discount loans for related projects.

The exploitation of coal bed gas has also attracted large amounts of foreign capital to flow in. By the end of April, 16 foreign companies had signed 27 contracts with Chinese companies regarding the coal bed gas products. So far, 180 million US dollars worth of investment have been put into the coal bed gas projects.

#### **Fujian to build its first nuclear power station**

**(China News, 2006-09-20)**

The first phase of Ningde Nuclear Power Station Project started under State Development and Reform Commission's permission at the beginning of September, which, when completed, will be the first nuclear power station in Fujian Province.

Ningde is located in the mountainous region in the northeast coast of Fujian. It is planned to build 6 mega-kw power-generating sets in 2 or 3 phases. Two pressurized water reactors, each with a capacity of no less than one mega-kw, will be built in the first phase.

Ningde Nuclear Power Co., LTD, jointly founded by China Guangdong Nuclear Power Holding, Co.,Ltd (with investment of 51% of total capital) and China Datang Corporation (with investment of 49% of total capital), is responsible for the project.

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**Wider Usage of Green Fuel Being Pushed in 9 Provinces****(CRI, 2006-09-28)**

China is promoting the use of ethanol-enriched petrol for motor vehicles in nine provinces, an official with the National Development and Reform Commission (NDRC) said Wednesday.

Liu Tienan, director of the commission's Department of Industry, was quoted by Xinhua News Agency as saying China had successfully established four bases of fuel ethanol production, with a capacity of 1.02 million tons every year.

Two State-owned oil industry giants, China National Petroleum Corporation and China Petroleum & Chemical Corporation, now have a production capacity of 10.2 million tons of ethanol-enriched petrol every year.

The consumption of ethanol-enriched petrol accounted for 20 per cent of the nation's total petrol consumption last year.

Liu said the nation is now spreading the use of ethanol-enriched petrol in Heilongjiang, Jilin, Liaoning, Henan, Anhui, Hebei, Shandong, Jiangsu and Hubei provinces.

In 2005, North China's three provinces grew 4.27 million tons of maize to produce fuel ethanol, an increase of 135 per cent over 2003.

"Fuel ethanol is a renewable and environmentally friendly resource," Liu said. "The spread of ethanol-enriched petrol has great significance because it can save energy, protect the environment and digest stocked grain."

Compared to regular petrol, ethanol-enriched fuel burns cleaner and produces fewer harmful emissions. It also has higher octane, which can help vehicles achieve maximum horsepower.

"And since ethanol can be distilled from maize, it plays a key role in efforts to reduce our country's dependence on oil," Liu said.

Liu said soaring international crude oil prices are putting great pressure on China's economic development and it is very urgent to find substitutes to oil.

Zhao Xuewen, an expert with Industrialization of Agriculture Office of Liaoning Province, said Northeast China, located in one of the world's three major "Corn Belts," plays a key role in the new energy revolution.

In 2005, the three provinces in Northeast China produced 40.63 million tons of maize, 30 per cent of the nation's total maize output.

## 1.2 Earth and Environment

### Scientific exploration of Bogda Biosphere Reserve kicks off

**(CAS, 2006-09-01)**

In cooperation with the Tianchi Scenic Spot Administration, researchers from the CAS Xinjiang Institute of Ecology and Geography have recently launched a general survey on the biospheric resources in

Bogda Peak, the highest of the heavily glaciated Bogda Massif, which is a northeast extension of the Tian Shan Mountain in China's Xinjiang Uygur Autonomous Region.

Composed of the Tianchi Natural Reserve and the CAS Fukang Station for Desert Ecosystem Observation and Experiment, the Bogda reserve is the first reserve in Xinjiang that has been accepted into the World Network of Biosphere Reserves of UN Educational, Scientific and Cultural Organization.

The survey, lasting for two years, will involve the local social economy, water, biology, soil and climate. It is the first scientific surveys in 36 natural reserves in Xinjiang. Researchers say the survey is of significance for the local sustainable development.

### **Water and soil conservation of Yangtze River monitored in China**

**(China News, 2006-09-01)**

Recently the natural environment monitoring system of the Yangtze River Valley was set up.

Based on remote sensing, geographical information and GPS technology, soil erosion in the Yangtze River Valley can be easily monitored, especially in the 700 thousand sq m of Three Gorges Dam region, the headwater area of Danjiangkou Reservoir, the Jialing River Valley and the lower reaches of the Jinshajiang River Valley. All kinds of soil erosion changes can be monitored in a few minutes.

### **Blue-green algae sweep over Taihu Lake**

**(China News, 2006-09-01)**

Due to continuous hot and dry weather, large amounts of blue-green algae have begun to emerge in the Taihu Lake. Large patches of blue-green algae are floating on rivers in Huzhou city in Zhejiang, sending out a bad smell.

Compared with previous years, the blue-green algae are affecting larger areas in Taihu Lake this year. For every liter of water in the lake, there are some tens of millions of blue-green algae. In addition, since the weather is hot and there is less precipitation, the water level at the banks is relatively low, causing the water and the blue-green algae on Taihu Lake to run into some neighboring lakes.

The blue-green algae have begun to affect the water resources for the two water plants in the north and west of Huzhou city. The water plants have initiated an emergency scheme to check the quantity of blue-green algae. Right now, the water quality provided by the plants meets national standards and 300,000 residents living nearby are able to get safe drinking water.

People from the Huzhou Environmental Protection Bureau said that blue-green algae were the result of eutrophication in the water. If large amounts of blue-green algae appear, it will pollute the water. However, there are still not many effective ways to kill blue-green algae.

### **A wild plant species disappears in Xinjiang every four years**

**(China News, 2006-09-04)**



Some kinds of precious wild plant species in Xinjiang are on the verge of extinction.

Currently a wild plant species in Xinjiang is dying out fast in

every four years because of excessive pasture, land cultivation, deforestation and tourism.

Liu Zhiyong, a scholar from the Xinjiang's Academy of Agricultural Science revealed that some kinds of precious wild plant species are on the verge of extinction. Wild coles, kindred wheat species and the same wild plant genera of onions can no longer be found in the original producing area. Wild peony and watermelon can hardly be seen also in their original producing areas.

Liu said there are no available specific data for evaluating the current conditions of wild plant species in Xinjiang. But he confirmed that many species have already died out in their original areas, especially in mountainous scenic spots where many rare plants have been destroyed.

### **Regional air-quality monitoring programme launched in Beijing**

**(China News, 2006-09-06)**

Beijing Municipal Bureau of Environmental Protection launched a regional air-quality monitoring programme recently, which will gather necessary information for guaranteeing air quality during the 2008 Olympics.

Being the biggest of its kind ever in the world, the programme covers Beijing, Tianjin, Hebei and Shanxi, with the help of unmanned aeroplanes to check the air quality of different atmospheric layers. The programme will collect the data on the transportation of both primary and secondary pollutants, and the emerging of the latter. The data will help to make a 3-D graph on the regional transportation of pollutants, and their transformation. The programme will also include quantizing researches that will discover the relationship between air quality and the quantity of pollutants in the air.

More than 20 institutes and organizations take part in the programme, including Leipzig Institute for Tropospheric Research, and Max-Planck Institute in Germany, Tokyo University in Japan and some other famous institutes and academies.

### **Expert finds way to transfer sludge into treasures**

**(Xinhua Net, 2006-09-11)**

A Chinese expert has recently found a new way of dealing with the mounting sludge produced in sewage treatment and dumped in city suburbs amid rapid urbanization process.

Weng Huanxin, a professor with the Environmental and Biological Geochemistry Institute of the Zhejiang University, east China's Zhejiang Province, has developed a method of transferring sludge into innocuous materials for bricks and cement at a low cost.

Sludge is threatening to besiege more than 700 cities in China. Beijing alone produces 1,000 tons of sludge a day, Shanghai 700 tons and Shenzhen 300 tons.

It is estimated that China's sludge amount will rise at an annual rate of 10 to 15 percent in the following years. Beijing is expected to discharge more than 2 million tons of sewage every day in 2008, which is likely to yield more than 2,000 tons of sludge if all the sewage is treated.

Most of the sludge is just piled up in open air or land filled, which occupies too much land and may cause pollution. Direct burning will produce toxic fumes.

According to Weng's new technology, sludge can be dried at a low temperature, under which toxic components are permanently fixed and won't volatilize any more. It is then made into hard bean-sized granules.

The granules, mixed with clays, can be burnt into light-weight bricks. Since each granule contains 1,500 kilocalories of heat, they themselves can contribute to burning and help save fuels.

Meanwhile, small holes emerging inside the granules after burning will reduce the weight of bricks and enhance their resistance against pressure.

Weng said that a production line using the new technology to deal with 100 tons of sludge a day will help save about 1 million yuan (125,000 U.S. dollars) of landfill cost.

Statistics show that accumulating sludge is also plaguing the United States and European countries.

The United States will see its sludge amount to 8.2 million tons in 2010, and Britain produces about 1.1 million tons of thickened sludge every year.

### **A new CAS institute on urban surroundings in the pipeline**

**(CAS, 2006-09-12)**

Under the joint sponsorship of the CAS and municipal government of Xiamen (Amoy) City in south China's Fujian Province, the preparations for the founding of a CAS Institute of Urban Environment (IUE) is underway in this picturesque summer resort and coastal city.

CAS and Xiamen government will jointly invest 300 million yuan (\$37.5 million) to start the new institute, which is slated for operation by the end of 2008. The final scope of IUE's staff membership will be 760, including 150 permanent employees, 260 temporary staff, 300 graduate students and 50 post-docs and visiting scholars.

The new institute's goal is to develop itself into a world-renowned research body, a national platform for the observation & monitoring network and an incubator of high-ranking researchers in the field.

In line with the cutting-edge development in the world and aiming at meeting China's strategic demands, IUE will address main environment and ecological problems facing China's urban modernization. By conducting systematic exploration, technology development and integration and implementing comprehensive application of the theories, methods and approaches borrowed from earth sciences, biology, ecology, informatics and related technologies, the institute strives to provide scientific grounds and key technologies for the sustainable development of Chinese cities and their clusters.

The institute's main research priorities will cover urban ecology, environment and healthy development; management, habilitation & repair technique for urban environment; environment-harnessing engineering cycled economics; and urban planning and administration.

### **Research vessel sets sail for open voyage**

**(CAS, 2006-09-14)**



The maritime investigation vessel Shiyan-3 of the CAS-affiliated South China Sea Institute of Oceanology (SCSIO) departed on Sept. 7 from the Xinzhou Wharf in the suburban Guangzhou of south China's Guangdong Province, starting a fresh effort in the surveying expedition to the South Sea.

More than 60 scientists from 14 research institutions and

universities took part in the 22-day-long study trip, which will cover various research fields, including marine & hydrologic measurements, on-the-spot observation, sea currents, meteorological surveys, the recording of the optical parameters on the top layers of the seawater, marine wildlife, its biology & ecology, measurement of the aerosol, sampling of seabed sediments etc.

Started in 2004, this is the third open voyage sponsored by the Guangzhou institute. By sharing the marine observation platform and data over the past three years among researchers from different fields and organizations, encouraging results have been achieved in recent years, including the nodules of cold-spring carbonate in relevance to the hydrate of natural gas, the successful recovery of the moored submersible buoys for detecting hydrological parameters totaling a value up to millions of yuan and the acquirement of current-related data obtained at fixed points on the sea during the past year.

Such a practice is spoken highly both by the governmental departments and research community. This year, another CAS Institute, the Qingdao-based Institute of Oceanology will also launch an open voyage by inviting marine researchers across the country to conduct a joint scientific expedition onboard its scientific surveying ship.

### **China to conserve botanical species in the Three Gorges Area**

**(China News, 2006-09-17)**

The Three Gorges Project, the world's largest hydroelectric project, is ready to store water to the 156-meter mark following this year's flood season, which is a devastating news to botanical species in that area.

Located in a subtropical zone and with more than 6,000 kinds of plants (47 are endangered and 37 are endemic in this area) dwell there, the Three Gorges Area is very important in the conservation of the diversity of botanical species. It is also called a haven for species from the Tertiary Period.

In order to save these species from extinction, Yichang Municipal Forestry Administration has set up Endangered Botanical Species Bank of the Three Gorges Area, with a live plant bank, a seed bank, a gene bank and a botanical information database.

Currently, the live plant bank has collected 92 endangered botanical species, and more than 50 species have been well conserved in the seed bank. The gene bank has collected the buds of 92 species, and kept them under 80 degrees centigrade below zero. The botanical information database has collected information of 80 species in the form of specimen.

If these species really become extinct someday, they can be easily reproduced with the help of the bank.

### **A mid-term appraisal on energy-water circulation concluded**

**(CAS, 2006-09-21)**

A panel of experts held the mid-term appraisal on a research project on the energy-water circulation over the Qinghai-Tibet Plateau on Sept 6 in Lhasa, capital of the Tibet Autonomous Region.

The project under the title of Joint Observation & Research of the Energy-Water circulation & Precipitation over the Qinghai-Tibet Plateau is a research item under the joint sponsorship of the

Bureau for International Cooperation under the National Natural Science Foundation of China and the CAS Academic Division for Earth Sciences.

According to the experts, the project has completed all joint field tests on schedule, including a series of continuous surveying materials obtained during the past year from the two field monitoring outposts stationed at the foot of the Mt. Qomolangma (Mt. Everest) and the Salt Lake Nam Co. The latter two stations are under the jurisdiction of the CAS Institute of Tibetan Plateau Research. The digital analysis of the satellite-relayed telemetric data and their numerical simulation are proceeding smoothly.

The staged results achieved by the project include the systematic analyses of the information concerning the heating field, energy balance of the surface radiation, energy exchange and intensity of the turbulence in the vicinity of Mt. Qomolangma, the characteristic parameters, vegetation parameters and surface heat flux and the distribution of the evaporated amount on the ground surface of the Plateau's north part. By using the numerical mode MM5, the field-distributing layout of the surface energy, vapor, wind velocity, temperature and moisture are acquired. In addition, the simulated results are compared with the data derived from the land-based tests and remote-sensing results on surface energy flux. The comparison shows the simulation's results are relatively rational.

The experts maintain that, at present, the field work scheduled for the early stage of the project has been done, providing fundamental data on involved parameters and the conclusive mark attained by the mid-term appraisal is A. In the same time, the panelists suggest that the further dig and integration of the obtained data be enhanced and financial grants be intensified for such a key and multi-disciplinary consortium of international cooperation.

### **China to participate in Int'l Polar Year Activities for the first (Xinhua Net, 2006-09-22)**

China will participate in activities for the International Polar Year (IPY) 2007/2008 that runs from March 1, 2007, to March 1, 2008, says a source with the Polar Research Center of China.

It would be the first time China had participated in IPY activities, said Zhang Zhanhai, director of the Polar Research Center of China.

IPY 2007-2008, to be launched by the International Council for Science (ICSU) in conjunction with the World Meteorological Organization (WMO), is the fourth of its kind since the 1882/1883 seasons when the first joint polar expedition was organized.

Chinese scientists had drawn up plans for the forthcoming IPY expedition season, including a plan known as PANDA, which was listed as one of the core research missions, said Zhang.

PANDA was a multi-goal research plan that included deep ice coring at Dome A, the highest location on the Antarctic ice sheet, and a study of the interactions of the ocean-ice shelf-ice sheet system from Pridz Bay to Dome A via the Amery Ice Shelf.

The IPY is an international event during which scientists' carryout large-scale joint scientific activities.

To date, 31 nations, including China have set up specialized national councils on the IPY. More than 100 countries and international organizations have put forward 1,200 research topics or suggestions for the IPY 2007-2008 polar expedition season.

China has launched 22 Antarctic expeditions since 1984 and built two permanent exploration stations named Changcheng (Great Wall) and Zhongshan.

China has almost 10,000 Antarctic aerolites, or meteorite stones, including priceless Lunar and Martian aerolites, the third largest collection in the world.

China also launched two Arctic expeditions and built the exploration station of Huanghe (Yellow River) in the Arctic in July 2004.

### **Chinese scientists to explore uninhabited zone**

**(Xinhua Net, 2006-09-23)**

Chinese scientists will carry out a research expedition to the central area of China's largest uninhabited region in October.

The central area of the Qinghai-Tibetan plateau is 2,500-km-long and 100-km-wide with altitude differences of over 1,000-meters. Rivers to the north of the plateau watershed run to the Pacific and rivers south to the Indian Ocean.

"Our task is to research the geological formation of the watershed and its influence on climate in China and the world," said Ding Lin, leader of the expedition team and researcher at the Institute of Tibetan Plateau Research of the Chinese Academy of Sciences.

The watershed is the spine of "the roof of the world", a major climate division on the Qinghai-Tibetan plateau and runs through the center of Hoh Xil, Ding said.

Hoh Xil, more than 4,000 meters above sea level, is the natural habitat of Tibetan antelopes and wild horses.

Ding said that scientists will survey the location of bronze, lead, zinc and gold deposits, collect floral species to compile a genetic database, learn about rare plateau animals in order to provide scientific input for animal protection following the commissioning of the Qinghai-Tibet railway, and also study ecological and environmental changes in Hoh Xil.

Chinese scientists completed a successful survey in Hoh Xil last year, collecting more than 200 lava, sediment and rock specimens. They found very rare mantle rocks and discovered gold mines and unusual boulders.

"We also obtained more than 100 genetic samples of Tibetan antelopes, wild yaks and plateau pikas," said Ding, who also led the last expedition.

### **Quake monitor system to be set up in Three Gorges Region**

**(China News, 2006-09-25)**

The Three Gorges Dam has stored water to 156-meter level since 22:00 on September 20. China Three Gorges Project Corporation, the major builder of the dam, said earthquakes in the reservoir region could be detected.

In the first phases of the project, many minor earthquakes occurred in the region, the biggest one being magnitude 2.1 on Richter Scale. All these earthquakes were the natural reaction to the project, and did no harm to the dam.

In order to get a better monitor over earthquakes in the reservoir region, an advanced earthquake monitor system will be put in place here, and scientists believe that earthquakes in the future in the region will remain harmless.

However, with the water rising, there will surely be more and stronger earthquakes.

## 1.3 Health

### **China has no human-to-human bird flu transmission case**

**(China News, 2006-09-01)**

At the 2006 High Level Seminar on Bird Flu Prevention and Control, an official from the Ministry of Health said on Wednesday that among all human-infected bird flu cases in China, there was no human-to-human transmission case.

Director of the Ministry of Health Emergency Office Chen Xianyi said that so far, there were all together 21 human-infected bird flu cases occurring in 13 provinces, autonomous regions, and municipalities across China. These bird flu cases did not occur at the same time but randomly in different places. There was no correlation between these cases. When analyzing the H5N1 virus strain, scientists did not find any gene reassortment. The gene structure of the virus showed that it is still transmitted among chickens, not among humans.

Chen said that in China, experts' knowledge about bird flu was still rudimentary. Large numbers of poultry are raised in China, most of them being scattered in the fields instead of in cages. Poultry excrements are not properly handled. In rural areas, poultry are killed and sold under a simple and crude condition. All these indicate that in China, there is a high possibility that more human-infected bird flu cases would occur in future.

### **Authorities encourage drug firms to innovate**

**(Xinhua Net, 2006-09-07)**

The central government will increase investment in developing new drugs and encourage innovation in domestic pharmaceutical companies, according to the National Development and Reform Commission.

At least 5 percent of income from pharmaceutical sales of major companies will be reinvested in research into new drugs and medical equipment, said a national guideline for the development of medical and pharmaceutical industries.

The guideline, released early this week, was mapped out by the commission to guide China's medicine industry development in the coming five years.

Insufficient funding for research and development and a lack of innovation has seriously hampered development of China's pharmaceutical industry, Zhang Guobao, vice-minister of the commission, was quoted by Xinhua News Agency as saying.

In Chinese drug companies the average percentage of research investment from total sales income is 1.02 per cent.

Currently, the main research units for new medicines in China are research institutes and colleges. And only half of the large and-medium-sized pharmaceutical enterprises have special research departments.

Due to the lack of innovation, the majority of products of Chinese companies are copied from overseas counterparts.

Usually these products only require low-level techniques.

The laggard research capacity also confines many companies to producing similar medicines. For example, there are nearly 300 enterprises producing aspirin.

To achieve a larger sales volume, they have to constantly reduce prices, and many enterprises are facing bankruptcy.

In 2004, there were 4,738 pharmaceutical enterprises in China. However, nearly 84 per cent of them are small ones.

According to the guideline, the nation will establish a new medicine innovation system, in which the enterprises will be the main engine of new product research and industrialization.

The key areas for new drugs will be cancer, cardiovascular and cerebrovascular systems, viral infections, nervous and psychological systems, blood sugar reduction and senile illnesses.

And the government will take many favourable measures, including taxation and financial investment, to improve enterprises' behaviour in this field. No details about these measures are available.

### **Biotechnology to account for 5% of China's GDP in 2020**

**(CAS, 2006-09-07)**

A leading Chinese life scientist estimated that the output of China's biotechnology industry will hit two trillion yuan (250 billion U.S. dollars), or 5 percent of GDP, in 2020.

China would enter the top five countries in the world in terms of biotechnology industry scale, ZHANG Yaping, a CAS member, in a speech at the ongoing Nobel Laureates Beijing Forum 2006. Zhang, also director of the CAS Kunming Institute of Zoology, said China had made significant progress in life sciences and biotechnology.

Biotechnology industry has listed as one of the key areas for China's science and technology development in the next 15 years, according to the guidelines on national medium and long-term programs for science and technology development (2006-2020), issued by the State Council earlier this year.

By 2020, China is set to develop its own frontier technologies, such as pharmaceutical elements, genetic operations and protein engineering, dry cell-based human tissue engineering, and new-generation industrial biotechnology.

China has established five large biotechnology research and development centers in Beijing, Shanghai, Xi'an, Tianjin and Nanjing, and has successfully developed more than 200 kinds of bio-chip products.

### **China builds gene bank of 54 ethnic minorities**

**(CAS, 2006-09-08)**

Chinese scientists announced on August 30 that they have completed a gene bank with over 8,000 DNA samples from all its ethnic minorities except the Gaoshan in Taiwan.

It took more than four years to build the country's largest gene bank of minorities with funding from the government, says XIAO Chunjie, of southwest China's Yunnan University, which organized the project. The bank was co-established by several universities and research institutions, including CAS Kunming Institute of Zoology.

With 56 nationalities plus some of unidentified ethnical populations across the country, China boasts one of the world's most diverse genetic pools.

**Foodborne Diseases Menacing China's Food Safety**  
**(China News, 2006-09-10)**

(Official data showed that about an annual average of 300 million people in China would contract foodborne diseases. Meat product contaminated by bacteria typhimurium has the highest morbidity.)

Chinese experts warned Sunday that foodborne diseases rather than chemical pollutants are the top menace to the food safety of Chinese consumers.

Liu Xiumei, a research fellow with the Food Safety Institute of the Chinese Center for Disease Control and Prevention, said that foodborne disease threats were expanding in China.

In a latest food-poisoning case, eighty-seven Chinese fell ill after eating half-cooked snails in a restaurant in Beijing and were later diagnosed with a type of angiostrongyliasis, a disease caused by parasites that affects the brain and spinal cord, and can lead to meningitis, according to the Beijing Health Bureau.

Official data showed that about an annual average of 300 million people in China would contract foodborne diseases. Meat product contaminated by bacteria typhimurium has the highest morbidity; *Bibrio Parahemolyticus*, often contained in rotten aquatic products, was the second biggest pathogenic bacteria.

Liu said that foodborne diseases often happened to group dining, especially at canteens for students or employees, restaurants and fast food outlets. Triggers are material contamination, food deterioration, improper storage and bad processing.

Academician Chen Junshi with the China Academy of Engineering said that China was very concerned about chemical contamination such as the residue of fertilizer and heavy metal but often neglected foodborne diseases caused by microorganism.

To deal with the situation, experts said that those who cook must make sure clean water and safe materials are used and pay attention to kitchen sanitation.

Food, especially meat, poultry, eggs and sea food, must be well cooked, they warned.

A population of 830 million in 16 provinces are covered by the country's food safety surveillance network, representing 63.8 percent of China's total population.

**Scientists convenes to discuss medical metabonomics**  
**(CAS, 2006-09-20)**

More than 50 scientists at home and abroad participated in the 284th meeting of the Xiangshan Science Conference (XSC) held on Sept. 13 and 14 at the campus of the CAS Dalian Institute of Chemical Physics in northeast China's Liaoning Province.

XSC was initiated in 1992 by the former State Science and Technology Commission, now the Ministry of Science and Technology (MOST). It was officially inaugurated in 1993 under the joint sponsorship of MOST and CAS. It also draws support from the National Natural Sciences Foundation of China, the Chinese Academy of Engineering, the Ministry of Education and other

government departments and organizations. XSC promotes multi- and inter-disciplinary research, overall comprehensive studies, innovative thinking and knowledge innovation by creating a relaxed environment for academic exchanges, upholding the spirit of free academic discussion, and giving priority to scientific frontiers and their future development.

Under the theme of metabonomics in medical research, this session of XSC was jointly chaired by LIU Changxiao from Tianjin Institute of Pharmaceutical Research and CHEN Kaixian from the CAS Shanghai Institute of Materia Medica. In addition to Chinese participants, overseas researchers, such as Jeremy K. Nicholson from Imperial College in London, Jan van der Greef from Leiden University, Oliver Fiehn from the University of California, Davis, were also invited to attend the meeting. The topics of the meeting included the metabonomics of major diseases, the drug metabonomics, technical platforms for the new subject and its interaction with systematic biology.

Metabonomics is a newly emerging "omics" science. Thanks to its burgeoning development since the late 1990s, the subject has become a new research hot spot and finds out a series of applications in disease marker research, development of new drugs, appraisal of toxicity, metabolic networks concerning nutrition, plants or bacteria and environmental protection.

Participants called for cooperation of Chinese researchers in various regions, including Hong Kong and Macao, to make research breakthroughs in the field so as to promote the innovation, development and internationalization of traditional Chinese medicine.

### **Number of cancer cases rises rapidly**

**(China News, 2006-09-20)**

The combined factors of improper diet and stress have increased the incidence of some highly fatal cancers in China, including colorectal and pancreatic cancers.

During recent medical conferences, experts reported alarming growth of some forms of cancer and called on the public to guard against the diseases by changing unhealthy lifestyles and ensuring early detection.

#### **The major killer**

The Ministry of Health reported early this year that cancer has become the leading killer of Chinese. Cancer deaths have increased 29 per cent over the last 20 years.

In Shanghai, colorectal cancer has become the most fatal cancer after lung cancer, surgeons reported at the Second International Colorectal Cancer Forum on Saturday.

In 2000, the cancer was reported to have hit 40.8 Shanghai residents in every 100,000. Its incidence rate has increased by 4.2 percent each year.

"The cancer incidence rate in Shanghai, Beijing and Guangzhou almost equals that in Western countries, but the growth is twice the global figure," said Dr Xu Xinyu of Zhongshan Hospital.

The same is true of pancreatic cancer, the most risky malignant tumour of the digestive system.

Pancreatic cancer hits about 10 in every 100,000 people, foreign medical journals report. China's statistics are not available.

"We have seen the number of patients diagnosed with pancreatic cancer increase year by year around the country," said Professor Zhao Yupei, president of the Chinese Society of Surgery under the Chinese Medical Association, during the 11th China Pancreatic Surgery Conference held early

this month in West China's Qinghai Province.

The Beijing-based Peking Union Medical College Hospital reported that the number of pancreatic cancer patients admitted to the hospital is six times greater than five decades ago.

"A particular feature of the cancer is the significant increase in the number of young adult patients in recent years, for whom the cancer is more malignant and medical intervention is less successful," said Professor Zhao.

On average, pancreatic cancer patients survive less than six months; less than 1 per cent of patients survive five years. No more than 20 per cent of patients can undergo surgery, the most effective therapy currently available to treat the cancer.

#### **Early detection and prevention**

Surgeons attribute the high mortality rate to the features of the pancreatic cancer: it's hard to detect and cancer cells spread to other areas quickly. But poor awareness of the public is the leading cause.

"About 85 percent of patients fail to be diagnosed until pancreatic cancer develops to the late stage," said Professor Zhao, stressing the importance of early detection and prevention.

"If the cancer can be detected when the tumour is less than 1 centimetres, about 80 per cent of patients are expected to survive for five years."

However, most pancreatic cancer patients with early symptoms are misdiagnosed with stomach or gallbladder problems. "If people have pain in the upper abdominal area, and possibilities of other diseases are ruled out they should consider the pancreas and take further checks," said surgeon Yu Conghui at the Hepatobiliary Department at the General Hospital of Beijing Military Command.

Professor Xu said that many colorectal cancer patients mistakenly assume their problem is hemorrhoids at the early stage." Given timely treatment at the early stage, the five-year survival rate of colorectal cancer patients would reach more than 70 per cent," said Xu.

Experts say the increase in cancer is closely connected to the environment and unhealthy lifestyles.

Pancreatic cancer is closely related with high alcohol consumption and excessive intake of food rich in protein and fat. "Many patients like drinking bowls of liquor and take a large amount of beef and mutton, which are very risky factors," said Professor Wu Xinmin, president of Qinghai People's Hospital.

Medical experts recommend that people quit smoking, eat more vegetables and fruit rich in fibre and take physical exercise. For people over 40 years old, especially those with a family history of cancer, a health check every year is important.

#### **China will see a surge in GMOs production (Xinhua Net, 2006-09-22)**

Zhang Qifa, an academician from the Chinese Academy of Social Sciences and vice chairman of the China Science and Technology Association, said on Wednesday that over the next ten years, China would see a surge in genetically modified organisms (GMOs) production.

He made the statement at the first Genetically Modified Organism International Forum.

He says that in recent years, China has successfully produced some new strains and new materials made with genetically modified technology. Biotechnology industry thus has emerged, in which

genetic engineering vaccination and forage biologic technology take a lead in this aspect. New technologies, such as the study of genes to stimulate paddy rice cell expansion, genes to cure male sterility, and genes for herbicide resistance, have made a new breakthrough. By the end of 2005, China has successfully promoted its anti-insect transgene cotton in 100 million *mu* of land across the country, accounting for 73% of the total anti-insect transgene cotton acreage in China. Such technology has yielded 15 billion yuan worth of social and economic benefits.

Hong Fuzeng, honorary president of the China Agricultural Association, says that China has placed biotechnology high in the country's long-term strategic program. When developing genetically modified organisms, China attaches great importance to gene security, believing that it is essential to guarantee the development of biotechnological industry and safeguard organism security and human health.

### **Stem cell data bank requires more donors**

**(Xinhua Net, 2006-09-25)**

A data bank which collects a type of stem cell that can help treat people suffering from serious diseases, such as cancer, is appealing for more donors.

An official from Guangdong Provincial Hematopoietic Stem Cell Donor Data Bank made the call on the sidelines of a ceremony over the weekend to mark a special event.

A donor at the data bank, named Li An, has become a Hematopoietic stem cell donor for a leukaemia patient in Singapore.

At the event, Chen Zechi, director of the data bank, said the centre still urgently needs local residents to become volunteers.

Hematopoietic stem cells are cells which have been isolated from blood or bone marrow that can renew themselves. Once taken out of a donor, they can be given to people with serious illnesses, such as leukaemia.

Li's Hematopoietic stem cells were taken to a Singaporean hospital to help a 21-year old leukaemia patient last Tuesday.

He was the first Hematopoietic stem cell donor to give to an overseas Chinese person since the data bank was opened in January this year.

Li, from Hunan Province, now works for a concrete firm in Huizhou, a city in Guangdong.

"The provincial bank has the data of merely 15,000 volunteers, only 3,000 of whom are Guangdong residents," Chen said.

"Guangdong has a very high incidence of leukaemia and thalassaemia. The data we have is small compared to the 300,000 leukaemia patients in the province," he said. "And many overseas Chinese are of Guangdong origin."

The matching probability for unrelated donors is between 1/10,000 and 1/100,000.

Chen said that the province aims to recruit 20,000 volunteers each year over the next five years and wants to set up smaller offices in 21 cities across Guangdong by the end of 2007.

The province will finish gathering and testing blood samples for 6,000 volunteers this year.

"Those aged from 18 to 35 and with fixed jobs and homes in the province are the main target," he said.

He added that the province is offering a one-year life insurance policy worth 350,000 yuan

(43,157 U.S. dollars) to donors.

They and their family members will also be able to enjoy courtesy blood of between 800 to 1,000 millilitres if they need it in an operation as a reward for donating.

Sun Jing, director of Nanfang Hospital's blood department, said volunteers often go back on their promise to donate at the last minute because of unfounded fears about how donating will affect their health.

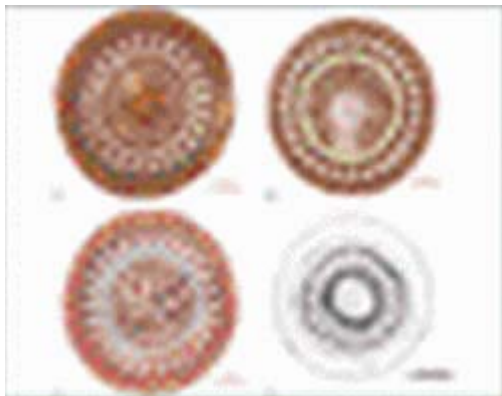
"Four volunteers backed out when they were asked to do bone marrow matching work for a leukaemia patient in my hospital," Sun said.

He said that Hematopoietic stem cells are strongly reproductive and so any donated cells will be replaced within one or two weeks.

"An authoritative foreign research institute once monitored the health situation of 100,000 Hematopoietic stem cell donors for 10 years, and none of them were found to be unhealthy due to the donation," Sun said.

### **Studies shed new light on evolutionary relationship within peritrichs**

**(CAS, 2006-09-26)**



The peritrichs, *peritrich ciliates*, are a large and distinctive group of ciliates, which are protozoans characterized by cilia and two kinds of nuclei, macronucleus and micronucleus. Traditionally, they have been subdivided into the Orders Sessilida and Mobilida according to morphological characters. Recent molecular studies by a research group at the CAS Institute of Hydrobiology (IHB) will help people to gain insight into the evolutionary relationship of the groups. Their work entitled

"Reevaluation of the phylogenetic relationship between mobiline and sessiline peritrichs (Ciliophora, Oligohymenophora) based on sequences of 18S small subunit rRNA genes" was reported in *Journal of Eukaryotic Microbiology*, a key US journal in the field.

In order to understand the evolutionary relationships within peritrichs, GONG Yingchun, a doctoral student at the Laboratory of Taxonomy and Ecology of Protozoa, IHB, used the complete small subunit rRNA (SSU rRNA) sequences of four mobilid species (*Trichodina nobilis*, *Trichodina heterodentata*, *Trichodina reticulata*, and *Trichodinella myakkae*) to construct a phylogenetic tree. Under the guidance of YU Yuhe a protozoologist at IHB, Gong carried out studies by using maximum parsimony, neighbor joining and Bayesian analyses. It turned out that, whatever phylogenetic method was used, the peritrichs did not constitute a monophyletic group: mobilid and sessilid species did not cluster together. Similarity in morphology but difference in molecular data led the researchers to suggest that the oral structures of peritrichs are the result of evolutionary convergence.

Experts say the new discovery will lead to in-depth explorations on the taxonomic position of sessiline on the phylogenetic tree.

**Seminar on hepatitis virus held at Institut Pasteur Shanghai**

**(CAS, 2006-09-26)**

To follow up the implementation of national key projects on the prevention and control of important infectious diseases and to strengthen the national cooperation and exchanges in the field, the CAS Institut Pasteur Shanghai convened a Seminar on Hepatitis Virus on Sept.9, 2006, in Shanghai.

The seminar gathered more than 20 scientists and experts from the Chinese Center for Disease Control and Prevention, CAS headquarters, Shanghai Municipal Bureau of Public Health, Shanghai Science and Technology Commission, Shanghai Center for New Drug Development, Shanghai Center for Public Health, Institute of Infectious Diseases of the PLA Hospital No.302, the Second Military University of Medicine, the CAS Shanghai Institute of Material Medica, the Institute of Farming and Veterinary, Shanghai Academy of Agriculture, etc. Scientific presentations were given at the seminar by scientists, which inspired a hot debate.

A consensus was reached at the seminar. The participants maintained that the situation of the diseases caused by hepatitis virus and their endangerment are very serious. It's urgent to initiate key projects on prevention and control of the diseases caused by hepatitis virus. The participants proposed that the institutions concerned should work together to carry out all-dimensional and all-levels cooperation, in order to make contribution to the prevention and control of infectious diseases in China and to the establishment of a modern conception for health.

**Life Science Partnering China & Europe Programme Held in Beijing**

**(MOST, 2006-09-27)**

The Life Science Partnering China & Europe Programme was held on September 18 in Beijing. The event was co-sponsored by China National Center for Biotechnology Development (CNCBD), Europe Unlimited, BioMedico Forum and European Federation of Biotechnology.

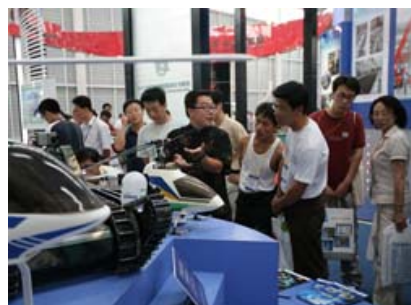
Attendants of the event were delegates from over 60 biotechnology and medicine companies from 20 or so countries, including UK, Germany, Belgium, Sweden, Estonian, Singapore and Australia. 300 or so delegates from 160 domestic companies or organizations also joined the meeting.

The delegates held in-depth discussions centered on topics such as medicine, agriculture, food, industry, environment and energy. The conference intends to build a cooperation and exchange platform for biotechnology and medicine companies of both sides and it will serve as a window for Europe to get to know Chinese biomedical enterprises for further cooperation.

## **1.4 Key Technologies**

**CAS Institute shows off its R&D capacity at exposition**

**(CAS, 2006-09-07)**



Research achievements in the field of robotics scored by the CAS Shenyang Institute of Automation (SIA) were in the limelight of the Fifth China International Equipment

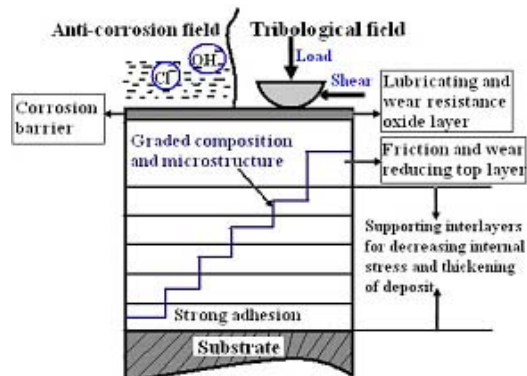
Manufacturing Exposition, which opened on August 29 in Shenyang, capital of Northeast China's Liaoning Province.

At the exposition, SIA's key lab and spin-off firm the SIASUN Co. Ltd had their new products on the display, highlighting their outstanding up-to-date strength in developing the modernized manufacturing technology, especially in the field of robotic manufacture.

Among them, the most attracting gadgets are the robots for low-altitude surveillance airplane and the portable mobile robotic, both featuring unique appearance and promising prospects in their application potential. They could be used for anti-terrorism, explosion prevention and public security.

### Superb nanocrystalline alloys for plating developed by CAS scientists

(CAS, 2006-09-11)



With high rigidity and antiwear performance, nanocrystalline metals and their alloys can find wide applications in surface protection. However, the existence of grain boundaries often leads to erosive micro-batteries which accelerate the process of corrosion. Therefore, it has already become a key issue for surface engineering researchers to find nano materials with higher lubricating, anticorrosion and antiwear capacities.

Functionally graded nanocrystalline (NC)

Ni-Co/CoO plating with excellent lubricating, anticorrosion and antiwear performances has recently been fabricated by the State Key Laboratory of Solid Lubrication, Lanzhou Institute of Chemical Physics (LICP) under CAS.

The research group, headed by CAS member XUE Qunji and "Bairen (Hundreds Talent) Program" awardee ZHANG Junyan, originally borrowed an idea of functionally graded materials (FGMs) into the design and experiment of lubricative plating. They well controlled the deposit composition as well as the grain size and phase structure during the process of electro-deposition, and after cyclic thermal oxidation functionally graded nanocrystalline Ni-Co/CoO was successfully turned out.

In addition to enhanced corrosion resistance in both NaOH and NaCl solutions, the NC Ni-Co/CoO plating shows improved good wear resistance when compared with the NC Ni and Ni-Co graded plating under dry sliding wear conditions.

This study was reviewed as early as in April, 2005 by the Research Highlights column of *Advanced Coatings and Surface Technology Alert* website. The latest research result, published in *Nanotechnology* (vol.17, 2006), has won high praises from the magazine reviewers --"it does make a valuable contribution in the field of tribology and corrosion protection."

### China develops new CPU chip

(People's Daily, 2006-09-14)

China's newly upgraded generic 64-bit CPU chip, dubbed Longxin IIE, was accredited by experts

on Wednesday, marking a major step forward in the country's ambitions to control its own intellectual property rights in microprocessors.

Longxin IIE, developed by the Chinese Academy of Sciences (CAS), is a chip the size of two thumbs with 47 million transistors and a power consumption ranging from three to eight watts, said Li Guojie, director of the Institute of Computer Technology under the CAS.

"Its calculations capacity is twice as fast as the previous version," Li said, adding that China possesses the full intellectual property rights for it.

Its highest frequency can reach 1.0 GHz and the peak speed can go up to 4 billion calculations per second under a dual accuracy check, he explained.

It proves that China is capable of furrowing its own path amid the fierce competition for the development of general-purpose CPU chips, although many patents have been achieved in other countries, Li said.

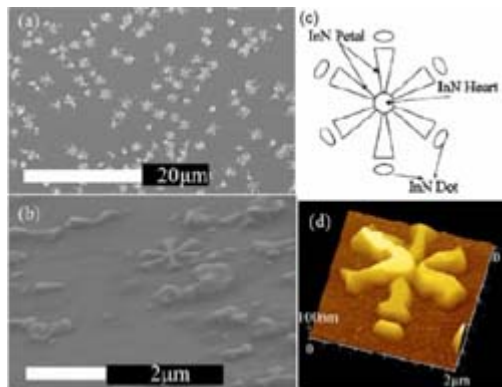
Experts believe that Longxin IIE, an equivalent of the Intel Pentium 4 processor, is only next to those produced in the United States and Japan.

Mass production of the Longxin IIE chips has begun and they will be on the market by the end of this year.

The CAS has devoted its efforts to improving the Longxin II series - Longxin IIB, Longxin IIC, Longxin IIE - ever since it successfully developed Longxin I in 2002. It is also working on adding multi-processor support to a future Longxin III.

### Nanostructures: Say it with flowers

(CAS, 2006-09-18)

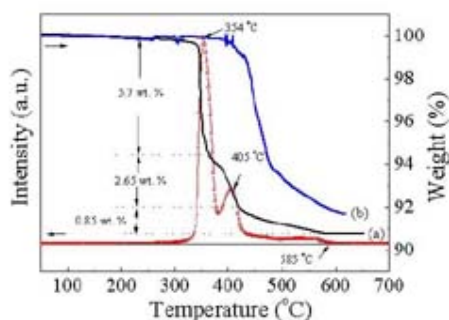


After several years of controversy, there is now a general consensus that the bandgap of indium nitride -- a group-III nitride semiconductor -- is between 0.7 and 0.9 eV. Its attractive electron-transport properties and narrow bandgap make this material a promising candidate for the production of novel ultrahigh-frequency optoelectronic devices for terahertz communications.

Producing nanosized InN structures raises the possibility of fabricating devices whose operation is based on quantum effects. However, InN nanostructures grown from either indium chloride or indium oxide by metal-organic chemical vapour deposition (MOCVD) often contain unwanted impurities. Now, Ting-Ting Kang and colleagues<sup>1</sup> (in *Appl. Phys. Lett.* (2006)) from the Chinese Academy of Sciences in Beijing have grown hexagonal InN 'nanoflowers' by a 'self-catalysis' method that does not require either of these precursors or any foreign catalysts. In this process, hydrogen gas is deliberately introduced during MOCVD growth to promote the formation of metallic indium, which acts as a catalyst for the formation of InN. Although hydrogen is known to hinder the growth of InN by MOCVD processes, careful control of its flow rate allows the synthesis to proceed.

These results shed new light on the growth mechanism of InN by MOCVD and will be important for the synthesis of novel nanometre-scale InN device structures.

### Scientists develop new hydrogen storage materials (CAS, 2006-09-18)



Magnesium destabilized the LiBH<sub>4</sub> resulting in complete dehydrogenation of the borohydride phase and the formation of a Li-Mg alloy, prior to the appearance of MgB<sub>2</sub>. a) TG and MS results for the evolution of H<sub>2</sub> from LiBH<sub>4</sub>/MgH<sub>2</sub> milled for 1 h. b) TG results for LiBH<sub>4</sub>. Both experiments used a heating rate of 10 °C min<sup>-1</sup>.

A new dehydrogenation mechanism for LiBH<sub>4</sub>, a

new hydrogen storage material, has recently been developed by CAS scientists and scholars from the University of Nottingham (UoN), showing a promising future for its onboard applications.

With very high hydrogen storage capacities, LiBH<sub>4</sub> is widely recognized as an ideal fuel carrier for future vehicles and has become a hot issue in the materials science since years ago. However, the reaction conditions of its dehydrogenation and rehydrogenation, the superior temperature and pressure needed for instance, have long been a headache for scientists.

Dr. YU Xuebin from the Laboratory of Energy Science & Technology, Shanghai Institute of Microsystem and Information Technology (SIMIT) under CAS and Dr. Garvin S. WALKER from UoN Advanced Materials Research Group have made joint efforts with their colleagues in this regard to seek new catalysts which can help improve the kinetics of the reactions and help reduce the stern conditions required for rehydrogenation.

In their experiment, a mixture of LiBH<sub>4</sub> and MgH<sub>2</sub> was investigated on its hydrogen storage capacities. The result showed that magnesium destabilized LiBH<sub>4</sub>, namely a complete dehydrogenation of the borohydride phase while the dehydrogenation and rehydrogenation temperatures of the mixture prominently lowered. The formation of Li-Mg alloys were discovered for the first time, which indicated the significance of Mg as an effective catalyst.

The research outcome has already been published in the latest volume of *Chemical Communications* (2006, DOI: 10.1039/b607869a).

As early as in May this year, the two sides of the research team inked an agreement for carrying out substantial and effective research cooperation on the basis of mutual benefit.

## 1.5 Structure of Matter

### Scientists reveal why Earth aurorae shine (CAS, 2006-09-04)

By using the data obtained from three satellites of the Cluster mission launched by the European Space Agency (ESA), CAO Jinbin from CAS Center for Space Science and Applied Research

(CSSAR) and his US and European co-workers have clarified why Earth's aurorae shine. Their work entitled Joint Observations by Cluster Satellites of Bursty Bulk Flows in the Magnetotail was published in a recent issue of *Journal of Geophysical Research*.

ESA's Cluster mission has established that high-speed flows of electrified gas, known as bursty bulk flows, in the Earth's magnetic field are the carriers of decisive amounts of mass, energy and magnetic perturbation towards the Earth during magnetic substorms. When substorms occur, energetic particles strike our atmosphere, causing aurorae to shine.

Such colourful aurorae regularly light the higher latitudes in the northern and southern hemisphere. They are caused mostly by energetic electrons spiralling down the Earth's magnetic field lines and colliding with atmospheric atoms at about 100 kilometres altitude. These electrons come from the magnetotail, a region of space on the night-side of Earth where the Sun's wind of particles pushes the Earth's magnetic field into a long tail.

At the tail's centre is a denser region known as the plasmashet. Violent changes of the plasmashet are known as magnetic substorms. They last up to a couple of hours and somehow hurl electrons and other charged particles earthwards. Apart from the beautiful light show, substorms also excite the Earth's ionosphere, perturbing the reception of GPS signals and communications between the Earth and orbiting satellites.

A key issue about substorms has been to determine how they fling material earthwards. The so called 'Bursty Bulk Flows' (BBFs), flows of gas that travel at over 300 kilometres per second through the plasmashet, were discovered in the 1980s and became a candidate mechanism.

Observations suggested that BBFs were relatively small and typically lasted only 10 minutes, casting doubt on whether BBFs could play a major role in the magnetic substorm phenomenon. There was also doubt as to whether BBFs took place for all substorms.

Now these doubts are challenged by a statistical study of BBFs and magnetic substorms by Dr Cao, Key Laboratory of Space Weather, CSSAR, and his colleagues.

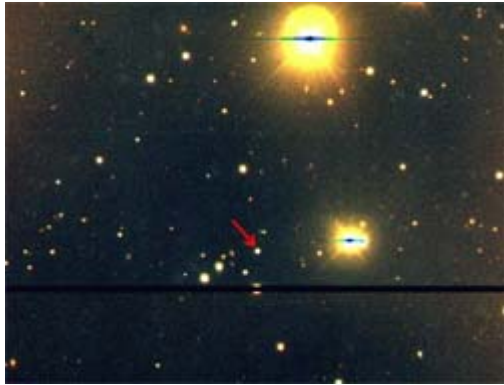
Using observations of the central plasmashet collected by three satellites of ESA's Cluster mission during July to October of 2001 and 2002, Cao and colleagues found 67 substorms and 209 BBFs. When they used the observations of only one spacecraft, they found that 78 percent of substorms are accompanied by at least one BBF. However, by combined observations from three out of the four Cluster spacecraft, they discovered that 95.5 percent of substorms are accompanied by BBFs. "For the first time, it seems possible that all substorms are accompanied by BBFs", says Cao.

Another key result of this work is that the average BBF duration is longer than previously estimated. Single satellite observations confirmed past results that the BBF duration was around 10 minutes.

However, by combining the data from three of the Cluster spacecraft, the observations reveal an average duration almost twice as long: 18 minutes and 25 seconds. So again, the multiple spacecraft data offered by Cluster was found to reveal more about the Earth's magnetic environment than data collected by single spacecraft.

"These new results by the Cluster mission clearly show that multi-point observations are the key to understanding the magnetic substorm phenomenon," says Philippe Escoubet, Cluster and Double Star Project Scientist of the European Space Agency.

**Scientists reveal new mechanism for the origin of  $\gamma$ -ray bursts**  
**(CAS, 2006-09-05)**



A VLT image of GRB060218 (marked with red arrow).

Teaming up with colleagues from Europe, Japan, and US, Dr. DENG Jinsong from the National Astronomical Observatories at CAS (NAOC) has made new progress in revealing the mechanism behind the origin of the long-duration gamma-ray bursts (GRBs), which are short-lived, localized, and intense bursts of gamma radiation that originate outside our Milky Way galaxy from sources yet to be understood by astronomers. The work entitled

"A neutron-star-driven X-ray flash associated with supernova SN 2006aj" was reported in August 31 issue of *Nature*.

GRBs occur at very large distances, usually several billion light years away. As the most luminous physical phenomenon in the universe known to astronomers, it can release, within dozens of seconds, a huge amount of energy, equivalent to the sum of the visible light emitted by our galaxy in several years.

Scientists have long been puzzled by how the large amount of energy turns into gamma rays in an instant and there have been many theories to explain GRBs. Studies over the past decade indicate that they may be "cosmic fireworks" composed of ultrarelativistic jets "released" from a black hole in the twinkling of the final death of a massive star before exploding into a supernova.

To understand the mystery, an international consortium led by Dr. Elena Pian has carried out observations on GRB 060218, a X-ray flash (XRF) detected by the Burst Alert Telescope on board the NASA's Swift Spacecraft on Feb. 18, 2006. XRFs are a special kind of GRBs whose nature are even more elusive. The astronomers made follow-up observations on an associated supernova named 2006aj with the European Southern Observatory's 8.2-m Very Large Telescope, providing the strongest evidence yet that supernovae and XRFs are linked.

A theoretical and numerical simulation of the related data on the new supernova has been carried out by Dr. Deng and Dr. Paolo Mazzali from Max-Planck Institute for Astrophysics in Germany. They reveal that, the supernova 2006aj has less matter ejected by itself when compared with other GRB-associated supernovae. Based on this, it is calculated that its progenitor star had a mass of only about 20 times the Sun's mass and a star with such a mass cannot form a black hole which is known for its infinite density, but ending in a neutron star instead after its "death." According to this scenario, the article argues, the central engine of the X-ray flash should be a newborn neutron star with powerful magnetic emission and rotating at a high speed up to milli-seconds in its rotation period. Such a bizarre star has magnetic field intensity on its surface as high as millions of billion times of that of the Earth or the Sun. The energy amount taken from the dipolar radiation of its magnetic field can easily drive the GRB event to appear and trigger the birth of the accompanied supernova.

Sky-watchers and astronomers at NAOC and Nanjing University are now furthering their

observation and theoretical exploration of the GRB 060218.

### **CPT atomic frequency standard established in Wuhan**

**(CAS, 2006-09-11)**

CAS scientists from the Wuhan Institute of Physics & Mathematics have developed a prototype recently for the Coherent Population Trapping (CPT) atomic frequency standard.

The gadget is capable of making miniature versions of the frequency standards which have been a common dream so long cherished by many research units in this country. But, the Wuhan scientists are the first group of Chinese researchers succeeding in developing it after being engaged in this poser as a result of the more than one-year arduous work.

The CPT frequency standard is a new type of atomic frequency standards whose working principle is based on coherent population trapping phenomenon in alkali-metal atoms. It features large-margin reduction in both a unit's volume and power consumption when compared with the traditional types. It may be achieved a size as a hand watch's and powered by button cells. According to overseas news reports, some foreign firms have developed mini-CPT standards with a total power consumption of less than 200mw and overall device volume less than 10 cubic centimeters.

The portable versions of such a gadget are said to be able to offer service to a wide range of military and civilian clients in coming years. In the US, for example, some brands have been making their way into military marketplaces in batches. Very probably, it is expected that, in the wake of the reduced price and manufacturing cost, it might form a swarming stance getting into military and civilian marketplaces in a great number in the near future.

### **China's biggest super-conducting solenoid magnet developed at CAS**

**(CAS, 2006-09-22)**

At 20:00pm, Sept. 19, the magnetic field of super-conducting magnet at the BESIII, an upgrade of Beijing Spectrometer, reached 1.0TG, 20,000 times as that of the earth. The current intensity reached 3,368A, and the energy stored by the solenoid reached 10MJ. Tests shown that the designed requirements had been fully met, which constitutes an important milestone for the BEPC Upgrade which is underway at the CAS Institute of High Energy Physic (IHEP).

Beijing Electron Position Collider (BEPC) was built in 1988. The successful building of BEPC and its research achievement in tau-charm physics indicated that high-energy physics experiment of China occupied a significant position in the world. BESIII is an important part of the upgrade program of BEPC (BEPCII) at the tau-charm energy region with a luminosity of  $10^{33} \text{ cm}^{-2}\text{s}^{-1}$ , two orders higher than present machine.

The Super-conducting Solenoid Magnet is one of the key components for BESIII, consisting of super-conducting coil, cryo-stat, coil support and valve box, etc. It provides BESIII with an axial magnetic field of about 1.0TG and good uniformity. The magnet adopts single layer coil, using indirect cooling method to realize long-distance control of the system.

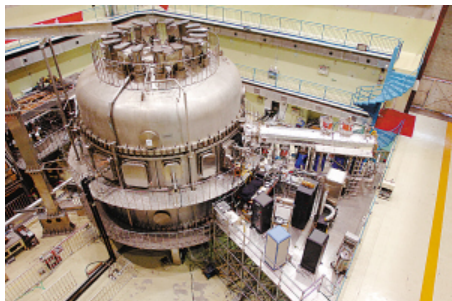
The Magnet, the biggest of its kind in China, was developed independently by IHEP scientists after three-year hard work since 2003, during which many difficulties had been overcome and key technologies developed.

**EAST project in the limelight of int'l symposium on fusion technology  
(CAS, 2006-09-27)**

The Experimental Advanced Superconducting Tokamak (EAST) constructed by researchers at the Institute of Plasma Physics (ASIPP), the CAS Hefei Institutes of Physical Science, drew much attention at the 24th Symposium on Fusion Technology (SOFT) held Sept. 11 to 15 in Warsaw.

The objectives of SOFT are to exchange information on design, construction and operation of fusion experiments and on the technology for present fusion machines, the next step and power plants. It includes oral and poster presentations as well as an industrial and R&D exhibition. The International Thermonuclear Experimental Reactor (ITER) project will be a significant theme of the symposium. About 620 participants from 24 countries attended the conference.

ASIPP Vice Director WU Songtao gave an overview on the EAST project at the plenary session. Approved in 1998 by the Chinese government, the construction of EAST began in 2000. Its scientific and engineering missions are to study physical issues of the advanced steady-state operation modes and to establish technology basis of full superconducting tokamaks for future reactors. The EAST machine assembly has been pre-completed in Jan. 2006. Its first engineering commissioning, began from Feb. 7 and finished on Mar. 17, scored major achievements.

**Test of thermonuclear fusion reactor succeeds  
(CAS, 2006-09-29)**

On Sept. 28 CAS scientists successfully conducted the first test of an experimental thermonuclear fusion reactor, which replicates the same energy generation process that fuels the sun.

The Experimental Advanced Superconducting Tokamak (EAST) fusion device, nicknamed "artificial sun", was tested at the CAS Institute of Plasma Physics in Hefei, capital city of east China's Anhui Province.

EAST is an upgrade of China's first-generation Tokamak device and the first of its kind in operation in the world, said Chinese scientists.

Unlike traditional nuclear fission reactors, which split atoms to create energy and produce dangerous radioactive waste, EAST imitates the energy-producing process of the sun, generating energy and producing no greenhouse gas emissions and low levels of radioactive waste.

The reactor will provide a cheaper, safer, cleaner and endless energy resource, reducing the world's dependence on fossil fuels, said scientists.

## 1.6 Transport and Space

**China to launch new communications satellite  
(Xinhua Net, 2006-09-05)**

China will launch a new satellite for television broadcasting, mobile communications and other

services in late October this year, Sun Laiyan, administrator of the China National Space Administration said here Tuesday.

The satellite, known as "Xinnuo 2", was given the green light to leave the factory Monday after passing final checks by the Commission of Science, Technology and Industry for National Defense.

A Long March 3B carrier rocket to be used to launch the satellite also passed final checks on Monday.

"Xinnuo 2" is China's first large-capacity communications satellite, according to experts from the Chinese Research Institute of Space Technology.

The satellite will provide live television broadcasting services to the Chinese mainland, as well as Hong Kong, Macao and Taiwan. It is designed to have a lifespan of 15 years.

"Xinnuo 2", which has taken China six years to develop, marks a breakthrough in China's development of a new generation of large-capacity static orbit satellites, said Sun Laiyan.

China achieved several important technology breakthroughs through independent research during the development of the satellite and holds intellectual property rights over these technologies, he said.

#### **China to launch upgraded oceanic satellite**

**(Xinhua Net, 2006-09-08)**

Chinese scientists plan to put into orbit the Haiyang 1-B (Ocean 1-B), an advanced version of the Haiyang 1-A oceanic satellite, by the end of this year to monitor marine environment and disasters.

The Haiyang 1-B Satellite was still undergoing testing, said Sun Laiyan, vice director of the Commission of Science Technology and Industry for National Defense.

Sun told a national conference on oceanic science and technology that the technical flaws of the Haiyang 1-A had been removed from the upgraded satellite, and the data quality to be collected would be improved.

Bai Zhaoguang, chief scientist on the Haiyang 1-B project, said the main function of the Haiyang 1-B would be to observe sea surface height, waves, currents and temperatures.

The satellite's operational life was expected to reach three years, one year more than that of Haiyang 1-A, Bai said.

The Haiyang 1-A, China's first experimental satellite to use ocean color detecting, was successfully launched in May 2002 and had a designed lifespan of two years.

The "color" of the ocean is determined by the interactions of light with the water. The satellite can measure a wide array of shades to determine levels of phytoplankton, sediments, and dissolved organic chemicals, which most affect the color.

The oceanic satellite would be China's most important satellites together with a series of weather and resources satellites, said Sun Zhihui, director of the State Oceanic Administration.

The administration would actively participate in the country's space plan and develop satellite projects to realize three-dimensional monitoring of the ocean, Sun added.

**China launches 1st breeding satellite****(Xinhua Net, 2006-09-09)**

China launched a satellite from the Jiuquan Satellite Launch Center Saturday, carrying 215 kilograms of seeds of plants and fungus, the largest-ever such payload since 1987.

The seed-breeding satellite, "Shijian-8", has been successfully brought into the pre-set track in space by a Long March-2C rocket carrier.

Once the space-bred seeds are recovered, the Ministry of Agriculture will organize research institutions to develop new seeds featuring high yield, good quality and high efficiency, according to a spokesman with the Space-breeding Center of the Chinese Academy of Agricultural Science.

It is the 90th space flight of the Long March rockets and the 23rd return satellite China has launched so far. It has been the country's 48th successful space launch in succession since October 1996.

The Xi'an Satellite Control Center is responsible for monitoring, controlling, and recovering the Shijian-8.

**China launches telecom satellite****(Xinhua Net, 2006-09-13)**

China launched a new telecommunications satellite, Zhongxing-22A, with a Long March-3A rocket carrier, at the Xichang Satellite Launch Center, at 00:02 on Wednesday.

Twenty-five minutes later, the Xi'an Satellite Monitoring and Controlling Center reported that Zhongxing-22A successfully entered onto the preset orbit, at a perigee of 207 kilometers and an apogee of 42,000 kilometers.

Zhongxing-22A, an earth-synchronous telecommunications satellite is designed by the Chinese Academy of Space Technology under the China Aerospace Technology Group Company.

The satellite has been designed to work for eight years, for the owner -- the China Telecommunication Broadcast Satellite Company under the China Telecommunications Satellite Group Company.

It has been the 10th successful launch in succession of the Long March-3A and the 91st launch of the Long March rocket carriers.

Since October, 1996, the Xichang Satellite Launch Center has succeeded in 18 successive launches, and it is also the country's 49th successful space launch in the running.

According to some experts, once the satellite shifts its track, it will be fixed above the Equator, at 98 degrees east longitude, under the guidance of the Xi'an center and ocean-going space measuring vessels. Afterwards, it will be handed over to the owner.

**China expected to launch "ShenzhouVII" in 2008****(China News, 2006-09-18)**

China's "Shenzhou VII" spaceship carrying three astronauts is expected to be launched in 2008, and the astronauts will be able to walk out of the cabin, said Qi Faren, Academician of Chinese

Academy of Engineering and known as China's "Father of Shenzhou".

Qi, 72, chief designer of Shenzhou I to Shenzhou V, gave a speech in Changsha on September 16. He was the main chief technician of China's first Dongfeng Missile and first man-made satellite Dongfanghong 1 (Red East 1). And at the end of last century, he became the chief designer of Shenzhou spaceships.

Qi said from now on China would launch more than ten satellites successively. "Shenzhou VII" is scheduled to be launched in 2008 with sufficient technical preparation required now as the astronauts would walk in space.

### **China plans to send spacecraft to study asteroids**

**(Xinhua Net, 2006-09-18)**

China's space scientists plan to develop spacecraft to study asteroids in the near future, according to experts at the annual conference of the China Association for Science and Technology.

The Beijing Morning Post on Monday quoted an unnamed expert with the China Aerospace Science and Industry Corp. as saying the study of asteroids or comets had been listed on China's space program.

The Chinese spacecraft would probably land on the asteroids or crash into minor planets, similar to the Deep Impact mission of NASA, said the expert.

On July 4 last year, the Deep Impact spacecraft arrived at Comet Tempel 1, impacting with a mass of 370 kg.

The study of asteroids was significant to the search for life outside the Earth, said experts.

Japan has also sent spacecraft to probe asteroids.

Asteroids are rock and metallic objects that orbit the Sun, but are too small to be considered planets. They are known as minor planets and range in size from Ceres, with a diameter of about 1,000 km, down to the size of pebbles.

Sixteen asteroids have a diameter of at least 240 km. They have been found inside the Earth's orbit to beyond Saturn's orbit. Most, however, are contained within a main belt between the orbits of Mars and Jupiter. Some have orbits that cross the Earth's path and some have even hit the Earth in times past.

Asteroids are material left over from the formation of the solar system. Much of mankind's understanding of asteroids comes from examining pieces of space debris fall to the earth surface.

Because asteroids are material from the very early solar system, scientists are interested in their composition.

Before 1991 the only information obtained on asteroids was through Earth-based observations. Then in October 1991, asteroid 951 Gaspra was visited by the Galileo spacecraft and became the first asteroid subject to high-resolution images.

### **Space suit for ShenzhouVII costs 160mln yuan**

**(China News, 2006-09-22)**

Vice general instructor of the Shenzhou VII space shuttle Jinyong said early this week that Shenzhou VII might be launched next year or the year after. By then, there might be three astronauts taking the first space walk. The space suits made for the astronauts for the space walk

outside the cabin each will cost 20 million US dollars, or 160 million yuan, the *Morning News* reported.

At present, engineers are trying to finish making the shuttle on schedule. The technology for conducting space walk and that for relieving and resuming pressure in the orbital module are the two key technologies facing engineers. When astronauts prepare to conduct space walk, they will have to shift from an environment containing pressure inside the cabin to a vacuum environment in space, which requires that the quality of the space suits be good enough for astronauts to complete the mission.

The Shenzhou VII space shuttle will carry two sets of space suits outside the cabin, one for the astronaut to wear when he conducts space walk and the other for the astronaut in the orbital module to wear. Each set of space suit is estimated to cost about 20 – 30 million US dollars. The outer protective material for the space suit has been successfully made by Donghua University. The material contains high-function fiber and nano metal powder to make the suit so that it can meet all the requirements for walking in space.

It is said that the total flight time for Shenzhou VII will also be five days, same as the Shenzhou VI. Shenzhou VI had one camera in the orbital capsule and one camera in the re-entry camera. In addition, it also had a small digital camera. In order to observe clearly the astronauts' conditions inside the capsule and the experimental process, Shenzhou VII will be equipped with more cameras than Shenzhou VI. The training exercise for the astronauts has also started.

### **China's seed breeding satellite returns to earth**

**(Xinhua Net, 2006-09-24)**

China's seed-breeding satellite, Shijian-8, successfully landed in Sichuan Province, southwest China, at 10:43 a.m. Beijing time on Sunday after a 15-day flight in space.

The recoverable satellite was launched from the Jiuquan Satellite Launch Center in the northwest China desert on Sept. 9.

The satellite's return capsule was recovered in Suining, Sichuan Province. The orbital module will continue to orbit the earth and carry out more experiments until its battery gives up the ghost.

The satellite carried 215 kilograms of seeds of vegetables, fruits, grains and cotton, the largest payload of this kind since 1987.

Scientists from the Space-breeding Center of the Chinese Academy of Agricultural Science used the mission to carry out experiments aimed at discovering what happens to the germination and sprouting of plants when they are exposed to zero gravity.

After being exposed to cosmic radiation and zero gravity, some seeds may mutate and produce higher yields and improved quality when planted back on earth, scientists said.

During its flight, the satellite sent back high-definition digital images of sprouting vegetables, according to the Institute of Plant Physiology & Ecology with the Shanghai Institute for Biological Sciences under the Chinese Academy of Sciences, which is conducting the experiment.

An official from the Ministry of Agriculture said the ministry will ask research institutes to use the seeds returned from space to develop new seeds featuring high yields, good quality and high efficiency.

Since 1987, China has carried out seed breeding tests on nine satellites and a number of new

species of plant seeds have been bred in space by Chinese scientists.

Over the past four years, new types of crop developed with space-bred seeds have been planted in a total of 567,000 hectares of farmland, producing 340 million kilograms of grain and direct GDP of 500 million yuan (62.5 million U.S. dollars).

The United States and Russia are also capable of breeding seeds in space.

The Shijian-8 is the 90th space flight made by Long March rockets and the 23rd time China has launched a recoverable satellite. China has chalked up 48 successful space launches in a row since October 1996.

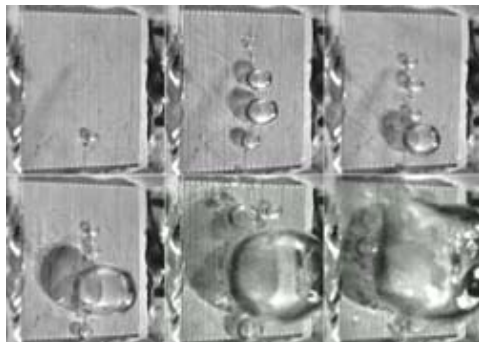
The Xi'an Satellite Control Center is responsible for monitoring, controlling, and recovering the Shijian-8.

According to official sources, China's recoverable satellites will compete on the international market.

China launched its first recoverable satellite for science and technological experiments in 1975.

### **Pool boiling experiment onboard satellite successful**

**(CAS, 2006-09-27)**



An experiment developed by CAS researchers to observe pool boiling under microgravity conditions onboard the "Shijian-8," a recoverable Chinese satellite for breeding seeds of plants, has been successful. An analysis on the data and images from the satellite shows that the test apparatuses are operating smoothly.

Boiling heat transfer, a phenomenon with important academic and applied significance, could be seen from the daily life to manned space programs. The increasing demands for dynamics, heat and fluid management system of large-scale space programs have boosted the studies on boiling research under microgravity.

## **2 News from Universities**

### **Number of foreign students in China exceeds 140,000**

**(People's Daily, 2006-09-27)**

The number of overseas students in China exceeded 140,000 in 2005. They were distributed between high schools and universities across 31 provinces, autonomous regions and municipalities.

They have made a great contribution to exchange and cooperation in education, culture, economy and trade between China and the rest of world, said Cao Guoxing from the Ministry of Education.

More and more countries worldwide are recognizing China's tertiary education system because of the country's long history, strong economic growth and achievements in reform and opening up. China has signed agreements to have qualifications mutually recognized by 26 countries, which has attracted an increasing number of students to China.

There has been annual increase of 20 percent in the number of overseas students coming to China since 2000, according to the Ministry of Education.

### **3 Innovation Management**

#### **International Training Workshop on Marine Biotechnology to be Held in Qingdao**

**(MOST, 2006-09-04)**

The International Training Workshop on Marine Biotechnology and Organism-derived Products is to be held from September 6 to 26 in Qingdao, Shandong Province. The workshop is sponsored by Department of International Cooperation, Ministry of Science and Technology and organized by Institute of Oceanology of Chinese Academy of Sciences.

Participants from developing countries will learn the principles, status quo and development trend of international marine biotechnology and organism product research. They will be able to apply, in light of their countries' practical situation, the research findings in marine variety identification, new variety breeding, healthy cultivation, marine bioproducts and medicine. The workshop will publicize China's achievements in this field and boost international cooperation and exchange between China and other developing countries.

#### **China to build 5 more research institutes**

**(Xinhua Net, 2006-09-17)**

The Chinese Academy of Sciences (CAS) will establish five more research institutes together with the governments of five cities by 2010 to bolster the country's scientific creativity, especially in new and high-tech sectors, sources with the CAS said Sunday.

The five new institutes will be located in the coastal or economically booming cities of Yantai, Qingdao, Suzhou, Shenzhen and Xiamen. They mainly cover coastal sustainable development, bioenergy, nanoscience, urban environment, and other advanced technologies.

The CAS boasts scientific research prowess in Beijing and Shanghai and the country's western parts. Now it is improving regional scientific deployment by setting up the research institutes in the eastern and southern areas.

The establishment of the new institutes will push forward the country's reform of scientific system and boost the nation's overall capability of scientific innovation, said Lu Yongxiang, president of the Chinese Academy of Sciences.

The Outline of the National Program for Long-and Medium-Term Scientific and Technological Development, issued by the State Council earlier this year, demands that by 2020 the spending on research and development reach 2.5 percent of the country's gross domestic product.

The outline calls for additional spending in 16 key areas, including software and semiconductors, telecommunications, nuclear power, genetically modified crops and space exploration. In 2005, China devoted about 1.23 percent of its GDP to research and development.

#### **11th Five-Year Priority Fields for International Cooperation Identified**

**(MOST, 2006-09-20)**

The Department of International Cooperation decided on priority fields, orientations and major partner countries of international S&T cooperation in the 11th Five-Year Plan through study on the strategy, related policies, and demands of collaboration as well as available resources both at home and abroad.

Priorities are given to the following fields:

1. Cooperation in energy, water resources and environmental protection, which helps solve the bottlenecks constraining the national economy.
2. Cooperation in ensuring food safety, optimizing agro-product structure and improving health care, with initial breakthroughs in biotech cooperation.
3. Cooperation centering on industrial upgrading, which promotes the development of information technology, new material technology and advanced manufacturing technology, and enhances China's innovation capability of major equipment and product manufacturing.
4. Cooperation in basic science and cutting-edge technologies with a view to achieving innovation in major fields where China boasts strength and characteristics.

#### **China to undertake 12 sci-tech projects**

**(People's Daily, 2006-09-24)**

China is scheduled to invest more than 6 billion yuan in infrastructure construction in important fields of science and technology during the 11th Five-Year Plan (2006-2010).

The 12 projects include Spallation Neutron Sources (SNS), an Ice Wind Tunnel, a research ship for marine science, a large astronomical telescope, a remote aviation sensing system, a network to monitor continental structure, meridian engineering, agriculture biology safety and more.

Furthermore, the National Development and Reform Commission (NDRC) plans to allot some 5 billion yuan to implement Phase III of the project on knowledge innovation at the Chinese Academy of Sciences. It will establish or improve 50 national research centers, 100 national engineering labs, support the construction of 300 enterprise skill centers authorized by the government and create a basic platform for self-innovation during the 11th Five-Year Plan.

#### **CAS, Suzhou to jointly set up a new institute**

**(CAS, 2006-09-26)**

An agreement on the foundation of Suzhou Institute of Nano-Tech and Nano-Bionics (SINN) was signed by CAS leaders and local government officials on Sept. 18 in Suzhou, Jiangsu Province.

CAS President LU Yongxiang, Jiangsu Province Governor LIANG Baohua and Suzhou Mayor YAN Li attended the signing ceremony which was chaired by vice-governor ZHANG Taolin.

President Lu expressed his confidence in the new institute. It is a good decision for CAS to co-build SINN with local governments in face of the cutting-edge development in nano-technology and China's strategic demands. A successful SINN will not only sharpen our edges in global nanotech competition but elevate the local capacities of scientific and innovative capacities in Suzhou and Jiangsu as a whole, notes LU, who is also vice chairman of the Standing Committee of China's top legislature, NPC.

The signing ceremony was followed by a ground-breaking rite, in which president Lu unveiled and then earthed up the foundation stone of SINN together with Governor Liang.

SINN, located in the picturesque Suzhou Industrial Park with a campus covering 6.6 hectares, is expected to be completed by 2008 under the joint sponsorship of CAS, and the governments of Jiangsu and Suzhou.

According to the agreement, a total of 393 million yuan (about US\$ 49 million) will be injected into the construction.

YANG Hui, head of the preparation office and former deputy director of CAS Semiconductors Institute, says the largest strength for the new institute lies in its economic advantages in the Yangtze Delta while the chief weakness is the lack of talents at this very beginning stage.

Yang worked as a postdoc and visiting researcher at the Berlin Paul-Drude-Institute for Solid State Electronics, German from 1993 to 1996. He has successfully developed the first cubic GaN blue LED device in the world.

YANG says important aspects like the construction blueprint, the subject arrangement and the constitution of the institute have already been drafted out by the preparation office. Also, up to now, SINN has enrolled 9 graduates for studies and researches at SINN.

By plan, the staff membership at SINN will finally reach 700, including 200 permanent employees, 200 temporary ones, 250 graduate students and 50 postdocs and visiting scholars. Principal investigators will be hunted from home and abroad through public recruitment.

The Suzhou institute will focus on four fields of nano researches, i.e. the making of nano-bionics, nano-devices and related materials, nano-biotechnology & nano-medicine and the security problem of nano-technology. Moreover, it is to feature a lot of interdisciplinary studies, for instance the nano-info technology, the bio-physical or bio-chemical technology to achieve the transition from micro-electronics to nano-electronics and intelligent micro-level medical diagnosis & treatment.

The Suzhou institute is among the entire ten institutes to be newly established during the third phase of CAS Knowledge Innovation Program (2006-2010). The other four which are already in the pipeline are Yantai Institute of Coastal Research for Sustainable Development, Shenzhen Institute of Advanced Technology, Xiamen Institute of Urban Environment and Qingdao Institute of Biomass Energy and Bioprocess Technology.

### **China to strengthen management on national science funds (People's Daily, 2006-09-26)**

The State Council has publicized a draft regulation on the national science funds in order to solicit public opinions on how science projects to be sponsored, supervised and managed.

According to the draft, the National Natural Science Foundation of China should solicit advice from experts from universities, scientific research institutes when approving projects supported by the funds.

Expert panels should independently judge and evaluate the applications of candidate researchers in terms of scientific values, innovation, social effects, the researcher's ability and the feasibility of the project, said the draft.

The foundation should spot-check the implementation of the project and regularly evaluate the work, establishing databases of research data and expert panels.

If the principals of the project falsify research facts or plagiarize scientific research the funds will

be suspended, said the draft.

Project researchers who are involved in falsifying research data, padding expenses, embezzling and waste funds could be banned from applying for funds for five to seven years, according to the draft.

Several recent scandals at China's top universities have raised public concern over the supervision of academics at higher-learning institutions.

Earlier in May, Chen Jin, a dean at Shanghai Jiaotong University, was fired for faking state-funded research on the Hanxin computer chip and Liu Hui of Tsinghua University was dismissed as professor in March for forging his academic achievements and work experience.

According to Minister of Science and Technology Xu Guanhua, China's investment in science and technology will reach 71.6 billion yuan (8.95 billion U.S. dollars) in 2006, up 19.2 percent from 2005.

### **China encourages hiring top-notch foreign scientists**

**(China News, 2006-09-27)**

At the 2006 Biological Economy Summit held in Beijing last Saturday, Wu Zhongze, a senior official from the Ministry of Science and Technology, said that in order to build China into a nation with advanced biological technologies and a large biological industry, China encourages companies and research institutes to directly hire top-notch scientists and engineers from overseas. In this way, China can gradually build up a world first-class research team and upgrade researchers' general strength in biotechnological field.

He said that to this end China needs to take a series of important measures. Among them, personnel strategy would stand out as the most important one. This strategy covers three aspects: first, to directly hire high-grade scientific researchers from overseas and attract senior Chinese scientific personnel to come back to make their contributions; second, to apply an open recruiting system to some key work posts, such as laboratory directors, heads of key research institutes, and other senior posts in scientific field; third, through the national 863 program (the National High Technology Research and Development Program), and the national 973 program (the Major State Basic Research Development Program), to train some excellent scientific personnel and some internationally recognized team researchers.

China's general biological strength is at the forefront among developing countries. China now has over 200 biotechnological research institutes and over 30,000 researchers working in biological field. In recent years, while traditional biological industry is still in the leading position, modern biological industry is emerging rapidly and new biological technologies are mushrooming. According to a rough calculation, China has over 7,300 companies working in biotechnological field. Among them, 3,000 have grown to become the key companies in modern biological field, generating 60 billion yuan worth of output every year.

### **CAS joins forces with CUHK and Shenzhen for a new institute**

**(CAS, 2006-09-28)**

A signing ceremony on the establishment of the CAS Advance Integrated Technology Institute (AITI) was held in Shenzhen on Sept. 22.

The three co-partners of the new institute were respectively presented at the ceremony by LU Yongxiang, CAS president and vice chairman of the NPC Standing Committee, Prof. Lawrence J. Lau, vice-chancellor of the Chinese University of Hong Kong (CUHK) and LI Hongzhong, secretary of Shenzhen Municipal Committee of the CPC.

AITI is the only core research institute under the Shenzhen Institute of Advanced Technology under CAS (SIAT-CAS), which was initiated recently to feed the city's soaring number of high-tech firms. Focusing on strategic and cutting-edge research ranging from intelligent bionics, human-machine interface, computation and data simulation, auto electronics, medical equipments to precision engineering and integrated electronics, CAS and CUHK will bring their preeminent research powers in these fields to the full play.

AITI is also the first research institute jointly sponsored by CAS and a university in Hong Kong as well as the first significant cooperation project between CUHK and Shenzhen Municipal Government.

President Lu expressed his confidence in building a successful AITI. The education standard and research capability of CUHK are of world reputation, Lu remarks, and the determination and insights of the three co-partners will help the institute produce more S&T innovations in the region.

Prof. XU Yangsheng, chairman of Automation and Computer-Aided Engineering Department at CUHK, is appointed the founding director of AITI. Before joining CUHK, he was a faculty member at the Robotics Institute, School of Computer Science of Carnegie Mellon University where he directed the Space Robotics Laboratory and developed the world first zero-gravity laboratory environment and various real-time controlled space robots systems. He is also the first Chinese scientist to be elected IEEE fellow in robotics and automation.

SIAT-CAS is among the new institutes to be established during the third phase of CAS Knowledge Innovation Program (2006-2010). The other four already in the pipeline include Yantai Institute of Coastal Research for Sustainable Development, Suzhou institute of Nano-Tech and Nano-Bionics, Xiamen Institute of Urban Environment and Qingdao Institute of Biomass Energy and Bioprocess Technology.

### **More than 6,100 grads receive their degrees at CAS in 2006 (CAS, 2006-09-29)**



Diplomas were handed out, tassels switched, and caps tossed into the air. A total of 2,655 and 3,502 students received their master's and doctoral degrees respectively at the 2006 Commencement of the Graduate University of CAS (GUCAS) held on Sept. 28 at the Yuquan Campus in Beijing.

GUCAS President BAI Chunli, who is also CAS Executive Vice President, was present at the ceremony.

Over the past 25 years, about 20,000 doctoral candidates and 30,000 Master's candidates have graduated from GUCAS. At present more than 33,000 students are pursuing their degrees at the university.

## 4 China's International Science Cooperation

### CAS, ASU co-launch a joint center for urban sustainability research (CAS, 2006-09-01)



An unveiling ceremony to inaugurate the Joint Center for Urban Sustainability (JCUS) under the sponsorship of CAS and Arizona State University (ASU) was held on August 25 on the campus of the CAS Institute of Geographical Sciences and Natural Resources in Beijing.

Chaired by Vice Director of the CAS Bureau of International Cooperation CAO Jianhua, the ceremony was attended by CAS Vice

President LI Jiayang and ZSU Vice President Michael Crow and 30 or so scholars and administrators from the two sides.

According to the agreement, JCUS will be made up of two research laboratories: the Urbanization Process and Sustainability laboratory and the Urban Ecosystem Studies Laboratory. Faculty and students in the two labs will conduct joint research on urbanization and regional planning, urban landscape ecology, urbanization process and its environment impact on water resource, air pollution, dust storm, and other pertinent urban sustainability issues. The research teams will also conduct comparative studies in US and Chinese cities. It will also sponsor joint workshops. The first one will be held in November 2006 in Tempe, Arizona. A reciprocal workshop will take place in May 2007 in Beijing.

### China, Russia plan moon exploration (China News, 2006-09-12)

Russia will cooperate closely with China on moon exploration, and the two nations could sign space cooperation agreements by the year's end, the Russian space chief said Monday.

Federal Space Agency chief Anatoly Perminov said that Chinese experts had shown a strong interest in Russia's lunar experience.

"Russia is ready for close cooperation with China in the field," Perminov said in remarks posted on his agency's Web site. "This is a serious and quite promising field of cooperation. In the past the Russian-Chinese cooperation have been mostly limited to the sales of Russian equipment, but now we are considering the development and implementation of joint projects."

The Soviet Union sent numerous unmanned missions that explored the moon, including two rovers that studied the moon's surface in 1970-73. However, it lost the moon race to the United States, abandoning its manned lunar program after a series of booster rocket explosions.

Perminov said that the two nations had formalized their plans for the moon research in a specific action plan approved in June 2005 and followed up on that with several expert meetings. The latest meeting of Russian and Chinese space officials took place last week.

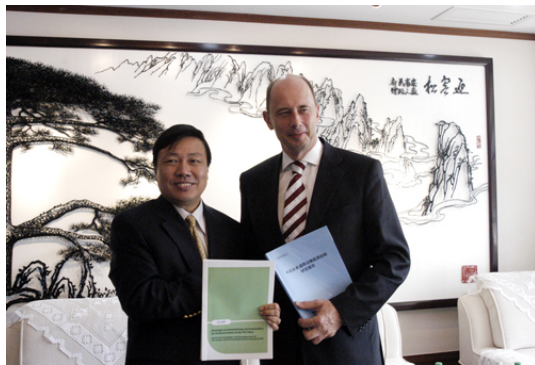
"Joint lunar research is our priority," Anatoly Perminov said, according to the RIA Novosti news agency. He didn't elaborate on specific plans for the moon research, but said that new agreements on space cooperation could be signed during Russian Prime Minister Mikhail Fradkov's visit to Beijing in the fall.

Perminov also said that China could join Russia's project of sending a probe to Mars' moon, Phobos, to take soil samples and deliver them back to Earth. The mission is set for 2009.

Russia sold China the technology that formed the basis of its manned space program, which launched its first astronaut in 2003 and two others in 2005. The next Chinese manned space flight is due next year. Officials say they also want to send up a space station and land a robot probe on the Moon by 2010.

### **Vice Minister SHANG Yong Meets with German Federal Minister of Transport, Building and Urban Affairs**

**(MOST, 2006-09-28)**



On September 22, 2006, Vice Minister SHANG Yong met with Wolfgang Tiefensee, German Federal Minister of Transport, Building and Urban Affairs, and his delegation in the office building of MOST. The two sides held in-depth talks on China-Germany cooperation in the areas of renewable transport fuels, energy-saving building, intelligent transport and high-speed magnetic levitation system.

### **EU donates 10mln euros for Yangtze River soil conservation**

**(China News, 2006-09-28)**

The European Union, the World Bank and the Chinese Ministry of Water Resources on Tuesday kicked off a joint-funded program in Wuhan in Hubei province. The program aims to improve the natural conditions in the Yangtze River and Pearl River delta regions. EU has donated 10 million euros to the program for soil conservation in the upper reaches of the Yangtze River where the economy is relatively poor.

By applying biophysical means and other methods, the program aims to raise utilization efficiency of natural resources and local resources in those places. The World Bank has provided big loans for the program. Chinese government has also allocated a large sum of money. With EU donation, the program can further cover the poor places in the upper reaches of the Yangtze River.

Meanwhile, EU has also worked with the Ministry of Water Resources, the General Administration of Environmental Protection, the Yangtze River Water Conservation Committee and the Yellow River Resource Committee to jointly set up the EU-China River Management Program, under which EU will provide 15 million euros. The program aims to explore new means to better manage the Yangtze and Yellow rivers. Methods used in the management program will be applied to a related program that focuses on problem solving, so that they can achieve more effective results when working together. The EU-China River Management Program will be

kicked off in January 2007 and last for 5 years. It is expected that methods used in this program can serve as a good example for similar river management issues in other parts of China.

## 5 Miscellaneous

### **Nobel Laureates Beijing Forum 2006 opens in Beijing**

(CAS, 2006-09-07)



Under the joint sponsorship of the People's Government of Beijing Municipality and CAS, the Nobel Laureates Beijing Forum 2006 opened on Sept. 5 at the Great Hall of the People. State Councilor CHEN Zhili, Beijing Mayor WANG Qishan, 1999 Nobel Prize winner in economics Robert A. Mundell and other experts spoke at the opening ceremony, which was chaired by CAS Vice President LI Jinghai.

The three-day event has brought together seven Nobel laureates (T. D. Lee, Robert Huber, Hartmut Michel, Ferid Murad, Louis J. Ignarro, Robert A. Mundell, Aaron Ciechanover) and other world-renowned scientists to Beijing. They will discuss and exchange ideas on such topics as innovation and development strategy of science and technology, development of life sciences and biological medicine industry. Under the theme of life sciences & human health, the forum has also invited well-known Chinese scientist in life sciences, giving talks on various issues ranging from the neoformative paroxysmic infectious disease to cognitive science and transgenic technology.

### **Manned deep-water diving machine to be tested during 11th Five-Year period**

(People's Daily, 2006-09-07)

At the National Marine Science and Technology Convention held in Beijing recently it was revealed that China's manned deep-water diving machine, which can travel to depth of 7,000 meters, will begin offshore tests during the 11th Five-Year period.

This machine, which can carry three, is at the forefront of modern technology and looks set to become the first manned diving machine to reach such depths.

The size of the earth's deep-sea seabed is 249 million square kilometers -- nearly half the area of the earth's surface. There are abundant mineral and biological resources in the ocean.

China has acquired the exclusive and preferential rights to explore 75,000 square-kilometers. The main aim of the project is to find and exploit, if possible, strategic resources, said Sun Zhihui, the director of the State Oceanic Administration.

### **CAS physicist WANG Enge receives Humboldt Research Award**

(CAS, 2006-09-08)



Wang Enge, a physicist from the CAS Institute of Physics, has been awarded the prestigious Humboldt Research Award from the Alexander von Humboldt Foundation in Bonn, Germany. The awarding ceremony was held on July 12 in Berlin.

Prof. Wang has made many groundbreaking contributions to computational material science, in particular surface physics, says Chairman of Humboldt Foundation Wolfgang Fruhwald. For example, he has advanced

current understanding of the mechanisms and kinetics of nanostructure growth and has guided the synthesis of novel materials with new functionalities, such as 'tubular graphite cones' and polymerized carbon-nitrogen 'nanobells,' he adds.

Each year the foundation grants up to 100 Humboldt Research awards to scientists and scholars with internationally recognized academic qualifications. The awards honor the lifetime academic achievements of the winners. Since the establishment of the award in 1972, four scientists from China mainland have won the prize. Wang is the only laureate of the award from China mainland this year.

### **Six scientists win Shaw Prize in Hong Kong**

**(Xinhua Net, 2006-09-12)**

Six scientists were awarded the Shaw Prize Tuesday at a prize-giving ceremony for their outstanding achievements in astronomy, life science and medicine, and mathematical sciences.

The Mathematical Science Award was jointly given to Professor Wu Wentun of University of the Chinese Academy of Sciences at Beijing of the Mainland and Professor David Mumford of the Brown University of America.

Wu and Mumford were respectively commended for contributing to the new interdisciplinary fields of mathematics and mechanization and that of pattern theory and vision research.

Professor Saul Perlmutter of the University of California in Berkeley of America, Professor Adam Riess of the Space Telescope Science Institute of America and Professor Brian Schmidt of the Australian National University of Australia received the Astronomy Award.

They were commended for discovering that the expansion rate of universe is accelerating, implying in the simplest interpretation that the energy density of space is non-vanishing in the absence of any matter and radiation.

Life Science and Medicine Award went to Professor Wang Xiaodong of the University of Texas Southwestern Medical Center at Dallas of America for his discovery of the biochemical basis of programmed cell death, a vital process that balances cell birth and defends against cancer.

Established in 2002 under the auspices of Run Run Shaw, the annual Prize consists of three prizes including Astronomy, Life Science and Medicine, and Mathematical Sciences. Each prize bearing a monetary award of one million US dollars.

The Prize honors individuals who have achieved significant breakthrough in academic and scientific research or application and whose work has resulted in a positive and profound impact on mankind.

**Experiments onboard "seeding satellite" work well**
**(CAS, 2006-09-13)**


A micro-gravity platform for experiments of life sciences developed by CAS scientists has been operating smoothly onboard the orbiter module of the "Shijian-8," a recoverable Chinese satellite for breeding seeds of plants, which was launched on Sept. 9 from the Jiuquan Satellite Launch Center in northwestern China's Gansu Province.

On the morning of Sept. 10, images received from the "seeding satellite" showed that two experiment facilities designed by scientists of the CAS Shanghai Institute of Technical Physics to study the impact of space environment on the embryonic development of transgenic stem cells and the growth of higher plants are working well. This is the first satellite specially designed for seed breeding in space. Its orbiting module has a payload up to 500 kg with a size of a medium satellite. The scientific tests on the module are manipulated by land-based scientists through real-time interference.

Since 1987, nine Chinese satellites and several of China's six Shenzhou spacecraft have carried seeds for experiments and a number of new species of plant seeds have been bred in space, but never before has the country launched a satellite exclusively for seed breeding, according to reports by *China Daily*.

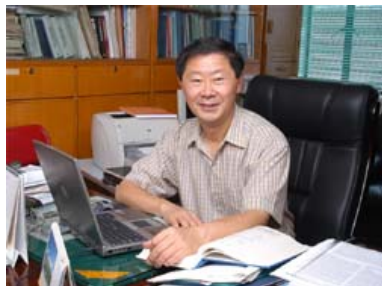
By last October, China had approved large-scale plantation of 43 species of space seeds. The planting of space tomatoes and green peppers in Southwest China's Sichuan Province, which started in 1999, has raised average yield by 10 to 20 per cent, with the fruits bigger and of better quality, according to earlier newspaper reports.

**CAS chemist honored with Helmholtz Award**
**(CAS, 2006-09-20)**


Dr. XIANG Hongwei, a chemist from the CAS Institute of Chemistry, has received 2006 Helmholtz Award for developing a theory for complex and consistently simple fluids to understand the corresponding-states generalization embodied upon water as one of the recent-based substances for scientific fundamental and practical application.

The IAPWS Helmholtz Award is issued by the International Association for the Properties of Water and Steam (IAPWS) each year to a promising young researcher, who is at most 40 years, working in an area of interest to IAPWS. The purpose of the award is to recognize promising early-to-mid career scientists and engineers who are making significant contributions to, or defining new directions in, the areas of research of interest to IAPWS.

Xiang received the award from IAPWS President F. Marsik and was invited to give an award lecture entitled Corresponding States: A General Theory Including Aqueous States at the IAPWS annual meeting on Sept. 6 in UK.

**CAS physicist receives Button Prize****(CAS, 2006-09-21)**

At the 31st meeting of the International Conference on Infrared and Millimeter Waves and Terahertz Electronics (IRMMW-THz2006) opened on Sept. 19 in Shanghai, SHEN Xuechu, a physicist from the CAS Shanghai Institute of Technical Physics, was honored with the Kenneth J Button Prize for outstanding contributions to the field of infrared condensed matter physics and, in particular, to infrared semiconductor physics and spectroscopy.

The IRMMW-THz 2006 is the oldest continuous forum specifically devoted to the field of ultra high frequency electronics and applications. The Kenneth J Button Prize is awarded annually at IRMMW in recognition of outstanding contributions to the science of the electromagnetic spectrum. The Prize is named after the founder of the Conference and is administered by the Institute of Physics in London.

## **6 Information for upcoming Workshops in November**

**2006 International Conference on Computational Intelligence and Security****Date:** November 3 – November 6**City:** Guangzhou, Guangdong Province<http://cis2006.gdut.edu.cn/>**The IEE International Conference on Wireless, Mobile & Multimedia Networks 2006****Date:** November 6 – November 8**City:** Hangzhou, Zhejiang Province<http://icwmmn06.njtu.edu.cn/>**International Technology and Innovation Conference 2006 - Advanced Manufacturing Technologies****Date:** November 6 – November 8**City:** Hangzhou, Zhejiang Province<http://conferences.iee.org/itic/china06/>**5th International Non-wood Fiber Pulping & Papermaking Conference 3rd International Symposium on Emerging Technology of Pulping and Papermaking****Date:** November 8 – November 10**City:** Guangzhou, Guangdong Province<http://www.ppeskl.labs.gov.cn/INWFPPC/gjhy.htm>

**8th International Conference on Signal Processing**

**Date:** November 16 – November 20

**City:** Nanning, Guangxi Zhuang Autonomous Region

<http://icsp06.njtu.edu.cn/index.htm>

**The International Conference on Communication Technology**

**Date:** November 27 – November 30

**City:** Guilin, Guangxi Zhuang Autonomous Region

<http://www.cie-china.org/icct2006/>

**Second International Conference on Estuaries & Coasts**

**Date:** November 28 – November 30

**City:** Guangzhou, Guangdong Province

<http://www.prwri.com.cn/icec2006-eindex.htm>

**16th International Conference on Artificial Reality and Telexistence**

**Date:** November 29 – December 1

**City:** Hangzhou, Zhejiang Province

<http://www.icat2006.org/>

## **Abbreviations**

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