

# Content

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Collected and Compiled by Helmholtz Beijing Office

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## Helmholtz News in China

Dr. Hack, the present head of Asian Affairs of IB (BMBF International Office), has come to Beijing. He is going to take over the post from his predecessor, Dr. Keune, as the science councilor on the 15 August in the German embassy. On a round-table discussion with the representatives from the German research organizations and also on the coming up reception party for him and farewell party to Dr. Keune, he expressed his sincere wish of knowing more about Helmholtz activities and strategies in China. He is keen about Helmholtz. Before he went for IB, he worked in BMBF responsible for oceanographic and geological research.

Between 22nd and 23rd June, SPI, a contracted company, based in Portugal and USA, managed together with its partners in China an EU meeting focused on “NEST” in Beijing. It was organized in hope of better understanding on the scheme, strength and other characteristics of the Chinese frontier researches. It is stated by the EU officials that in the coming EU Framework 7, the criterion for proposal submission will be based more on the excellence of the idea; even bilateral cooperation with China would be possible, while at present there were requirement on multiple European partners. More cooperation between Europe and China would not only be wished politically but also much more possible. Dr. Vitor Santos from Helmholtz Infection Centre and Dr. Hong HE, head of the Helmholtz Beijing Office, were all invited to attend this meeting and each had given a presentation on their mission and their experience with Europe-China cooperation.

Between the 24th and the 28th June, Prof. Kainer, director of the GKSS Institute of Magnesium Alloy, visited China again. He went firstly to the Institute for Metallic Materials in Shengyang. He found good matching partners there. As an institute of Chinese Academy of Sciences, many of its PIs having overseas experiences, especially connection to Germany. Prof. Lu Ke, director of this institute led a very active and productive MPG partner group. Prof. Kainer found more similarities between this CAS institute and his in GKSS. He noticed that in comparison to MPG or other German universities, they both are more focused on the practical industrial application. Prof. Kainer acted then as the cochairman of an international conference on magnesium technology in Beijing. This big conference has successfully attracted many active researchers from China and also USA, Russia, etc. He felt the great achievement of these nations, especially the US researchers are gradually getting to take the leading position over Germany. He said he would also appreciate so much funding and staff as Prof. Pan Fushen, his partner in Chongqing University. The willingness of China and the scope of its investment in this field is very impressive.

In this month, our Helmholtz Beijing Office has helped collecting basic information about the Chinese researches on coal liquefaction for FZJ and BTL (biomass technology for liquid fuel) for FZK colleagues. There have been a couple of Chinese groups working actively on alternatives for oil, some of them really claim to have made breakthroughs. Chinese are very fast on following up new ideas from the publications, and they can also easily raise sufficient investment for putting their know-how into practice. There would mean a big challenge for our German colleagues, who are interested in the technology market in China. Even in a country like China, only the most advanced and industrial mature technologies would have the opportunity to succeed on the market.

Helmholtz Beijing Office

## **1 Science News**

### **1.1 Energy**

#### **Nuclear fusion reactor gives a headstart**

**(Xinhua Net, 2006-06-02)**

A nuclear fusion device will be built in the country by the end of the year, which will help scientists try to come to grips with the new source of power before the rest of the world.

The device will allow Chinese scientists involved in an international project to build a giant experimental fusion reactor in France to begin work before the latter is ready, Minister of Science and Technology Xu Guanhua said recently.

The Experimental Advanced Superconducting Tokamak, or EAST, will be the first of its kind in the world and is quite similar to but much smaller than the International Thermonuclear Experimental Reactor (ITER), which is not expected to be fully operational for a decade.

EAST is based in Hefei, capital of East China's Anhui Province.

"Over the next 10 years, while ITER is being built, we can conduct preliminary research on EAST to facilitate the operation and exploitation of ITER in the future," Xu told China Daily in an interview.

EAST will be one of the two major Tokamak devices in China the other traditional one is based in Sichuan Province.

Both facilities will contribute to ITER, the largest multinational scientific co-operation project China has ever taken part in, said the minister.

Last month, the government reached an agreement with the European Union, the United States, Russia, Japan, India and South Korea, to build the multi-billion-dollar reactor to address the world's energy crisis and global warming.

The reactor will emulate the fusion power of the Sun, harnessing the tremendous amounts of energy that are released when atoms fuse.

Inside the reactor, deuterium and tritium atoms will be forced together at a temperature of 100 million C, fuse and emit blasts of energy.

It will have fusion power of about 500 megawatts.

Chinese experts are involved in 12 of ITER's programmes including manufacturing superconductors, creating insulation to contain super-heated plasma, and providing high-powered pulse supply units.

"Our scientific and industrial prowess in these fields will improve by participating in these programmes, especially as they are totally new to the world," said Xu.

"We will also take advantage of the project to foster a number of experts in nuclear fusion for more self-reliant development."

As an equal member with the other six parties, several managers and researchers will be deputed to ITER; and the country will have access to all intellectual property rights of generated technologies.

Fusion power holds the key to solving projected energy shortages, with just 1 kilogram of fusion fuel capable of creating as much power as 10 million kilograms of fossil fuel.

**China found new clean energy****(China News, 2006-06-03)**

Chinese scientists recently discovered a latent flammable ice up growth area southwest of the Dongsha Islands in the South China Sea. The area is likely to become the first choice of China's flammable ice exploitation in the future.

Gas hydrate is commonly referred to as flammable ice. It is a new clean energy source found in the ocean and frozen earth belts in recent twenty years and can be a substitute of traditional energy sources such as oil and carbon. It is estimated that the total volume of organic carbon contained in the flammable ice worldwide is equivalent to two-fold that in coal, oil and natural gas. China did not begin substantial investigation and study on flammable ice until 1999, and has found evidence for the existence of it in three areas, including northern South China Sea and East China Sea.

The South China Sea Institute of Oceanology under the Chinese Academy of Sciences revealed that recently when carrying through detailed investigations, the scientific personnel discovered a carbonate concretion southwest of the Dongsha Islands in northern South China Sea. After an analysis in the lab, experts believed that there might be flammable ice hidden in the shallow layer of the seabed in this segment.

It is learned that the carbonate concretion is another type of carbonatite sediments after Chinese scientists found carbonate substance in northern South China Sea. This area shows the geological feature of structural aggregate flammable ice of high content, large resource volume, high recovery ratio and considerable economic potential. This area is likely to become the first choice of China's future exploitation of flammable ice.

Specialists proclaimed that this achievement will expand the research and study scale of flammable ice in northern South China Sea and also accelerate the process of studying gas hydrate and obtaining flammable ice samples.

**China's fast reactor nuclear system to put to commercial use about 2035****(People's Daily, 2006-06-08)**

Chinese fast reactor nuclear power plant will likely supply electricity for Chinese electricity market 30 years later, said Wang Naiyan, the academician of Chinese Academy of Sciences and director of China Institute of Atomic Energy, on June 7th in Beijing.

China will strive hard to make commercial use of its fast reactor nuclear system in around 2035 and make it the main source of nuclear power after 2050, according to the Mr. Wang's academic report delivered at the 13th China Science Institute Academic Conference.

"Nuclear power plant is very safe. Due to the advancement of nuclear technologies, tragedies like Chernobyl nuclear disaster will not happen again. While upgrading heating reactor nuclear technologies, we should make great efforts to develop fast reactor nuclear technologies which have a bright future," said he.

Mr. Wang remarked that fast reactor nuclear system not only involves the faster reactor nuclear technologies, but also fuel-short after-treatment, fast reactor fuel, as well as other complicated

technical and engineering issues. It will be an arduous task for China.

Sustainability of nuclear energy depends on the full use of uranium resources and minimization of nuclear wastes. Nowadays, however, just less than 1% of the uranium resources are fully used in the heating reactor nuclear power plants across the world. Not until most of uranium-238 are burnt while circulating in fast reactor is the utilization of nuclear resources optimized.

Mr. Wang said, "The known regular nuclear resources can last for several thousand years if we adopt fast reactor and closed nuclear fuel cycle technologies." "The researches on nuclear fuel cycle for fast reactor are very difficult. But China has never done any kind of this research before. So we should bring up a technical scheme and an implementation plan for fast reactor nuclear fuel cycle research on the basis of learning from foreign experience," he added.

### **China to build 1st nuclear power plant in northeast region**

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

Construction of northeast China's first nuclear power plant is expected to begin next year, a Chinese official said on Thursday.

Preparations have begun for construction of the first phase of the Hongyanhe Nuclear Power Plant, located at the Donggang Town of Wafangdian City in Liaoning Province, Zhang Guobao, vice minister of the National Development and Reform Commission, told a news conference in Beijing.

The first phase of the project will consist of two generating units each with an installed capacity of one million kilowatts. The project is scheduled to be completed in 2011 at an estimated cost of 23 billion yuan (2.875 billion U.S. dollars).

China Power Investment Corporation, China Guangdong Nuclear Power Holding Co., Ltd. and two local companies in Liaoning have jointly set up the Liaoning Nuclear Power Co., Ltd., which is responsible for the construction and operation of the Hongyanhe project.

Hongyanhe project is one of the measures the central government has taken in the planned redevelopment of the northeast industrial region, said Li Wancai, vice governor of Liaoning.

Sitting on the eastern shore of the Liaodong Bay of the Bohai Sea and covering 380 hectares, the Hongyanhe project will be designed, built and operated by China, according to Liaoning Provincial Development and Reform Commission.

According to a source, a desalination plant will also form part of the project so that seawater can be used by the power plant and local people.

Insiders said that the Hongyanhe project is expected to play a significant role in balancing power supply and consumption, reducing pollution and promoting manufacturing of nuclear power equipment in the northeast region.

China plans to increase its nuclear power installed capacity to 40 million kilowatts by 2020, accounting for four percent of the country's total installed capacity by that time, said the National Development and Reform Commission's Zhang.

To reach the goal, China needs to build about 32 nuclear power units each with an installed capacity of one million kilowatts in the coming 15 years, Zhang said.

By the end of last year, nuclear power only made up 1.35 percent of China's total of 508 million kilowatts.

Currently, China has nine nuclear generators in commercial operation with a total capacity of about seven million kilowatts. One generator with a capacity of 1.06 million kilowatts is in trial operation and five others with a combined capacity of 4.52 million kilowatts are under construction.

China's power consumption has increased rapidly as a result of fast economic growth. The electricity consumption in the first quarter this year reached 624.98 billion kilowatts-hours, a year on year rise of 11.81 percent.

The potential for growth in nuclear power is drawing interest from international firms such as U.S.-based Westinghouse, France's Areva and Russia's AtomStroyExport (ASE).

### **Breakthrough in coal gasification technology**

**(MOST, 2006-06-15)**

On May 30, the topic of new type of coal water slurry gasification technology passed acceptance check. This topic was supported by 863 Program of the Tenth Five-year Plan and undertaken jointly by Yankuang Group and East China University of Science & Technology.

MOST gave very strong support to the new type of coal water slurry gasification technology developed by East China University of Science & Technology through 863 Program and applied this technology to actual projects. The gasification system with 1,150 ton daily treatment capacity was successfully put into operation in the demonstration project of Yankuang Group on July 21, 2005. Up to now, this technology has already been in steady operation in the demonstration project of Yankuang Group and has already been popularized and applied to other projects.

The successful completion of this topic means that China already possesses complete independent intellectual property of the coal gasification technology, thereby breaking the monopoly of foreign companies in this technology.

### **Successful integration of fuel cell with methanol-reforming system**

**(CAS, 2006-06-19)**



Researchers at the CAS Dalian Institute of Chemical Physics (DICP) have scored important progress in their studies on a 75kW fuel cell system fuelled by hydrogen from catalytic reforming of methanol.

They were successful in an integration of a CO resistant proton exchange membrane fuel cell system with a hydrogen source system of catalytic reforming of methanol on June 7 with a steady electricity generation for 3 hours.

This proved that the fuel cell system could adapt to hydrogen generated by methanol reformers and contained trace amount of CO, according to experts. The operation showed that the maximum power output attained 75.5kW, and stable hydrogen supply from the methanol reformer was 70.5Nm<sup>3</sup> H<sub>2</sub>/h. In the reforming gas, the hydrogen content was 53 v%, and CO was ca. 20ppm.

As a key project of the CAS Knowledge Innovation Program conducted by DICP researchers, its

integration experiment confirmed the feasibility of employing in-situ hydrogen generation from hydrogen-rich liquid fuels by proton exchange membrane fuel cells. It also made DICP become one of the organizations that possesses a proprietary technology of integrating hydrogen sources generated by catalytic methanol reformer with large power fuel cells. The latest advance in this kind of technology was the methanol-reformer fuelled NECAR5 type fuel cell sedan by Daimler-Chrysler Co. of USA.

### **First clean fuel buses running on Beijing roads**

**(China News, 2006-06-21)**



Emission-free fuel cell buses, which could help Beijing solve its power shortage and pollution problems, began their rounds in the city yesterday.

The three buses will run from 9 am to 3pm during weekdays, following an 18.2 kilometers route through the northwest suburbs, from the North Gate of the Summer Palace to Wudaokou.

The DaimlerChrysler buses were purchased with United Nations grants to help China research and develop environmentally friendly vehicles.

Altogether only 36 DaimlerChrysler fuel cell buses are running worldwide.

"Today marks the first public operation of fuel cell buses in Beijing. It is also the first ever in China," said Renaud Meyer, United Nations Development Programme (UNDP) deputy resident representative in China, at the buses' launch.

The buses are powered by hydrogen fuel cells, which produce no exhaust emissions.

A hydrogen refueling station, to be fully operational this summer, will also be the first of its kind in China, added Meyer.

The buses are running under a demonstration project to show fuel cell buses can be used commercially throughout the country, jointly launched by UNDP China, the Ministry of Science and Technology and other partners.

Meyer said they would not only reduce damage to the environment, but also offer a new solution to shrinking fossil fuel supplies.

"Through this project we can build a foundation for full-scale commercialization of hydrogen fuel cell buses to promote sustainable transport, use of renewable energy and cleaner air," he said.

Three fuel cell buses will also be introduced in Shanghai late this year, said Wang Ju, director of the demonstration project office.

Wang said that, with international aid, Chinese scientists and researchers would collect data on the buses' success to support efforts to commercialize fuel cell technology.

Coal and oil, the two primary sources of air pollution, constitute 90 per cent of China's total energy use.

The transport sector, which relies almost entirely on fossil fuels, is expected to account for most of China's oil demand over the next 20 years. It is predicted that by 2010, the percentage of emissions from big cities will represent 64 per cent of total emissions from all cities in China.

"That's why we must seek alternative fuel vehicles," said Meyer.

**Solar power used along Qinghai-Tibet railway****(People's Daily, 2006-06-22)**

Recently, an auxiliary solar power system for railway telecommunications located over 4,600 meters above sea level has begun operation in Geermu-Lhasa section of the Qinghai-Tibet railway. It is a self-developed system by China, which includes 9 solar power stations with total capacities of 122.4 kw. It is also the highest and largest solar power system in China.

**Guangdong setting up a cluster of nuclear power plants****(China News, 2006-06-28)**

Few people can be seen around the former Qunlian production brigade of Sanjing Village, Lianjiangkou Town, Yingde County, Qingyuan City, Guangdong Province, where a dead silence can be felt everywhere. Most villagers have moved to a town which is more than ten kilometers away. A modern nuclear power station, Baishadong Nuclear Power Station, is likely to be here in the near future.

In mid June, the third meeting of the leading committee and expert committee for the construction of the Guangdong nuclear power plants was held in Guangzhou. It was reported that ten new locations had been selected for nuclear power stations in Guangdong Province, and Lianjiangkou town has been included.

In addition to several previously-built nuclear power stations, Guangdong Province has been quietly planning to set up a cluster of nuclear power stations in the Pearl River Delta region and the eastern, western, and northern parts of the province. It is the first time that nuclear power stations are built on such a large scale in a province within China.

According to the plan made by Guangdong Province, its total installed nuclear power capacity will reach 24 million kw by 2020, while the scheduled total capacity for the entire country in the same period is 40 million kw. Based on the aforesaid forecast, the installed nuclear power capacity of Guangdong Province will account for 60% of that in the whole of China.

**China makes breakthrough in turning stalk into bio-oil****(Xinhua Net, 2006-06-29)**

Scientists from the University of Science and Technology of China said Thursday they have made a breakthrough in reducing the cost of converting crop stalks, chaff and sawdust into bio-oil, an alternative source of energy.

Bio-oil produced with the scientists' technology is 56.8 percent cheaper than diesel oil and 39.1 percent cheaper than heavy oil, said Professor Guo Qingxiang with the Biomass Clean Energy Laboratory of the university, in east China's Anhui Province.

Guo pointed out, however, that bio-oil only produces two fifths of the heat from the same amount of diesel oil and only half that of heavy oil, Guo said.

The technology, which can produce more than 6 kg of bio-oil from 10 kg of sawdust and 5 kg from stalks, has passed appraisals by the provincial department of science and technology, Guo said.

Producing one ton of bio-oil in the Chinese lab only costs about 100 U.S. dollars.

The lab also invented a machine that can process 120 kg of biomass per hour.

Scientists in a number of countries began researching how to convert biomass into an liquid energy source in the 1980's. The process is known as pyrolysis liquefaction technologies, which decompose biomass using heat which then turns it into liquid. The high cost of conversion has so far prevented scientists from making an economically feasible energy product.

Some scientists in the Netherlands and Germany are also doing research in the field, Guo said.

"The Chinese government will subsidize the application of the lab's technologies," said Cui Weiping, an official with the office of countryside energy of Anhui Province.

More than 700 million tons of stalk and chaff are left over from harvest every year. Traditionally they were burned, causing not only pollution but also a huge waste of energy, according to Guo.

Bio-oil can be used directly in heating boilers and as fuel for motor vehicles after further refining.

Ethanol can also be extracted from bio-oil.

### **Chinese company develops high-efficient wind power generator**

**(Xinhua Net, 2006-06-30)**

A new type of wind power generator that can operate in low winds is one of the star attractions at the Third Asian Wind Energy Exhibition being held here this week.

A breeze of just over 5 kms an hour is sufficient to start the machine, which means it can operate for many more hours than traditional wind turbines, said Zeng Zhiyong, president of the Zhongke Hengyuan Energy Technology which developed the turbine with the help of the Chinese Academy of Sciences in Guangzhou.

It will be particularly helpful to people living in remote areas out of reach of existing power grids. Statistics show there are still more than 70 million people in China living without electricity.

Li Guokun, chief scientist for the turbine project, said government tests show the new technology can produce 20 percent more electricity than traditional wind turbines.

Zhongke Hengyuan is currently planning to manufacture the turbines which can be made to produce from 300 watts to 20 kilowatts.

The 3rd Asian Wind Energy Exhibition & Conference runs from June 28-30 at the China World Trade Center in Beijing.

## **1.2 Earth and Environment**

### **Survey of coral reefs in South China Sea completed**

**(CAS, 2006-06-01)**



An investigation of the coral reefs in South China Sea has recently completed by CAS scientists at South China Sea Institute of Oceanography (SCSIO) in Guangzhou. The compilation and analysis of the obtained data is now under way.

The maritime survey was conducted by a research

team headed by Prof. HUANG Hui with SCSIO, covering major off-shore continental shelves along the south China coastline, the periphery of the Hainan Island and Xisha Archipelago. In the 110-day-long expedition from July to September, 2005 and March to May, 2006, the investigators made detailed surveys on some 100 prescribed areas, obtaining a great number of underwater photos and digital materials on the exuberant colonies of the coral vegetation in the tropical seas. According to experts, the field investigation is conducive to the renewal of the existing data and the recent inauguration of a new data bank for China's coral trove.

**China to focus on environmental safety of 5 river basins**

**(China News, 2006-06-02)**

Seven related organizations under the State Council of China recently announced that in the future, they would focus on the environmental safety of five seriously polluted drainage basins including the Changjiang River and the Yellow River.

Zhou Shengxian, head of the State Environmental Protection Administration (SEPA), said that related departments will carry out examination of hidden hazards to environmental safety in large and medium-sized hazardous chemical producers in five river basins of the Changjiang River, the Yellow River, the Huai River, the Liao River and the Songhua River. Pollution discharging enterprises which directly cause the water quality of drinking water sources to exceed normal standard will be ordered to immediately suspend production for rectification.

China's longest river Changjiang River has been diagnosed with "early cancer" for serious pollution. Experts warned that without effective control of environmental pollution, the Changjiang River will follow the old disastrous road of the Yellow River, the "mother river" that is already gravely polluted.

SEPA pointed out that some adjacent regions to the above five river basins cannot find clean drinking water or clean air. Soil pollution poses serious threat to the safety of farm produce while environmental pollution and ecological damage have caused huge economic losses.

Chinese Premier Wen Jiabao recently gave an instruction of the special environmental protection campaign in 2006, requesting related departments to clarify responsibilities and strictly enforce the law.



**Scientists warn of possible floods caused by melting glaciers**

**(CAS, 2006-06-05)**

A research team led by Prof .LI Xin from the Cold & Arid Regions Environmental and Engineering Research Institute under CAS recently appealed to the authorities to set up an early warning system for the possible floods due to glacial lake outburst in China's alpine hinterland.

The global climate change is an irresistible trend and a challenge facing today's world, says Dr. CHE

Tao, a member of the team. As reported by the Intergovernmental Panel on Climate Change, the average global temperature is to go up by 1.4-5.8°C by 2100 while the annual average temperature in China's West has seen a rise up to 2°C over the past century.

From their glacier-monitoring work surrounding the Mt. Xixiabangma on the Sino-Nepali borderline, the group found that, due to the on-going global warming-up trend, the total area of the glacial lakes is increasing.

Many glacial lakes are dotted with the Qinghai-Tibet Plateau, and along with the glaciers, they act as the sources or head waters of many large rivers on the Roof of the World. The glacial lakes are mostly formed from the build-up of melt water when end moraines block the water flows. The majority of the Plateau's glacial lakes are dammed by unstable moraines, which were formed during the Little Ice Age. Occasional collapses of a moraine would soon release the lake's stored water, causing flooding downstream along the river route.

This phenomenon, known as a glacial lake outburst flood (GLOF), is an eruptive and potentially precarious event and a problem of common occurrence on the high-elevation massifs of the mighty Himalayas, covering the bordering areas of China, Nepal, India, Pakistan and Bhutan. In the course of the on-going deglaciation to modify Himalayan valleys, this is one of most devastating processes as a mountainous hazard for the local inhabitants, note the researchers.

By using multi-temporal remote sensing images on the flooding and breakdown events of glacial lakes in the Himalayas and the Xinjiang Uygur Autonomous Region, a long-standing survey by Dr. Che and his colleagues revealed that the glaciers on the eastern slope of the Mount Xixiabangma are undergoing a drastic decrease during the past 27 years, leading to the increase of the glacial lakes areas.

The total area of Jicongpu Glacier in the southern slope of Mt. Xixiabangma, for example, has reduced by 7.29% with a retreat speed of 57,099 square meters per year, according to the scientists. They also found that the ice tongue at the glacier's foot have lost 16.6% of its total volume with an averaging withdrawal speed of 48 meters each year. Another example is the Lumchimi Glacial Lake on the northern slope of the Mount. Its total area grew up to 117.79%, an increase of 79,048 square meters in its yearly rate. The Reqiang Glacier on the Mount's northern side has dwindled 22.9% of its coverage, averaging about 63,000 square meters in its annual shrinkage speed and its ice tongue went down by 27.56%, roughly reaching 71 meters in annual reduction rate. The glacial Lake Gangxi Cuo in the Mount's north swelled up by 878.14% in total area, averaging about 73,425 meters each year. (See Figure)

According to Dr. Che, the lakes are stemmed by the moraine (rock debris) at the end of glaciers. But the naturally-formed barrier is always fragile and unstable. The situation becomes increasingly aggravated due to the further glacial retreat and the glacial lake inflation as a result of the warming-up process. The disastrous breakdown and flooding risk are unavoidable and it is necessary to introduce an early warning system to defuse the possible ecological collapse. The scientists urge related administrations to keep an eye on the potential dangerous situation by strengthening the monitoring capacity. As the first step for the reduction of the possible calamities, they suggest, efforts should be made to establish a precautionary system for the dangerous glacial lakes in Western China.

**Beijing capable of bringing white moth under control, expert****(China News, 2006-06-07)**

Head of the Beijing Forestry Protection Station Tao Wang said in an interview yesterday that the Beijing municipal government had paid high attention to the spreading of the American white moth. Although they cannot kill the entire harmful insects, the local government is capable of preventing them from escalating into a disaster.

Tao said that technicians had obtained methods that could be used to kill the American white moth at different stages. At present, the insects are scattered over large parts of the city. However, in most cases, the insects appear sporadically and they are unlikely to escalate into a disaster. For the downtown areas of Beijing, the probability is even less for the harmful insects to grow in large numbers.

Currently, Beijing has over 1,500 stations to monitor the conditions of the American white moth. About 40,000 ecological forest workers work round the clock to keep tabs on the development of the insects.

In order to kill the harmful insects, forestry authorities have used planes over 500 times to spread insecticide over the woods. Tao said that the insecticide they used were biochemical substances, which would kill the eggs and larvae of the insects, but would not do any harm to humans, animals or birds.

Meanwhile, the forestry department has raised over one billion *Chouioia cunea* Yang. As the natural enemy for the American white moth, the *Chouioia cunea* Yang can kill the pupae of the harmful insects.

**Device offers end to fresh water shortage****(People's Daily, 2006-06-08)**

A new solar power collection and heating device could be used to turn salt water into fresh water at an unprecedented low cost, researchers said yesterday in Nanjing, capital of East China's Jiangsu Province.

The new invention, by scientists at the School of New Materials and New Energy in Hehai University (HHU) and Nanjing Fiberglass Research and Design Institute, has been reported in the local media.

According to Zhou Ningyu, a senior engineer with HHU, the new desalinating device consists primarily of a heliostat, which absorbs solar power and turns it into heat. The heat is then used to bring water to boiling point, and when vaporization occurs the salt becomes separated.

According to Zhou, the country currently has 20 desalination projects, which mainly use osmosis and electronic distilling technologies.

"These consume other resources, such as electricity and carbon, to produce fresh water. But our device makes use of solar power. The only costs are the heliostat system and the infrastructure construction. It is the most economical and eco-friendly desalination method invented so far," said Zhou.

Furthermore, a special heliostat, invented by a scientist in the team, costs only a quarter of the normal price but still generates the same amount of energy, Zhou told China Daily.

Zhou did not reveal the exact cost for fresh water production, but said it would definitely be much

lower than the current technologies, which cost about 5-8 yuan (US\$0.62-1) per cubic metre.

The water distilled by the new device meets the standard for drinking water and could be used in local houses, according to Zhou.

Zhou also revealed that salt companies are already interested in buying the salt produced, another form of economic return.

While they believe the system can be profitable, the scientists said they have not raised enough capital to put their design into large-scale production.

"The investment for a large-scale desalination project would be huge, and exceeds the capacity of ordinary individual enterprises," said Zhang Yaoming, a 63-year-old expert who led the research team.

Zhang said he is seeking financial support from relevant bureaus including the Ministry of Science and Technology.

He added that the abundant solar resources in China, if properly used, could equal "thousands of Three Gorges Power Plants."

Zhang said that he is confident of the future application of the new device in thirsty coastal areas in the country.

Listed among the driest countries in the world, two-thirds of China's cities are suffering from water supply shortages for domestic and industrial use.

According to the National Development and Reform Commission and other State-level agencies, desalinated sea water is expected to contribute 16 to 24 per cent of the water supply in coastal areas by 2010, with a daily capacity of up to 3 million cubic metres in 2020.

### **China's biggest freshwater lake becomes salty**

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

China's largest inland freshwater lake, Bostan Lake, which used to be clean and limpid with green reeds, is suffering from severe salt pollution and its fresh water has become salty at present.

Covering a water area of 1,001 square kilometers, Bostan Lake is China's biggest inland freshwater lake. According to Zhang Handong, the deputy governor of the Bayinguoleng Mongolia Autonomous Prefecture of Xinjiang in China, the lake has been severely polluted in recent years. The degree of mineralization of the water rose from 1.17 grams per liter in 2000 to 1.32 grams per liter in 2005.

Farm drainage, industrial sewage and domestic wastewater are regarded as the three major pollution sources of Bostan Lake, of which farm drainage has caused salt pollution to the lake while industrial sewage and domestic wastewater have induced eutrophication of the lake.

As the recycling ability of this lake is weak, environment protection department estimated that there are at least 50,000 tons of salt deposits in the lake every year. Furthermore, the industrial corporations around the lake discharge production sewage of more than 7 megatons annually.

In order to prevent the ecology of Bostan Lake from worsening, a sewage disposal project utilizing loans from the Austrian government commences this year.

### **The botanic data bank of the Three Gorges Area completed**

**(China News, 2006-06-15)**

The largest botanic data bank of the Three Gorges Area has been completed in Yichang on June 12. The bank, with its collection of more than 1,000 specimens, is the best reflection of the biodiversity in the Three Gorges Area.

“The Three Gorges Area is in the north of the subtropical region, where grows more than 6,000 plants, 84 of which being rare species or species peculiar to this area. Here is a haven for those plants that have existed since the Tertiary Period. We can say that the Three Gorges Area is the core of the provincial series of all Chinese plants,” said an expert from Yichang Forestry Bureau.

The botanic data bank is the key part of the Endangered Plant Species Rescue Project, and there are four sub-banks in the data bank. Fifty-six plant species have been transplanted into the living bank. The seed bank has collected the seeds of 45 rare species. The gene bank has preserved the tissue of the shoots of 93 rare species. The specimen bank has collected the specimens of 80 rare species and more than 1,000 other species. The data bank has kept a record of the genetic information of the plant species in the Three Gorges Area, thus there is no need to worry about the extinction of these plants. Scientists can reproduce them according to their genetic information if necessary.

#### **Station for vapor process monitoring to be operational at Linzhi (CAS, 2006-06-16)**



After a one-year-long preparation, the work to construct a CAS station in Linzhi (Nyingchi) Prefecture of Tibet Autonomous Region to monitor the evaporating process and alpine landscape on the "Roof of the World" is to be complete by July 20.

With an objective of monitoring the transmission of water and heat properties in alpine regions and its influence on landscape, the station is to provide complete basic data about mountain vertical belts under global change and related environmental effect. Its work would also facilitate local ecological and economical development, as well as the environmental and social construction.

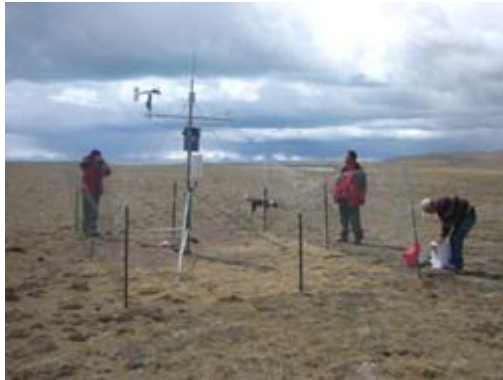
The station has now acquired a 30-acre field for scientific research. Once completed, it will consist of three sections involving observation field, living area and nearby observation spots.

In the observation field, regular ground meteorological observation equipment will be set up to collect precipitation. While in the nearby observation spots, sustained monitoring of forest line and tree growth will be conducted on east and west slopes of Mt. Sejila. Moreover, glacial mobility variation will be regularly monitored in Bomi. Meanwhile, Yigong Lake will also be subject to persistent monitoring for its stability. Two hundred-square-meter open field will be used as

premises to house guests, on-site staff.

It is estimated that the station, if function fully, can accommodate 30 experts in the fields of atmospheric, alpine landscape and glacier monitoring.

**Second peripheral survey of the salt-lake Nam Co completed  
(CAS, 2006-06-16)**



On May 26 and 27, a group of S&T workers with the CAS Institute for Tibet Plateau Research finished their second peripheral survey of the salt-lake Nam Co.

The surveying activities include sampling of the lake water specimens, floral distribution, and the collection of data recorded by the automatic outposts of meteorology on the lake side since last October. In the same time, the investigators sampled some snow pits on the Qugaqie glacier and

established the first hydrological station at its lower reaches.

Through braving the hostile elements and car breakdown, the surveyors succeeded in collecting more than 100 samples of water specimen and dozens of floral specimens. Their work is conducive to deepening our understanding of the natural conditions around the lake.

**China helps Africa on desert control  
(China News, 2006-06-18)**

Officials and technicians from African countries will come to northwest China's Gansu Province in August for an annual training program on combating desertification.

The African trainees will learn Chinese experiences on desert control through lectures and field practice, said Man Duoqing, head of the international affairs department of Gansu Desert Control Research Institute (GDCRI).

"They will spend some 25 days in the field across Gansu and neighboring provinces and regions to learn how to choose plants for desert control and how to set up windbreaks, among others," according to Man.

The two-month China International Training Course on Desert Control Science and Technology is run by the GDCRI, a leading anti-desertification agency. It has more than 20 trainees this year, among whom a dozen come from Africa.

One third of the world's land faces threat of desertification that which causes 42 billion U.S. dollars in economic losses every year, UN statistics show.

With deserts including the Sahara, Africa is the worst desertified region in the world. The poverty-stricken continent is in urgent need of international economic and technical assistance.

China will cover all the expenses of the trainees, including tuition and accommodation, as well as air tickets to and from China if needed, GDCRI director Wang Jihe said.

Wang said China aims to boost international cooperation in desert control and help developing countries especially those from Africa in this regard.

Since the first session of the program in 1993, about 150 African officials and technicians from more than 30 countries including Egypt, the Republic of Congo, Ghana, Angola and Tanzania have been trained, Wang added.

This year's trainees will stay in Minqin, a central-north county in Gansu labeled as one of the four sandstorm sources in China, to see how China painstakingly fight against desertification.

Minqin brought 2,000 hectares of desert under control last year with a simple but practical method, which first prevents sand from moving by placing nets made of wheat straw on it and then grows drought-enduring plants.

China's deserts are shrinking by 7,585 sq km annually, compared with an annual expansion of 10,400 sq km at the end of last century, said Zhu Lieke, deputy director of the State Forestry Administration, in late May.

The decrease showed the desertification that started in China in the late 1990s had been "primarily brought under control", Zhu said.

However, some experts argued that the situation is still very severe. Dr. Osama M. A. Nofal, an Egyptian at the 2005 session, told Man during his visit to Egypt last month "many of my colleagues have taken the training in China, and we have found that the techniques are very practical in our local desert control efforts."

Wilson Owusu Asare, a forestry official from Ghana and an trainee at the 2005 session, said in a recent email to GDCRI that he is very grateful for the training.

"The training laid emphasis on practical skills, and the experiences I learned in China has proved very helpful," he said.

### **China to basically control desertification by 2010**

**(China News, 2006-06-19)**

Relevant official with the State Forestry Administration of China noted on the 17th that China will focus on controlling desertification, especially desertification of lands, in its northern areas, and strive to basically rein in the growing trend of desertification by 2010.

The mid and long-term targets are by the year 2030, China will realize "defeating desertification by human forestation" and by 2050, desertified lands that can be repaired should receive basic improvement and achieve harmonious development of economy, society and ecology.

Liu Tuo, director of the Sand Prevention and Control Office of the State Forestry Administration, verified that China's land desertification has seen overall improvement after prevention and control, but deserts are still expanding in some regions, such as southern Xinjiang regions, which are major sand producing areas and there is no time to delay in accelerating control.

State Forestry Administration deputy director general Zhu Lieke indicated that desertification has posed dire threats on the living spaces of Chinese people and serious restriction on the country's economic and social development. Direct financial losses caused by land desertification have surpassed 54 billion yuan (US\$6.75 billion) each year.

### **Chinese student finds a new channel of plants evolution**

**(China News, 2006-06-30)**

The international science weekly Nature has published an article "Pollination: Self-fertilization

Strategy in an Orchid" in its June 22 issue. This article is written by Liu Kewei, a sophomore from the School of Life Science of the University of Science and Technology of China (USTC), and also recommended by Nature's editors on its cover.

The article describes a new kind of self-pollination mechanism of flowering plants for the first time. Such mechanism allows the flowers to accomplish their pollinating process without the aid of any medium. Scientists once believed all kinds of flowering plants had to rely on animals, wind or gravity to convey pollen grains. However, they had no ideas on their pollinating process if no medium existed in a given ecological environment.

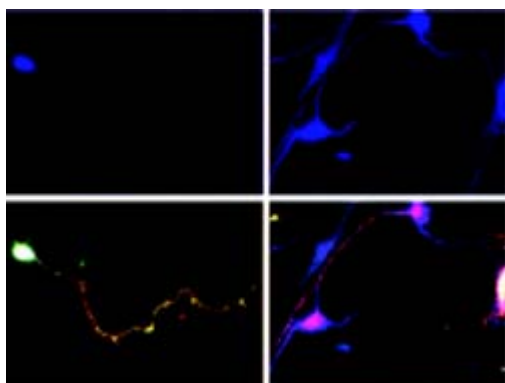
In 2002, when Liu was still a high school student, he had an opportunity to conduct research in the Center for Conservation of Orchid Plants in Shenzhen. He surprisingly discovered that a kind of orchid native to Yunnan Province, *Holcoglossum amesianum*, could make its bisexual flower turn it against another through 360° in order to insert pollen into its own stigma cavity and thus accomplished its own pollinating process.

Based on Liu's discovery, a leading scientist Liu Zhongjian from the Center for Conservation of Orchid Plants, and Prof. Huang Laiqiang from Tsinghua University proved that such kind of self-pollination mechanism was the only way that *Holcoglossum amesianum* could propagate itself under drought conditions. They also indicated that similar species could also adapt to the changing climate and survive in harsh environments. They also believed this discovery could start a new era for the evolution research.

Liu, 19, is interested in all kinds of flowers and herbs. His parents both are horticulturists in Shenzhen. Liu was enrolled by USTC in 2004.

## 1.3 Health

### Studies gain insight into neuronal polarity (CAS, 2006-06-02)



A typical matured nerve cell (or neuron) has one axon and multiple dendrites. It receives information at the dendrites and sending signals to other neurons via the axon. Although scientists have discovered that this Axon-dendrite polarity is a cardinal feature of neuronal morphology essential for information flow, they are still in the dark about the cause of this polarization.

A recent study by Prof. LUO Zhenge and colleagues from the Institute of Neuroscience under the CAS Shanghai Institutes for Biological Sciences shed new light on the issue, and their work was reported at the May 30 issue of *Proceedings of the National Academy of Sciences* (PNAS).

The paper, which was first-authored by Dr. CHEN Yanmin, reported a role for microtubule affinity-regulating kinase (MARK) PAR-1 in determining neuronal polarity. It suggested that

MARK2 inhibition by aPKC play an active role in regulating neuronal polarity and, in particular, in regulating axon development. The researchers proposed that aPKC, when complexed with PAR-3 and PAR-6, negatively regulates MARK(s), which in turn leads to dephosphorylation of MAPs such as tau, and finally promotes the assembly of stable MTs and axon elongation.

Experts say that this work not only reveals a mechanism governing the establishment of the neuron cell's polarity, but also provides a new approach and target for repairing a neurological damage or treating neuro-regressive diseases.

### **China's progress in AIDS treatment satisfactory**

**(China News, 2006-06-02)**

The report published on May 30 by the Joint United Nations Programme on HIV/AIDS (UNAIDS) revealed that the statistical figures for AIDS cases in China show "satisfactory" progress.

The report issued by UNAIDS indicates a pessimistic prospect for the AIDS situation in the world. It pointed out that since American medical experts diagnosed and confirmed the first case of AIDS in June 1981, the HIV virus has been coldly transmitted from scattered AIDS hotspots to every country in the world. By the end of 2005, the number of AIDS patients worldwide had reached 38.6 million. 4.1 million new AIDS-infected patients were added to the list last year and an estimated 2.8 million people died of AIDS.

Based on the report, with regards to the situation in China, up to late 2005, there were 650,000 HIV carriers in China and 31,000 people died of AIDS. Peter Ghys, who is the UNAIDS staff in charge of the appraisal and forecast for the AIDS epidemic outbreak situation, said that China has made progress in collecting statistics and analysis of such statistics, which enables the UN to offer a relatively satisfactory appraisal for China's epidemic outbreak situation for AIDS.

At the UN Global Compact Summit held in Shanghai last November, Mark Moody-Stuart, chairman of the Global Business Coalition on HIV/AIDS (GBC) was highly complimentary about the efforts that the Chinese government has taken with regards to AIDS prevention. Stuart remarked that the Chinese government fully supported a lot of activities developed by GBC in China and GBC could engage in cooperation with local governments and health departments.

### **New anti-cancer progress scored in vascular targeting treatment**

**(CAS, 2006-06-05)**



A research team headed by Prof. YAN Xiyun at the CAS Institute of Biophysics (IBP) has scored encouraging progress in developing a vascular-targeting therapy against cancers.

The cancer becomes the No.1 killer disease in today's world. Three conventional approaches have been developed by physicians to deal with it, namely, the surgical removal, chemotherapy and radiotherapy. But the therapeutic results are not always ideal as operations cannot subdue leukemia, and it becomes useless in the early and advanced stages of carcinoma. Chemotherapy and radiotherapy have their own

limitations because, apart from the drug tolerance due to repeated application, they kill both cancerous cells and healthy ones. In addition, their side effects are always intolerable to patients. Because of the defects of the traditional therapies, people are eager to search new approaches in the enduring human strife against cancers.

During the 1970s, Prof. Judah Folkman at the Harvard University published in a medical journal his theory that tumors have the capability to grow their own blood vessels, thereby obtaining the nourishment they need to keep growing in the human body. According to his idea, cancer cells could "starve to death" by developing a drug to block the growth of new blood vessels in the tumor. Although under heavy fire, a landmark trial of such an anti-angiogenesis drug, Avastin, successfully prolonged the lives of patients with terminal colon cancer, vindicating Folkman's long-maligned research work in 2004.

Prof. Yan, who conducted her postdoc studies at US Memorial Sloan-Kettering Cancer Center before joining IPB in 1997 with the support of the prestigious CAS Bairen Program, and colleagues made a systematic study on the role in angiopoiesis played by some targeting molecules of vascular endothelium such as vascular endothelial growth factor (VEGF), vascular cell adhesion molecule (VCAM), and vascular cell basement membrane. They reported for the first time in the world that the cohesive molecule CD146 is a cancer-tagging molecule on the vascular tissue capable of participating in the growth of new blood vessels, creation and transfer of the tumor. Their pioneering work laid a solid foundation for the rapid development in the fields over the latest two years.

In addition, Prof. Yan and her colleagues succeeded in developing the monoclonal antibody, genetic engineering antibody, antibody Fusion Protein capable of coping with the targeting molecules on the internal wall of a blood vessel. Among them, the anti-CD146 antigen has proved to be effective in inhibiting the growth of the liver cancer, pancreas cancer and smooth muscle tumor. At present, it has been co-developed into an immunology reagent by the EMD of the US and China's Beijing Yuetai Bio-engineering Company and in the status of a marketable commodity, it is now put on sale in all marketplaces across the world. Another invention of this kind, the therapeutic antigen of human origin AA98 is in the stages of the up-scale test and pre-clinical research.

The research team also built up and perfected an antigen-developing platform and related techniques such as the screening models for the targeting molecules and an appraising system to evaluate the bio-activity of the inhibitors, the construction of an antigen bank derived from phagosome, an antigen culture on human origin, the technology to make an antigen's affinity matured, an antigen's perfect and top-performance expression and purification etc.

Their work was reported as a cover story by the US journal *Blood* in 2003. Members of the team have been invited to speak at a dozen of international academic conferences. They have also filed for six patents, including one in US and published 15 SCI-cited research papers. On May 9, their research on new drug development for target molecules of tumor vessels was honored by a Beijing S&T prize.

When making comments on the research feat, Prof. Alan N. Houghton, an immunology professor at the medical school under the US Cornell University and chief editor of *J. Exp. Med.*, I, says that It was just because of the work's innovation, completeness, top quality and high value in clinical

application, the research work was chosen by the journal Blood and to be a cover story. Its result is not only of vital practical value against the treatment against cancers, but also of special clinical value in other diseases caused by anomaly of vascular growth such as the healing of a wound and the heart's vascular diseases. Currently, the research team is conducting its pre-clinical research and strives as early as possible to develop China's first drug for the cancer's vascular therapy with our own independent intellectual properties.

### **Heavy ion best radioactive cure for cancer, says scientist**

**(People's Daily, 2006-06-06)**

A leading Chinese nuclear physicist said on Tuesday that Chinese scientists are building the country's first heavy ion therapeutic machine to be used as a radioactive cure for cancer.

Zhan Wenlong, member of the Chinese Academy of Sciences (CAS), said in an interview with Xinhua, "The physical feature of heavy ion radiation makes beams of the particle the most ideal weapon to kill tumor cells while leaving healthy cells intact."

Scientists from the CAS Institute of Modern Physics, which is headed by Zhan, are trying to use heavy ion beams from the Heavy Ion Research Facility in Lanzhou (HIRFL) to cure cancer patients.

Zhan said they were successful when tested on animals. The CAS institute is now applying for an official permit for clinical use. American, German and Japanese scientists have already developed such equipment for cancer treatment..

Traditional medical use of gamma-rays, electron-rays or X-rays in treating cancer patients would inevitably kill healthy cells while eliminating tumors. Heavy ion is unique in concentrating its energy on the target of tumors. Only a little radioactive elements would affect healthy human cells in the heavy ion therapy, Zhan acknowledged.

The application has been widely tested in the United States, Germany and Japan since the 1990s. German and Japanese scientists even created special heavy ion accelerators for medical use. In the coming couple of years, Zhan said, there might be six to ten such machines in Europe and the Japanese are going to make 60 machines.

"Although the heavy ion method is effective and safe," Zhan said, "we still need to address some basic technical problems for its medical use."

### **First home-made HIV/AIDS vaccine ends 1st-phase tests**

**(Xinhua Net, 2006-06-12)**



(A woman volunteer gets a dose of HIV/AIDS vaccine in Nanning, Guangxi Zhuang Autonomous Region on March 12, 2005.)

The first stage of a three-phase clinical test for China's first joint HIV/AIDS vaccine has been completed in Nanning, capital of South China's Guangxi Zhuang Autonomous Region.

The 15-month-long test came to an end over the weekend as

scientists of the Guangxi regional Centre for Disease Control and Prevention finished follow-up examinations on 49 volunteers inoculated with the vaccine.

Researchers will write a report based on statistics and experimental data collected in the test. The State Food and Drug Administration will examine the report and decide whether the centre can go ahead with the second phase.

"The aim of the first-phase test is primarily to check the safety of the vaccine," Chen Jie, deputy director of the centre, was quoted by Xinhua News Agency as saying.

Currently, all data shows that the reactions of vaccine carriers are normal, and researchers are confident about the approval of the second phase, Chen noted.

The second phase of the trials will test antibody induction and continue to test the safety of the vaccine, Chen added, and more volunteers will be recruited.

The third phase will focus on testing the vaccine's ability to protect high-risk groups including drug abusers and sex workers.

A vaccine can be approved for production and usage only after it passes three test phases.

At present, about 35 AIDS vaccine are being tested on humans in the world. But the majority of them are still in the first phase.

In the 25-year history of the AIDS pandemic, at least 120 vaccines have been tested, and only one, AIDSVAX, has completed the full three-phase trial process. However, it ultimately proved a failure.

"The HIV virus has many sub-types and keeps changing. This makes it incredibly difficult for scientist to find an effective vaccine," said Zeng Yi, an expert with the Chinese Academy of Sciences.

He urged the government to invest more in research work given the country currently has over 650,000 HIV carriers.

"A special national foundation should be established to enhance the development of a vaccine. In the coming years, at least 1 billion yuan (US\$120 million) must be invested," Zeng said in a report published recently.

Due to the lack of financial support and shortage of qualified researchers progress has been slow, Zeng said.

He said that in developed countries, thanks to good public education, medical treatment and high-risk activities intervention, the epidemic has been effectively controlled.

However, for developing countries like China, more action still needs to be taken in AIDS education, prevention and control.

Because of this, a vaccine is urgently needed to curb the rapid spread of the virus.

Zeng noted that the economic losses brought by AIDS to China in the coming five years are estimated to exceed 300 billion yuan (US\$42.25 billion)

Among China's HIV/AIDS cases, 49.8 per cent were transmitted by unsafe sex, 48.6 per cent by drug injection, and 1.6 per cent from mothers to babies, Zeng said.

### **A young gene specific to man identified**

**(CAS, 2006-06-14)**

A CAS-Max Planck Junior Research Group headed by Prof. Wang Wen, vice director of the CAS

Kunming Institute of Zoology, recently succeeded in identified a young gene specific to man clorf37-dup. Their work was published on last June 1 in internationally prestigious journal Human Molecular Genetics (15:1870-1875).

The research team consists of young geneticists from the Key Laboratory of Bio-resources Conservation & Utilization, the Human Genetics Center under Yunnan University, CAS-Max Planck Junior Research Group and Key Laboratory of Cellular & Molecular Evolution attached to the CAS Institute of Zoology and the CAS-run Kunming Primate Research Center and the CAS Graduate School in Beijing.

The clorf37-dup is a trans-membrane protein gene, derived from the conserved clorf30 gene through retro-position since the divergence of man and chimpanzee. It has evolved rapidly driven by the positive Darwinian selection as evident as having been from a significantly high ratio of non-synonymous substitution rate to the synonymous substitution rate ( $Ka/Ks = 2.08$ ) between it and its parental clorf37 gene. Population genetics analysis disclosed a very low level of polymorphism in it and its neighboring regions, providing support for the occurrence of a recent selective sweep.

Some of GFP experiments revealed that it can encodes a trans-membrane protein associated with cell membranes. Non-random distribution of amino acid changes indicates that its protein may have evolved diverged functions in the presumably functionally important N-terminal region in the cytoplasm and the extra-cellular loop. These lines of evidence support the view that its functional adaptation has occurred in humans. Unlike its ubiquitously expressed parental gene, clorf37-dup encodes a novel trans-membrane protein, including those in the human brain. It is suggested that it can encode a novel trans-membrane protein in the human body which potentially endows new properties to cell surface interaction.

#### **Advances achieved on studies of East Asian mtDNA phylogeny**

**(CAS, 2006-06-14)**

A group of geneticists at the CAS Kunming Institute of Zoology (KIZ) succeeded in advancing human knowledge on the East Asian phylogeny of human mitochondrial DNA (mtDNA). Their work has been published by the internationally prestigious journal Human Molecular Genetics. The work was finished by Dr. Kong Qingpeng under the guidance of Prof. Zhang Yaping, a CAS member.

The exploration of human mtDNA is an essential research topic not only for evaluating the pathogenic role of specific mtDNA mutations, but also for performing the studies to reliably associate mtDNA haplogroups with some complex human diseases. In the recent years, the main features of the East Asian portion of the mtDNA phylogeny have been identified through the approach of complete genomic sequencing with the exception of some basal lineages which are still undetermined. What is worse, apparently, the recently published mtDNA sequences do not fit into the known phylogenetic tree and instead, they run counter with the established nomenclature. In order to refine the East Asian mtDNA tree and resolves the confusion of nomenclature, the KIZ researchers first completely sequenced 20 mtDNAs which were carefully selected as the possible candidates of representatives from novel sub-haplogroups and then the researchers applied a motif-search procedure to a large collection of samples in a bid to distinguish

haplogroup-diagnostic mutations from private variants. The novel information was incorporated into an updated East Asian mtDNA tree composed of more than 1,000 (near-) complete mtDNA genomes. A reassessment of the mtDNA data from a series of human disease studies testified to the usefulness of such a refined mtDNA tree in evaluating the pathogenicity of mtDNA mutations. In particular, a claimed pathogenic role of some mutations e.g. G3316A, T3394C, A4833G and G15497A appears to be the most questionable as those initial claims were derived from anecdotal findings rather than well-designed association studies. Following a guideline based on the phylogenetic knowledge as proposed above could be of help avoiding similar problems in the future studies.

**China and WHO to fight infectious diseases at new center  
(People's Daily, 2006-06-13)**

China and the World Health Organization said Monday they are setting up a center to fight infectious diseases.

The center, scheduled to open Tuesday at the Centre for Disease Control and Prevention of Guangdong Province, will focus on forecasting and monitoring of emerging infectious diseases as well as training and research, WHO and the Ministry of Health said in a statement.

"The center in Guangdong is a milestone in China's contribution to global public health," vice minister of health Huang Jiefu was quoted as saying. "It reflects our country's commitment to playing a prominent role in this regard, at an especially critical moment in public health history."

The center will become a training base in Guangdong and other southern provinces of China and may expand to become a training center for neighbouring countries, the statement said.

"We know from SARS and avian influenza that what happens in one country affects another," Dr Omi, WHO regional director for the western pacific was quoted as saying. "China is helping WHO and the world implement lessons learned from recent emerging infectious diseases for the national, regional and global public health good."

The center will also work with the Guangdong CDC laboratory to detect emerging infectious diseases, including influenza, the statement said.

The centre will carry out epidemiological research and study the origin of diseases that can be spread from animals, it said.

**China to launch new nationwide survey on death causes  
(People's Daily, 2006-06-13)**

China's health authorities are to launch this year the third nationwide survey on causes of death, a health official announced Monday.

Patterns of illness and death had changed over recent decades due to improved living and health conditions, so updated information was needed to optimize disease control plans and allocation of health resources, said Ministry of Health spokesman Mao Qun'an.

The survey, focusing on cancer and jointly launched by the Ministry of Health and Ministry of Science and Technology, would cover more than 100 million people, nearly 10 percent of the population.

It is expected to identify cancer death rates in various regions since 2000, as well as the

geographical spread of major cancers, said Mao.

The findings would be used as a reference in the formation of the country's cancer control guidelines, and as a basis for establishing a cancer registration system and a study of key illnesses and related risk factors.

Two previous surveys on causes of death, in the 1970s and 1990s, showed rapid increases in cancer deaths in the urban and rural regions. Cancer has become the top killer of the Chinese people.

In the 1970s, cancer killed 700,000 Chinese every year, about 0.074 percent of the total population. In the 1990s, 1.17 million died of cancer annually, accounting for 0.094 percent of the population. At the beginning of this century, 1.5 million Chinese died of cancer every year, 0.115 percent of the population.

Health officials have warned that the toll might double in the next 20 years if no effective measures were taken.

### **China-made Tamiflu approved for production**

**(People's Daily, 2006-06-13)**

A Chinese company has been approved by the State Food and Drug Administration (SFDA) to produce the anti-flu drug, Tamiflu, sources with the SFDA said Tuesday.

Tamiflu is an anti-viral drug which is considered the most effective treatment available to counter the H5N1 strain of bird flu.

Tests showed the domestic Tamiflu was as effective and safe on humans as the imported version, said an official with the SFDA.

It would be used to treat type A and B flu in adults and children over the age of one, and to prevent type A and B flu in adults and youngsters over the age of 13.

Buyers must have a doctor's prescription and take the drug under guidance, the official said.

Swiss pharmaceutical firm Roche Swiss granted a sub-license for the production of Tamiflu to the Shanghai Pharmaceutical Group in December. Clinical studies on the effectiveness of Tamiflu began in March.

Tamiflu was invented by US-based Gilead and licensed to Roche in 1996. Roche, based in Basel, now has exclusive world-wide rights for the manufacturing and marketing of the medicine.

The latest bird flu outbreak occurred in remote Xinjiang Uygur Autonomous Region early this month has been contained, with more than 17,100 poultry slaughtered. The country has reported more than 30 outbreaks in birds since last October.

China has reported 18 cases of human infection of bird flu since last November with 12 fatalities. The last case was confirmed on April 27.

Globally, 225 human infections, including 128 deaths, have been recorded by the World Health Organization (WHO), according to the WHO website.

The central government is strengthening prevention and control of bird flu although no new human cases have been confirmed for more than a month, a health official said Monday.

"We are still keeping a close eye on bird flu and have strengthened scientific research and nationwide surveillance," said Ministry of Health spokesman Mao Qun'an at a press conference.

So far, the virus outside of the human infections had shown no sign of mutation, and

human-to-human transmission was still unproved in clinical studies, he said.

### **High blood pressure haunts students**

**(People's Daily, 2006-06-14)**

More than 60 per cent of high school students in Beijing are suffering from high blood pressure, it has emerged.

Du Songpeng, deputy director of the Beijing Municipal Commission of Education, revealed the figures at a closed-door working conference on Sunday.

About half of the pupils at middle schools in the capital also have high blood pressure, he added.

Du warned teaching staff that academic learning and achievement should not be at the expense of pupils' health.

The statistics Du cited were from the commission's 2005 health report on local students, which has not been released officially.

Li Baoyuan, a professor at Beijing Normal University, criticized schools for concentrating too much on students' academic achievements, though physically, at least, they appear to be growing normally.

A recent study by the Beijing Municipal Physical Science Research Institute shows children aged 6-18 are growing steadily in terms of height, weight and chest measurement.

Li said students' worsening health was as a result of doing less sport.

He urged that students' health status should be taken into consideration as part of the school's year-end performance evaluation system.

Short-sightedness, physical weakness and obesity, as well as high blood pressure, were listed as the most common health problems for students in the study.

In Guangdong Province, an increasing number of children are overweight, sources with the Guangdong Provincial Education Bureau said.

A survey conducted by the bureau last year showed that nearly 11 per cent of children in the province are overweight.

In the provincial capital of Guangzhou alone, the number of children who are classified as overweight is 200,000, accounting for 15 per cent of the total.

As a result, children are being urged to pay much attention to their diet and to take more exercise.

"Irregular eating habits, such as skipping breakfast and having too much fast food, are linked with being overweight or obese," said Liu Li, a doctor with the Guangzhou Children's Hospital.

Liu said that the number of children with obesity problems who came to her hospital during summer vacations has been rising steadily in recent years.

Besides heart disease and liver conditions, overweight children also often suffer with psychological problems, she said.

"Children who are overweight are often reluctant to talk to others, which harms their psychological development," said Liu.

### **Study finds acupuncture effective to relieve symptoms of severe musculoskeletal disease**

**(People's Daily, 2006-06-14)**

The traditional Chinese acupuncture could reduce the symptoms of a musculoskeletal disease that

disables many people, a study released on Tuesday said.

The disease, called fibromyalgia, is characterized by chronic, widespread musculoskeletal pain and symptoms such as fatigue, joint stiffness and sleep disturbance. No cure is known and available treatments are only partially effective.

But according to a research team led by Dr. David Martin, an anesthesiologist at the Mayo Clinic, fibromyalgia patients who received acupuncture reported improvement in fatigue and anxiety, among other symptoms.

Acupuncture was also well tolerated with minimal side effects, the researchers said in the June issue of the Mayo Clinic Proceedings. This work lends credence to patients' belief that nontraditional methods may improve their health, they noted.

The study involved 50 fibromyalgia patients enrolled in a randomized, controlled trial to determine if acupuncture improved their symptoms. Twenty-five in the acupuncture group and 25 in the control group.

In the acupuncture group, total fibromyalgia symptoms were significantly improved compared with the control group during the study period, the researchers found. Fatigue and anxiety were the most significantly improved symptoms during the follow-up period.

"We found that acupuncture significantly improved symptoms of fibromyalgia. Symptomatic improvement was not restricted to pain relief and was most significant for fatigue and anxiety," the researchers concluded.

According to Martin, the study demonstrated that acupuncture is helpful, and also proves physicians can conduct a rigorous, controlled acupuncture study.

Future research could help physicians understand which medical conditions respond best to acupuncture, how to apply it to best relieve symptoms, and how long patients can expect to their symptoms to decrease after each treatment.

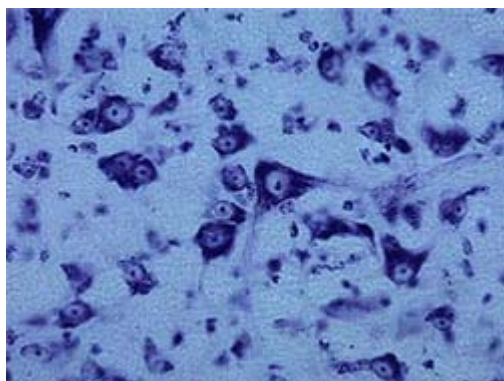
Patients are increasingly interested in pursuing complementary medicine techniques, such as the acupuncture, in conjunction with their mainstream medical care, Martin said.

"The results of the study convince me there is something more than the placebo effect to acupuncture," he said in a statement.

"It affirms a lot of clinical impressions that this complementary medical technique is helpful for patients," he added.

### **CAS researchers find glial synapses have plasticity**

**(CAS, 2006-06-15)**



Traditionally regarded as merely padding and supportive, glia, small cells that dramatically outnumber their larger neighbors, neurons, may play an essential role in information processing in the brain.

The recent discovery by a team headed by Prof. Duan Shumin at the Institute of Neuroscience under the CAS Institutes for Biological Sciences may shed light on the working of the brain. Their work

(The larger objects in the picture are neurons while the smaller ones are the long underrated glial cells.)

was published at the June 9th issue of the prestigious journal *Science*.

The brain is made up of two kinds of neural cells: neurons and glial cells. Until recently, neuroscientists concentrated more attention on the former and have a relatively clear picture about how information is processed in neurons. The function of synapses, the key structure for signal transmission and process among neurons, has been known to be changeable, or plastic. The plasticity of synapses, known as long-term potentiation (LTP), is related to the learning and memory.

Although accounting for 90% of the human brain cells, the glial cells were once characterized as inert, only sticking around the neurons like glue to support or nurture them. The cells per se were regarded as having nothing to do with neural signal transmission and processing. Although a direct synaptic connection has been found recently between neurons and NG2 glial cells, a distinct population of macroglia-like cells widely distributed in the brain, it is not clear whether these synapses have plasticity and, if they have, what the underlying mechanisms are.

After four-year hard work, Duan, his doctoral students GE Wuping (Woo-Ping Ge), YANG Xiujuan (Xiu-Juan Yang), and others found that synaptic transmission between hippocampal neurons and nearby NG2 glial cells became stronger for a prolonged period after a high frequency simulation, a property that was previously found only in neurons and has been related to the learning and memory of the brain.

In their report, the CAS scientists describe that these neuron-glia synapses undergo activity-dependent modifications analogous to neuronal LTP, but the underlying mechanisms are different.

In most cases, the LTP induction in neuronal synapse results from the activation of the NMDA receptors which do not exist on NG2 cells. Instead, these NG2 cells have Ca<sup>2+</sup>-permeable AMPA receptors. By activating the latter, LTP can be induced in these glial cells.

As synaptic plasticity is relevant to various important brain functions such as signal processing, storage, learning and memory, the discovery of the synaptic plasticity in the glial cells and its underlying mechanisms may have important impact on understanding how the brain works and may hint at future research on brain functions, says Prof. Duan.

### **Systematic national technical platform for new drug R&D primarily established (MOST, 2006-06-16)**

In light of the overall process of new drug R&D, the major National S&T special project of "Innovative Drug and Modernization of Traditional Chinese Medicine" has integrated the dominant domestic strengths to set up and perfect the technical platforms of new drug screening and pre-clinical safety evaluation (GLP). A new drug innovation platform and R&D system with appropriate layout has been primarily established, which notably increased the overall standard and integrated strength of innovative drug research in China.

All of the 9 drug safety evaluation centers or key laboratories established through this special project have in turn passed the GLP accreditation by the State Food and Drug Administration (SFDA). The GCP platforms supported by this special project all passed the SFDA reassessment of the qualifications of drug clinical trial institutions. During the construction period, the drug metabolism platform undertook the drug metabolism and dynamics evaluation of over 60% of

innovative chemical drugs and over 80% of innovative biotech drugs.

### **China prudent in developing GM farm produce**

**(Xinhua Net, 2006-06-17)**

China is prudent in developing genetically modified (GM) farm produce but it will keep working in bio-engineering for agriculture, said an agricultural official at a forum on food safety held here on Saturday.

Luo Bin, deputy director of Farm Produce Quality Safety Center under the Ministry of Agriculture, said that China has developed over 100 varieties of GM farm produce, but the ministry has only allowed five categories of them to go on market, which are soybean, corn, oil-seed rape, cotton and tomato.

"The development, production and sales of GM farm produce are very strictly controlled in China," said Luo at the International Forum on the Safety of Farm Produce held in this capital of northeast China's Heilongjiang Province.

The most widely planted GM product in China is cotton. The country has 8 million ha of farmland under over 30 varieties of cotton crops modified with anti-pest genes, since they were first introduced to farmers in 1998.

The growing of GM cotton helped reduce the use of pesticides by 50,000 tons, bringing about economic returns of 16.8 billion yuan (2.1 billion U.S. dollars), said Luo.

### **China conducts research on side-effects of contraceptives**

**(People's Daily, 2006-06-22)**

The world's most populous nation is building a national network to monitor and prevent possibly harmful side-effects of contraceptives.

About 100 monitoring stations are expected to be operating across China by 2010, Xinhua learned at a national population and family planning science and technology conference on Thursday.

The government had initiated monitoring and evaluation research on contraceptive medicines and instruments over the past five years in Anhui and Sichuan Provinces and the two municipalities of Shanghai and Chongqing.

The pilot program is expected to see a monitoring station in each of 10 counties of 10 different provinces by 2007.

Research had shown that contraceptive medicines possibly contributed to cardiovascular diseases, while some people using hypodermic medication reported headaches.

Researchers would also visit contraceptive users through the family planning network that covers almost every village in China to gather more samples.

Chinese researchers had carried out safety studies on contraceptive medicines in the 1990s in east Jiangsu Province, but the nationwide program was the first of its kind, said Li Ying, head of Jiangsu Family Planning Science and Technology Research Institute.

Apart from setting relevant technological standards, research software had been developed to help set up a database on the safety, efficacy and risks of using contraceptives.

China has around 200 million couples of reproductive age. The government is giving away contraceptives worth 420 million yuan (52.5 million US dollars) to the public this year.

### Tongji, SIBS join hands in setting up a protein research center

(CAS, 2006-06-26)



The nameplate-unveiling ceremony for a joint center for protein research between Tong Ji University and the CAS Institutes for Biological Sciences (SIBS) was held on June 15 at the Tong Ji campus in Shanghai. General Secretary of the Party Committee at Tong Ji ZHOU Jialun and SIBS President PEI Gang were present at the ceremony.

The two sides agree that they will make joint efforts in promoting the development of their research and teaching staff, running graduate programs, and

organizing international academic activities. In addition, Tong Ji is going to recommend students with research potentials for admission of SIBS graduate programs.

### CAS scientists find a cytokine against auto-immune hepatitis

(CAS, 2006-06-30)



There are about 400 million patients of hepatitis in the world. Some of them are suffering from autoimmune hepatitis, a disease in which the body's immune system attacks liver cells.

A research team headed by Prof. TIAN Zhigang from the University of Science and Technology of China (USTC) recently discovered that a cytokine, a protein produced by white blood cells that act as chemical messengers between cells, could prevent mice liver from immune-mediated injury. The work,

which was published at the recent issue of prestigious journal *HEPATOLOGY*, is applauded as providing guidance for the treatment of human autoimmune hepatitis.

Con-A-induced hepatitis is considered a good experimental model of human autoimmune hepatitis with characterized by leukocyte activation and infiltration of the liver. Using the model, Prof. Tian and colleagues found that injection of Interleukin-15 (IL-15), an important cytokine, could prevent mice from Con A-induced mortality, elevation of serum transaminase, liver necrosis, and hepatocyte apoptosis.

The researchers discovered that the mechanism for this lies in the fact that IL-15 pretreatment could decrease the NKT-derived IL-4, IL-5, and TNF- production, thereby resulting in less infiltration of eosinophils, which play a critical role in Con A-induced liver injury. Their studies indicate that IL-15 protects against Con A-induced liver injury via an NKT cell-dependent mechanism by reducing their production of IL-4, IL-5, and infiltration of eosinophils. These findings suggest that IL-15 may be of therapeutic relevance in human autoimmune-related hepatitis.

**When it comes to numbers, words count****(Xinhua Net, 2006-06-30)**

Despite using the same numerals in computing, English and Chinese speakers displayed different brain activities in processing them, according to a new study conducted by a China-US research team.

This supports the idea that culture plays an important role in processing numbers, say scientists.

Researchers compared 12 native English speakers living in China and 12 local Chinese, all in their 20s and equally divided by sex during four sessions between 2002 and 2004.

They were first shown three symbols and told to judge the spatial orientation of the third in relation to the first two.

For example, the participants might have been shown symbols of an erect scythe and a cleaver and asked to figure out the visual orientation of a tilted knife in relation to the first two.

"No difference of brain activity was found between the two language groups," said Tang Yiyuan, the lead author of the report, which was published this week in *Proceedings of the National Academy of Sciences*, a US science journal.

When scientists replaced symbols with Arabic numbers, however, significant differences emerged. Brain scans showed that while Chinese still relied on a region of their brains involved in visual information processing, English speakers largely employed their language-related brain areas.

To confirm the finding, Tang, a neuroscientist at Dalian University of Technology, and his team performed two more tests. The differences were even more appreciable when participants were asked to perform simple addition and compare numerical values.

"These results raised an interesting question," said Tang, who also works for the State Key-Lab for Brain and Cognitive Science, Chinese Academy of Sciences.

"Is it a basic cultural difference or perhaps a difference in language processing, since Chinese characters are a more visual form than alphabetic words, that led to such differences?"

Cognitive scientist Michael Posner, who evaluated the report, said in a written reply to *China Daily* that the difference in language could have encouraged different styles of computation.

"But cultural factors such as math learning strategies taught and trained in school as well as educational system may also contribute to the differences," added Posner, who teaches at University of Oregon.

Another co-author, Eric Reiman of the Banner Good Samaritan Medical Centre in Phoenix, Arizona, suggested that the use of the abacus in many Asian schools may encourage the brains of students in the region to think spatially and visually about numbers, according to *New Scientist*.

Nonetheless, all the scientists insisted that the research results do not conclusively prove which is more effective in doing maths.

And they emphasize that the difference in brain activity does not lead to an answer to the question "which brain is smarter in maths, English or Chinese?"

Liu Yijun, an associate professor of University of Florida McKnight Brain Institute who was also in the research team, said US educators have long noticed that Asian students perform better in maths than their Western counterparts.

"But this may be a result of a combination of factors including genetic difference, family

education and personal effort. Our findings may provide a direction for primary education," he said.

The neuroscientist suggests his team members conduct similar research among Chinese children adopted by US families. "They are native Chinese speakers but are educated in the Western way. There might be more interesting discoveries," he said.

Posner added that the discovery may help scientists adopt different strategies of working with numbers.

"It could well turn out that certain strategies may be optimal even when used with a different type of language," he said.

This way, educators in different language groups may work out the best method to help young students improve their ability to solve maths problems.

### **Experts: do not underestimate the harm of chronic pain**

**(China News, 2006-06-30)**

Specialists of the Chinese Association for the Study of Pain (CASP) under the Chinese Medical Association promoted the "new conception of pain diagnosis and treatment" to doctors in Nanjing on Wednesday. CASP member Prof. Fu Chengzhang suggested in his lecture that chronic pain has become one of the most prevalent diseases seriously threatening people's health. In fact, it is unnecessary for human to bear chronic physical pain, since enduring pain will only do more damage to one's health.

Statistics show that roughly 30% of Chinese adults suffer from chronic pain, and around two-thirds of outpatients have various types of pain symptoms.

Prof. Fu said that at present, "chronic pain as a kind of disease" is a new conception in international pain diagnosis and treatment. Some people believe that if one is sick or has just had an operation, one must endure some pain, otherwise he/she will be regarded as weak. It is especially embarrassing for men to cry out because of pain. Even some doctors agree that it is quite common for pain relief to be administered late, or not at all. This traditional viewpoint of medical treatment is now opposed and abandoned by medical circle worldwide.

According to Prof. Fu, the dangers and negative effects on humans induced by pain itself cannot be quantified but should not be underestimated. For instance, it can cause different degrees of negative emotions such as fear, panic, anxiety and melancholy, result in functional disorder in the body and low immunity that will lead to all kinds of complications, or even bring about pain-induced disability and threaten the patients' lives. Therefore, nowadays the medical world has ranked pain as the fifth most important living indicator after breath, pulse, blood pressure and temperature.

## **1.4 Key Technologies**

### **China to set up integrated circuit research center**

**(People's Daily, 2006-06-08)**

The Chinese government plans to set up a national research and development center for integrated circuit (IC) products with the goal of holding 15 percent of the global market, says a leading scientist.

Wang Yangyuan, a member of the Chinese Academy of Sciences (CAS) and director of the Microelectronics Institute of Beijing University, told the annual national conference of the academy that the center would become a driving force for the Chinese IC industry.

The center would have a 4,000 to 5,000 square-meter laboratory.

"To reduce repetitive research, increase the technological output of research and strengthen the protection of intellectual property, it is necessary to establish an alliance of companies based around the national IC research and development center," Wang said.

He suggested the members-only alliance with investment from central and local governments, domestic and foreign companies, share the risks and benefits of research and development.

A report on suggestions to build a strong national microelectronics industry by the academic divisions of the CAS said China was expected to have 20 to 30 IC design houses with design products valued at 100 million U.S. dollars by 2010, including two or three firms with sales revenue of one billion U.S. dollars. The product value of the design industry was expected to reach 6.25 billion U.S. dollars.

The total revenue of the IC industry in China reached 380.3 billion yuan (47.5 billion U.S. dollars) last year, and was expected to reach 700 billion yuan (87.5 billion U.S. dollars) by 2010. Imports of IC products totaled 78.8 billion U.S. dollars, becoming the largest source of China's trade deficit.

"China is still an IC products consumption country," Wang said.

A CAS report said China would become a major producer, with sales revenue exceeding 270 billion yuan (33.8 billion U.S. dollars), by 2010, accounting for 35 percent of the domestic market and 10 percent the global market.

By 2020, China would be a leading manufacturer with sales revenue expected to account for 15 percent of the world market.

China's own products would meet 95 percent of domestic demand.

"It takes about ten years for IC products to go from research to production peak," Wang said.

"China should start a strategic response to the market and technological development ten years in advance."

### **Tsinghua University developed brain-computer interface system (China News, 2006-06-15)**

Beijing-based Tsinghua University has succeeded in developing a brain-computer interface system that can change brain wave of human thinking into computer steering instructions. With this system, people can not only have a robot dog play football, but also make a phone call by just thinking of it.

A special soccer game was going on in the laboratory of the Biomedical Engineering Department of Tsinghua University's School of Medicine on the 14th. On the football field were two robot dogs, one acting as the forward and the other as the goalkeeper. Behind the goalkeeper was a football, and the forward needed to go over the obstacles in front of it, rush to the other side of the

field, dodge the goalkeeper and score.

Different from robot dog soccer games in the past, this game was not controlled by computer programs, but by two Tsinghua University students wearing electrode caps in front of the brain wave displayer that recorded their thinking.

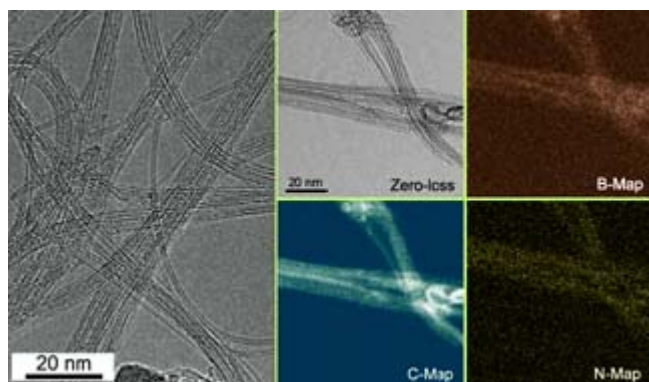
With the same principle of having robot dogs play soccer, Tsinghua University also demonstrated how to make a phone call by just thinking of it. A student acted as a person who lost the movement of his limbs in an accident and could only call his friends or relatives through thinking. In front of him was the face of a telephone with number keys, B (backspace) and C (call) keys. He kept his eyes on a number for three to five seconds and after 78 seconds, he made the call successfully.

This technology simultaneously records brain wave, interprets simple ideas of humans to some extent and translates the ideas into instructions so that people can control computers, household electric appliances, robots and other equipment directly through thinking.

This high-end composite technology that integrates artificial intelligence with bio intelligence can help handicapped people who have a normally functioning brain but have lost movement to control their wheelchairs or artificial limbs and even surf the internet with computers. This technology has applied for national patent.

### Single-walled B-C-N nano-tubes synthesized by CAS scientists

(CAS, 2006-06-22)



A research team at the CAS Institute of Physics was recently reported to achieve an important progress in preparation of the tri-element nano-tubes containing boron and nitrogen. The work has been published by the prestigious us journal *JACS*.

Attached to the National Laboratory for Condensed-matter Physics under the CAS institute, three scientists in the team, namely, Wang Wenlong, Bai Xuedong and Wang Enge, succeeded in preparing the large-scale arrays of ternary boron carbon nitride single-walled nanotubes (BCN-SWNTs) through direct synthesis in the bias-assisted hot filament chemical vapor deposition. Since the successful development of the pure carbon nanotubes, scientists were eager to prepare B-C-N ternary nano-tubes and explore their properties. Related theoretical probes predict that, unlike carbon nano-tubes, the tri-element nano-tubes have their own electronic structure determined mainly by their chemical components and irrelevant to their structure's geometric chirality while their energy gaps may be regulated between graphite and boron nitride. All of these characteristics may be used to manufacture new types of micro-electronic devices. Yet, to combine the three elements via a covalent bonding within a lab, this is a real challenge to developers of new materials.

In recent years, the research team headed by Prof. Wang Enge has made a series of studies on the synthesis and property characterization of the nano-structures made from light elements. Based on

this, the teammates adopted a new approach for the crystal growth on gaseous deposition with the introduction of highly specific catalysts and optimized growth parameters, leading to the realization of the direct synthesis. When characterizing the new material's properties, they came to join hands with Japan's National Institute for Materials Science. The joint research indicates the new material has intact walls, high contents of B and N in the ternary nano-tubes, becoming a new and encouraging advance in making nano-structures of light elements.

The research was funded by the CAS, the Ministry of Science & Technology and National Foundation for Natural Sciences of China.

#### **NCNST, IHEP jointly set up a lab for nanosafety (CAS, 2006-06-27)**



The National Center for Nanoscience and Technology (NCNST) at CAS and the CAS Institute of High Energy Physics (IHEP) have joined hands in establishing a Laboratory for Biological Effects of Nanomaterials and Nanosafety (NCNST-IHEP) in Beijing. Its nameplate-unveiling ceremony was held on June 22 on the campus of IHEP. CAS Executive Vice President BAI Chunli was present at the event.

Research into bio-effects of nanomaterials and nanosafety concerns the application and long-term development of nanotechnology, notes Prof Bai. It also contains innovation opportunities in the field. Apart from a social responsibility for scientists, the in-depth studies of nanosafety will effectively promote the health development of nanoscience and technology.

In addition to providing guidance for the safety of nano-products and improving consumers' confidence in the products, says Prof. Bai, the studies will lead to the new technology that could be used in monitoring, analyzing and even reducing the pollution caused by nano- and micro-materials that have already existed in our life. The cooperation between NCNST, which is a national public platform for nanotechnology, and IHEP, which is equipped with megascience research facilities, will be conducive to the upgrading of their overall research level in the field.

## **1.5 Structure of Matter**

#### **Most powerful heavy ion accelerator to be completed (Xinhua Net, 2006-06-06)**

One of China's most expensive science facilities, the Heavy Ion Research Facility in Lanzhou (HIRFL) - Cooler Storage Ring (CSR), is expected to be completed soon, a leading scientist said on Tuesday.

Zhan Wenlong, member of the Chinese Academy of Sciences (CAS) and director of the CAS

Institute of Modern Physics, said in an interview with Xinhua, the HIRFL-CSR will lead its global peers in technology and performance.

"Our target is to form new heavy elements and expand the Periodic Table," Zhan said.

Meanwhile, he said, the National Lab of Heavy Ion Acceleration, which is based in the CAS Institute in the inland city of Lanzhou, will open to global scientists for research.

The HIRFL-CSR, with a state investment of about 300 million yuan (37.5 U.S. dollars), includes a main ring, experimental ring, a radioactive separator and experimental detectors.

"The building of large science facilities demonstrates not only our specific technological know-how, but also the prowess of our basic research," Zhan said.

Chinese science strategists decided to build the HIRFL in the mid 1980s. The facility, which was put into operation in December 1988, was awarded the top national prize for technological advancement in 1992.

The CSR is the latest upgrade of the HIRFL, which has helped Chinese scientists to form two new heavy-nuclear elements.

"We are able to thoroughly study the heavy ion collision inside the experimental ring," said Zhan.

The CAS institute invited seven prominent nuclear physicists from Germany, Russia, Japan and Sweden to advise the construction of the HIRFL-CSR.

The Chinese physicists were invited by Germany as key partners for research on the antiproton and ion accelerator in Germany.

### **China, U.S. to launch largest neutrino experiment at Chinese nuclear site (People's Daily, 2006-06-08)**

Chinese and American physicists are joining hands to conduct the world's largest neutrino experiment at the Daya Bay Nuclear Plant in south China.

The experiment, costing roughly 400 million yuan (50 million U.S. dollars), is designed to test the mixing angle of neutrino,  $\theta_{13}$ , which is a vital measurement in the most advanced particle physics.

The Chinese Academy of Sciences and the Brookhaven National Laboratory and Lawrence Berkeley National Laboratory of the United States will participate in the significant underground experiment.

## **1.6 Transport and Space**

### **Self-developed jet to fly maiden trip (Xinhua Net, 2006-06-01)**

China's first independently developed passenger jet will take off on its maiden flight in 2008.

The 70-seater ARJ21 turboprop aircraft is due to make its first flight in March 2008 after being fully assembled by the end of next year.

The plane, slated to run regional lines and now being built by the China Aviation Industry Corporation I (AVIC I), will become available to buyers in September 2009, said the company's President Liu Gaozhuo at a working meeting in Beijing.

He added that the corporation aims to produce 11 ARJ21s a year by 2010, taking a lion's share of the world's fiercely-competitive civil aviation market.

Design work began on the aircraft in March 2002.

AVIC I Senior Vice-President Yang Yuzhong said the plane entered the final trial production stage yesterday, having already completed a feasibility study, preliminary development, and development period.

Zhang Yunchuan, head of the Commission of Science Technology and Industry for National Defence (COSTIND), said more than 40 orders have already been placed for ARJ21s, despite production having yet to begin.

Buyers include Shanghai Airlines, he said.

"This is a milestone for China's aviation industry, in that it is the country's first independently-developed civil aviation programme and a prerequisite for future trunk-liners," Zhang said.

Zhang said 19 foreign suppliers have become risk partners in developing the ARJ21.

According to the Xinhua News Agency, there are only 74 feeder liners planes suitable for use on non-trunk lines currently available on the Chinese mainland, although more than 600 will be needed in the coming two decades.

Demand from the international feeder line transport market is expected to exceed 4,000.

Wu Guanghui, chief designer of ARJ21 and president of the AVIC I First Aircraft Institute, said after all types of experiments last year the plane has finally met its designed flight characteristics.

"Ninety per cent of the plane's components will be made by the end of this year," he said.

AVIC I set up shareholding firm Commercial Aircraft Co Ltd (ACAC) in September 2002 to develop civil aircraft. ACAC is now the co-ordinator in developing the ARJ21.

Wu said they plan to develop a series of ARJ21 planes, seating between 70 and 110, in order to meet the diverse air industry's demands.

He added that passengers would be very comfortable onboard the turbofan aircraft, which will have a range of 3,600 kilometres.

Shao Xiaoyun, vice-president of Shanghai Airlines, said they are fully confident on the success of ARJ21, and as a buyer the airline will offer its full support to the feeder liner.

China's air transport industry has expanded at an annual rate of 18 per cent since 1978, and more than 90 feeder liners have been built in the mainland's medium-scale cities in recent years.

However the share of feeder liners among China's total fleet still less than 10 per cent.

The Chinese mainland, which has the second most air traffic in the world, now has some 570 general aviation aircraft, said the Xinhua News Agency.

Over the past 51 years COSTIND has produced Chinese-made Y-7, Y-8 and Y-10 aircraft for military use.

And speaking on condition of anonymity last night COSTIND officials said they are now developing a Y-12E general-purpose aircraft for use in high-temperature and plateau conditions as well as providing Z-11 and Z-9 helicopters for the commercial market.

**China-Europe Galileo (IOV) Cooperation Conference convened  
(MOST, 2006-06-03)**

## China Highlights — June, 2006



The National Remote Sensing Center of China and the Galileo Joint Undertaking co-hosted the China-Europe Galileo (IOV) Cooperation Conference on June 1st and 2nd in Beijing Hotel.

The goal of the conference, promoting the following-up cooperation based on the In-Orbit Validation (IOV) phase, was met with great success. The China-EU senior officials and experts exchanged views on the Galileo

projects and up-coming joint efforts.

Galileo cooperative project is the largest S&T collaboration project between China and Europe. Since the signing of related agreements, great accomplishments have been witnessed under the concerted efforts. 11 IOV-phase projects have been undertaken by Chinese enterprises, concerning space segment, ground segment and user segment.

### **"Beijing-1" satellite starts remote sensing service (People's Daily, 2006-06-08)**

China's satellite "Beijing-1", launched from Russia in October last year, started to provide a wide range of remote sensing services on Thursday.

The satellite, weighing 166.4 kilograms, is in an orbit 686 kilometers above Earth, said sources with the Ministry of Science and Technology.

Trials over the last few months showed that Beijing-1 was fully functional.

It will be used to survey land resources, for geological research and water resources research, and to monitor floods and winter wheat, and used by urban planners and archaeologists.

Government departments will also use the satellite during emergencies to aid decision-making of the central government.

Research institutes, colleges and universities, and non-profit organizations will also benefit from the service provided by the satellite in their research programs.

### **China makes breakthroughs for lunar probe (People's Daily, 2006-06-20)**

Deputy chief designer of China's Lunar Exploration Project (CLEP), Long Lehao said on June 18 that China's Lunar Exploration Project is going well and Cheng'e I is supposed to be launched between March and April, 2007.

When attending the Fourth Fujian-China Project Fair Long said that Chang'e I has overcome four major difficulties in the engineering research process. Furthermore, verification of the scheme and the designing of the preliminary sample have been finished. At present, the final sample is being made as scheduled. He expected to launch the Chang'e I before April, 2007 and have on-the-orbit test between April and June, 2006.

There were four major difficulties during the research of Chang'e I: the orbit design and the flight control, the tri-vector control of the satellite attitude; environment adaptability design of the

satellite, the distance probing and communicating. At present, all the four major difficulties have been overcome, and all the experiments go smoothly as planned.

Long forecasted that China will get into the second phase of the Chang'e project between 2009 to 2015 after the Chang'e I Project. By then there will be two to three times soft-landing probes. China is ready for that technically and economically.

In 2017, the third phase of Chang'e project will send robot to the moon and get samples from the moon. In 2024, during the fourth phase of the Chang'e project, Chinese astronauts will set foot and return from the moon.

### **China tests super telescopes for moon-probe project (People's Daily, 2006-06-20)**

Chinese scientists have successfully tested the ability of four super radio telescopes to monitor a moon-orbiting satellite, sources with the project announced on Friday.

The project aimed to test the joint function and ability of the radio telescopes, which would monitor China's first moon-orbit program scheduled for launch in 2007, sources with the Chinese Academy of Sciences (CAS) said.

The moon satellite detected and tracked by the super telescope belongs to European Space Agency (ESA).

The monitoring project had successfully proved that China was able to detect and track moon-orbiting satellites, according to Li Yan, director of the CAS Yunnan Observatory.

With diameters ranging from 25 to 50 meters, the telescopes set up in Beijing, Shanghai, the southwestern Yunnan Province, and the northwestern Xinjiang Uygur Autonomous Region were 2,000 to 3,000 kilometers apart from each other.

They would form a comprehensive earth-based research and survey network that was capable of detecting, tracking and retrieving data sent from China's first moon-orbiting satellite, Li said.

China plans to launch its first moon-orbiting satellite in 2007 and to make an integrated global survey of the moon.

The successful test of radio telescopes further increased confidence in being able to control the satellite, he said.

Wang Min, chief scientist in charge of the telescope test project, said the test lasted five days in accordance with an agreement between CAS and ESA. Every four hours, the satellite circled the moon and the telescopes were able to detect half the orbit, or about two hours.

"China's super telescopes started work from when the moon could be first seen at about 7:00 a.m. and continued till it disappeared from the visual field," Wang said.

Whatever the weather or the cloud cover, the telescopes detected and tracked the satellite for an average 10 hours each day, he said.

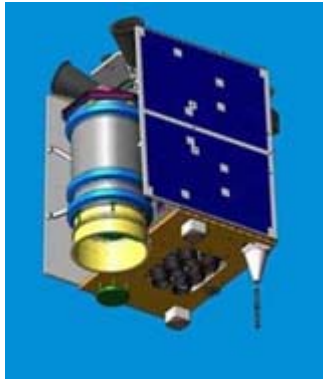
"This is a great step towards our dream of flying to the moon," Wang said.

Wang also revealed that the first moon-orbiting satellite would be named Chang'e, after a beautiful woman in the Chinese fairy tale "Chang'e Benyue", who takes a magic medicine to enable her to fly to the moon where she stays.

If Chang'e is launched successfully, China plans to send its own moon probe by 2012 to collect samples for scientific research before returning to Earth in 2017.

**Blue Whale File System to be used for "Olympic Satellite"**

(CAS, 2006-06-21)



BWFS will provide service for the Beijing-1, an earth-observation spacecraft specially designed the 2008 Beijing Olympic Games.

CAS researchers have developed an integrated data storage system for satellites with their own intellectual property right -- Blue Whale File System (BWFS) --for the Beijing Landview Mapping Information Technology Ltd (BLMIT). The system will be used for the data processing at the BLMIT Remote Sensing Satellite Ground Station, a key application system for the Beijing-1, which is an earth-observation spacecraft specially designed the 2008 Beijing Olympic Games.

Developed by the National Research Centers for High Performance Computers (NRCHPC) at the CAS Institute of Computing Technology (ICT), BWFS is a high-performance cluster system for data transmission and sharing in a system for massive data process in a cluster environment.

**CAS builds up China's largest radio antennae system**

(CAS, 2006-06-22)



After three--and-half-year efforts, the National Astronomical Observatories at CAS (NAOC) has constructed two arrays of radio antennae: the 50m array of antennae at Miyun Station in Beijing and the 40m one in Kunming, capital of southwest China's Yunnan Province.

The two are the largest radio-astronomic antennae operational in China so far. Along with two 25m antennae in Sheshan and Urumqi, they constitute a complete observatory network of Very Long Baseline Interferometry (VLBI) to take part in a global cooperation astronomical observation. According to experts, the success undoubtedly lays a solid foundation for NAOC to shoulder more national sky-watching tasks in coming years and with the new facilities, Chinese scientists can play a more constructive role in the worldwide activities of radio-astronomic observation.

## 2 News from Universities

### **Foreign students hit record high**

**(People's Daily, 2006-06-13)**

With a rapidly growing economy and unique culture, China is becoming one of the world's major education and employment destinations.

Last year saw the largest number of overseas students coming to China since 1949 about 141,000, up 27.28 per cent from the previous year, figures from the Ministry of Education show.

South Korea and Japan are listed as the top two student exporters to China, with 54,079 and 18,874 students studying here respectively.

"The increase shows that China's growing economy and ancient culture has gained world recognition," said Zhang Xiuqin, secretary-general of the China Scholarship Council, an institution in charge of the organization, management and funding of international students in China.

The residential environment, education quality, medical and social insurance provided by Chinese higher learning institutes also attract many overseas students, she said, adding that the low tuition fees are also a big draw.

Once the director of the ministry's foreign students affairs department, Zhang was glad to see the growth in the number of overseas students in China during the past 20 years.

China's first group of 33 foreign students came from Eastern Europe in 1950, but the numbers did not begin to rise until the nation's opening-up in the early 1980s.

"Today, we have students from more than 160 countries," said Zhang.

"With such momentum, China will soon become the biggest education destination country in the Asia and Oceania region."

The students' stay in China is no longer just a cultural experience and has become an important part of their future professional careers, said Cen Jianju, deputy director-general of the ministry's International Exchanges and Co-operation Department.

Sam Gor, a 26-year-old student from Santa Clara, a county near San Francisco, said he was in Beijing to help him find a good job when he returns to the US.

"Culture matters," he said. "But more importantly, to learn Chinese and get a better understanding of the country may help me professionally."

As a new student at Beijing Language and Culture University (BLCU), Gor hopes to find a job in Santa Clara's local government when he goes back home in a year. "I need to learn Chinese if I want the job, as we have a large Chinese community there."

Ministry figures show that language courses are still foreign students' favorite, with 86,679 students or 60 per cent of the total coming to the country to learn Chinese last year.

But economics, law and medicine are also becoming more popular, "especially after China's entry into the World Trade Organization," said Zhang. She said Chinese schools are trying to adjust their curriculum to cater for students who are not in the country to learn languages.

**State-sponsored students for overseas increase****(People's Daily, 2006-06-16)**

A record number of State-sponsored students began studying overseas last year to train for the country's most-needed professions.

About 7,200 students, up 75 per cent from 2004, joined the State Sponsored Study Abroad Programme, figures from the China Scholarship Council show.

The United States, UK and Germany are listed as the top three destinations for Chinese State-funded students, with 2,177, 1,102 and 491 students studying there respectively.

Figures also show that about 70 per cent of the students took majors in seven categories that receive particular State support.

They are telecommunication and information technology, high-tech agriculture, life science and public health, materials science, energy and environment, engineering science, applied social science and studies related to the World Trade Organization.

Zhang Xiuqin, secretary-general of the council, explained that they offered particular support to these areas because China was suffering "huge talent shortages," and the development of these studies were still "far behind that in developed countries."

Zhang added: "Unlike individual studies overseas, the State-sponsored programmes are to train people for the country's most-needed professions."

She told China Daily that the number of students to be recruited this year would remain the same as last year.

Established on June 16 in 1996, the council, responsible for the organization, management and provision of financial assistance to Chinese citizens studying abroad, is having its 10-year anniversary today.

Zhang said she was glad to see the growth in the number of State-funded students studying overseas during the past 10 years.

In 1996, China sent only 2,000 students to study abroad. And the number of students who broke their pledges by not returning to China has decreased sharply.

Figures show that less than 90 per cent of State-funded students returned to the country after they finished their studies in 1996, but the percentage reached 99 per cent last year.

"The booming economy, increasing opportunity to start their own business, and preferential policies for students who return have drawn more students home," Zhang said.

Hu Haiyan, president of Nanjing University of Aeronautics and Astronautics, was among the first batch of students the council sent overseas in 1996.

He said his sponsored one-year of study in the United States was even more fruitful than his previous two-year private studies in Germany.

"I was even more diligent, because I felt a strong sense of responsibility. I was spending money from our taxpayers."

**China becoming popular student destination in Asia-Pacific region****(People's Daily, 2006-06-17)**

China has become an increasingly popular destination in the Asia-Pacific region for overseas students, a senior official with the Ministry of Education said on Friday.

Zhang Xinsheng, vice minister of education, said China was drawing a growing number of students from overseas to study thanks to its stable political environment, rapid economic growth and an increasing international influence.

The teaching quality of higher-learning institutions was improving and receiving greater recognition abroad, Zhang told a forum on the training of human resources.

Since the China Scholarship Council (CSC) was established in 1996, the number of foreign students studying in China funded by the Chinese Government Scholarship Programs has gradually increased from 4,000 a year to more than 7,000 in 2005.

So far, CSC has provided scholarship from the Chinese Government Scholarship Programs to students from more than 150 countries, according to Zhang.

Meanwhile, the level and quality of international students coming to China also kept improving. In 2005, the number of scholarship students who register in degree programs in Chinese institutions of higher education accounted for 58.5 percent of the total number of international students studying in China.

China has been seizing opportunities to expand new channels for overseas students to study in the country. Since 2003, entrusted by organizations overseas, CSC has begun implementing and administrating scholarship programs for students coming to China funded by foreign governments. The scholarship programs under the administration of CSC are the Vietnamese Government Funded Scholarship, the Pakistan Government Funded Scholarship Program for Graduate Education, the Thai Government Scholarship and the Tanzanian Government Scholarship, according to CSC.

China welcomed the record number of foreign students with the most diversified countries of origin in 2005.

Statistics from CSC show that 141,000 overseas students from 179 countries and regions came to China to study in 2005, up 27.28 percent from the previous year, including 86,679 to study Putonghua or standard Chinese.

Of the 141,000 overseas students, 75.73 percent came from Asia, 11.67 percent from Europe, 9.37 percent from America, 1.95 percent from Africa, and another 1.28 percent from the Pacific region. China had received a total of 884,315 foreign students from 1950 to 2005.

### **3 Innovation Management**

#### **DFG President: Transparency important to prevent scientific misconducts**

**(People's Daily, 2006-06-01)**

The president of the German Research Foundation (DFG) said that raising China's national standards to world levels of best scientific practices may contribute to a significant reduction of scientific misconduct.

"Scientific misconduct cannot be totally avoided, and the crucial thing is to have transparency in competition and the rules which scientists are aware of," Dr. Ernst-Ludwig Winnacker said in an exclusive interview with Xinhua here Wednesday.

Dr. Winnacker led a DFG delegation to Beijing to mark the 20th anniversary of the founding of the National Natural Science Foundation of China (NSFC), China's equivalent to the DFG.

The DFG is a private foundation that allocates public funding for research in physical sciences.

"The fact that everybody in the scientific community knows that there is somebody who can deal with scientific misconduct already helps to prevent many cases," Dr. Winnacker said.

To combat scientific misconduct, the DFG used a three-person committee of science ombudsmen to provide assistance to all researchers who raise questions involving good scientific practice and scientific misconduct.

The DFG has established a set of rules governing plagiarism and falsification of scientific data.

"Plagiarism and falsification of scientific data are criminal activities and we need to cultivate a process to deal with them," Dr. Winnacker said, adding that protection for whistleblowers is also important for the scientific community in its fight against the crime.

The DFG also administers the Leibniz Prize, named after German mathematician and philosopher Gottfried W. Leibniz, which awards scientist research grants worth 2.5 million euros.

"We can't assure every research project will succeed," Dr. Winnacker said, "but as a funding agency, it has to make sure that the success rate is not too small, at least 25 to 30 percent."

China has announced a 15-year plan to develop frontier technologies in 11 fields including genetics, nuclear power, lasers and agriculture.

Its natural science foundation announced recently it will provide funding worth about 25 billion yuan (about 3.125 billion U.S. dollars) to scientists in the country. For the past two decades, the NSFC, which has provided 18 billion yuan (some 2.25 billion dollars) in funding on innovation-oriented basic research.

Dr. Winnacker said, "I'm very glad to hear the Chinese government will also fund science-oriented research because you never know where the next success is going to happen."

"China has a wonderful source of scientists," Dr. Winnacker said, adding the Chinese government has recognized the significance of basic science, science in general and technology that will lead the innovation process.

"This is a very important gesture," Dr. Winnacker acknowledged, advising the Chinese government to achieve a still better balance between planned research and free exploration.

"When you have limited funds, you tend to fund the mainstream, those projects where the success appears or where you can expect success," he said. "But these may not be the most innovative ones."

Dr. Winnacker said the experience of the DFG is fair competition so that the best scientists can be selected. "The DFG tries to have a broad base of reviewers to make it as international as possible." The Sino-German Center for Research Promotion in Beijing, co-founded by the NSFC and the DFG, aims to promote cooperation between scientists in China and in Germany, focusing on basic research in the natural, life and engineering sciences. It has organized workshops between Chinese and German scientists, and hundreds of scientists met in these workshops and started joint projects in various fields of science.

### **HK to become world's renowned intellectual center**

**(People's Daily, 2006-06-03)**

The Institute for Advanced Study (IAS) at the Hong Kong University of Science and Technology is destined to be one of the world's leading intellectual centers, said the university president Prof. Paul Chu Friday.

The IAS is a key initiative outlined in the university's Strategic Plan 2005-2020 with the mission to drive major scientific and technological advances, as well as to nurture young talents as innovators and leaders of tomorrow.

Prof. Chu, IAS's Founding Director, said, "As the academic mecca of Hong Kong, IAS will place Hong Kong firmly on the world map, on a par with the top research institutes in the world.

"We're now actively recruiting the permanent faculty members who will form the backbone of the Institute."

The Institute will provide a home for internationally renowned scholars, who will work in close partnership with local academics in advancing the frontiers of knowledge and making scientific breakthroughs.

They will also teach and mentor gifted students, both undergraduate and postgraduate, give public lectures and promote popular science.

According to Prof. Chu, IAS will focus on selected high-impact study areas including nano-science and nano-technology, biological sciences and biotechnology, information technology, and the environment and sustainable development.

### **Backdrop: General Assembly of CAS**

**(VAS, 2006-06-06)**



(CASAD was officially inaugurated on June 1, 1955 in Beijing.)

The General Assembly of the Chinese Academy of Sciences (CAS) is the highest organizational form of the Academic Divisions of the Chinese Academy of Sciences (CASAD). Starting from 1992, it convenes biennially, generally in the first week of June of the even years of the calendar.

The Functions of the General Assembly are to examine and appraise the work reports of the

standing leading body; to elect members of the standing leading body and proclaim its

organization; to enact and amend the By-laws on the Members; to decide on the organization and adjustment of the Academic Divisions; to elect Foreign Members; to organize academic activities; and, to put forward major suggestions.

#### Development Highlights

June 1, 1955

CASAD was officially inaugurated in Beijing.

CAS was founded on November 1, 1949. To enhance the academic leadership in CAS and national S&T community, upon the approval of the former State Administration Council, preparations were started on January 28, 1954 for the establishment of CASAD. It was composed of four divisions: physics, mathematics and chemistry; biological and earth sciences; technological sciences; and philosophy and social sciences. Work also began for the selection of Members of CASAD. On the recommendation of the S&T community across the country, through repeated discussions among different departments and after the approval of the State Council, 172 natural scientists were chosen as first batch of CASAD Members.

May 23, 1957

The Second General Assembly was opened in Beijing. On the recommendation of CASAD Members and with the approval of the 12th meeting of the CAS leadership, 18 natural scientists were selected as new members of CASAD at the assembly.

April 17, 1960

The Third General Assembly opened in Shanghai. Earlier, the Division of Physics, Mathematics and Chemistry was renamed as the Division of Mathematics, Physics and Chemistry; while the Division of Biology and Earth Sciences was divided into the Division of Biology and the Division of Earth Sciences. Selection of new members was suspended until January 1979. Earlier, the Division of Philosophical and Social Sciences became independent from CAS on May 7, 1977

May 11, 1981

The Fourth General Assembly was opened in Beijing. Earlier, the Division of Mathematics, Physics and Chemistry had been divided into the Division of Mathematics and Physics, and the Division of Chemistry.

January 5, 1984

The Fifth General Assembly opened in Beijing. The status of the General Assembly was changed from the Academy's top decision-making organ into the nation's top S&T advisory body. Meanwhile, CASAD membership remained to be the highest academic title of the country in science and technology. The meeting called on CASAD to strive for the studies into S&T issues in China's modernization drive and active participation in the national S&T policy-making.

April 20, 1992

The Sixth General Assembly opened on April 20, 1992 in Beijing. The Bylaws for CASAD Members (in trial implementation) was ratified at the meeting. Later, Rules Concerning the Election of CASAD Members was ratified at the meeting of Presidium of CASAD held in December 1992. The title of CASAD Member renamed as CAS Member at the 11th Meeting of the Standing Committee of the State Council held on October 19, 1993.

June 3, 1994

The Seventh General Assembly was opened in Beijing.

The Bylaws for CAS Members was amended and adopted at the conference. The first batch of 14 Foreign Members of CAS was elected at the meeting.

June 1, 1998

The Ninth General Assembly opened in Beijing. The Bylaws for the Members of CAS was further amended and adopted at the conference. In line with the decision of the State Council, an article about Senior Membership system was added to the Bylaws, since then the title of Senior Membership has been given to members at age of 80 or older.

June 2, 2004

The 12th General Assembly opened in Beijing. The meeting decided through ballot that the Division of Biology was renamed the Division of Life Sciences and Medicine, and the Division of Technological Sciences was divided into Division of Information Technical Science and Division of Technological Sciences.

### **CASAD fulfills its role as national top S&T advisory body (CAS, 2006-06-06)**

Over the past two years, the Academic Divisions of CAS (CASAD), being the top-level advisory body of the State in science and technology, have actively taken part in the strategic studies for, and review of, the national long and medium-term plan for scientific and technological (S&T) development. Prof. Lu Yongxiang, CAS President, made the remarks at the on-going CAS General Assembly.

Consultation and evaluation are the main function of CASAD, a major task for the development of a national scientific think tank. In 2005, the Committee for Consultation and Evaluation of CASAD organized projects ranging from energy, water resources, ecological conservation to education in science, urbanization and other subjects that are pivotal to China's development. As a result, in that year, more than 20 consultation reports and CAS Member proposals were submitted to the State Council or its ministries and commissions, winning both acclaim and recognition as important references for the country's strategic decision-making.

For instance, at the request of the National Development and Reform Commission under the State Council, in 2004, CAS and CAE jointly organized a project to study development priorities of China's high-tech industries under the 11th National Five-Year Plan for Economic and Social Development (2006-2010). The project had the participation of 117 CAS and CAE members and 344 other experts. They worked for 10 months and completed their studies on eight specialized

fields, namely, information technology and electronics, biology and pharmaceuticals, aeronautics and aerospace, advanced energy sources, new materials, advanced manufacturing, advanced technology for environmental protection and process industry. The study reports thus prepared were taken as important references for the formulation of China's 11th Five-Year Plan for Economic and Social Development.

Some of the consultation reports by CASAD in 2005 are as follows:

A Report on Defense against Biological and Chemical Terrorism

A Proposal on Developing a New Generation of Solid State Lighting

A Proposal on Developing the New Generation Network

A Proposal on Vigorously Enhancing China's Capability of Independently Developing Scientific Instruments and Industrializing Their Production through Implementation of the Zhang Heng Program

A Study on Strategies for the Rise of China's Central Region

Some of the proposals of CAS Members adopted by the State and government departments in 2005:

Basic Research: the Fundamental Source of National Strength (by MA Dayou)

On the Need to Promote Basic Research (By MA Dayou)

A Consultation Report on Nurturing China's Natural Pastures and Establishing a 40-Million-Hectare National Base to Grow High-quality and High-yielding Fodder Grass (by ZHANG Xinshi and KUANG Tingyun)

A Consultation Report on Developing 27 Million Hectares of Fast-growing and high-yielding Trees (by ZHANG Xinshi and KUANG Tingyun)

### **Outstanding scientists honored with Tan Kah Kee Awards (CAS, 2006-06-06)**



(State Councilor CHEN Zhili, CAS President LU Yongxiang and CAE President XU Kuangdi pose for a photo with the laureates of the 2006 Tan Kah Kee Science Awards.)

Four Chinese researchers were bestowed on the 2006 Tan Kah Kee Science Awards at the joint plenary session of the 13th General Assembly of CAS and 8th General Assembly of CAE on the morning of June 6 in Beijing. State Councilor CHEN Zhili, CAS President LU Yongxiang and

CAE President XU Kuangdi were present at the awarding ceremony.

The 300,000 yuan (about USD 37.500) award honors Chinese scientists who have excelled on scientific research in each of the categories of the awards.

The scientists are awarded every other year by the Tan Kah Kee Science Awards Foundation, which inaugurated in 2003 by CAS and the Bank of China.

Prof .FAN Haifu from the CAS Institute of Physics won the award for mathematics and physics for his efforts in solving crystal structures from their diffraction effects. His study on the origin,

appearance and resolving methods of the phase ambiguity led to the outstanding achievements, which have important applications to both material science and life science.

Another CAS researcher, Prof. RAO Zihe from the CAS Institute of Biophysics, won the Award for life sciences. His studies on crystal structure of mitochondrial respiratory membrane protein complex II provides a bona fide model for study of the mitochondrial respiratory system and human mitochondrial diseases related to mutations in this complex.

This years Award for information technical science went to Prof. WANG Xiaoyun, a cryptographer from the Shangdong University. Her research on hash functions and scored world-shocking achievements by breaking two widely-used hash functions MD5 and SHA-1 successively.

TU Chuanyi, a space physicist from Peking University, collected the Award for Earth Sciences. Tu made great contributions on the study of the solar wind turbulence and the heating of the solar wind. By developing a WKB-like turbulence theory which combines the linear wave refraction effect and non-linear turbulence effect, Tu described for the first time the energy transfer of the Alfvénic fluctuations in the solar wind in both real space and in frequency range.

The Tan Kah Kee Science Awards grew out of the former Tan Kah Kee Awards, which were established in 1988 and named after Mr. Tan Kah Kee (1874-1961), a well-known overseas Chinese leader who had contributed greatly to the development of science and education in China. The Awards were first set up by Mr. Tan's relatives, and the Chinese Academy of Sciences was entrusted with its organization and evaluation of awardees.

### **Institute of Neuroscience receives international acclaim (CAS, 2006-06-15)**



The work of principal investigators (PIs) of the Institute of Neuroscience (ION) under the CAS Shanghai Institutes for Biological Sciences was applauded by an international evaluation panel that convened on June 9 and 10 at ION.

The institute is doing fantastically well, commends the panel, which is composed of eight world renowned experts in the field, including two Nobel Prize winners. They were invited by the institute to make an appraisal of the performance of its five PIs

who have just completed their terms, namely, Mu-Ming POO, GUO Aike, WANG Yizheng, DUAN Shumin and ZHANG Xu. Based on the evaluation, ION will make decisions on the continuation of the PIs' contracts and research funding.

### **Winners of Shaw Prize 2006 announced (People's Daily, 2006-06-21)**

The Shaw Prize Foundation announced here Wednesday three laureates of the Shaw Prize for 2006.

The prize, which is regarded by some as the Nobel Prize in the east, consists of three annual prizes of Astronomy, Life Science and Medicine, and Mathematical Sciences, each bearing a monetary

award of 1 million U.S. dollars.

Professor Wu Wenjun of the Chinese Academy of Sciences at Beijing gained the Mathematical Sciences award for his contributions to the new interdisciplinary field of mathematics and mechanization. Professor David Mumford of the Brown University of U.S.A. shared the Mathematical Sciences award for his contributions to mathematics, and to the new interdisciplinary fields of pattern theory and vision research.

The Astronomy Award was jointly awarded to Professor Saul Perlmutter of the Lawrence Berkeley Laboratory of the University of California, Professor Adam Riess of the Space Telescope Science Institute in Baltimore of the United States of America, and Professor Brian Schmidt of the Mount Stromlo Observatory of the Australian National University. They are commended for discovering that the expansion rate of the universe is accelerating, implying in the simplest interpretation that the energy density of space is non-vanishing even in the absence of any matter and radiation.

Life Science and Medicine Award went to Professor Xiaodong Wang of the University of Texas Southwestern Medical Center at Dallas in the United States 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 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.

The Shaw Prize is an international award managed and administered by the Shaw Prize Foundation based in Hong Kong.

### **Government says public funding for R&D effective (People's Daily, 2006-06-26)**

In response to criticism of possible squandering of public money on research and development, an official with the Ministry of Science and Technology said here Monday the state allocations are effective boosters for the country's research prowess.

Qin Yong, who is in charge of the national science and technology development planning, said the ministry invested about 26 billion yuan (3.25 billion U.S. dollars) in three major state programs from 2001 to 2005, accounting for 3.2 percent of China's total R&D expenditure over the same period.

The three programs include the State Key Basic Research and Development Program, the State Hi-tech Research and Development Program, and the State Key Technologies Research and Development Program.

In basic research, Qin said, Chinese scientists published 60,767 papers, with 38,210 being listed in either the Science Citation Index or the Engineering Index. Some research, such as quantum communication, analysis on protein structure and function, and cognitive study of the brain, show that Chinese scientists are among the global leaders in those fields.

In the development of high technologies, Qin pointed out that the Suma 4000A high-performance server and the Godson Pentium III-equivalent central processing unit, both of which were developed by the Chinese Academy of Sciences (CAS) Institute of Computing, helped China break the monopoly of developed countries in the strategically important research fields.

"We were previously satisfied with copying and modeling Western technologies," Qin said, "but we are now adopting a national strategy of innovation."

An investigation team from the ministry proved last month a U.S.-educated researcher Chen Jin cheated in claiming breakthroughs in system-on-chip development. Chen was sacked from the post of dean at Jiaotong University in Shanghai and ordered to refund the money he got from the program.

After an investigation the ministry announced to reform the fund granting mechanism and to make it more transparent.

In a recent announcement, the ministry said it will publish online all applications and appraisals for public R&D funding, which introduces public supervision on research activities.

## 4 China's International Science Cooperation

### **Nobel Prize Winner Masatoshi Koshihba visits CAS institute**

(CAS, 2006-06-01)



With the support of the prestigious CAS Albert Einstein Visiting Professorship, 2002 Nobel Prize winner in physics Masatoshi Koshihba, visited the CAS Institute of High Energy Physics (IHEP) from May 18 to 23.

During his visit, Prof. Koshihba delivered speeches, "Neutrino, Neutrino and Neutrino" and "the Birth of Neutrino Astrophysics" at the CAS Graduate University, IHEP and Tsinghua University respectively.

He also held discussions with IHEP researchers about cooperation on neutrino long baseline detection, neutrino detection in Dayawan Bay, and International Linear Collider. He expressed his sincere hope to promote the cooperative research on the issues between Japan and China, and among Asian countries.

Prof. Koshihba indicates that time is ripe for establishing a world-class science center in Asia, and calling for the initiation of a scientific gathering around the Pacific Rim.

Prof. Koshihba was born in 1926. He got ph. D. at University of Rochester in 1955, and received the Nobel Prize in Physics in 2002 for his pioneering contributions to astrophysics, in particular for the detection of cosmic neutrinos.

### **Minister XU Guanhua signed the Memorandum of Cooperation with German Federal Minister of Transport, Building and Urban Affairs**

(MOST, 2006-06-06)

On May 22, 2006, Mr. Wolfgang Tiefensee, German Federal Minister of Transport, Building and Urban Affairs and his delegation visited MOST and had a meeting with XU Guanhua, Chinese Minister of Science and Technology.

During the meeting, the two sides exchanged views on high speed magnetic levitation transport, renewable transport energy, intelligent transport and building energy-saving. They both expressed the willingness to further strengthen cooperation and exchange in the above-mentioned fields. In the end, Minister XU Guanhua and Minister Wolfgang Tiefensee jointly signed a memorandum of cooperation in the technology of satellite and mobile communication positioning tolling for the field of intelligent transport.

### **The Kavli Institute for Theoretical Physics China established at CAS (CAS, 2006-06-20)**



On June 18, the launching ceremony for the Kavli Institute for Theoretical Physics China at CAS (KITPC-CAS) was held on the campus of the CAS Institute of Theoretical Physics (ITP) in Beijing.

At the ceremony, CAS Executive Vice President BAI Chunli and Director of the Kavli Institute for Theoretical Physics (KITP) at the University of California, Santa Barbara, David J. Gross jointly signed the cooperation agreement, and the Kavli Foundation announced a three-million donation to

the new institute.

The establishment of KITPC will play an important role for promoting the development of theoretical physics in China, says Prof. Bai.

We are glad to share the development momentum in scientific research in China, notes Prof. Gross, a Nobel laureate and chairman of the first international advisory committee at ITP.

Directed by Prof. Gross, KITP is one of the most renowned institutes for theoretical physics in the world. Its founding director is Nobel Prize winner Walter Kohn and its former faculty members include Stephen Hawking and 2004 Nobel Prize winner in physics Frank Wilczek.

Industrialist Fred Kavli, founder of the Kavli Foundation, called from Sweden to congratulate the event. "Through the ages, China has contributed immensely to science and technology," he said. "We are pleased to recognize the dedicated pursuit of excellence in China's fast growing research enterprise today and participate in its future potential. I am confident that these two institutes will make important contributions to science."

Established in 2000, the California-based Kavli Foundation is dedicated to the advancement of science for the benefit of humanity. It supports scientific research, honors scientific achievement, and promotes public understanding of scientists and their work through an international program of research institutes, prizes, professorships, and symposia in the fields of astrophysics, nanoscience and neuroscience.

The newly-established KITPC-CAS is expected to have important national and international roles in the future. Nationally, it will coordinate basic research on theoretical physics in China and

facilitate interaction between theory and experiment, as well as promote research in interdisciplinary areas among physics and other branches of science. Internationally, it will host international conferences, workshops, summer schools, guest scientist and visitor programs, which will promote the interaction of Chinese scientists with their counterparts in other countries.

**Germany helps northwest province to develop solar energy**  
**(People's Daily, 2006-06-21)**

Villagers in parts of northwest China's Qinghai Province no longer have to rely on candlelight at night, thanks to a Sino-German solar energy cooperation program.

Photovoltaic and photovoltaic-diesel engine hybrid stations have been constructed at 11 villages in the Mongolian-Tibetan-Kazak Prefecture of Haixi and the Tibetan Prefecture of Haibei, benefiting 520 rural households, said Liu Hong, general manager of Qinghai Illumination Engineering Co. Ltd., which oversees the cooperation program.

The Sino-German cooperation program, launched in July 2002, is striving to improve energy resources through utilizing renewable sources in remote areas of Qinghai.

The entire program has a budget of 92.4 million yuan (11.39 million U.S. dollars), including 7.89 million U.S. dollars from the German government and 28 million yuan from the Qinghai provincial government.

A German company will be responsible for training technical workers to manage the photovoltaic or photovoltaic-diesel engine hybrid stations, according to the general manager.

Apart from Haixi and Haibei prefectures, the Sino-German cooperation program is also executed in the three Tibetan autonomous prefectures of Hainan, Huangnan and Yushu, all in Qinghai Province, as well as in Haidong Prefecture south to Xining, the provincial capital.

More new photovoltaic stations will be constructed at more than 60 villages in the above mentioned regions during the second phase of the cooperation program.

It is estimated 5,400 rural households will be brought within reach of electrical supply when the second phase is finished by July next year.

Situated deep in the Qinghai-Tibet Plateau, Qinghai Province abounds in solar resources, with annual average sunlight standing between 2,300 hours and 3,600 hours.

A survey conducted in 2004 showed there was no power supply in some 1,000 villages across Qinghai.

## 5 Miscellaneous

### Nowcasting System to be pre-demonstrated in Beijing

(People's Daily, 2006-06-02)

A trial version of Hong Kong Observatory's Nowcasting System, which will support the specialized weather forecasting service for the 2008 Beijing Olympics, will be shipped to Beijing this summer for a preliminary demonstration, a government press release said Thursday.

To support the Olympic equestrian event in Hong Kong, the observatory has also developed a system to monitor a horse's heat stress, and will collect the necessary climatological data starting this summer.

"The Olympics is an important event for our country," Chief Executive Donald Tsang said. "I am glad the observatory will use advanced technologies to serve the country and Hong Kong."

While visiting the observatory's Central Forecasting Office, Tsang was briefed on its work, particularly its pivotal role of research and development in the provision of weather services, and watched a replay of the sequence of weather events during the approach of Typhoon Chanchu last month.

"It is important to predict accurately the movement of a tropical cyclone so that workers and students can plan their transport arrangements as early as possible," he said.

He then visited the observatory's television studio to see how a single professional meteorologist produced an entire weather program. He said television weather programs brought observatory colleagues closer to the public.

"It is the main channel of weather information for senior citizens. I appreciate the observatory's efforts to meet the needs of the community," he said.

### Chinese mathematicians solve global puzzle

(Xinhua Net, 2006-06-03)



(Foreign member of the Chinese Academy of Sciences, Professor Shing-Tung Yau (2nd R) from Harvard University introduce the Poincare

China's Guangdong Province, co-authored the paper, "A Complete Proof of the Poincaré and Geometrization Conjectures - application of the Hamilton-Perelman theory of the Ricci flow",

Two Chinese mathematicians have put the final pieces together in the solution to a puzzle that has perplexed scientists around the globe for more than a century.

The two scientists have published a paper in the latest U.S.-based Asian Journal of Mathematics, providing complete proof of the Poincaré Conjecture promulgated by Frenchman Henri Poincaré in 1904.

Professor Cao Huaidong, of Lehigh University in Pennsylvania, and Professor Zhu Xiping, of Zhongshan (Sun Yat-sen) University in south

published in the June issue of the journal.

Cao and Zhu put the finishing touches to the complete proof of the Poincaré Conjecture, which had puzzled mathematicians around the world, said Professor Shing-Tung Yau, a mathematician at Harvard University and one of the journal's editors-in-chief.

The conjecture was rated as one of the major mathematical puzzles of the 20th Century, said Yau. "The conjecture is that if in a closed three-dimensional space, any closed curves can shrink to a point continuously, this space can be deformed to a sphere," he explained.

By the end of the 1970s, U.S. mathematician William P. Thurston had produced partial proof of Poincaré's Conjecture on geometric structure, and was awarded the Fields Prize for the achievement. Fellow American Richard Hamilton completed the majority of the program and the geometrization conjecture. In 2003, Russian mathematician Grigory Perelman made key new contributions.

Based on those major developments, the paper by Cao and Zhu, which ran to more than 300 pages, provided complete proof, said Yau, adding the findings would help scientists to further understand three-dimensional space and heavily influence the development of physics and engineering.

### **More Chinese choose to come back after studying abroad**

**(People's Daily, 2006-06-06)**

Around 27,200 Chinese nationals chose to return and work in China after finishing schooling abroad at their own expense in 2005, up 47.9 percent from the previous year, the Ministry of Education said here on Monday.

The ministry's spokesman Wang Xuming told a press conference that though China saw a slight annual increase, or 2.1 percent, of the number of Chinese studying abroad at their own expense last year, the number of those who wanted to return mushroomed.

Altogether 118,500 Chinese studied abroad in 2005, including nearly 4,000 funded by the government, some 8,000 dispatched by their employers, and 106,500 at their own expense, according to statistics from the ministry.

"The booming economy, increasing opportunity to start their own business, and preferential policies for the returned students have drawn more Chinese students home," said Zhang Xiuqin, secretary-general of the China Scholarship Council (CSC) under the ministry.

About 933,400 Chinese had gone abroad to study between 1978 and 2005, and 232,900 have returned, the ministry said.

### **Cofferdam of Three Gorges Dam demolished**

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



Demolition of the last cofferdam protecting the just-completed main wall of the Three Gorges Dam, the world's largest, started at 4:00 on Tuesday afternoon in the middle reaches of the Yangtze River, China's longest, with explosives enough to topple down 400 10-storey buildings.

The operation took about 12 seconds, causing

nearly 190,000 cubic meters of concrete fragments from the upper-30-meter section of the cofferdam to tumble into the river.

The removal of the cofferdam means the main wall of the Three Gorges Project will formally begin its role in flood control, which will be two years ahead of the schedule.

The world's largest dam in Three Gorges area, central China's Hubei Province, was completed on May 20, signifying a milestone accomplishment of major structure of the mammoth Three Gorges water control project that aims to tame the flood-prone Yangtze River.

### CAS Foreign Members (1994-2004)

(CAS, 2006-06-08)



According to the Bylaw of CAS Members, scholars and specialists of foreign nationality who have made important contributions to the S&T cause in China and who enjoy high academic standing internationally may be nominated and elected Foreign Members of CAS. From 1994 to 2004, six elections have been held and a total of 52 Foreign Members were elected.

The first election was held on June 8, 1994, and 14 scientists were elected CAS Foreign Members: Derek Harold Richard Barton (U.K.), Leroy L. Chang (U.S.), Shiing-Shen Chern (U.S.), Yuan-Cheng B. Fung (U.S.), Tsung-Dao Lee (U.S.), Chia-Chiao Lin (U.S.), Joseph Needham (U.K.), Peter. H. Raven (U.S.), Herbert A. Simon (U.S.), Chang-Lin Tien (U.S.), Samuel C.C. Ting (U.S.), Chen Ning Yang (U.S.), Chien-Shiung Wu (U.S.), and Shing-Tung Yau (U.S.).

In the second election 10 Foreign Members were elected on June 7, 1996: Robert Wolfgang Cahn (U.K.), Alfred Y. Cho (U.S.), Wilbur Norman Christiansen (Australia), C.W. Chu (U.S.), Yuet Wai Kan (U.S.), Charles K. Kao (U.S.), Tung-Yen Lin (U.S.), Ho-Kwang Mao (U.S.), Y.Ron Shen (U.S.) and Peter J. Wyllie (U.S.).

The third election was held on June 5, 1998, eight Foreign Members were elected: Burrell Clark Burchfiel (U.S.), Steven Chu (U.S.), Ernest S. Kuh (U.S.), Norman N. Li (U.S.), Jacques-Louis Lions (France), Rudolph A. Marcus (U.S.), Helmut Moritz (Austria) and Olgierd Cecil Zienkiewicz (U.K.).

The fourth election was held in June 2000, seven Foreign Members were elected: Y. Austin Chang (U.S.), Chee Daniel Tsui (U.S.), Yu-Chi Ho (U.S.), Tomas Hokfelt (Sweden), Hiroo. Inokuchi (Japan), Hartmut Michel (Germany), Chih-Tang Sah (U.S.).

The fifth election was held in June 2002. Seven Foreign Members were elected: Frank. A. Cotton (U.S.), Else Marie Friis (Sweden), Brian John Höskins (U.K.), Thomas S. Huang (U.S.), Gurdev S. Khush (India), Wolfgang K.H. Panofsky (U.S.), Theodore Yao-Tsu Wu (U.S.).

The sixth election was held in 2004. Six scientists were elected new Foreign Members: Andrew Chi-Chih Yao (U.S.), Guy B. De-The (France), Jean-Marie Lehn (France), Richard N. Zare (U.S.), Torsten N. Wiesel (US), Yum-Tong Siu (US).

According to the by-law, the election of Foreign Members is held every two years. A candidate for

Foreign Members shall become eligible only when nominated by not less than five Members. At election, each Member may nominate no more than two candidates. The election shall be held at the CAS General Assembly by secret ballot. A candidate will be elected a Foreign Member when more than half of the membership take part in the election and when the candidate wins not less than two thirds of the votes cast.

The by-Law stipulates that Foreign Members have the right to make suggestions for the S&T development in this country and the work of CAS Academic Divisions. When invited, they may attend relevant meetings and academic activities organized by the divisions, and they may receive publications issued by the divisions. They are not entitled to nominate candidates for Members or Foreign Members, or to vote or stand for election at CAS Academic Divisions.

### **Government pushes logistics development**

**(Xinhua Net, 2006-06-10)**

The supervision and tracking of goods and services in China will be enhanced by a government push to develop Radio Frequency Identification (RFID) technology in the country.

RFID technology uses an antenna and transceiver (often combined into one reader) and a transponder (the tag) along with electromagnetic signals to uniquely identify items.

The technology affects the lives of everyone living and working in China, said Zhang Zhiwen from the Department of High-Tech Development and Industrialization, under the Ministry of Science and Technology.

"For example, currently if you post a parcel it seems that it disappears and is out of your control, without knowing how it is going along the way," he said on Friday at the launch of the China RFID Technology and Policy White Book.

However, with the help of an RFID tag, which can be fastened to a parcel, people can follow the parcel at any stage in its journey using a reader or a computer.

China Post is carrying out a pilot project in Shanghai using RFID technology to help people track their parcels, Zhang said.

RFID technology is emerging as an alternative to the bar code, which is currently widely used to identify goods.

The radio frequency technology is more complicated and can store more information about the goods it identifies.

The new white book, which explains China's policy on developing the technology, was jointly compiled by 15 departments under the State Council, including Zhang's ministry.

RFID technology is developing quickly in China and worldwide, Zhang said.

Used with the Internet, RFID can assist in the tracking of goods and information-sharing in a global sense, said Ma Songde, science and technology vice-minister.

Gradually, the technology will be widely used in public security, production management and control, logistics, food and drug management, anti-counterfeiting, and in the management of big events such as the Olympic Games.

"For the Olympic Games, an RFID tag with a visitor's details could be attached to a ticket to guard against false tickets," Zhang said.

In Shanghai, pets can be fitted with RFID tags on their ears or elsewhere on their bodies for their

owners to monitor their health, location and other conditions.

As part of a pilot RFID programme in China, the first batch of RFID tags were affixed to the bodies of 1,000 live pigs in Sichuan Province last month to help track epidemics, the website [www.chinarfidnews.com](http://www.chinarfidnews.com) reported.

With a tag in place, the pig's breeding, butchering and distribution can be easily checked.

However, the price of the tags and related monitors is still quite high because research and production costs are expensive.

The cost of an RFID tag ranges from 15 US cents to US\$100 depending on its objectives.

The government will provide favourable policies to companies using this technology to encourage them to be more innovative and improve manufacturing, Ma said.

Companies developing RFID technology in China are mostly small and need to co-operate with one another and devote more effort to research, said Yin Hong, assistant of General Manager of Shanghai Zhangjiang (Group) Co Ltd.

### **China develops three new avian influenza vaccines**

**(People's Daily, 2006-06-15)**

China has just successfully developed three kinds of new avian influenza vaccines and a new technology on diagnosing avian influenza, according to sources with the Chinese Ministry of Agriculture on Wednesday.

The ministry said the three new vaccines, if used together, can "offer a solid technical guarantee for the Chinese government to effectively control the highly pathogenic avian influenza."

The new types, H5N1 mark inactivated vaccine, Codon optimized H5 avian influenza Ha gene DNA vaccine, and Recombinant influenza Ha subunit vaccine, were all developed by the National Avian Influenza Reference Laboratory, said the ministry.

Professor Chen Hualan, director of the National Avian Influenza Reference Laboratory, told Xinhua that though the three new vaccines have not yet put into production, they have been proved very effective in prevention and control of the avian influenza epidemic.

According to the ministry, China led the world in developing the H5N1 mark inactivated vaccine. This vaccine will allow the serological differentiation of vaccinated from infected chickens, which has been proved with high efficiency and safety through lab tests.

The newly developed Rapid diagnostic strip for detecting H5 avian influenza virus can detect out H5 subtype avian influenza virus with only 10-plus minutes, which will be of great importance for a rapid control of bird flu epidemic in China, said the ministry.

China promoted the use of its first vaccine product--avian influenza inactivated vaccine (H5N2 subtype ) in 2004 when the highly pathogenic avian broke out in the country.

Based on the first vaccine proved effective in containing the bird flu epidemic, scientists at the National Lab, using a technique called reverse genetics, altered the genome sequence of the virus and constructed three other vaccines in succession since the year 2004.

According to Prof. Chen, the three vaccines included the reverse genetics inactivated vaccine (H5N1), H5N1 recombinant fowlpox vaccine, and recombinant bivalent avian influenza-Newcastle disease live vaccine.

The Ministry of Agriculture approved the production of the reverse genetics inactivated vaccine

(H5N1) and the H5N1 recombinant fowlpox vaccine in 2004.

The ministry said the reverse genetics inactivated vaccine (H5N1), the currently most advanced vaccine in its kind, "cut a key link in the transmission chain of the highly pathogenic avian influenza among water fowl". The vaccine has been widely used in China and some foreign countries like Vietnam.

The recombinant bivalent avian influenza-Newcastle disease live vaccine, one completely researched and developed by Chinese scientists at the end of 2005, is also a breakthrough in the world, which has already been put into production.

Currently, these vaccines under production have been exported to many countries, including Vietnam, Indonesia, Mongolia, Egypt and Iraq.

According to the ministry, China's National Reference Lab on Foot-and-Mouth Disease has also finished the lab study on a new kind of Foot-and-Mouth Disease vaccine, which is believed more safe and effective than the existing vaccines through lab tests.

China has reported 18 cases of human infection of bird flu since last November with 12 fatalities. The last case was confirmed on April 27.

Globally, 225 human infections, including 128 deaths, have been recorded by the World Health Organization (WHO), according to the WHO website.

The central government is strengthening prevention and control of bird flu although no new human cases have been confirmed for more than a month, a health official said Monday.

China's Ministry of Agriculture also issued an emergency order Monday for local governments to tighten controls over poultry stocks to prevent bird flu contamination by migratory birds.

And the ministry also started a national check this week on the implementation of the immunization policy in most areas of the country. About 31 inspection groups have arrived at the rural farms to check the effects of immunization.

The Chinese government believed the immunization measures, carried out properly, will lower the possibility of a large-scale outbreak in the country.

The Chinese government is attaching more attention on scientific research about avian influenza vaccines. Nine companies have been appointed by the Ministry of Agriculture to produce the vaccines.

### **Desertified land shrinks in Beijing**

**(China News, 2006-06-18)**

Beijing has seen its desertified land shrink by 1,613 hectares, a drop of three percentage points than five years ago.

A report released by the municipal horticulture and afforestation bureau Saturday shows that 92 percent of the city's largest piece of eroded land around Yongding River has been put under control from further expansion in the past five years.

Beijing, the host of the 2008 Olympic Games, has been frequently hit by sandstorms over recent years. Previous reports said that deserts in the north of the city had been expanding rapidly.

Li Jinhai, an official with the bureau, said that Beijing's three major waterways, Yongding, Chaohe and Wenyu rivers, used to be coasted by 54,621 hectares of desertified land.

Tree and grass planting has stopped 49,856 hectares, or 92 percent of the city's total, from further

eroding, and 1,613 hectares have been restored into green land, he said.

**Stephen Hawking floats his genesis bubble in Beijing****(People's Daily, 2006-06-20)**

Is the universe eternal, or did it have a beginning? World-renowned physicist Stephen Hawking gave his answer to a large audience in Beijing on Monday.

He gave a 45-minute multimedia presentation at the Great Hall of People on the occasion of the International Conference on String Theory 2006, that traced the development of theories on cosmic origins, beginning with African creation myths.

He described -- through his electronic speech synthesizer -- how the general theory of relativity and the discovery of the expansion of the universe provoked conceptual changes, which meant that the idea of an ever-existing, ever-lasting universe was no longer tenable.

The 64-year-old scientist and author of the global best-seller "A Brief History of Time" uses a wheelchair and communicates with the help of a computer because he suffers from a neurological disorder called amyotrophic lateral sclerosis, or ALS.

One of the best-known theoretical physicists of his generation, Hawking has done groundbreaking research on black holes and the origins of the universe, proposing that space and time have no beginning and no end.

The image Hawking drew of this process was that of bubbles appearing and bursting, corresponding to mini universes that expand and collapse. Only those which grew to a certain size would be safe from collapse and would continue to expand at an ever increasing rate.

The theorem which he and Prof. Roger Penrose developed in 1970 said that general relativity predicated that the universe and time itself would begin with the big bang and that time would come to an end in black holes.

"One can get rid of the problem of time having a beginning in a similar way in which we got rid of the edge of the world," said Hawking.

Likening the beginning of the universe to the South Pole, with degrees of latitude playing the role of time, Hawking explained that the universe would start as a point at the South Pole.

"As one moves north, the circles of constant latitude, representing the size of the universe, would expand. To ask what happened before the beginning of the universe would become a meaningless question because there is nothing south of the South Pole," Hawking said.

In this view, the beginning of the universe would be governed by the laws of science: the creation of the universe would be down to spontaneous quantum creation.

"Cosmology is a very exciting and active subject. We are getting close to answering the age-old questions: Why are we here? Where did we come from?" Hawking said.

**Stephen Hawking opens his mind to Chinese food and women****(People's Daily, 2006-06-22)**

After a barrage of camera flashes by Chinese students and reporters, Stephen Hawking slowly spelled out his words of wisdom to a packed auditorium in Beijing Wednesday.

"I like Chinese culture, Chinese food and above all Chinese women. They are beautiful," Hawking said, setting off a storm of applause.

Hawking, the world-renowned physicist for his theories of black holes and the origins of the universe and author of the global best-seller "A Brief History of Time", appeared for a seminar on string theory and answered questions submitted earlier by the audience through a computer and voice synthesizer.

"There are many things I want to achieve. If we lose our dreams, we die," Hawking said.

He said that although he has many physical challenges, his mind is free to move back to the beginning of time and into the black holes. "There are no limitations for the human mind," he said. Diagnosed with amyotrophic lateral sclerosis (ALS) before getting his PhD in 1965, Hawking has been confined to a wheelchair since. He lost function of his three last working fingers two years ago and can now only communicate by moving his eyelids.

He controls his computerized voice system using a blink-activated infrared monitor embedded in his glasses. To change each section of his prepared text, he blinks an eye, slightly scrunching up his cheek in the process.

As the headliner of the International Conference on String Theory 2006, Hawking gave a lecture on the origin of the universe Monday at the Great Hall of People to an audience of 6,000, describing how the General Theory of Relativity of Albert Einstein and the discovery of the expansion of the universe provoked conceptual changes, which meant that the idea of an ever-existing, ever-lasting universe was no longer tenable.

Hawking has been treated to a Hollywood-style reception in China, whenever he appears, immediately becoming the focus of attention and the target of flashbulbs.

The astrophysicist said he had always wanted to travel to Tibet, but he was not sure he could make it now.

"Professor Hawking is a great physicist, but his personal charm and strong character are what inspire me most," said Liang Senfeng, a mathematics graduate from the Beijing University of Technology.

## 6 Information on Upcoming Workshops in August 2006

### **2006 International Symposium on Artificial Intelligence—50 Years' Achievements, Social Impacts and Future Directions (ISAI'06)**

**Date:** August 01 – August 03

**City:** Beijing

<http://caai.cn:8086/isai06/>

### **The 5th International Conference on Traffic & Transportation Studies**

**Date:** August 02 – August 04

**City:** Beijing

<http://ictts.njtu.edu.cn/ictts.htm>

### **International Symposium on Precision Mechanical Measurements**

**Date:** August 02 – August 06

**City:** Urumqi, Xinjiang Autonomous Region

<http://www1.hfut.edu.cn/brief/ISPM/>

### **First International Conference on Knowledge Science, Engineering and Management (KSEM'06)**

**Date:** August 05 – August 08

**City:** Hongkong

<http://www.cs.ust.hk/ksem06/>

### **The 25th Chinese Control Conference**

**Date:** August 07 – August 10

**City:** Changchun, Jilin Province

<http://ccc.iss.ac.cn/>

### **International Conference on Forest and Water in a Changing Environment**

**Date:** August 08 – August 10

**City:** Beijing

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### **The 2nd IEEE/ASME International Conference on Mechatronic and Embedded Systems and Applications**

**Date:** August 13 – August 16

**City:** Beijing

<https://150.135.155.193/ mesa06/>

**International Conference on Machine Learning and Cybernetics 2006**

**Date:** August 13 – August 16

**City:** Shijiazhuang, Hebei Province

<http://www.icmlc.org/welcome.htm>

**The 2006 CES/IEEE-PELS International Power Electronics and Motion Control Conference**

**Date:** August 13 – August 16

**City:** Shanghai

<http://ipemc2006.sjtu.edu.cn/>

**The 2nd International Conference on Advanced Data Mining and Applications**

**Date:** August 14 – August 16

**City:** Xi'an, Shanxi Province

<http://www.itee.uq.edu.au/~adma06/>

**International Symposium on Information and Computational Science 2006**

**Date:** August 15 – August 18

**City:** Dalian, Liaoning Province

<http://isics06.dlut.edu.cn/>

**International Conference on Regional Carbon Budgets**

**Date:** August 16 – August 18

**City:** Beijing

<http://www.icrcb.org.cn/>

**2006 International Conference on Intelligent Computing**

**Date:** August 16 – August 19

**City:** Kunming, Yunnan Province

<http://www.ic-ic.org/2006/>

**2006 IEEE International Conferenece on Information Acquisition**

**Date:** August 20 – August 23

**City:** Weihai, Shandong Province

<http://www.ee.cuhk.edu.hk/~qhmeng/ia/ICIA2006/>

**7th International Conference on Electronics Packaging Technology**

**Date:** August 26 – August 29

**City:** Shanghai

<http://www.icept.cn/new.asp?id=655>

**IX International Colloquium on Invertebrate Pathology and Microbial Control (ICIPMC)**

**Date:** August 27 – September 01

**City:** Wuhan, Hubei Province

<http://sip2006.hzau.edu.cn/>

**7th International Conference on Electronics Packaging Technology**

**Date:** August 26 – August 29

**City:** Shanghai

<http://www.icept.cn/new.asp?id=655>

**2006 International Conference on Innovative Computing, Information and Control**

**Date:** August 30 – September 01

**City:** Beijing

<http://icicic06.njtu.edu.cn/ic2006.htm>

**6th IFAC Symposium on Fault Detection, Supervision and Safety of Technical Processes**

**Date:** August 29 – September 01

**City:** Beijing

<http://www.au.tsinghua.edu.cn/safe/safeprocess2006/index.htm>

## Abbreviations

- CAS** - Chinese Academy of Sciences  
**MOST** - Ministry of Science and Technology