

# Content

Content.....	1
1 Science News .....	2
1.1 Energy .....	2
1.2 Earth and Environment .....	4
1.3 Health.....	28
1.4 Key Technologies .....	39
1.5 Structure of Matter.....	41
1.6 Transport and Space .....	42
2 Innovation Management.....	48
3 News from Universities .....	51
4 China's International Science Cooperation .....	52
5 Miscellaneous .....	56
6 Information for Coming Workshops in June .....	62

## 1 Science News

### 1.1 Energy

#### **World's largest nuclear engineering group stresses cooperation with China**

**(Xinhua Net, 2005-04-06)**

The France-based Areva Group, the world's largest nuclear engineering firm, will enhance its research and development in China so as to help solve the serious power shortages and environmental problems in the country, said its President Anne Lauvergeon here Tuesday.

Lauvergeon made the remark at an ongoing seminar on China-France economic cooperation. China's power shortage makes it necessary to rapidly develop nuclear power plants, and France, which has the most advanced nuclear power technology and equipment, has had fruitful cooperation with China in this field, she said.

"Over 3,500 Areva employees are now working in China, and the group has worked out special technology-transfer plans for China," she said.

China's rapid economic development has led to a severe power shortage problem. Power brownouts became frequent in many places last year. The state has already listed the nuclear power industry as a priority in its plans for high technology research and development, and China's nuclear power generation capacity is expected to triple to account for 4 percent of its total power output by 2020, according to sources with the State Development and Reform Commission.

After more than 20 years of efforts, China now has the ability to build 300,000 kilowatt-level and 600,000 kilowatt-level nuclear power stations. It can also manufacture key equipment for one million kilowatt-level nuclear power stations.

Electricity generated by nuclear power, however, still accounts for less than 2 percent of China's total electricity supply, compared to 77 percent in France and 20 percent in the United States. Chinese high-level officials have called for promotion of nuclear power international cooperation, in particular in project-related technology bidding and technical instruction.

China first used nuclear power technology from France in its Daya Bay Nuclear Power Plant in southern Guangdong Province, and later furthered cooperation with France in Ling'ao Nuclear Power Plant, located in the same province.

Hardly any carbon dioxide will be emitted during the nuclear power generation process, which is both cost-effective and safe, so the nuclear power technology is conducive to China's environmental protection, Lauvergeon said.

The Areva group, with its services mainly focused on power generation and grid construction, will continue to make contributions to China's power industry, she said.

The net profits of Areva reportedly rose 10 percent to 428 million euros (570.8 million dollars) in 2004, much of which were contributed by its successful overseas services.

#### **China plans 40 more nuclear plants**

**(China Daily, 2005-04-07)**

China plans to build 40 nuclear power plants over the next 15 years, making them the main power source for its booming east coast, a government technology official says.

"Nuclear power will play an increasingly important role in the development of China's power industry," said Zhang Fubao, an official of the Commission of Science, Technology and Industry for National Defense, quoted Thursday by the Xinhua news agency.

China is expected to be the world's biggest developer of nuclear power stations in coming decades as the government tries to meet soaring demands for electricity while reducing pollution from coal-fired power plants.

With no plants planned in the United States and few in other Western countries, suppliers of equipment are looking to China to drive sales in their industry.

Zhang, deputy director of the system-engineering department under the technology commission, was speaking Wednesday at a symposium on the nuclear power market and technology.

Zhang said the Chinese nuclear industry's generating capacity was expected to reach 40 million kilowatts in 2020, though it didn't say how that compared to current levels.

"Nuclear power will become the pillar of energy supply in coastal areas of east China," the center of the country's export-driven economic boom, he was quoted as saying.

China is reviewing plans for expanding two nuclear power plants and proposals to start building two more in the booming southern provinces of Guangdong and Zhejiang, Xinhua said.

According to Xinhua, China's nuclear power plants supplied 50.4 billion kilowatt hours of electricity last year, accounting for 2.3 percent of the national total.

### **Largest grid-connected solar power project in China (CRI, 2005-04-21)**



(Part of the completed PV system at the International Garden and Flower Expo Park in Shenzhen)

With the support of the National High-technology Development Program (dubbed the 863 Program), scientists and engineers from the CAS Institute of Electrical Engineering has recently completed a study on key technologies for megawatt-level building-integrated and grid-connected photovoltaic (PV) power generation. The project was checked and accepted by an expert panel on March 25.

Their technologies have been applied to the design, supply and implementation of the 1-MW Green Garden Solar Plant at the International Garden and Flower Expo Park in Shenzhen in southeast China's Guangdong Province. It is largest solar station in Asia to date.

The PV electric generation is marching into the mainstream of power service due to its low cost, high efficiency, easy maintenance, and zero emissions. According to experts, the solar power station is expected to save 384 tons of coal and reduce the discharge of about 170 tons of CO<sub>2</sub> and 7.68 or so tons of SO<sub>2</sub>, compared with the traditional thermal generation.

The Shenzhen 1-MWp PV station is also the first commercialized large scale PV plant in China. Along with the rising awareness of the importance of the renewable power, the Shenzhen station will bring about more social benefits.

## 1.2 Earth and Environment

### **Data center for resources and environmental sciences established**

**(CAS, 2005-04-01)**

The Data Center for Resources and Environmental Sciences (RESDC) was inaugurated at the CAS Institute of Geographical Sciences and Natural Resources Research (IGSNRR) on March 21. Its website ([www.resdc.cn](http://www.resdc.cn)) is also in service.

The celebrative meeting was attended by CAS Vice President Li Jiayang, Fu Bojie, the Director of the CAS Bureau of Science and Technology for the Resources and the Environment, and other CAS leaders and scientists.

This data pool is based at IGSNRR and has nine branch stations providing data in fields concerned with the environmental and life sciences ranging from the land utility to the biodiversity, instructed by the RESDC director Liu Jiyuan. It patches up 14 CAS research institutes into a data platform featuring the scientific data sharing and integration. Moreover, the RESDC website will further facilitate the information inquiries in a wider touch of the public and the scientific bodies.

At present, as the difficulty in finding shared data is a big problem that encumbers the scientific research, six major S&T platforms will be established under the auspices of the Ministry of Science and Technology and the RESDC is one of them. It's expected to serve as the main body of the Data-Sharing Network of China Earth System Science, providing data support for the research in this field and contributing to the E-government construction and S&T data integration and sharing.

### **CAS sets up an ecosystem network lab**

**(CAS, 2005-04-04)**

The Key Laboratory of Ecosystem Network Monitoring and Simulation was recently established at CAS. It will function as an integrated data platform and a fostering base to facilitate the ecological study and encourage international exchanges and collaborating programs.

Putting its emphasis on the study over the ecosystem change under the influence imposed by the environmental and human activities, the laboratory focuses on a wide range of research domains from the ecological IT improvement to the all-around study on the ecosystem management and regional sustainable development. It uses multi-analysis method featuring network monitoring and integrated simulation to answer the questions concerned with the China's ecosystem transformation, such as its driving force, dynamics and mechanism, temporal and special characteristics and impact on the global environmental changes.

Sponsored by the Chinese Ecosystem Research Network at CAS (CERN), the laboratory will carry out network experimentation, belt transect analysis, long-term dynamic observation, and specialized research projects over the ecological system. It will exert tremendous impact on the ecological research and application, as the only one laboratory in the field of network monitoring and simulation.

### A massive Chinese floral corpus completed (CAS, 2005-04-05)



(Through the efforts of four-generation Chinese botanists over the past 50 years, a massive 81-volume corpus (in 126 books) on China's flora has finally been completed, announced a recent news release held on March 31 in Beijing.)

Through the efforts of four-generation Chinese botanists over the past 50 years, a massive 80-volume corpus (in 126 books) on China's flora, *Flora Reipublicae Popularis Sinicae* (Chinese edition), has finally been completed, announced a recent news release held on March 31 in Beijing.

In comparison with the similar works in the world, the corpus are unmatched in terms of the number of the catalogued plant species, textual length and overall quality of the compiling scholarship, said CAS Vice President Chen Zhu at the news conference, which was jointly organized by the Ministry of Science & Technology (MOST) National Natural Science Foundation of China (NSFC) and CAS. "It is the most comprehensive, most voluminous and most complete flora ever emerging in China in the latest 100 years," he added.

The botanical richness of China is unrivalled among countries in temperate latitudes. As the third richest country in the world for plant life, China holds some 12% of the world's plant biodiversity. The magnificent *Flora* is a comprehensive summary of the vascular plants native to China (including pteridophytes and seed plants). Vascular plants, constituting the center piece of plant resources, cover the overwhelming majority of plants for daily life such as grain, cotton, vegetable, timber, medicinal herbs and forage. The work documents more than 30,000 indigenous species of such plants (in 301 families and 3,408 genera) in China, with more than 540 million characters and some 9,000 illustrations. As well as detailed descriptions, illustrations, and keys to the genera and species, each family treatment also includes information on economic uses and taxonomic importance, Chinese names, and much more. Among the 30,000 plants catalogued by the corpus, more than 10,000 were discovered and named by Chinese scientists.

Written floras are important resources that provide information about the plants of a region and form the basis for ecological and systematic studies, studies of biodiversity and economic botany, land use planning and conservation. Floras are especially important for the study of biogeography because they provide the information necessary for comparing the vegetation in both nearby and distant regions.

Although Chinese scientists started to collect of plant species and literatures with an ambition for the compilation of a national flora as early as in 1920s, the work on the magnificent *Flora*

*Reipublicae Popularis Sinicae* actually began in early 1950s. It was interrupted in the 1960s and early 1970s during the so-called Cultural Revolution, then resumed in the 1970s and has continued to the present.

Under the auspices of CAS and with the support from MOST and NSFC, the work has involved hundreds of botanists across the country. Its Editorial Committee was officially inaugurated at CAS in 1959 and Qian Chengshu (1883-1965) and Chen Huanyong (1890-1971) co-chairs the Committee. Since then three noted botanists, Lin Rong (1903-1981), Yu Dejun (or Yu Te-tsun, 1908-1986) and Wu Zhengyi (Wu Cheng-yih; 1916- ) have served as its editor-in-chief successively. Among the 126 books contained in the Flora, 119 were completed by after 1978 when the opening-up policy and reform drive were introduced to the country. The English edition of the work, *the Flora of China* was initiated as a joint Sino-American venture in the early 1980s.

**Tremor monitoring network established for Three Gorges reservoir area  
(People's Daily, 2005-04-05)**

A tremor monitoring and early warning network for the Three Gorges reservoir area was set up in Chongqing, western China's biggest municipality, the local government said.

The network combines a local earthquake monitoring station with the city's GPS monitoring network. It will improve the existing geological disaster monitoring system, which was designed for detecting medium and strong geological movement, the city's seismological bureau said.

"With the new network, even the slightest movement in the reservoir area can be detected, providing local government complete first-hand information," said Hu Xuqing, an official in charge of the geological calamities prevention office of the reservoir area.

The construction of the Three Gorges Project on the Yangtze River, the world's biggest hydro-electric project, began in 1993 and is expected to be completed in 2009. The huge reservoir began to fill in June, 2003, with more than 220 counties inundated in Chongqing and Hubei Province on the river's upper and middle reaches.

Geological disasters like landslides, collapses and muck-rock flows were very common before the construction of the Three Gorges Project, sparking fears about possible calamities after the water storage.

China has invested more than 4 billion yuan (482 million US dollars) in the prevention and control of geological disasters in the Three Gorges area. This new network is a part of the system, said Hu. "We have started 24-hour monitoring of the geological situation in the reservoir area and will issue early warnings if necessary," he said.

Hu said that a special geographical disaster data base for the reservoir area has been established and advanced technologies like satellite remote sensing are being used to monitor the geological situation in the area.

**Scientists warn global warming may trigger water crisis in Yellow River**  
(CAS, 2005-04-06)



The temperature of the upper reaches of the Yellow River, the second longest river in China, is clearly relevant with the world-wide warming trend, according to a study conducted by CAS researchers and their colleagues from administration of hydrology and water resources of the Upper Reaches of the Yellow River. Due to the possible temperature hike and drastic decline in local precipitation, the runoff in the reaches may face a trend of continued decrease over the next decade, they warn.

The prediction is made after an analysis of the characteristics, possible causes and trends of variations of temperature, precipitation and runoff in the upper Yellow River basin using the hydrological and meteorological data over the past 50 or so years at some observation stations, report the scientists in a recent issue of the Journal of Glaciology and Geocryology.

The study forecasts the possible changes of runoff over the Yellow River Basin under global warming scenarios, notes Prof. Lan Yongchao, lead author of the article and an expert in forecast models of long and mid-term river runoffs and water resources from the CAS Cold and Arid Region Environmental and Engineering Research Institute.

The upper portion of the Yellow River to which he refers in the study is the Yellow River drainage area above Tangnag in the northeastern part of the Qinghai Tibetan Plateau, notes Prof. Lan. Although the topography is high and cold and signs of human habitation sparse, the valley above tangnag is the source of more than 40% of the Yellow River's water, and the collection area comprises 16.2% of the Yellow River's total drainage area. The place is also the general exit for the Yellow River headwaters region; all the water flows through this point to its next stop--Longyangxia Reservoir.

In order to forecast changes in upper Yellow River water levels under these climatic conditions, Lan's group sequenced 63 possible climate combinations, with temperature rise ranging from no change to 3°C and precipitation fluctuating in a range of 20% increase to 20% decrease. The most beneficial of these climate combinations maintained temperature at the current level and increased precipitation 20%; the worst combination caused a 3°C rise in temperature and a 20% drop in precipitation. In the former scenario, the study indicates, the increase range may be more than that of precipitation because of the synchronously increasing supply of meltwater from snow, glaciers and frozen soils. In the latter scenario, then the amount of water in the upper reaches of the Yellow River will decrease 50% or more from the present level.

Studies show that due to the changes in the heating conditions and reorientation of the atmospheric currents, it is inevitable to give rise to the renewal of the water cycle and temporal and spatial redistribution of the water resources so that both the ecological setting and socio-economic

development in a region will be influenced. The latest decade saw the highest record in the average temperature per year since the beginning of meteorological observation about 140 years ago in the River's upper reaches. In the same context, the decade registered the lowest annual runoff during the past 50 years since the region has its own hydrological records, including the minimal incoming river water flow in 2002 at the hydrological station's cross-section. The big-margin decrease in the incoming flow volume not only comes across disastrous losses in the northwestern China's power grid, in which hydropower plays a predominant role but also greatly imposes a restraint on the development of the whole valley of the Yellow River even the regional GNP of the north China on the whole. The research project predicts the global warming-up trend will be going on in the 21st century, averaging a rise up to 1.5 - 4.5°C in the temperature on ground surface. The sustained and steady trend will lead to an intensified tension in the water-supplying situation which has been so far becoming oppressively tense in the River valley. The experts suggest that, in consideration of the further demands posed by the regional growth in the socio-economic development in coming years and the uncertainty in the local precipitation in the upper reaches, the overall hydrological situation will be menacingly grim. Thoroughly to do away with the issues by uprooting them, it is advisable to make the waterworks operational in the western part of the national program to shift water from the water-rich south to the arid north in an early date.

### **“Ocean No 1” lets China's global research mission dream fly away (People's Daily, 2005-04-06)**

With sounding a siren, the scientific mission ship of the Dayang Yihao (Ocean No 1) said good-bye to the crowd seen off. From the morning of April 2 the research ship would visit the Pacific Ocean, the Atlantic Ocean and the Indian Ocean after setting off from Qingdao in East China's Shandong Province, which is the first ever round-the-world ocean research mission for China.

The research ship is a 5,600-ton scientific mission ship meticulously equipped by China with powerful ocean navigation capacity and multi-disciplinary comprehensive conditions for research work. The round-the-world scientific research mission not only makes the long-term dream of Chinese ocean circles for sailing the three oceans come true, but also will write a new and brilliant page for the development history of China's ocean undertaking.

#### **Surface drift bottles: packed with Olympic invitation letters**

On April 2 12 pupils with drift bottles in hands caught attention at the sailing ceremony held for the first ever round-the-world ocean research mission. Lu Huisheng, captain of the vessel said that the 15 drift bottles made by pupils are the "special gifts" on board the ship. The 15 bottles will be divided into three groups with each group consisting of five bottles, throwing away to three oceans respectively. They will be put into the three oceans of the Pacific Ocean, the Atlantic Ocean and the Indian Ocean.

A red Chinese knot, a small sailing ship, a color painting by Qingdao young pioneers and a invitation letter from the Sailing Ship Committee (Qingdao) of the 29th Olympic Games Organizing Committee' will be packed into each transparent drift bottle.

The invitation letter is written as follows: "Dear friend: Congratulations if you have gotten the drift bottle as you receive an invitation letter from China's Qingdao -- the sailing ship competition city of the 29th Olympic Games. The invitation letter will be a sailing ship match ticket for you to

watch the 2008 Olympic Games. Situated in the west bank of the Pacific Ocean and bordering the Yellow Sea, Qingdao is a famous tourism city in China. Herein we sincerely invite you to come to Qingdao, China for watching the sailing boat matches of the Olympic Games in 2008. Qingdao is looking forward to your coming!

On the left top of the invitation letter there is a special marker for the Beijing 2008 Olympic Games and a five-ring marker. Below right there is a print of red official seal attached with many contacting ways.

### **What is the mission ship like?**

The original name of "Ocean No 1" was Geologist Peter Andropov. It was once a marine geology and geophysics research mission for the former Soviet Union. In July 1994 China Ocean Mineral Resources R & D Association bought it from the Russian Bureau for Far East Marine Geology Survey.

For better fulfilling the research mission of China's marine resources the ship was reequipped in Shanghai for nearly a year in 2001. The "modern updating project" for the ship was completed with research mission equipment installed in December 2002.

Entering into "Ocean No 1" one will feel entering into a labyrinth. There are more than 10 laboratories on the third and fourth floors on board the ship. The labs include gravity and ADCP, magnetism, seism, comprehensive electron, geology and biologic gene.

Li Jiabiao, research fellow and deputy director with the Second Institute of Oceanography, State Oceanic Administration and chief scientist with China Ocean Mineral Resources R & D Association, said, "Some of our equipment are self-made while others are imported. Generally speaking, the equipment is advanced in the world". For example, the visual deep-sea sampling system can transmit the 6,000-meter deep topographic pictures to the search ship and can take mineral and water samples at the deep-sea surface. The deep-sea rock-sampling drilling machine can drill a core measuring 60 millimeters in diameter and 500 millimeters long at 3,000-deep sea surface.

### **Cover a distance of 60,000 kilometers, aiming at four major results**

The mission is planned to last for 300 days on sea, with the ship returning to Qingdao next January. Excluding the back and forth working distance on the sea the single navigation distance on the Pacific Ocean reaches 10,555 nautical miles or 19,526 kilometers. As a result the total mileage is about 60,000 kilometers.

According to the introduction by a responsible person with China Ocean Mineral Resources R & D Association the first ever round-the-world mission is expected to achieve four achievements.

First, obtain the samples of sulfides, rocks and sediments near the hot liquid mouths at the target areas of the three oceans as well as biologic and other straight samples so as to offer a basis for further indoor researches.

Second, make an initial survey on the resources distribution of hot liquid sulfides in some sea floor areas in order to accumulate experiences and develop a group of ocean professionals for future round-the-world scientific research missions and in-depth surveys and researches on the hot liquid sulfides at sea floors.

Third, push forward the development of ocean scientific researches: obtain the relevant first-hand data including the mineral components, fluid chemical properties and living formation at the hot-fluid jet mouths through multi-disciplinary approaches involving geology, chemistry and biology in order to better understand the geologic formation of hot fluid as well as the functional

mechanism among hot liquid spout minerals, chemistry and living organisms.

Fourth, bring about the development of the related ocean technological equipment.

### **The captain is 38-year-old this year**

Lu Huisheng, captain of the vessel, is 38 years old this year. He has been captain for three years. When answering the question on what is the biggest problem he is facing while sailing, he said his biggest challenge would be safety. He said with long-term experiences, he has mastered a set of safety measures. However, there is also need for especial care.

Besides the work, "Ocean No 1" has offered all of us with sound technological guarantee. The ship has been equipped with satellite telecommunications facilities for wireless surfing online and there is no problem for online surfing. The crew and scientific personnel can contact with their family members by sending emails in order to reduce loneliness.

### **Crew rotation on the way**

The mission is planned to last for 300 days, crossing three oceans ... people cannot help asking: how can the survey personnel and crew work in all the 300 days in such a long journey?

"Quite a part of the personnel will only work for a certain navigation task" said Zhou Ning, department director with the China Ocean Mineral Resources R & D Association. The navigation will be divided into six working areas with five stopovers.

"We will take a rest for about four days for each stopover for supplying fuels, drinking water and vegetable", said Zhou. Part of the survey personnel and crew will be rotated when making stopovers. "There are 30 ordinary seamen on board the ship and there are about 10 crew at home waiting for rotation order". Chief scientists and captains will also be relieved on the way.

### **Field monitoring and research platform on Tibetan Plateau well under construction (CAS, 2005-04-06)**



With an objective of stimulating harmonious development between man and the mother nature on the environmentally fragile Tibetan Plateau, a program to build a field monitoring and research platform launched by the CAS Institute of Tibetan Plateau Research (ITP) last year is in smooth development.

According to ITP Director Yao Tandong, five first-order monitoring stations for geophysical, environmental, and atmospheric research will be set up in the coming 10 years, distributed to cover the major regions of the Tibetan Plateau. And the short-term plan will see three integrated monitoring stations built in Mt. Qomolangma, Nam Co Lake and Lin Zhi area in three to five years.

The whole program touches a good many representative ecological systems ranging from montane forest steppe to alpine desert. The scientific data received from the field monitoring, outdoor research and indoor analysis will facilitate to catalyze the social and economical sustainable development in Tibet and deepen the implementation of West Development Campaign on a large scale.

With the field monitoring facilities in place, the on-the-spot investigation for the Nam Co Station has been completed recently at the world's second largest and the highest alpine salt lake. The observation base in the region will assist to integrate the scientific outcome and carry out study on geodynamics. Afterwards, the scientists will switch to nail down the proper sites for the other two. Known as "the third pole of the earth", the Tibetan Plateau plays an important role in the world's climate, geodynamics, and environment. The platform is expected to produce a tremendous influence on both the natural environment and the human activities on the "roof of the world" and its neighboring regions as well.

### **Scientists discover a meltwater pool in Tianshan Mountain (CAS, 2005-04-07)**



Few people have ever imagined there would be sapphirine pools studded a glacier. The pool formed on an ice sheet is a kind of glacial landforms, which is embraced as amazing scenery by tourists, but worried vigilantly by the glaciologists.

On a prospecting tour to the northwest China's Glacier No. 1 on Tianshan Mountain, an explorative team from the CAS Cold and Arid Regions Environmental and Engineering Research Institute encountered a 15-meter-long, 4-meter-high nude ice cliff in the northwest of the source area on the glacier top. To their surprise, the south-facing ice cliff overlooked an approximately 30-m<sup>2</sup> pool sprawling on the glacial sheet, which according to the experts is at least 1.5 m deep and formed by the summer ablation. Since it was in winter, the water surface was frozen, and people could walk on it.

Stepping to further research in the source area, the scientists found that there was a distinct dust layer under the snow pack supposedly due to summer ablation. In addition, a snow-free region of

about 15 m<sup>2</sup> on the top of the ice cliff presented with the glacier ice barely exposed to the sun, suggesting intensive melting. The scientists detailed that the tail of the summit of the south-facing east branch of the Glacier No. 1 is receiving a large amount of sunshine, leading to partially glacial melting and also directly causing the formation of the melt water pool.

The lake was regarded as a signal indicating that the whole glacier may be seeing an accelerated process of ablation and will disappear in a relatively short time, warns Pro. Li Zhongqin. It's the right time to reconsider our living style and producing mode in order to protect the environment, which is already fragile enough. During the 38 years from 1962 to 2000, the No. 1 glacier shrunk 0.22 km<sup>2</sup>, and the retreat is on expressway due to the resultant reaction of all kinds of factors including global warming-up.

Added by Pro. Li, the Glacier No.1 is of significant research value. It's among the China's long-term observed glaciers, one of the typical central Asian's arid & semi-arid glaciers enlisted in the World Glaciers Inventory, and the top 10 representative glaciers worldwide recorded by the World Glacier Monitoring Service.

This discovery enriches the environmental research materials and will facilitate the study in various fields ranging from the ecological changes to the economic development within the Urumqi River drainage area.

The fairy-tale image of a meltwater pool nestling on a thawing glacier is actually an alarming signal sent by the on-going ominous trend of global warming-up.

### **Top legislature visits water and soil conservation center**

**(CAS, 2005-04-07)**



On April 5, Mr. Wu Bangguo, chairman of the Standing Committee of the National People's Congress, made an inspection tour of the Research Center for Water and Soil Conservation and Eco-environmental Sciences in Yangling, northwest China's Shaanxi Province. After listening to a report on the Center's research developments by Director Li Rui, Mr. Wu visited the Center's Laboratory of Artificial Precipitation and a high-tech demonstrative base. The Center was jointly established by CAS and Ministry of Education.

**CAS scientist finds out algorithm for early warning of tsunami  
(CAS, 2005-04-08)**



The Dec. 26, 2004 earthquake under the Indian Ocean floor triggered an outbreak of devastating tsunami, leading to incredible damage and tragic loss of life in littoral countries. Records showed that the killer tsunami reached the seaside Indonesian islands after half an hour, and within several hours it reached the beach lands of Sri Lanka, Thailand and other countries at the rim of the Ocean.

While earthquakes are somewhat unpredictable, and always beyond our control, according to experts, earthquake related tsunamis can be measured and predicted in time to release alert to residents of susceptible coastal areas. If an early warning system had been available in the Indian Ocean region, they believe, the casualties and losses would have been greatly mitigated.

In collaboration with US colleagues, Prof. Ni Sidao from the University of Science and Technology of China, a CAS affiliate, works out a rapid method to assess the seismic hazard in the immediate future by analyzing the high-frequency seismic signals. As reported in the March 31 issue of the journal *Nature*, the algorithm could determine the earthquake's rupture length, duration and other fundamental parameters for earthquake with magnitude 9 and above within 25 minutes so that an early warning may be issued.

The tsunami is often caused by underwater earthquakes, which usually radiate such seismic waves as the P-wave and S-wave. Through reactions with the earth surface and interior velocity structure, surface waves and secondary body waves (such as PP, PPP and SS) are formed. A big quake also excites the earth's free oscillation at a very low frequency. In different frequency ranges, the seismic waves have different strengths and travel at different speeds. P-waves, which always arrive first, play a critical role in determining the earthquake's basic parameters. A conventional approach is to invert the rupture process with low-frequency P-waves (less than 0.5 HZ). In the case of a mega quake, the P-wave would always be contaminated by the signals of PP and other secondary waves so that the basic parameters cannot be determined immediately. More time will be needed if using data from surface waves or the free oscillation.

As described in the paper titled "Energy radiation from the Sumatra earthquake," Prof. Ni and his US co-workers from the California Institute of Technology have succeeded in analyzing the inter-relations between the length of the seismic wave and its amplitude by using the high-frequency signals carried by the P-wave (above 2 HZ, where signals from PP, PPP and S waves are very weak) from the massive Sumatra-Andaman earthquake on December 26, 2004. The scientists were able to rapidly define the directivity of the rupture caused by the earthquake.

In this way, they discovered the rupture length was longer than 1,200 kilometers and the earthquake's duration was more than 500 seconds, substantially longer than those of the great Chilean quake in 1960. This method is found particularly applicable to great earthquakes, since it is suitable for scrutinizing powerful earthquakes higher than Mw 9 (moment magnitude). In addition, it is capable of determining the key seismic parameters within 25 minutes. By providing the timely key data to a tsunami-simulator, the approach can send out an early warning before the arrival of a catastrophic tsunami and hence massive casualties and economic losses may be avoided.

Ni et al.'s work is mirrored by Seth Stein and Emile Okal, both from Northwest University, based in Illinois, US, in another research paper published in the same issue of Nature. He hopes to further cooperate with the United States Geological Survey in data sharing and methodology discussion. "If global cooperation runs smoothly," Ni said, "we could realize effective early warning for big tsunamis caused by Magnitude 9 and above earthquakes in two years, with sound reliability."

### **Study shows early Earth atmosphere hydrogen-rich, favorable to life (CRI, 2005-04-09)**

Early Earth atmosphere was hydrogen-rich, favorable to life, US scientists said in a study published Thursday in the online edition of journal Science.

This new finding indicates Earth in its infancy probably had substantial quantities of hydrogen in atmosphere, altering the way many scientists think about how life began on the planet, according to researchers at the University of Colorado.

The new study indicates up to 40 percent of the early atmosphere was hydrogen, which implies a more favorable climate for the production of pre-biotic organic compounds like amino acids, and life ultimately.

Scientists believe Earth was formed about 4.6 billion years ago, and geologic evidence indicates life may have begun on Earth roughly a billion years later.

"This study indicates that the carbon dioxide-rich, hydrogen-poor Mars and Venus-like model of Earth's early atmosphere that scientists have been working with for the last 25 years is incorrect," said Owen Toon, senior author of the paper. In such atmospheres, organic molecules are not produced by photochemical reactions or electrical discharges.

Toon said the premise that early Earth had a carbon dioxide-dominated atmosphere long after its formation has caused many scientists to look for clues to the origin of life in hydrothermal vents in the sea, fresh-water hot springs or those delivered to Earth from space via meteorites or dust.

The researchers concluded that even if the atmospheric carbon dioxide concentrations were large, the hydrogen concentrations would have been larger. In that case, the production of organic compounds with the help of electrical discharge or photochemical reactions may have been efficient.

Amino acids that likely formed from organic materials in the hydrogen-rich environment may have accumulated in the oceans or in bays, lakes and swamps, enhancing potential birthplaces for life, the team reported.

The new study indicates the escape of hydrogen from Earth's early atmosphere was probably two orders of magnitude slower than scientists previously believed. The lower escape rate is based in part on the new estimates for past temperatures in the highest reaches of Earth's atmosphere some

3,500 kilometers in altitude where it meets the space environment.

While previous calculations assumed Earth's temperature at the top of the atmosphere to be well over 800 degrees Celsius several billion years ago, the new mathematical models show temperatures would have been twice as cool back then. The new calculations involve supersonic flows of gas escaping from Earth's upper atmosphere as a planetary wind, according to the study.

Despite somewhat higher ultraviolet radiation levels from the sun in Earth's infancy, the escape rate of hydrogen would have remained low, the researchers said. The escaping hydrogen would have been balanced by hydrogen being vented by Earth's volcanoes several billion years ago, making it a major component of the atmosphere.

In 1953, University of Chicago graduate student Stanley Miller sent an electrical current through a chamber containing methane, ammonia, hydrogen and water, yielding amino acids, considered to be the building blocks of life.

"I think this study makes the experiments by Miller and others relevant again," Toon said. "In this new scenario, organics can be produced efficiently in the early atmosphere, leading us back to the organic-rich soup-in-the-ocean concept."

In the new scenario, it is a hydrogen and carbon dioxide dominated atmosphere that leads to the production of organic molecules, not the methane and ammonia atmosphere used in Miller's experiment, Toon said.

### **China-made seawater desalination facility in operation**

**(People's Daily, 2005-04-08)**

China has succeeded in operating its first seawater desalination membrane, making it the fourth country, after only the United States, Japan and South Korea, to own the technology, said an expert with the National Bureau of Oceanography Tuesday.

The production line, run by Hangzhou Development Center of Water Treatment Technology in east China's Zhejiang Province, will significantly reduce the seawater treatment cost, said Wang Shougen, deputy director of the center.

According to Wang, the average price of desalted seawater now stands at five yuan (about 0.6 US dollars) per ton, among which a considerable part is for use of the imported membrane. If the Chinese alternative is used, water treatment cost could be reduced by at least 0.2 yuan (about 0.02 US dollars).

The reverse osmosis membrane has been the dominant technology worldwide for desalination ever since the United States developed it for more than 40 years ago.

Wang said his center will focus further on the anti-pollution and antioxidant membrane to protect water resources.

With a population of about 1.3 billion, China has suffered a serious water shortage especially in the northern and northwestern regions. In recent years, China has adopted a series of measures, including building reservoirs and diverting water from the water abundant south to water-hungry north, to resolve the shortage.

### **A batch of new water-saving products resulted from major agricultural water-saving S&T project**

**(MOST, 2005-04-12)**

Organized and implemented by MOST, Economical Green House Dripping Irrigation System—a

major S&T research project of water-saving agriculture—has filled a gap in China and broken foreign blockade on new technologies. An economical micro-irrigation system that is suitable for sunlight green house irrigation using small diameter micro-irrigation tubes (hoses) has been developed. A production line of high speed (60-80m/min) and stable 6mm drip irrigation pipes has been built. The price of drip irrigation pipes is reduced from 0.6-1.2 Yuan/m to 0.25 Yuan/m. The price of drip irrigation hoses is reduced from 0.15-0.2 Yuan/m to 0.08 Yuan/m. The price of green house micro-irrigation system is reduced from the present 600-3000 Yuan/mu to 350-1000 Yuan/mu. Cost has decreased by over a half. Performance of the products has reached world advanced level.

A breakthrough has been achieved in omni-degradation water-holding agricultural film, signifying an agricultural revolution. Using magnetism oscillation blown film technology, omni-degradation water-holding agricultural film of 20 micron in thickness has been produced, and a production line of 200 tons per year has been set up. Tests have shown that omni-degradation can be achieved within a year. The present agricultural film can be completely replaced.

Substantial progress has been made in the manufacturing of new mineral substance water retention agent. A new type of mineral substance water retention agent has been developed on the basis of instituting mineral substance-high polymer high sop up new type water holding composite which has high imbibition multiplying factor, good water holding capacity, excellent salt resistance and high gel strength, etc. And the price has been reduced from around 20 thousand Yuan/ton to about 9000 Yuan/ton, which is very competitive in the market.

Advanced international standards have been satisfied in the development of a new type of large caliber tubular product for agricultural water transfer. The newly-developed large caliber nylon multiunit tubular material for agricultural use, the reinforced polyethylene tubular material, the bamboo fibre composite tubular product have improved performance by over 30% compared with the high density polyethylene (HDPE) tubular material, while the cost has been cut by over 30%, satisfying advanced international standards and having great prospects in future.

A series of standardized tillers have come into being for ponding and soil moisture preservation. Twenty kinds of combined work and nearly 40 kinds of combination variety can be realized, such as plough combination (including deep loosening), planting combination (including overlain-film semination), plough and planting combination (including non-tillage planting) and multi-functions of straw manuring and root stubble shattering. The products boast of stable performance, low cost, broad future application.

Notable progress has been made in the development of water-saving equipment and the industrialization of products. Competitiveness in the international market is becoming ever stronger. A batch of leading domestic water-saving enterprises have been led into fast growth such as Tianye in Xinjiang, Lvyuan in Beijing, Laiwu in Shandong and Yatong in Fujian. Domestic-made agricultural water-saving equipment and market share have increased from 30% to 50%, which means that China has basically become independent of import in this respect.

### **China's youth leader awarded (CRI, 2005-04-12)**

Zhou Qiang and the All-China Youth Federation have won the special prize of the inaugural Champion of the Earth environmental award.

According to the United Nations Environment Program (UNEP), the prize goes to China in

recognition of Zhou's "outstanding achievements" as honorary chairman of the Federation and leader of the China Mother River Protection Operation.

The judges praised the Federation as "a very important force for protecting the environment," recalling that it has undertaken 882 afforestation projects covering 191,000 hectares in China.

At the beginning of 1999, Zhou promoted the Mother River Protection Operation in China and mobilized the Chinese youth to protect the environment. To date, 300 million young people have been mobilized to participate in protection of the mother river.

As the only national youth association in China, the All-China Youth Federation is a very important force for protecting the environment in China and the global environment.

**DFG visitors meet with CAS scientists for Tibetan Plateau studies  
(CAS, 2005-04-14)**



The visiting President of the German Research Foundation (DFG) Prof. Ernest-Ludwig Winnacker held talks with Prof. Liu Xiaohan, vice director of the CAS Institute of Tibetan Plateau Research (ITP), and his colleagues on April 11 in Beijing.

**Protecting biodiversity for the sake of cultural diversity  
(CAS, 2005-04-14)**



As one of the 55 ethnic groups in China, the Naxi people, with a population of 300,000, mostly live in mountainous communities in the Lijiang Naxi Autonomous County in southwest China's

Yunnan Province. They created pictographic characters called the "Dongba" script about 1,000 years ago, and produced hand-made paper to record their beautiful folklore, legends, poems and religious classics. However, the technique is facing extinction nowadays for few people know the craft and not enough raw materials available for the products.

With the support from Chinese Academy Science (CAS) and the Netherlands-based Interchurch Organization for Development Co-operation (ICCO), a group of ethno-botanists headed by Prof. Xu Jianchu from the CAS Kunming Institute of Botany has carried out studies into the mechanism for the saving the legacy from dying out.

Being in the mountainous area at the northwest tip of the Yunnan Province, which is noted for its flourishing cultural and biological diversities, the Naxi culture is intimately related to their mountainous environment. Studies show that the hand-made Naxi paper is the outcome of a marriage between paper-making technique, which was introduced to Yunnan when Naxi ancestors settled in Lijiang, and rich plant resources in the vicinity. Researchers discovered that the paper, which is made of local plants containing a natural insect repellent, is favorable for the long-term preservation. As a result, more than 30,000 copies of Dongba manuscripts are survived and collected by libraries worldwide.

The experts believe that it is necessary to prevent the complete loss of the papermaking skill as a major medium for the Dongba culture by teaching the young generations the traditional technique of papermaking. However, the exhausting supply of the raw material for the paper will hinder the practice.

It is discovered that the Dongba paper is made from two endemic stringbush plants *Wikstroemia delavayi* and *W. Lichiangensis*, noted for its well-developed bast fiber. In the period from 1950s to 1970s, the bast of the plants was largely collected by industrialized papermaking mills outside the province. As a result, the local population of the plants has been reduced into shrubs or thickets as the total volume of the resources has been mostly devastated. Although some local people would like to pick up the technique, the practice is strict due to the reduction of domestic plants.

There exists a close interrelationship between the traditional culture of the ethnical communities and native taxa, says Prof. Xu Jianchu. A region with magnificent biodiversity often has tremendous ethnic and cultural diversity. The various natural settings and rich biological resources in the region could be not only material basis for the ethnical people to survive and make eco-social progress, but also for their evolution and cultural development. When traditional culture declines, the local biodiversity will be under threat, and *vice versa*.

In order to protect and develop the ethnical culture, the scientists made following suggestions. First, the intellectual property rights of the ethnic technique should be fully recognized and protected. In this way, the paper-making technique may survive under the all-sweeping impact of the modern civilization.

Second, a full play will be given to the market level. Marketing mechanism might be introduced to transform the Naxi paper's sole function of cultural heritage as the Dongba scripture to communities as souvenirs.

Third, efforts are to be made for sustainable development of the local plant resources. With the support of the project, local people have succeeded in breeding the fibrous plants with cuttage and seeds in their experimental plots. In the current context of returning the reclaimed farmlands into their original state of forests and grasslands, it is expected that the raw material crisis in the traditional paper-making technique might be mitigated in coming years.

### **China to invite world leading scientists for glacier research**

**(CRI, 2005-04-14)**

The Chinese Academy of Sciences (CAS) Institute of Tibetan Plateau Research announced here recently it would seek leading global scientists in plateau research to work on the Qinghai-Tibet Plateau.

The CAS institute is providing ten senior research positions, whose annual salaries range from 80,000 to 150,000 yuan (9,700 to 18,000 US dollars) and include other perks.

The invited researchers are expected to focus on geodynamics, environmental and climate change, as well as atmosphere and earth face circles.

Successful candidates must hold doctoral degrees, be under the age of 45 and have a minimum of eight years' relevant research experience. They should also have published at least four academic papers in journals cited by the Science Citation Index, said a human resources official with the institute.

The Institute has already accepted Lonnie Thompson, a world recognized glacier expert who is also a professor at Ohio State University, to be vice institute director of academics.

With Prof. Thompson as a conduit, the institute is cooperating with US research groups to carry out joint research programs. One such endeavor is to take ice cores from icecaps in Southwest Tibet some time in the latter half this year.

Yao Tandong, director of the institute, said Wednesday in an interview with Xinhua that the Institute of Tibetan Plateau Research needs to borrow foreign knowledge and experience in glacier and environmental research.

The CAS started scientific research on the plateau roughly 50 years ago. In March 2003, the CAS reshuffled its glacier research resources and renamed the research body.

The institute targets at the toughest subjects in the field, rather than scattering limited resources in miscellaneous research projects.

In contrast to other CAS organs, the institute is headquartered in Beijing and has centers in Lhasa, capital of the Tibet Autonomous Region, and Kunming, capital of Yunnan Province.

Most researchers work in labs in Beijing, which are also platforms for international academic exchange.

The Lhasa center oversees construction and maintenance of outdoor observation stations, while the Kunming center is responsible for establishing a plateau plant samples reserve and coordinating biological research programs.

The Qinghai-Tibet Plateau is the world's highest.

### **Scientists sought for glacier research**

**(CAS, 2005-04-19)**

The CAS Institute of Tibetan Plateau Research announced recently it would seek leading global scientists in plateau research to work on the Qinghai-Tibet Plateau.

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The Qinghai-Tibet Plateau is the world's highest.

### **China becomes member of Arctic studies committee**

**(Xinhua Net, 2005-04-20)**

The Ny-Alesund Science Managers Committee (NySMAC), known as the "United Nations of Arctic studies", welcomes China's accession, said Guido di Prisco, the president of NySMAC.

"The NySMAC was established in 1994 to enhance cooperation and coordination amongst research activities at the Ny-Alesund International Arctic Research and Monitoring Facility," said Prisco in the Seventh Arctic Science Summit Week (ASSW2005).

"We accept China as the new member of NySMAC," said Prisco, "because it has become one of the most important partners of Arctic studies."

Running through April 17 to 24, the ASSW, which has attracted over 100 scientists from 22 countries, will be centered around "Arctic studies and its relations to China's climate."

"Our committee regularly convenes international scientific seminars and workshops focusing on topics related to research carried out in the Arctic area," said Prisco. "So far such countries as Norway, Germany, Japan, France, Italy and China have established laboratories in Ny-Alesund area."

Wang Shuguang, the director of China National Bureau of Oceanography (NBO) said that "China lies mainly in the Northern Hemisphere with its complicated natural and environmental variations and the Arctic region will directly affect China in such areas as ocean, climate, ecological conditions and economy."

China began its research in the Arctic area in the 1990s and carried out two scientific observations

in the Arctic area in 1999 and 2003. In 2004, China established its Yellow River observation site in Norway.

Thomas Pyle, the president of The Arctic Ocean Science Board (AOSB) marked China's role in research and exploration of the Arctic area as "increasingly important", saying that "we'd like to broaden the cooperation with China on Arctic research."

The ASSW was established in 1999 and is held annually to discuss and exchange the latest findings in Arctic area and to explore the possibilities of international cooperation.

### **Chinese Continental Scientific Drilling reaches 5, 158 meters**

**(People's Daily, 2005-04-20)**

After nearly four years' efforts, a borehole depth of 5, 158 meters has been realized at the No. 1 well of Chinese Continental Scientific Drilling (CCSD) program in Maobei Village, Donghai County of east China's Jiangsu Province accompanied with a series of scientific achievements.

It signifies China's significant breakthrough in its exploration deep into the earth.

According to Wang Da, chief commander of the program, due to the block of hard rocks, mankind has very little knowledge of the inner part of the earth. Since the 1950s, scientific drilling was started with collection of fluid from core, debris and rock layer by means of drilling, and geophysical logging as well as long-term observation through equipment placed at the drill hole.

To date, the deepest drill hole in the world is the superdeep drill hole at Kola, which reaches 12, 262 meters.

Chinese scientists started on June 25, 2001 drilling at the Sulu ultra-high-pressure metamorphic belt in east China, which is a border of converging plates of global implication. With China's self-developed technologies, a drilling depth of 5, 158 meters into the hard crystalline rock was realized, and precious samples of core deep at 5, 118.2 meters were acquired.

It is the deepest drilling both in China's history and among the over 20 ongoing projects of the International Continental Scientific Drilling Program (ICDP).

Through the scientific drilling this time, Chinese scientists made a number of innovative achievements as they uncovered the substance composition deep at the convergent boundary of plates and the composition deep in the ultra-high pressure metamorphic area; proved the existence of magnificent geological event in which plate with a huge amount of substance rushed to deep mantle, and the significant splitting seven to eight million years ago; marked typical geophysics field in crystalline-rock area; put forward new model of "deep subduction-exhumation".

China will establish a long-term observation station at main drill hole of the No. 1 well for further information on inside the earth.

### **Arctic icecap to melt completely by 2080: scientist**

**(Xinhua Net, 2005-04-20)**

A Chinese scientist predicted that the icecap of the Arctic area in summer will totally disappear if the current melting speed remains unchanged.

Zhang Zhanhai, director of Polar Research Institute of China, said that the melting rate of Arctic ice is "alarming" -- with the ice area shrinking by 10 percent and the thickness by 42 percent over the past 30 years.

"If this situation keeps unchanged, the world should be prepared for a more sizzling summer," Zhang warned at the ongoing seventh Arctic Science Summit Week (ASSW), being held in

Kunming, capital city of southwest China's Yunnan Province, from April 18 to 24.

China is a Northern Hemisphere country with sophisticated natural and environmental variations and any changes take place in Arctic area will directly affect the climate of China, experts say.

Zhang said, the cold front that affects China mainly comes from Siberia, but the source of the cold front is Arctic. "To some extent, Arctic is an 'air conditioner' of countries in the North Hemisphere," Zhang said.

"With more ice melting and the shrinking of permafrost, the Northern Hemisphere countries will experience more awful weather," said Zhang.

The direct influence of Arctic on the climate in Northern Hemisphere countries has remained a top concern of experts attending the summit.

Launched in 1999, the summit has become a platform where experts from various countries exchange views and Arctic research achievements, covering influence of human activities, ocean ecology, climatic changes, mechanism of polar climate formation, among others.

China has contributed many efforts to study the polar regions, including the sporadic observation activities since 1990s and the latest establishment of Yellow River observation site in Norway in July, 2004.

The melting of Arctic ice will not only be a sign of threat, it is also a good news, Zhang said.

"It is at least a good news for ocean shipping," said Zhang. "We can cut the journey by one-third by traveling directly to the Atlantic via the Bering Strait Gateway and via the Arctic Ocean."

### **China's first round-world oceanic expedition underway**

**(People's Daily, 2005-04-22)**

China's first round-world oceanic research expedition ship is now working at the West Pacific Ocean as planned. The expedition team has obtained a batch of data, minerals from seabed and environment samples. The team members also cast three drift bottles that carry Chinese people's best wishes in the Pacific Ocean.

The expedition team set out from Qingdao on April 2nd for the 300-day research. On Apr 5 the "Ocean One" entered the Pacific Ocean, and it arrived at working area on Apr 10. At 2 a.m. the members started experiments in order to test winch system and watertight function for the video system. Upon the experiments' completion at 6 pm, they started sampling by shallow drilling.

"The member who suffers from serious seasickness is back to normal. This makes all of us a little relieved," said Political Commissioner Zhang Baoming on April 13. By Apr 15 the team had surveyed a couple of sites in the working area.

On Apr 16 the team held a ceremony to release the 2nd batch of drift bottles. Chief Scientist Wang Chunsheng, Captain Lu Huisheng and Political Commissioner Zhang Baoming cast three drift bottles in the vast Pacific Ocean, hoping the ocean will carry their wishes for peace to people in different countries.

Due to influence of tropical cyclone and subtropical high the wind scale has increased to Beaufort scale 7 to 8 recently, which has brought difficulty for fix-point operation. To avoid influence of tropical cyclone, the team has moved to another working area in the evening of April 16, where they carried out photographing in deep sea and collected 700 kilograms of minerals and rock samples.

**Progress on studies of element cycling in wetland ecosystem on Sanjiang Plain  
(CAS, 2005-04-22)**



Sanjiang Plain in northeast China's Heilongjiang Province is a vast, low lying alluvial floodplain of about 54,000 square kilometers between the Songhua, Heilongjiang and Wusuli rivers. It is the largest fresh water wetlands in China, and one of the world's three major black-soil belts.

Supported by CAS, a project was started in 2002 to study the cycling of elements in typical marsh ecosystem in Sanjiang Plain, and after two years study, staged progress has been achieved. In January 2005, a panel of experts organized by the CAS headquarters made a mid-term assessment, in which the project won universal acclaim from the experts.

Headed by Prof. Liu Jingshuang, vice director of the Northeast Institute of Geography & Agricultural Ecology, CAS, the research team has made efforts to explore the transfer, transformation, build-up and decomposition of such elements as carbon (C), nitrogen (N) and phosphorus (P) in the complicated marsh ecosystem of water bodies, soils and plants, and their exchange with the outside environment.

Their objectives are to explain the fundamental rules concerning the related geochemical processes in the ecosystem, revealing the internal mechanism's influence imposed by human activities on the cycling of C, N, P and other elements in the ecosystem. Based on a clear understanding of the inter-relations between the cycling of the matters and the landscape and functions of the marshes, researchers are expected to offer suggestions for optimal readjustment and managerial modes to maintain the stability and healthy development of the ecosystem.

Until now, the research team has conducted 16 simulation experiments and field observations, collecting more than 5,000 samples and more than 17,000 data.

Through the experiments, researchers have made a clear picture on the following issues:

The water equilibrium of the hydrological system in the wetland and its N- and P-flux are determined; the characteristics in the amassment and decomposition of C, N and P elements in the plants of the wetland are initially revealed; the impacts of external input of N and P elements and the change in the water table on the plant bio-diversity, its density and water quality are explained; the inter-dependence between the variances in C/N and C/P and the wetland's N or P cycling, with the aid of the N isotope-tracking tests, the N transfer among the subsystems and within a subsystem as well as its relations with different environmental factors in the wetland ecosystem are exposed; the rules in releasing the C (or N) containing gases and the influence imposed from other factors under the sway of natural and human activities are developed. Furthermore, the scientists also make clear that the water amount has a more remarkable impact on the wetland than nutrients themselves and based on this, they suggest that water discharge from farmlands cannot lead the latter to eutrophication. They also succeeded in initially establishing a multi-cameral

model for depicting the C-, N- and P- cycling in the wetland ecosystem.

### **China to measure Qomolangma with radar detector**

**(People's Daily, 2005-04-27)**

In 2005 China is to measure the height of the Qomolangma again, this time with a deep ice radar detector, said Sun Zhanyi, senior engineer at the National Geomatics Center, at the base camp. This is the first time that China has used a deep ice & snow radar detector to measure the depth of snow at the top of the Qomolangma.

Measuring the depth of ice and snow at the top of the Qomolangma will be very significant for accurately measuring the height of the Qomolangma. According to sources China tries to measure the height up to the rocks at the top of the Qomolangma after accurately measuring the depth of snow at the Qomolangma top.

To make the measuring more accurate and more scientific apart from the deep ice radar detector China will also use the advanced GPS measuring system. Meanwhile it will coordinate the teams of professional climbers and mapping specialists and bring the equipment up to the top of the Qomolangma for measuring.

### **Successful operation of the "Model Project of Kiloton-level Seawater Circulating Cooling Technology"**

**(MOST, 2005-04-27)**

Major breakthrough has been made in the key technology for the "Model Project of Kiloton-level Seawater Circulating Cooling Technology" in the Program of "Technical Study on Water Safety Control", State key S&T project in the Tenth Five-year Plan, which is organized and implemented by MOST. The model project of 2500m<sup>3</sup>/h seawater circulating cooling technology was put into operation in Tianjin Chemical Plant of Tianjin Bohai Chemical Co., Ltd. on July 16, 2004 and has been operating steadily up to the present. Breakthrough has been made in the large-scale application of the seawater circulating cooling technology to the chemical engineering system. This marks a key step in the industrialized application of the seawater circulating cooling technology, for which China possesses independent intellectual property.

After successful completion of hundred-ton seawater circulating cooling commercial test, the key technologies of seawater treatment corrosion inhibitor, antiprecipitant and bactericide applicable to the chemical engineering system and carbon steel material and the mechanically ventilated seawater cooling tower have been solved through unremitting efforts and persistent work. The first kiloton-level seawater circulating cooling model project of the chemical engineering system has been built. During the operating period of the model project, the technical personnel conducted operation management, testing and monitoring continuously for half a year and completed research on the key technologies for the model project while guaranteeing its safe and stable operation, which has laid a solid foundation for the popularization and application and large scale development of seawater circulating cooling technology in the areas of chemical engineering and petrochemical industry.

After over 9 months' continual operation check, the various indices of the system have all reached design requirements. The independently developed seawater treatment medicament ensures the stable operation of the system. Control of erosion, fouling, bacterial alga meets the national standard indices for fresh water circulating cooling water; the thermal performance and floating

water rate of the independently designed seawater cooling tower reaches or exceeds design requirements; independently developed automated management system operates normally; the heat exchange efficiency of the production equipment has improved notably, satisfying the need of production in hot seasons and raising the output while the quality is guaranteed. In accordance with the data statistics of actual operation, the seawater circulating cooling model project has remarkable economic, social and environmental benefit. The system saves an average of 500,000t fresh water every year. The integrated operational cost has decreased by nearly 50%, compared with fresh water circulating cooling. The discharged condensed seawater has been used for making salt and soda. While seawater circulating cooling "zero" discharge is realized, the annual profit from the salt saved amounts to more than 3 million Yuan.

The model project of seawater circulating cooling technology has fulfilled three innovations: one, it has broken through the forbidden area of circulating cooling water standard requirement stipulated in "Design Specifications for Industrial Circulating Cooling Water Treatment" (GB50050-95) and realized the innovation of using seawater as the industrial circulating cooling water; two, it has broken through the forbidden area of suitable metal material for the seawater cooling technical field and realized the innovation of using plain carbon steel in the seawater circulating cooling system; three, it has reduced the discharge capacity by over 95% compared with seawater direct flow cooling, beneficial to protection of the environment and maintenance of ecological balance and has realized the innovation of environmental protection in the seawater cooling technology. The project has won 4 S&T results of provincial or ministerial level, has developed and applied for 9 new technologies and products and has applied for three patents. Relevant industry standard and technical specification are being drafted. The integration technologies of the "three mediums and one tower" of seawater circulating cooling and the optimized system design of the model project of the 2500m<sup>3</sup>/h seawater circulating cooling technology has filled in a domestic gap and reached international advanced standard.

#### **CAS to set up a lab for mountain hazards and surface process in Chengdu (CAS, 2005-04-28)**

The Key laboratory of Mountain Hazards and Surface Process is to be established at the CAS Chengdu Institute of Mountain Hazards and Environment. Among the six newly-authorized CAS key labs, it's the only one that is located in the west China.

A theoretic and technological system for hazards prevention and environmental protection will be made out with the research focused on the study of the mountain hazards, mountain environment and sustainable development.

#### **Scientists bring home stone samples (CCTV, 2005-04-28)**

The team of Chinese scientists undertaking research on the world's highest mountain, have collected stone samples from the peak and brought them back to Beijing.

The nearly 100 samples are metamorphic rocks and granites, which show the geological make-up of Qomolangma, known in the West as Mt. Everest. The rocks were collected from an area stretching from the scientists' base camp to a point 65-hundred meters up the mountain. Scientists will study the samples to gain information about geological and meteorological changes on Qomolangma over the past thousands of years. This work is expected to take a year to complete.

No samples were taken from above the 65-hundred meter mark because members of the research team began to suffer from altitude sickness. Research in that region has been left to members of the Tibet Mountaineering Association.

### **China steps up research on climate change**

**(CRI, 2005-04-29)**

China will invest in research into climate change to better protect the country's environment.

Research into the impact of climate change on eco-systems and the national economy will be used to develop measures to reduce the negative impact of these changes.

Director of the China Meteorological Administration Qin Dahe said at a forum Wednesday in Beijing that by 2100 temperature changes in China would be greater than the global average.

He has also warned the deteriorating climate conditions would increase the number of natural disasters.

### **World's highest meteorological center erected on Qomolangma**

**(Xinhua Net, 2005-04-29)**

China has built an automatic meteorological observation station at an elevation of 6,500 meters on Mount Qomolangma (Mount Everest), the highest mountain in the world.

The station, located at a narrow pass of Dongrongbu Glacier, will be used mainly for observing the condition of energy and materials conversion at high elevation areas of the mountain, said Jing Zhefan, an associate professor in charge of the project.

Jing defined energy conversion as observation of atmospheric temperature, pressure, humidity, solar radiation intensity, heat flux and atmosphere turbulence, and the conversion of materials as the collection of air and aerosol samples and snowfall and snow pit samples.

"By observing the data, we'll learn about the processes of energy and material conversion at Qomolangma and be able to provide an accurate explanation of the paleoclimate at the core of the snow-ice world," Jing acknowledged.

In 2001, Chinese scientists set up a meteorological observation center on the same spot. The equipment and the data stored in it, however, have disappeared. To ensure normal operation of the station, some members of the team will remain to keep watch until October. Data will be collected each April, Jing said.

The building of the meteorological observation center is part of China's fourth comprehensive scientific survey at Qomolangma, including the re-measurement of its height. This will be the second measurement China has made of the mountain. The first, in 1975, measured the peak at 8,848.13 meters.

**Studies make clear paddy emission of greenhouse gases in China**

(CAS, 2005-04-30)



A decade-long study of CAS researchers into the emissions of the greenhouse gases from rice paddy recently received a first prize for S&T progress from the in east China's Jiangsu Province.

The steady and sustained increase of the greenhouse gases in the atmosphere directly causes the global warming and has become a universal concern of both governments and the public across the world. The rice paddy ecosystem is considered a main source of the gases.

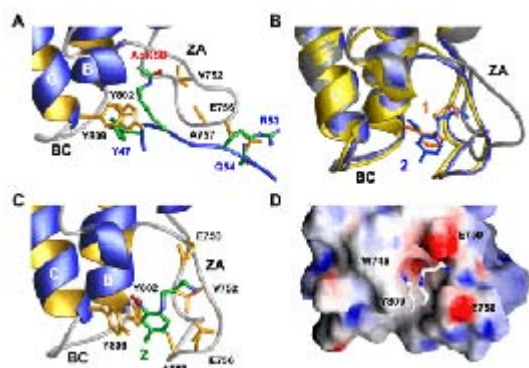
As a major rice producer in the world, China has a rice-planting acreage up to 23 million hectares with 36% of the global rice production. In such a situation, the methane release volume from China's paddy fields becomes a matter of international concern.

After about 10 years, a research group headed by Cai Zucong and Xing Guangxi from the CAS Nanjing Institute of Soil Science draws a clear picture of the spatial and temporal distribution of the emissions of greenhouse gases such as methane and N<sub>2</sub>O in China. They proved that the soil moisture in winter is a predominant factor in controlling the methane release from the paddy fields and the significant role of the rice-paddy ecosystem in the N<sub>2</sub>O release. They are the first in the world to put forward the interaction between the emission of methane and that of N<sub>2</sub>O in a rice-growing ecosystem.

Based on their research, the CAS scientists make a scientific estimate of the release volume from a paddy ecosystem. Their calculation is far lower than those of earlier estimates by an international organization. In addition, the research team suggested that less water injected into paddy fields in winter can remarkably reduce the methane release into the air from a rice-growing ecosystem.

## 1.3 Health

### CAS researchers develop new chemicals to inhibit HIV infection (CAS, 2005-04-01)



In corporation with peers from the Mount Sinai School of Medicine, New York University, researchers from the University of Science and Technology of China (USTC), a CAS affiliate, have come up with new chemical inhibitors against HIV reproduction, marking a significant progress in the development of anti-AIDS drugs based on natural host resistance.

Since the start of the HIV epidemic, a series of drugs have been developed which significantly prolong the lives of people who are HIV positive. However, the rapid mutation of drug-resistant human immunodeficiency virus type 1 (HIV-1) poses severe challenges to the drug development.

Unlike the conventional ways of aiming at a viral protein *per se*, reported Prof. Wang Zhiyong from USTC and Prof. MingMing Zhou from Mount Sinai of School Medicine in a recent issue of the *Journal of American Chemical Society*, the novel anti-Aids approach they have taken is to target the host cell proteins essential for the virus to replicate.

In order for HIV-1 reproduction to be initiated, according to the experts, the viral protein Tat, a viral regulatory protein required for HIV-1 replication, must interact with a protein found in the host cell called the PCAF, which normally functions to help convert human genes into human proteins. The researchers use nuclear magnetic resonance to define the structure of this interaction, and design and synthesize three small molecules that would bind to PCAF, preventing its interaction with Tat and ultimately preventing HIV from reproducing.

The findings offer new insight into the most effective approach for fighting the AIDS disease. Specifically the studies show that compounds designed for the PCAF bind selectively with high affinity to the site shared with the HIV-Tat protein, which could inhibit Tat's binding, thus abolishing the transcriptional activation and replication of HIV-1 and working as a potential therapeutic drug. The advantage of targeting a host protein is that drug resistance is less likely to develop than with drugs that target viral proteins.

### Anti-cancer TCM gains FDA approval for clinical use (People's Daily, 2005-04-05)

Shuanglingbensan, an anti-cancer traditional Chinese medicine has gained approval for clinical use from the Food and Drug Administration of America, and the clinic research will be carried out at the Sloan-Kettering Cancer Center in the US. The plan for clinic research is to be finalized in

April and the research will begin in June, confirmed China's State Administration of Traditional Chinese Medicine.

The FDA approval signifies recognition for fundamental and clinic research for the Shuanglinggubensan carried out in China, said Ren Xubin, Director of the Tumor Pharmacology and Radioactive Treatment Society of China and a tutor for doctoral students with the Shanghai Institute of Materia Medica, Chinese Academy of Sciences.

According to experts, Shuanglinggubensan has evident effect in alleviating side effect caused by radioactive treatment. The producer of the drug, Shanghai Green Valley Group has been admitted by the American Cancer Control Association. Using precious herb glossy ganoderma as main ingredient, Shuanglinggubensan contains anti-cancer ingredient and has become the sole anti-cancer TCM listed in the UN purchasing directory in 2004, introduced Lin Zhibin, president of Pharmacology Society of China and a tutor for doctoral students with the Medical Department of Peking University.

### **Successful development of new vaccine against forest encephalitis in China**

**(MOST, 2005-04-07)**

The State new drug certificate and new drug production approval number have been obtained for the new type of vaccine against forest encephalitis, a research subject of the key S&T project "Innovative Drug and Modernization of Traditional Chinese Medicine" organized by MOST. The new vaccine has been achieved by Changchun Institute of Biological Products through many years of hard work to tackle key problems.

Through close combination of the virus cultivation technology by cell with such modern biological technologies as continuous flow centrifugation, ultrafiltration concentration and column chromatography purification, this research has got rid of most chemical substances like hetero protein and formaldehyde and moved the antigen content and immunological protection index to  $\geq 5.0 \times 10^5$ , an increase of 5 times compared with previous technologies. Clinical research indicates that the serum neutralization antibody seroconversion rate of the volunteers exceeds 85%, an increase of over 70% compared with previous technologies. There is no systemic side reaction and the incidence of partial side reaction is 0.87 %, which proves that the vaccine possesses very good safety and immunological effect.

Forest encephalitis is an acute infectious disease of central nervous system caused by forest encephalitis virus. Characterized by high fatality rate and great harmfulness, it is an officially declared occupational disease caused by biological factors. Inoculation of highly efficient vaccine can prevent the outbreak and spreading of forest encephalitis. At present, Changchun Institute of Biological Products is ready to start mass production in light of market demand to replace the existing slipshod vaccine so as to provide an effective means for the prevention and cure of forest encephalitis in China.

### **Chinese, US scientists find new way to stop AIDS virus' reproduction**

**(People's Daily, 2005-04-08)**

Scientists from China and the United States said they have found a chemical that could stop AIDS virus from reproducing itself in the human body, raising hopes for a cure for AIDS.

The chemical was discovered by a research center at the prestigious University of Science and

Technology of China (USTC) in Hefei, capital of eastern China's Anhui Province, and Mount Sinai School of Medicine in the United States.

The Sino-US joint laboratory research has found a compound, which researchers said could stop AIDS from entering cells where the virus lives and reproduces itself.

The compound can anticipate AIDS virus and occupy the holes of human body cells that have yet to be invaded by the virus. This would block it from reproducing and surviving in human body, according to the researchers. The researchers did not say what the compound was and how they discovered it.

The research result was published in the Journal of American Chemical. The journal highly praised the research, saying the test work is an important step towards the confirmation of new target center of anti-AIDS medicine.

The present medicine treatment for AIDS has not yet reached "ideal effectiveness" and continues to have harmful side effects and high costs.

AIDS (acquired immunodeficiency syndrome) is a fatal infectious disease caused by HIV (human immunodeficiency virus). Since the first case was reported in the United States in 1981, AIDS has spread rapidly on a globe scale.

According to an assessment report on China's AIDS prevention and control, which was released by the Ministry of Health early last year, HIV cases had been reported in all the Chinese mainland's 31 provinces, autonomous regions and municipalities.

There are 840,000 HIV carriers on the mainland, of whom 80,000 suffer AIDS, said the Ministry of Health.

### **Scientists find compound leading to SARS cure (CRI, 2005-04-13)**

Scientists from the Chinese Academy of Sciences (CAS) and Singapore Polytechnic announced that they have found a natural compound from a plant is able to interdict the reproduction and spreading of coronavirus of severe acute respiratory syndrome (SARS).

Zhu Weiliang, principal investigator of the CAS Shanghai Institute of Materia Medica, said Tuesday that his research team, with aid of high-performance computers, filtered 220 compounds and ascertained a few that could combine a protease, scientifically known as 3CL-PRO, in the SARS coronavirus and stop its function.

The SARS coronavirus is spread via the protease. Therefore, Zhu said, impotence of the protease would stop the virus from spreading.

"The newly-found compound could firmly occupy the molecular slot of the protease in the SARS coronavirus," said Zhu.

Computer simulation proved that the compound is effective in combining itself with the coronavirus protease, Zhu said.

Though it has not been tried on humans, the simulation also showed that the compound, extracted from an edible plant, has few side effects, the researcher said.

The CAS institute and Singapore Polytechnic are applying for chemical patents in China and developed countries in the world. The researchers did not release the name of the compound while the patent application is in the pipeline.

Jiang Huiliang, vice director of the CAS institute, estimated that further drug development and clinical tests will be underway soon.

### **Plan for SARS Diagnosis initially fulfilled**

**(CRI, 2005-04-13)**

As revealed by Prof. Zhong Nanshan, expert in respiratory diseases and academician of Chinese Academy of Engineering the latest revision of the "diagnostic plan for epidemic atypical pneumonia (SARS)" has already been completed, which is to be published after the approval of the Ministry of Health. In the course of revision the effectiveness of the two methods for early diagnosis of SARS come to over 90 percent and they are able to find out through serum the antigenic infection within 5 -- 7 days after the oncoming of the SARS disease. Meanwhile in the study of the respiratory diseases in China a kind of anti-AIDS drug has been initially proved to be effective in the anti-virus treatment of the SARS patients.

On April 12, the newest report "Progress in the study of respiratory diseases" by the respiratory chapter of the Chinese Medical Association pointed out, 36 volunteers for the 1st phase clinic test of SARS vaccine are now underway for the study on the SARS antibody endurance while 24 volunteers are now respectively accepting the depleted SARS vaccine injection for them to produce neutralized antibody after six weeks. Up to the present moment they've all undergone 8 times of serum antibody monitoring without finding any obvious adverse effect.

At the same time the respiratory experts in China have made a complete sum-up on the methods used three times in the treatment of SARS diseases in 2003 and 2004 and they've come to an initial opinion that the kaletra drug used for anti-AIDS treatment is likely good for promoting the recovery of the peri-hemolymphocytes and reducing the mortality rate of SARS patients.

### **Guangzhou to set up an experimental center of nonhuman primates**

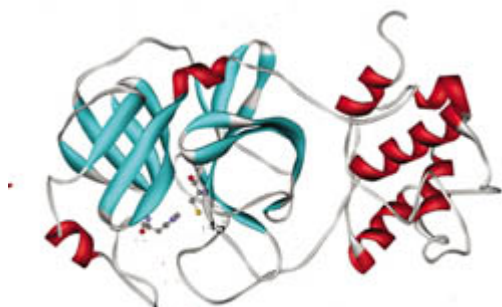
**(CAS, 2005-04-15)**



Teaming up with the Guangdong Entomological Institute (GEI) under the Guangdong Academy of Sciences, the CAS Institute of Biomedicine and Health (GIBH) in Guangzhou is to set up an experimental base of nonhuman primates in Jiufu, a northeastern suburb of Guangzhou about 40 kilometers from downtown.

Leaders and scientists from the CAS Guangdong Branch, GIBH, GEI and the Guangzhou government attended the ground breaking ceremony held on March 31. The center is expected to be a platform for clinic research, facilitating the fight against the challenges likely posed by such diseases as AIDS, cancer, SARS, neuropathy and cardiovascular diseases.

**A natural product as drug lead against both SARS and flu**  
(CAS, 2005-04-15)



In cooperation with colleagues of Singapore Polytechnic, CAS scientists have discovered a natural product from fruits that could be a drug lead to battle both severe acute respiratory syndrome (SARS) and flu viruses.

After screening more than two million compounds on a high-performance super-computer over the past two years, a research group headed by Prof. Zhu Weiliang from the Shanghai Institute of Materia Medica (SIMM) under the CAS Shanghai Institutes for Biological Science found a series of compounds that are potent in inhibiting 3CL proteinase, an enzyme that is essential to viral duplication.

The researchers particularly revealed a natural product that can clinch itself to the active site of the proteinase of the SARS coronavirus, preventing the launch of the normal process of viral duplication. In addition, it can effectively suppress the bio-activity of the proteinase in the flu virus so that the flu infection might be neutralized by the compounds. According to Dr. Shen Xu, who is in charge of the bioassay at SIMM, their experimental result is in agreement with the computer simulation.

Since the product is from human food, it should be free of toxicity. In spite of this, this team conducted, using a supercomputer, a systematic simulation on its possible binding with various kinds of protein including those from the human body. To their surprise and encouragement, they did not find any obvious side effect. Of late, both SIMM and its Singaporean partner are filing patents for the compound.

The compound is a wonderful drug lead as it is dual-functional to both SARS and flu, says Prof. Jiang Hualiang, vice director of SIMM. Hence, further study will be followed up. Also, according to deputy principal of the Singapore Polytechnic, Mr. Yeow Kian Peng and Dr. Puah Chum Mok, the cooperation on this subject will be strengthened for new drug development.

**China participates in outlining "gene map"**  
(People's Daily, 2005-04-21)

Where is the origin of human beings? From where did the ancestors of today's ethnic groups worldwide migrate? An explorative program on human races' migrations was initiated on April 18. To uncover the centuries' mystery, scientists with ten research centers of the participant countries, including China, Russia, France, Britain -- will collect 100, 000 human DNA samples in five years to outline an accurate genetic structure of peoples in the world.

The School of Life Science of Fudan University in east China's Shanghai municipality is the only institution in East Asia and Southeast Asia designated to the program. It will be dedicated to

collect over 10, 000 DNA samples in the region.

China started independently in 1997 on the Chinese part and has made some achievement, according to Dr. Li Hui from the School of Life Science of Fudan University. From the nearly 20, 000 DNA samples collected on different ethnic groups in China, it is found that Chinese ancestors set off from northeast Africa about 50, 000 years ago, across the Middle East, South Asia and Southeast Asia, arrived in today's Yunnan and Guangxi about 30, 000 years before now.

They evolved into 56 ethnic groups throughout tens of thousands of years, among whom, Han and Tibetan people were the latest to branch out therefore were the closest in terms of blood tie. This provides strong evidence for the concept that "Han and Tibetan people had the same ancestors".

Every cell in the human body has a whole set of genome, in which 99 percent of the DNA sequence information is the same and one percent is individually specific. If the samples are huge in amount, the one percent of individual information will converge into a large database through which scientists can easily find the common characteristics of different groups.

As for gene security, which draws much concern, Fudan University has specially established an ethics committee committed to monitoring the research on the DNA samples on China's part. Personal information will be stored anonymously and can not be shown without personal password.

### **State key S&T project "Functional Genome and Biological Chip" made progress (MOST, 2005-04-22)**

The State key S&T project "Functional Genome and Biological Chip" that is organized and implemented by Ministry of Science and Technology (MOST) has completed the scheduled task of rice mutant database and rice gene chip construction and has started in an all-round way the screening check of the functional genes of important agronomic characters. The Institute of Genetics and Developmental Biology, Chinese Academy of Sciences and China National Rice Research Institute and their cooperative units adopt the method of map position clone to separate clone rice tiller control gene BCl. This is the first time in the last 20 years that China cloned the functional gene of important agronomic characters of an important crop for which we possess our own intellectual property rights and application prospects. This marked new breakthroughs in the rice functional gene research in China.

#### (1) Setting up the rice mutant database

144, 000 independent T-DNA inserting rice regenerating strands have been acquired, which have mutant strands of strand mode, fertility, bearing stage, tiller, strand height, plant disease and insect-resistant and resistance types; the rice mutant database has been set up preliminarily; large-scale screening of T1 generation mutant family has acquired a batch of mutants varying in form and character and mutants related to draught-resistance and disease-resistance.

#### (2) Setting up the rice cDNA database

15 rice cDNA databases of different growing stages and different tissues and organs have been made. The cDNA database with rice Minghui 63 strand as its material has acquired over 62, 000 clones and completed tens of thousands of EST sequencing. More than 4, 000 full-length cDNA have been separated and cloned.

#### (3) Research on the rice gene chip

The genome chip containing 55, 791 unique genes has been obtained. The genome chip has been applied to the research on the gene expression spectrum of rice seedling, seedling and root during

the tiller stage and spike during the earing stage and milking stage and in the detailed analysis of the expression characteristics of different types of genes in different organs. It has also been applied to comparing the homologue of rice and Arabidopsis genome and the expression characteristics of unique genes in relevant organs. Development of the unique DNA chip of rice No. 4 chromosome has been completed. The gene unique expression spectrum of rice No. 4 chromosome has been systematically analyzed and thereby a batch of new expression genes has been discovered.

(4) The research findings on a batch of important functional genes such as paddy rice crisp stem gene BC1 that is cloned by map position are published on the internationally famous journal of the botanical discipline "Plant Cell". Also cloned are the candidate genes of over 20 important functional genes such as bacterial leaf-blight-resistant major gene Xa26 and Xa4, paddy rice control salt menaced K<sup>+</sup>concentration gene Kc1 and important agronomic character gene Eui. A series of functional genes relevant to important paddy rice agronomic character (including drought-resistance, disease-resistance, environmental menace and growth) are being separated, cloned and studied in depth.

**Successful application of protein chip technology in high flux drug screening  
(MOST, 2005-04-22)**

Screening of thousands or more of drugs on a minute sheet glass about 1 square centimeter not only saves a great deal of expensive reagent stuff but also greatly improves the efficiency of drug screening. This is the application of biochips technology to drug screening. This new technology of drug screening has already been realized by the "New Drug Screening and Key Technology Platform Research" topic, which is supported by the key project "Innovative Drug and Modernization of Traditional Chinese Medicine" under MOST 863 Program.

The biochip technology is a high and new technology developed in recent years. It mainly includes gene chip, protein chip, cell chip and tissue chip. Since protein has special three-dimensional structure and important structure-related function, preparation and application of its chip is especially difficult. When biochip technology was first publicized, researchers expected to apply this high and new technology to drug screening, yet drug screening was not realized in real sense.

The key problem in the technology of applying biochips to drug screening is the preparation of chips and the application of screened samples. Research personnel of the National Center for Pharmaceutical Screening of the Institute of Materia Medica, Chinese Academy of Medical Sciences, aiming at the key problem in preparation of protein chip and in light of the high flux drug screening experience, has made a breakthrough in the protein chip preparation technology after hard exploration and repeated experiments. The protein chip prepared by application of this technology can not only retain the original biological function of protein but also preserve it for a fairly long period of time, thus solving the key problem in the preparation of protein chip.

The basic requirements of drug screening are that screening of the biological activity or pharmacological action of multi-samples are completed under parallel conditions at the same time. In accordance with the technical requirements of drug screening, all research personnel creatively completed the preparation of anti-phase protein chip and preparation of chemical compound sample array through active endeavors, which has solved the key problem in the technology of conducting drug screening on minute chips and realized the objective of applying protein chips to

drug screening. At present, nearly 100,000 samples have been screened.

The protein chips prepared by the National Center for Pharmaceutical Screening of the Institute of Materia Medica, Chinese Academy of Medical Sciences include membrane receptor chip, nuclear receptor chip and enzyme chip. The membrane receptor protein chip and nuclear receptor protein chip can not only be used for drug screening but also for pharmaceutical research and analysis, especially analysis of the special ingredients in the biological samples. Application of this method to the human blood composition test of over 300 people proves that this method is characterized by high sensitivity, fast speed and low cost.

#### **Test on side effects of TCM underway**

**(Xinhua News Agency, 2005-02-23)**

The State Administration of Traditional Chinese Medicine has announced that it is going to examine "potential toxic side effects" of Chinese traditional medicine.

Aiming to prevent people from being poisoned by unsafe traditional treatments, the examination will cover 72 kinds of herbs in the Chinese Pharmacopoeia that have certain toxicity, according to CCTV International Thursday.

Meanwhile, herb processing and combination and mixture of herb in the traditional medicine will also be examined, said the report.

The expert team for the administration will mainly conduct basic experiments on selected herb and search for historical side-effects records. Then they will conclude on what herb can be used to make medicine and work out suggestions for taking traditional medicine.

For thousands of years, Chinese medicine makers have been processing herb with traditional methods. They would mix or combine several herb into certain medicine so as to reduce or counteract their toxicity.

However, modern medical sciences have had not much study and research on these methods and have had no rules to regulate traditional medicine plants in this regard. Therefore, some plants extended the usage of the medicine or even sold the medicine as tonic, which caused side-effects to medicine takers, said the report.

#### **China at forefront of global DNA project**

**(China Daily, 2005-04-24)**

Where Do We Come From? What Are We? Where Are We Going?

That's the title of what has been described as Paul Gauguin's ultimate masterpiece painted circa 1897.

More than a century ago, the celebrated French post-Impressionist artist tried to visually grapple with these existentialist issues but provided no definite answers -- neither could many thinkers, philosophers and religious figures before and after him.

More prosaically, a recent book, *Our Place in Nature -- Where Do We Come From*, by well-known authors -- Dr Jan Klein and Dr Naoyuki Takahata -- described how scientists decipher human origins from the record encrypted in DNA and protein molecules.

An issue as profound as our origins, our existence and afterlife has perhaps inevitably become entangled in politics, religion, schools and the courts in the United States, where "creationists' face off against "evolutionists."

China is taking a scientific, albeit cautious, approach as it teams up with the National Geographic

Society to address the issue and ensures that national interests are not compromised.

The society, founded in 1888 and one of the world's largest non-profit scientific and educational organizations, said this week in Beijing that China will become be a major participant in a worldwide genographic project over the next five years.

"About 10,000 samples will be collected in China, an important region for the evolution of the human beings," said Jin Li, a professor at Fudan University. The institution will be in charge of data collection in East and Southeast Asia for the undertaking.

Jin said samples -- from cotton swabs used to collect cells inside the cheeks of volunteers -- will be gathered on the bases of nationalities, language and geographic characteristics. More than 100,000 will be amassed in 10 regions across the world.

The project hopes to assemble one of the world's largest DNA databases, with the goal of mapping how the Earth was originally populated.

Led by society Explorer-in-Residence Spencer Wells, a team of international scientists and IBM researchers will analyze the results and report on the genetic roots of modern humans.

Experiments from the project are expected to reveal rich details about global human migratory history and to develop a new understanding about the connections and differences that make up the human species.

Wells described the project as "the 'moon shot' of anthropology, using genetics to fill in the gaps in our knowledge of human history."

He stressed the urgency of the project since people are migrating and inter-marrying far more than in the past.

"Genetic history is at the edge of losing its track in the modern world," Wells said.

Jin promised that no Chinese DNA samples will be exported. "They will be tested at the university locally in compliance with the Chinese regulations."

Qiu Hongwei, director of the department of the biological resource security under the Human Genetic Resource Administration of China, said government approval should be secured before any samples are actually collected.

"To better regulate such international genetic projects, a new regulation is being drafted and will be sent to the State Council for approval. It is expected to be approved next year," Qiu said.

He explained that genetic resources are personal and private information, and that the protection of such data should be guaranteed according to the law.

He noted that few Chinese enterprises are engaged in genetic medical research and "if some foreign drug producers get the information, they can develop genetics-based drugs which could impact on China's pharmaceutical industry."

However, Ajay K. Royyuru, senior manager of IBM's computational biology centre, said that the safety of all data would be strictly guaranteed.

### **CAS establishes a primate research center in Kunming**

**(CAS, 2005-04-28)**

After many rounds of discussions and verification, a proposal to set up the CAS Kunming Primate Research Center finally got the green light.

A non-incorporate organization, the center will be affiliated to the CAS Kunming Institute of Zoology. Its director works under the leadership of the Management Board and is responsible for center affairs. The center will serve as a research base for experiments against infectious diseases

and bio-terrorism and a pool of technology and resources to address human health problems.

As explained by an expert, the ambitious aim of the center is to rank among the first-class primate research organs in the world and grow into a national platform of technological support for the primate biomedical research as well as one of the key bases of vaccine and medicine research and development.

### **World DNA and Genome Day opened**

**(People's Daily, 2005-04-28)**

On April 25, 2005 World DNA and Genome Day was inaugurated in Dalian, a coastal city in Liaoning province in northeast China.

The theme of the event is "For our common thread". It is hosted by the Science & Technology Department of Liaoning Province, Dalian Municipal Government and World High Technology Society.

All the speakers at the ceremony, including those from the organizers and Dr. Avram Hershko, one of the five Nobel Laureates attending the event, stressed in their speeches that this year marks the 52nd anniversary of the discovery of DNA double Helix Structure and the 5th anniversary of the publication of the genome of human being.

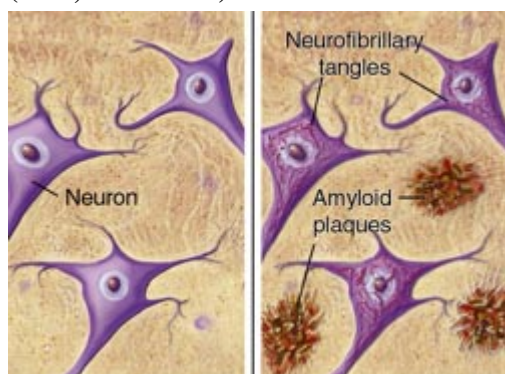
Dr. Avram Hershko, winner of Nobel Prize in 2004 for chemistry, and Dr. Ferid Murad who was honored Nobel Prize in 1998 for Medicine, gave presentations about their research at the Nobel Forum right after the ceremony.

There will be more than 30 sessions with focuses on genome technology and business. Keynote speeches by Nobel Laureates are scheduled.

The event will last till April 28.

### **Revealing mechanism of Alzheimer's disease**

**(CAS, 2005-04-29)**



Scientists from the Institute of Materia Medica under the CAS Shanghai Institutes for Biological Sciences have made significant progress in providing a possible mechanism for the accumulation of amyloid  $\beta$ -peptides (A $\beta$ s), which are believed to cause Alzheimer's disease.

A $\beta$ s are fragments of a protein that is snipped from another protein called amyloid precursor protein (APP). In a healthy brain, these protein fragments would be broken down and eliminated. In Alzheimer's disease, unfortunately, the fragments accumulate to form hard, insoluble plaques, which are the characteristic lesions found in Alzheimer's patients and could dramatically inhibit several genes critical to memory and learning.

Experimental studies show that A $\beta$ s feature an extended  $\beta$ -sheet structure when building up

whereas in the state of non-aggregation they adopt different structures according to various environments. For instance, they favor an  $\alpha$ -helix structure in a membrane or membrane-mimicking environment and they exist mainly as a random coil in aqueous solution. Although researchers have discovered that a conversion from an  $\alpha$ -helix or random coil to a  $\beta$ -sheet conformation occurs during (or before) the aggregation of A $\beta$ s. Due to the high propensity to, and rapid speed of, their aggregation, the process is difficult to identify with conventional experimental methods.

As reported by April 12 issue of the *Proceedings of the National Academy of Sciences* (PNAS), researchers from the Center for Drug Discovery and Design of the CAS Shanghai Institute of Materia Medica solved the problem through a large-scale study of molecular dynamics (MD) simulation, a complementary approach to experimental techniques in biochemical studies.

Under the guidance of Profs. Jiang Hualiang and Shen Jianhua, Xu Yechun, a doctoral student, and her colleagues made an in-depth analysis of the mechanism of A $\beta$ s conformational transition and agglomeration by a series of long-time MD simulations. For the first time in the world, they observed in atomic detail the conformational transition of A $\beta$ s from  $\alpha$ -helix to  $\beta$ -sheet in aqueous solution. They also found that four glycines (G25, G29, G33, and G37) are important for A $\beta$ s to form  $\beta$ -sheet in aqueous solution, and mutations of these glycines to alanines could abolish the  $\beta$ -sheet formation and increase the content of the helix component. Additional MD simulations by the researchers demonstrate although A $\beta$ s adopts helix as its major secondary structure in the lipid bilayer, the peptide has a tendency to move out of the lipid environment toward the surface lipid bilayer.

Their work provides a possible mechanism of amyloid fibrils aggregation, shedding new light on understanding the mechanism of amyloid formation and designing compounds for inhibiting the aggregation of A $\beta$ s.

### **Breakthrough made in anti-SARS medicine**

**(Xinhua Net, 2005-04-29)**

Experts in Guangxi Zhuang Autonomous Region announced they found substances in rhubarb, a traditional Chinese herb, that can effectively fight SARS (Severe Acute Respiratory Syndrome).

The announcement was made by a team led by Dr. Luo Weisheng, vice-president of Guilin Municipal Medical College, after two years of research over a variety of traditional Chinese herbs.

"The substances can restrain reproduction of the coronavirus of the disease by inactivating a protease, 3CL, which is indispensable in the coronavirus' life circle," Luo said.

Researchers also found the extracted substances could deactivate influenza viruses and a kind of respiratory virus responsible for most lower-respiratory-tract infections among children and old people.

Researchers have been applying for a state patent for the research and the application has passed preliminary procedures from the State Intellectual Property Office of China, Luo said.

Rhubarb, a cheap traditional herb, has been widely used in extracting "toxic substances" from human bodies, according to Chinese medical doctrines.

## 1.4 Key Technologies

### **China, Germany cooperate in nanotechnology (CRI, 2005-04-13)**

Experts from China and Germany will exchange views on nanotechnology development on the three-day Sino-German international conference on nano and biological technology starting Tuesday in Changsha, capital of central China's Hunan Province.

The conference is cosponsored by the Ministries of Science and Technology of the both countries, said Jiang Xiaowei, an official with the Ministry of Science and Technology of China.

Appearing in the late 1980s, nanotechnology will greatly influence the social and economic development after information technology and biological technology.

Jiang said companies from the two countries will negotiate on cooperative projects. Germany will invest in nanofertilizer technology, a field in which China takes the lead, he said.

"The gap in the nanoscience between China and western countries is not very big. China is even in a leading position in some fields of the technology," said the official.

He Jishan, academician of Chinese Academy of Engineering, said nanoscience enables people to produce materials and tools the size of molecules and atoms, which will bring about technological reform in information technology, material, energy, environment, medicine and health, biology and agriculture.

Huang Boyun, president of Changsha-based Central South University, spoke highly of the application of nanoscience in cancer research, saying that some tumors may be curable in 15 years with the help of the technology.

Jiang said he hoped Chinese medical workers will become aware of the importance of nanotechnology through this conference.

Experts say the economic value of the world's nanotechnology output will exceed 300 billion US dollars by 2010.

### **Progress in developing a novel CPU chip and its production line (CAS, 2005-04-20)**



With the joint support from the national High-technology Development Program (or the 863 Program) and CAS Knowledge Innovation Program, scientists from the CAS Institute of Computing Technology (ICT) have developed China's first home-made 64-bit high-performance general-purpose CPU chips, marking a breakthrough in microprocessor development. The

announcement was made at a press conference held on April 18 in Beijing under the joint auspices of the Ministry of Science and Technology, CAS and Ministry of Information Industry.

Dubbed Godson-2, the overall performance of the new 500MHz chip could be comparable to an Intel Pentium III, or 10 times than that of the Godson-1, which was released by ICT less than two year ago, according to the news release. The new chips support Linux and X-window systems and have a wide application perspective. They could be used for such networking devices as desktop network terminals, low-end servers, firewalls, routers, switches and multimedia networking terminals.

In order to promote the domestic chip industry, China has set up a manufacturing chain for Godson chip series, in which ICT focuses on core technology development, BLX IC Design Co. Ltd plays a role as an intermediate link between research bodies and manufacturing sector, and Godson Labs and business firms act as down-stream partners. A CAS-Menglan Industrialization Base for the mass production of Godson chips have been set up in east China's Jiangsu Province.

### **Progress in developing a novel CPU chip and its production line (CAS, 2005-04-20)**



With the joint support from the national High-technology Development Program (or the 863 Program) and CAS Knowledge Innovation Program, scientists from the CAS Institute of Computing Technology (ICT) have developed China's first home-made 64-bit high-performance general-purpose CPU chips, marking a breakthrough in microprocessor development. The announcement was made at a press conference held on April 18 in Beijing under the joint auspices of the Ministry of Science and Technology, CAS and Ministry of Information Industry.

Dubbed Godson-2, the overall performance of the new 500MHz chip could be comparable to an Intel Pentium III, or 10 times than that of the Godson-1, which was released by ICT less than two year ago, according to the news release. The new chips support Linux and X-window systems and have a wide application perspective. They could be used for such networking devices as desktop network terminals, low-end servers, firewalls, routers, switches and multimedia networking terminals.

In order to promote the domestic chip industry, China has set up a manufacturing chain for Godson chip series, in which ICT focuses on core technology development, BLX IC Design Co. Ltd plays a role as an intermediate link between research bodies and manufacturing sector, and Godson Labs and business firms act as down-stream partners. A CAS-Menglan Industrialization Base for the mass production of Godson chips have been set up in east China's Jiangsu Province.

### China's first 'domestic' robot

(China News, 2005-04-30)

A household robot that can walk, talk, work independently, take care of human beings and, at the same time, safeguard a household is expected to be produced before the end of this year, making it the first household robot developed by China.

On Apr. 25, a household robot with integrated functions was unveiled at the lab of the Multi Agent Robotics Research Center of the School of Computer Science and Technology under the Harbin Institute of Technology. The robot is 50 centimeters tall and weighs 20 kilos. Though he looks small, he has all the essential human body parts, including a head, the five sense organs, a body and legs.

Professor Hong Bingrong, who is responsible for the household robot project, said that the new robot is installed with an ultrasonic device, various types of sensors and protective devices all over his body. With such equipment the robot can measure distance and identify barriers by himself, avoiding collisions with furniture and human beings and saving himself from physical damage.

CPUs control the robot and help it perform according to a variety of commands. A camera system functions as his eyes, and a pickup and speaker system allows him to identify sound and "talk" to people. The robot also has the ability to carry and operate a cell phone. If his owner is away on business the robot can keep him apprised of family situations.

## 1.5 Structure of Matter

### A positron source commissioned at BEPCII

(CAS, 2005-04-11)



Positron beams were successfully commissioned to the injection point of the BEPCII Linac at the CAS Institute of High Energy Physics on 19 March, marking another critical step towards the final goal of the BEPCII Linac upgrade project. With an initial beam intensity of 45mA, the beam is one order of magnitude higher than the old BEPC specifications. Now the beam energy has reached 1.3 GeV, which is enough to satisfy the requirements of the storage ring for its machine study.

Electrons were successfully commissioned to the injection point on 19 November 2004, hence having ensured a dedicated storage ring running for SR and test beams for BESIII between the injections. The positron source commissioning started after the Spring Festival. Taking advantage of the time intervals between the injections for the dedicated SR running, the Linac staff solved

many difficulties and problems by carefully examining and testing equipments, in the end they successfully commissioned positrons to the injection point.

### **Successful construction of a beamline with double crystal monochromator in middle X-ray range**

**(CAS, 2005-04-18)**



The beamline 3B3 with double crystal monochromator in the middle X-ray range has been successfully constructed at the Beijing Synchrotron Radiation Facility (BSRF) in the CAS Institute of High Energy Physics. It was checked and accepted by a panel of experts on April 4 in Beijing.

The beamline is an engineering project by integrating different high-technologies, including X-ray optics, fine machinery, ultra-high vacuum technology, electronics and microcomputer control technology. Consisting of the front-end and mainbody beamline, the project is the first synchrotron radiation beamline in middle X-ray range developed by Chinese mainland scientists. It may be applied to various research and experimental activities in the medium energy zone ranging from 1.2keV to 6.0keV, involving metrology, detector's properties, the development of new optical elements and devices, absorption spectroscopy.

## **1.6 Transport and Space**

### **Chinese astronomers draws virtual picture of the Universe**

**(People's Daily, 2005-04-05)**

A large virtual picture of the Universe unveiled by Chinese astronomers recently has attracted the attention of international scientists.

Astronomers from the Shanghai Observatory under the Chinese Academy of Sciences(CAS) simulated cosmic movement and evolution using super computing servers and special software.

Jing Yipeng, senior researcher with the observatory, and his team worked out a formula to describe how cosmic dark matter congregates, the newspaper said. The formula unravels the structure of the halo of cosmic dark matter.

Modern physicists believe that cosmic dark matter and its halo are basic to the study of the Universe. It is still a very difficult mission, however, to measure dark matter.

In the virtual picture, Jing's team identifies cosmic dark matter and dark energy, which have never been clearly isolated by human beings.

International scientists called the picture drawn by the Chinese as a competitive achievement in

basic cosmic research.

### **China outlines blueprint of lunar probe**

**(People's Daily, 2005-04-06)**

China will, after completing unmanned lunar probe, launch manned exploration at proper opportune and will build a moon base with other countries.

This is learned at a symposium on technological innovation in space flight the promotion of the development of the industry.

According to Luan Enjie, chief commander of the moon probe program, human's moon exploration is composed of three stages: probe, landing and stationing.

Now China is at the first stage, that is unmanned landing on the moon. China's moon probe is divided into three steps: a moon-orbiting probe, an exploration based on landing vehicles and returning with samples brought back to the earth.

Luan said, the scientific goal of China's moon probe is to draw a "portrait" of the moon.

The objective at the first stage is to launch a moon-orbiting satellite by the year 2007, which is aimed to obtain three-dimensional images of the moon surface, ascertain the distribution of the 14 elements and substances on the moon, probe the depth of the lunar soil and the space of 40, 000 to 400, 000 kilometers between the earth and the moon.

Ruan held that He3, a rare but important resource on the earth, may be found through the moon probe, which is conducive to solving the energy problem on the earth. He added that preparations for virtual moon observatory are under way in China.

### **China to export first Chinese satellite**

**(CRI, 2005-04-13)**

China will sell a communications satellite to Nigeria, the first overseas buyer of a satellite made by China's space sector.

A spokesperson for China Aerospace Science and Technology Corp. described the sale as a "milestone" in the history of the country's space industry, saying the deal represents a major breakthrough for Chinese satellite manufacturers.

According to the deal signed between the space administration of Nigeria and the China Great Wall Industrial Corporation, the satellite is known as Dongfanghong IV.

The satellite, which has 28 transponders, will be put into the orbit by a Long March 3 B carrier rocket at the Xichang Space Launch Center in southwest China's Sichuan Province.

As part of the deal, China will also launch the satellite atop its Chinese-made Long March carrier rocket.

Since 1985, China has launched more than 20 commercial satellites and sent 30 foreign satellites into space using Long March carrier rockets.

### **China building base to boost spaceflight**

**(China Daily, 2005-04-20)**

China is building a new space center in Shanghai to boost its manned spaceflight and satellite launching programs, an official newspaper said Monday.

The new about 200-acre base will consolidate and expand operations of the Shanghai Academy of Spaceflight Technology, the China Daily said.

The academy produced communications and fuel systems for China's first manned spacecraft, the Shenzhou 5, which in October 2003 carried astronaut Yang Liwei on a one-day Earth-orbit mission.

That mission made China the third country after the United States and Russia to put a man into space, lending new prestige and momentum to the decades-old military-linked space program.

The Shanghai academy also produces parts for China's latest-model Long March 2D rocket, along with the fuel module, power plant and communications system for China's next manned spacecraft, the Shenzhou 6. That flight, scheduled for this autumn, plans to send a pair of Chinese astronauts into space on a mission of up to seven days.

The academy hopes to increase efficiency by concentrating Shanghai's scattered space industry installations in the same area to provide research, manufacturing and logistics facilities. It will also take on cooperative projects with foreign partners through parent organization, the China Aerospace Science and Technology Corporation, the China Daily said.

Parts of the base will open in 2007 with completion set for 2010, the newspaper said. It said plans call also for a museum displaying parts of rockets, satellites and other space aviation technology developed by the academy.

### **China works out robot series for lunar exploration**

**(People's Daily, 2005-04-20)**

Chinese scientists say they have worked out a group of secondary robots which resemble wheels of a vehicle to carry out exploration missions on the moon.

The robot series are an array of independently-controlled, concurrent and reconfigurable secondary robots, each consisting of an arm for carrying objects, collecting samples, surveying and mapping, and a triangular wheel for independent walking and skipping obstacles, said a spokesman for the Automation Institute of the Chinese Academy of Sciences (CAS).

The institute, based in Shenyang, capital of northeast China's Liaoning Province, is the independent developer of the robots which have passed the appraisal test by the Chinese government.

These secondary robots are like wheels of the moon rover, which is also made up of a primary robot, the bodywork of the vehicle, said the CAS spokesman who declined to be named.

"The system will begin working when all the secondary robots' arms are linked to the primary robot, and a precise positioning system will help the whole system achieve concurrent and automatic operation," he said. "The secondary robots can be sent to different missions collecting data or removing any obstacle and automatically return to the main system."

The reconfigurable system will play a leading role in China's future explorations to the moon or other planets, he said.

The Chinese government has also announced its plan to launch a satellite to orbit the moon by 2007 as part of China's three-stage lunar project. Moreover, the country plans to land an unmanned rover on the Moon for collecting Lunar soil samples around 2020.

### **"Chang'e 1" program going on smoothly**

**(People's Daily, 2005-04-24)**

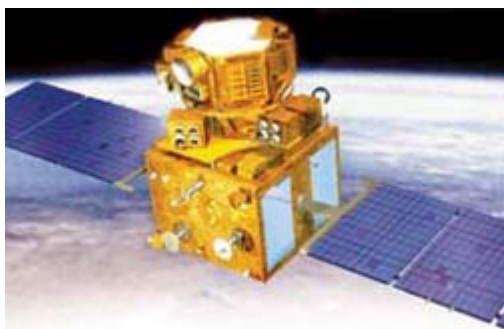
The development of "Chang'e 1", the third milestone of China's space flight program, is going smoothly, according to sources from a symposium marking the 35th anniversary of the successful

launch of "Dongfanghong 1".

At the 35th anniversary of the successful launch of China's first man-made satellite, "Dongfanghong 1", pioneers of China's space flight who participated in the research, design, manufacture and management of the satellite went to the birthplace of China's satellites, the Beijing Satellite Plant of the Chinese Research Institute of Space Technology, to attend an unveiling ceremony for a monument commemorating "Dongfanghong 1".

China has independently developed and launched more than 60 satellites and five "Shenzhou" spaceships during the past 35 years and twelve of these are still operating. China now has seven types of spacecrafts: recoverable remote satellites, communication satellites, meteorological satellites, scientific research satellites, earth resources satellites, navigation and positioning satellites and "Shenzhou" spaceships, which are operating in Geostationary Earth Orbit, medium Earth Orbit and low Earth Orbit. The recoverable remote sensing satellites, earth-synchronous communication satellites and earth resources satellites have become world-class in terms of their technical level.

### **CAS satellite station to offer remote-sensing data from IRS-P6 (CAS, 2005-04-25)**



After nearly one year of hard work, the CAS Remote-Sensing Satellite Ground Station has set up a system for receiving and processing the data from IRS-P6, a state-of-the-art remote sensing satellite developed by India. The announcement was made at a press conference held on April 22 in Beijing.

Launched on Oct 17, 2003, IRS-P6 has a LISS-IV camera with a spatial resolution of 5.8 meters, an improved version of LISS-III and an advanced Wide Field Sensor. Apart from agriculture, its data could also be used in city planning, disaster control and map-making. For the time being the station could provide its users with remote sensing data from a total of 12 satellites.

### **Shenzhou VI soliciting space-worthy objects (China.org.cn, 2005-04-29)**

The vice commander of China's second manned spacecraft announced on Monday that people in Hong Kong, Taiwan, Macao as well as overseas Chinese can apply before the end of May to have objects with special meaning put on board Shenzhou VI when it blasts off in September.

Hu Shixiang said the only application from overseas so far has been from Chinese American Hua Junxiong, who wants to include a small stone in the historic flight.

Hu said people can apply for goods of limited weight to be put on the spaceship, and that many from Hong Kong had expressed an interest, though no formal applications have as yet been

received from the special administrative region.

The final decision on which ideas will be taken up will be made after receiving all applications, and Hu recommended objects of special political significance.

He added that women from Taiwan, Hong Kong and Macao would also be able to take part in the selection of women astronauts for Shenzhou VII, the process for which will start at the end of 2005. He stressed that a military background is not required, though obviously physical fitness is a must.

Hu pressed the launch button for China's first artificial satellite *Dongfanghong 1* thirty-five years ago and has taken part in over 100 launches since then.

### **Reconfigurable robots for lunar exploration (CAS, 2005-04-30)**

With the support of the National High-tech Development Program (dubbed 863 Program), CAS researchers have made progress in developing modular reconfigurable robots for lunar exploration.

Like in other space exploration, robots for lunar probes are both expensive and at high risk. To cope with the problem, developing modular reconfigurable robots become a major option for the mission.

Modular reconfigurable robotics is an approach to building robots for various complex tasks. Instead of designing a different mechanical robot exclusively for each task, people just build many copies of simple modules. The module don't do much by itself, but when putting many of them together you get a system that can do complicated things. In fact, a modular robot can even reconfigure itself -- change its shape by moving its modules around -- to meet the demands of different tasks or in various working environments.

In cooperation with colleagues from Japan's Tokyo Institute of Technology, researchers from the CAS Shenyang Institute of Automation have score significant achievements in the studies of reconfigurable robots.

The robotic series are an array of independently-controlled, concurrent and reconfigurable secondary robots, each consisting of an arm for carrying objects, collecting samples, surveying and mapping, and a triangular wheel for independent walking and skipping obstacles, said a spokesman for the Shenyang institute.

These secondary robots are like wheels of the moon rover, which is also made up of a primary robot, the bodywork of the vehicle, said the CAS spokesman.

"The system will begin working when arms attached to all the secondary robots are linked to the primary robot, and a precise positioning system will help the whole system achieve concurrent and automatic operation," he said. "The secondary robots can be sent to different missions such as collecting data or removing an obstacle and automatically return to the main system."



The reconfigurable system will play a leading role in China's future explorations to the moon or other planets, he said.

The Chinese government has also announced its plan to launch a satellite to orbit the moon by 2007 as part of China's three-stage lunar project. Moreover, the country plans to land an unmanned rover on the Moon for collecting soil samples from lunar surface around 2020.

### **China to launch space lab next year**

**(China News, 2005-04-30)**

The Chinese Academy of Sciences revealed that China's groundbreaking educational tool, the mini "Space light-weight experimental system" is formally a project that will accompany the "seedling satellite" to be launched into space next year.

This "Unmanned Space Lab" has a "mini" exterior, its height being only two meters and its diameter 2.2 meters and can carry a payload of 500 kilos. It is equivalent to a medium size satellite. What is more interesting is that the main actors inside this space lab are not white-coated scientists, but embryonic cells of different animals and a row of shiny green plants.

In the second half of 2006, the "Lab" will follow the "Seedling Satellite" to space. According to plan, the satellite is retrievable and will return to earth after completing its mission. As the satellite's stationary capsule, the "Unmanned Lab" will stay behind in space until its batteries run out and its mission finished. Although it is situated in remote space, untended by humans, the lab is not beyond reach. Scientists said that, using an invisible hand for remote control, they could intervene in the various types of experiments to be conducted inside the "Lab". At the same time, following the transmission of relevant diagrams and data back to earth, humans can observe every twist and turn of this "Space Lab".

The "Lab" uses a super-light weight environment to conduct its experiments, closest to the natural state of various materials and substances it will be testing. Sources said that scientists will carry out multiple experiments in biology, fluid dynamics, fundamental physics and ignition and have high hopes of obtaining pleasantly surprising results.

## 2 Innovation Management

### **Training on local project management of key international S&T cooperation program held (MOST, 2005-04-02)**

In order to strengthen and standardize application and management for the key international scientific and technological cooperation project plan (hereinafter referred to as international cooperation program) and improve the quality of application documents and the project management of each locality (province or city), the Department of International Cooperation, the Ministry of Science and Technology conducted “Training on Local Project Management of International Cooperation Program” on March 22, 2005 in Beijing. Program management personnel from the department (bureau) of science and technology of all the provinces, autonomous regions, municipalities attended the training program. This is the first nationwide professional training program organized by MOST since the initiation of the international cooperation program.

At the training program, the Department of International Cooperation mainly briefed on the significance, goal and characteristics of the international cooperation plan and the development objective during the “Eleventh Five-year Plan” and encouraged local science and technology departments to take an active part in the international cooperation program, give full play to their role in administrative management, and promote local international cooperation in an all-round manner. The training program summarized the achievements made in the international cooperation plan since 2001 and the major problems in plan management and made detailed instruction and explanation on application for the international cooperation program in 2005.

Another important content of the training is the standardized management, including program management method, management procedure and issues for attention. The technical personnel lectured on the use and operation of the management system on the international cooperation program website.

Through the training, local management personnel came to understand the significance, goal and development objective of the international cooperation program more clearly. The training also helps to improve the level of standardized program management and Internet operating skills, achieving satisfactory results.

### **Scientific innovation essential**

#### **(China Daily, 2005-04-04)**

Facing a growing ban on core technology transfer to China, State Councillor Chen Zhili urged Chinese scientists and enterprises on Friday to become more innovative in building up the nation's research strength.

She said the country will invest more capital to make breakthroughs in key technologies and offer preferential taxation and financial solutions to help enterprises become involved in the endeavour.

"Many lessons have taught us that some countries don't lift barriers when we need technologies to improve people's lives and build up national defence," Chen told Friday's science and technology meeting, which was attended by nationwide science officials via a video-conference system.

Chen said the priority of the government's work in science and technology this year is to create an environment that is conducive to innovation, encouraging the nation to develop more home-grown patents.

Currently, nearly half of all the technologies applied in China originate overseas, a situation that has led to legal disputes between Chinese enterprises and overseas patent-holders.

Such disputes are likely to become increasingly common if the country remains heavily dependent on foreign technology. "It's not easy to obtain patent transfers in high-tech fields from developed countries because restrictions are still being enforced," said Chen.

She said the negative trend has even slowed the pace of China's economic restructuring.

She urged enterprises to play a bigger role in changing the trend and turn research towards innovation as China's market-oriented reform has already created an environment for them.

"International experiences indicated that enterprises, especially those of medium and small size, should perform an idea role in the endeavour," said Chen.

Statistics indicate that enterprises in developed economies earmark at least 5 per cent of their annual revenues to research and development. But in China, the rate is no more than 1 per cent.

China used 184 billion yuan (US\$22 billion) - 1.35 per cent of its gross domestic product (GDP) - in 2004 to aid scientific research and development. The rate was 1 per cent in 2003, according to figures released at the meeting by Xu Guanhua, minister of science and technology.

He also said the ability to innovate is a key factor for any country looking to compete in the global economy.

He stressed the importance of expanding international exchanges and co-operation to achieve innovation.

Since the 1980s when it embarked on reform, China has invested huge capital in following up science and technology development and research in developed countries.

The "following strategy" has realized many achievements and breakthroughs, which have made great contributions to China's social and economic development.

But problems have occurred as a result of China's lack of original inventions and findings, which are critical in the country's modernization drive.

The central government's efforts to set up a national mechanism for technological innovation began in 1999.

"We need more efforts to further prompt the national strategy," said Xu.

### **Establishment of nine engineering technology research centers**

#### **(MOST, 2005-4-05)**

Recently, the Ministry of Science and Technology (MOST) has evaluated and commented on the 2004 feasibility study reports applying for national Engineering Technology Research Centers. After consideration, MOST agreed to list the following nine centers under the 2004 plan for the establishment of national Engineering Technology Research Centers:

- 1.National Engineering Research Center for Peanut (Shandong)
- 2.National Engineering Research Center for Tantalum and Niobium Special Metallic Materials (Ningxia)
- 3.National Engineering Research Center for Milk Cow Embryo (Beijing)
- 4.National Engineering Research Center for Flower (Ministry of Education)
- 5.National Engineering Research Center for Wind Power (Xinjiang)
- 6.National Engineering Research Center for Ultra Precision Machine Tool (Beijing)
- 7.National Engineering Research Center for Anti-forgery (Hubei)

8.National Engineering Research Center for Modified Compound Polymeric Materials (Guizhou)

9.National Engineering Research Center for Energy-saving and Environment-Friendly Automobile (Anhui)

### **Scientific circle strives to enhance innovation capability**

**(CRI, 2005-04-07)**

According to Institute for Scientific Information's Essential Scientific Indicator, China has 253,566 theses included in the ESI from 1993 to 2003, ranking the 9th in the world. The theses are cited 735,288 times, 2.9 times per thesis, ranking the 18th and 994 theses are of the world class, ranking 17th in the world.

The US is the No.1 in the world with 2,799,593 theses included in ESI. The US, the UK, Japan, Germany and France are leading countries in scientific research, revealed Xiao Xiantao, chief writer of China Academy of Science's report on "International scientific development trend and Chinese science's influence".

The output of patent literature, an indicator of capability of technical innovation, is not satisfactory though China has made notable progress in the quantity of thesis. China is still far behind the major developed countries in terms of scientific innovation capability, the report shows.

### **Plans for three state key laboratories passed feasibility study**

**(MOST, 2005-04-07)**

On January 30 and 31, 2005, the Department of Basic Research of MOST organized a team of experts in Beijing to conduct joint feasibility study on the plans for the State Key Laboratory of Virology (Wuhan University and Wuhan Institute of Virology, Chinese Academy of Sciences), the State Key Laboratory of Pathogenic Microorganism Bio-safety (Academy of Military Medical Science) and the State Key Laboratory of Infectious Disease Prevention & Control (Chinese Center for Disease Prevention and Control). Joint feasibility study on the plans of laboratories, with similar research orientation is a new try in developing state key laboratories. The expert team, headed by academician ZHUANG Hui with Beijing University, is made up of experts from universities, research institutes and National Natural Science Foundation of China. Also present at the feasibility study conference were relevant officials from the Department of Science and Technology of the Ministry of Education, the Department of Science and Education of the Ministry of Health and supporting units and relevant staff from the laboratories.

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### 3 News from Universities

#### **Dalian International Maritime Research Centre established**

**(CRI, 2005-04-12)**

China's first international maritime research centre, Dalian Maritime University, was set up on Mar. 9.

The maritime research centre is expected to provide government with the theoretical basis for the decision-making concerning formulation, revision, acceptance as well as performance of international maritime convention, and offer constructive ideas for the relevant governmental institutions in safeguarding the land-and-water traffic safety and protecting marine environment.

## 4 China's International Science Cooperation

### **The 11th Intermediate Conference of the Sino-Italy Joint Committee for S&T held in Rome (MOST, 2005-04-02)**

In light of the Minute of the Eleventh Conference of the Sino-Italy Joint Committee for Science and Technology signed on November 14, 2002, the delegation from MOST and the Department of Culture and Cooperation, the Ministry of Foreign Affairs in Italy jointly held the 11<sup>th</sup> Intermediate Conference of the Sino-Italy Joint Committee for Science and Technology in Rome on March 19, 2005.

Both sides reviewed, with satisfaction, the implementation of the projects established by the 11<sup>th</sup> Conference of the Joint Committee for Science and Technology and exchanged ideas on mutual scientific and technological communication and cooperation. Both sides agreed to hold the 12<sup>th</sup> Conference of the Joint Committee for Science and Technology in Beijing from the end of November to the beginning of December 2005. The collection of projects for the 12<sup>th</sup> Conference of the Joint Committee for Science and Technology will start at the beginning of May simultaneously in both countries. Priority will be given to the sectors of space technology, basic science, information communication technology, energy and environment, agriculture, medicine & traditional Chinese medicine, biotechnology, nanometer technology, material science and historical relic protection technology.

### **National Center for Drug Screening achieves progress in international cooperation (MOST, 2005-04-04)**

The National Center for Drug Screening (NCDS), which was set up by Shanghai Institute of Materia Medica, Chinese Academy of Sciences and other units during the key science and technology projects of the Ministry of Science and Technology “Innovative Drug and Modernization of Traditional Chinese Medicine” and “Research on Drug Screening and Key Technological Platform”, applied advanced drug screening technology of high flux and high connotation to conduct large-scale random screening of the chemical compound sample storage, peculiar to China (natural products include traditional Chinese medicine). On the basis of structural optimization and reconstruction of the active compound discovered during the screening, it developed an original new drug for treating tumor, central nervous system disease and metabolic disease. As an important constituent of the innovative drug research system of China, the NCDS is also making delightful progress in international cooperation. For instance, the cooperation with the Swiss Actelion pharmaceutical company is in its third year and has discovered neuromedin U-1 receptor selective micromolecule excitant which has so far not been publicized; NCDS' joint study with TANABE SEIYAKU Co. Ltd. in Japan on original drug screening has led to the discovery of the micromolecule modifying agent of nicotinic type acetylcholine receptor that has high biological activity and brand-new structure; NCDS' strategic partnership with the US Cellomics Company has brought about the establishment of the first drug screening technological platform of high connotation that has reached international advanced level and is put into use. These achievements not only advanced the technical level and international fame of China in new drug study, but also laid a solid foundation for downstream development of relevant lead compound.

### **"Sino-Europe Training Program on Laws and Regulations for Traditional Medicine" held in**

## Beijing

(MOST, 2005-04-08)

From March 30 to April 1, the "Sino-Europe Training Program on Laws and Regulations for Traditional Medicine", sponsored by the Ministry of Science and Technology (MOST) of China and the Ministry of Health of Italy, and undertaken by the Administrative Center for China's Agenda 21 was successfully held in Beijing. The training program was aimed at implementing the scientific and technological cooperation agreement on traditional medicine signed between the two governments, strengthening mutual exchange in traditional medicine management and jointly promoting the access of high-quality Chinese-made traditional medical products to the European market.

Five experts from Italy, including Director-General Vittorio Silano, the Department of Innovation of the Ministry of Health and Dr. Roberto Gatto, head for the sanitation plan of Sino-Italy Foundation were invited to give lectures at the training program in Beijing. Chinese experts invited to give lectures included Professor DENG Haigen from SFDA training center, Director LIN Ruichao, Division of the Traditional Chinese Medicine of the National Institute for the Control of Pharmaceutical and Biological Products and Director LIU Zhanglin, Division of the Traditional Chinese Medicine, China Chamber of Commerce of Medicines and Health Products Importers and Exporters. More than 30 entrepreneurs and professionals from all parts of China engaged in R&D, production, management and import and export trade of traditional Chinese medicine participated in this training program. They learned about European laws and regulations on traditional medicine registration and GMP certification method, comparative analysis of Chinese and European medicine GMP, analysis of Italian and European plant drug market and the policies and methods related to the access of traditional Chinese medicine to the European market. Deputy Director-General SUN Hong, the Department of Rural and Social Development of MOST and Prof. Vittorio Silano delivered speeches at the training program on behalf of both sides. They indicated that the "Sino-Europe Training Program on Laws and Regulations for Traditional Medicine" put up a very good exchange platform for bilateral cooperation in the research, management and production of traditional medicine and laid a solid foundation for promoting the access of traditional Chinese medicine to the European medicine market, which will serve the undertaking of human health.

## German optical delegation from the Federal Ministry of Education and Research visited Changchun

(MOST, 2005-04-08)

At the invitation of MOST, a German optical delegation from the Federal Ministry of Education and Research headed by Director-General Walter Monig, the Department of International Cooperation visited Changchun from 16 to 19 March, 2005. During the visit, the delegation participated in the "Seminar on Sino-Germany Laser Cooperation", held talks on project link with representatives of optical enterprises from 3 provinces and 4 cities in Northeast China and inspected key enterprises of optical technology in Changchun.

This visit was made to implement the "Memorandum on Scientific and Technological Cooperation to Invigorate the Industry of Northeast China" signed between MOST and the Federal Ministry of Education and Research in 2004, and to accelerate bilateral cooperation in reinvigorating northeast China. The visit by the German optical delegation and the Seminar marked deeper and more

substantive technical and industrial cooperation in the field of optics.

The delegation also inspected the subway assembly line and laser plasma water-cutting machine in Changchun Railway Vehicles Co., Ltd.; China FAW Group Corporation and its FAW-Volkswagen welding assembly plant and car body laser welding line for Audi and Bora; Changchun Institute of Optics, Fine Mechanics and Physics and its optical glass production line and semiconductor laser laboratory.

### **Prof. Lu Yongxiang holds talks with DFG visitors (CAS, 2005-04-13)**



CAS President Lu Yongxiang met with a 16-member delegation led by Prof. Ernst-Ludwig Winnacker, president of the German Research Foundation (DFG) on April 10 in Beijing. While in Beijing, the DFG delegation also had discussions with leaders of the CAS Institute of Tibetan Plateau Research on research cooperation.

### **Sino-Canada Marine Technology Seminar held in Qingdao (MOST, 2005-04-13)**

On March 28 and 29, Sino-Canada Marine Technology Seminar, jointly sponsored by the Ministry of Science and Technology of China (MOST) and the National Research Council (NRC) of Canada, was successfully held in Qingdao. More than 60 specialists from 42 marine technology research institutes from both home and abroad attended the Seminar.

Research fellow XIANG Jianhai, head of the expert committee for resources and environment technology in the 863 Program and Professor Mary Williams from the Institute of Marine Technology of NRC briefed on the demand, current status and future trend of marine technology in respective country. During the Seminar, marine technologists from both China and Canada held extensive exchanges and talks on ocean monitoring & forecast, ocean engineering, ocean oil-gas & mineral resources exploration & development, marine biotechnology and utilization of marine fishing resources, reached essential consensus on promoting research in the prospecting technology of ocean natural gas hydrate, ocean red tide monitoring technology and marine ecological environment monitoring system technology and established uniform intention for cooperation in joint research on 12 marine technologies such as deep-sea multi-parameter profiler, aquaculture biologic nutrition and genetic improvement and ocean engineering underwater operation equipment.

This Seminar fully reflected the common demand and urgent desire of the scientific community of both countries for cooperation in conducting marine technology research and advancing the

development of marine technology & industry and laid an important foundation for the promotion of mutual cooperation in marine technology and industry.

### **Symposium on “Sino-German Cooperation Plan for Natural Medicine R&D Network” held (MOST, 2005-04-20)**

On April 10, 2005, a symposium on “Sino-German Cooperation Plan for Natural Medicine R&D Network” was held in Beijing University’s medical science department, with the purpose of promoting cooperation between China and Germany in natural medicine.

At the symposium, there were 20 representatives from research institutes and enterprises such as Beijing University, Shanghai Institute of Materia Medica and Kunming Institute of Botany from Chinese Academy of Sciences, Institute of Materia Medica and Institute of Medicinal Plant Development from Chinese Academy of Medical Sciences, Traditional Chinese Medicine Modernization Research Center, Linuo Group of Shangdong Province and Paisheng Pharmaceuticals Manufacturing Company. ZHANG Mu, Deputy Director-General of China National Center for Biotechnology Development, officials from Department of International Cooperation of Ministry of Science and technology (MOST), and Academician ZHANG Lihe of Beijing University Pharmacy College also took part in the symposium.

Through the discussions, the representatives at the symposium reached consensus on promoting the establishment of Sino-German natural medicine R&D network. The symposium unanimously agreed that the establishment of an R&D network would be conducive to synergic integration of advantages and major breakthroughs. It would also help with the improvement of national pharmaceutical industry, with the enhancement of innovative pharmaceuticals research awareness, and with the training of personnel. At the same time, more channels would be provided for traditional Chinese medicine to enter the European and the global markets. The symposium decided on the units and liaisons on the Chinese side at the initial stage of the network cooperation plan, and held discussions with the German side on the concrete items of cooperation, including the division of labor, major areas, intellectual property rights, etc. Detailed programs of the network cooperation would be submitted to the 7<sup>th</sup> meeting of the China-German Biotechnology Executive Committee for deliberation.

## 5 Miscellaneous

### **Successful development of highly efficient catalyst for direct coal liquefaction**

**(MOST, 2005-04-04)**

The project of “Highly Efficient Catalyst for Direct Coal Liquefaction” in the 863 Program has passed acceptance check. This project is undertaken and completed by Beijing Coal Chemical Engineering Research Branch, China Coal Research Institute (CCRI). The Branch has applied for 3 invention patents and 2 utility and new type patents with regard to the relevant technologies of highly efficient catalyst.

Beijing Coal Chemical Engineering Research Branch, CCRI has been engaged in the technical study on direct coal liquefaction for more than 20 years and has made great efforts in the development of liquefaction catalyst. Under the support of the 863 Program, the Beijing Coal Chemical Engineering Research Branch, CCRI established a set of intermediate test device for continuous catalyst preparation, has completed the continuous running experiment of the intermediate test devices and conducted several verification experiments of the catalyst. The Branch also developed the coal liquefaction continuous testing device. The independently developed 863 highly efficient catalysts can be dispersed evenly over the surface of the carrier, giving full play to its catalytic activity. The dosage is only one fourth of the conventional catalysts. The oil collection rate of coal liquefaction is about 5% more than conventional catalyst of the iron family. Besides, the catalyst consumption cost for liquefying one ton of coal is only RMB14 to 19 Yuan. There is obvious economic benefit and great application prospects. Shenhua Group has decided to use this highly efficient catalyst on its first model production line for the direct coal liquefaction pilot project. Development of the technical package for the catalyst and the basic design of the Shenhua preliminary project have already been completed and detailed design is now under way.

The research and development of direct coal liquefaction catalyst is one of the key technologies for reducing liquefaction cost and increasing liquefaction oil collection efficiency. The successful research and development of the highly efficient catalyst for direct coal liquefaction with independent intellectual property right and its application in the future will greatly push forward the development of direct coal liquefaction technology in China and lay a solid foundation for project implementation of this technology.

### **Tracking migration route of black-necked cranes with satellite**

**(CAS, 2005-04-05)**



In collaboration with colleagues at home and abroad, CAS scientists launched China's first ever

satellite tracking project on black-necked cranes in late February at the National Dashanbao Black-Necked Crane Natural Reserve in southwest China's Yunnan Province. Its objective is to understand the migration route of east population of the birds so as to better protect the rare bird species.

The black-necked crane (*Grus nigricollis*), is ranked "vulnerable" by the IUCN Red List and under the first-grade national protection in China. It is the only alpine crane among the 15 crane species in the world. But it is the latest discovered and least studied one by avian researchers.

The world's Black-necked Crane population is estimated at 5,600 - 7,500 individuals. The species' breeding range includes much of the Qinghai-Tibetan Plateau in China. Three populations are identified: western population that breeds in alpine region in Tibet Autonomous Region and winters in Yarlung Tsangpo Valley, central population that winters in northwest part of Yunnan Province, and eastern population that winters in northeast part of Yunnan Province and northwest part of Guizhou Province.

It was presumed that the Rouergai Wetland at the northernmost tip of Sichuan Province was the breeding site for 2,000 or so individuals in the eastern population of the Black-necked Crane, according to Prof. Yang Xiaojun, a coordinator of the project from the CAS Kunming Institute of Zoology. But the recent survey shows that only about 200 individuals found there in winter. Scientists believe that the population must have other unknown breeding ground.

In a bid to understand and learn more about these magnificent birds, the Yunnan Provincial Forestry Bureau, the Kunming Institute of Zoology, and the International Crane Foundation have collaborated to study the birds and to learn how they survive the winters in the Dashanbao Mountain. At the end of last year, the scientists made a survey of the Dashanbao reserve and worked out a plan for the enforcement of the tracking operation, including installation of satellite radio transmitters on 10 adult cranes in three years.

Researchers have successfully place satellite transmitters on four Black-necked Cranes at Dashanbao in preparation for the spring migration study. With the aid of orbiting satellites, the tracking operation is expected to enable scientists to make clear the crane's unknown stopovers, wintering habitats, breeding grounds and migrating routes in its winter flight. As the birds migrate, we will collect location data from satellite transmitters placed on their backs. Using these data, we will map the birds' locations, learning about their migration routes and, ultimately, their final stopping points.

### **HK Science Museum receives dinosaur egg fossils (CRI, 2005-04-07)**

Two dinosaur egg fossils were given by the Nanyang municipal government of Chinese mainland to the government of the Hong Kong Special Administrative Region (HKSAR) on Wednesday. Director of Hong Kong Leisure and Cultural Services Anissa WongSean-ye, accepted the egg fossils on behalf of the HKSAR.

She thanked the representative of the Nanyang municipal government for the generous donation of the fossils and she hoped that this would further strengthen cooperation between the people of the two places.

With the species name, *Spheroolithus* sp., the two fossils were excavated in Henan Province of the mainland in October 2001. They belong to the Mesozoic era, late Cretaceous period.

The fossils are 16cm in length, 13cm in width, 12cm in height, 3.15kg in weight and 14cm in

length, 12cm in width, 12cm in height, 2.75kg in weight respectively.

According to Wong, the fossils will be the first of their kind at the Hong Kong Science Museum. They will be on show at the Life Sciences Hall in the museum from April 11.

**Botanists breed new begonia strains in Kunming**

**(CAS, 2005-04-08)**



Based on its previous work on 13 Begonia cultivars, a research team headed by Prof. Guan Kaiyun from the CAS Kunming Institute of Botany has been successful in cultivating seven new Begonia strains, namely, Begonia "Luxuriant", B. "Sillegona", B. "Purple Leaf", B. "Purple Stem", B. "Fragrant Queen", B. "Bushy" and B. "Dalie."

Begonia is a group of tropical herbs and shrubs noted for its beautiful flowers and widely bred as ornamental plants. According to statistics, there are about 2,000 undomesticated species (or their variants) in the world and more are cultivated by flower breeders. China is a country noted for her fecund trove of Begonia varieties, including 139 scrutinized or registered by plant taxonomists. They are mainly distributed in southwest China, and Yunnan is a rich gene pool for developing the floral resources.

**Amateur Chinese astronomer spots fast-moving space object**

**(CRI, 2004-04-11)**

A fast-moving asteroid discovered by an amateur Chinese astronomer came close to Earth on Saturday in an orbit forecast by international scientists.

The asteroid, 15 meters in diameter, was spotted by Yu Jun, a doctoral student at the Chinese University of Science and Technology in Hefei, capital of east China's Anhui Province.

Yu discovered the asteroid on April 1, while reviewing telescope images on the Internet for the University of Arizona's Spacewatch program.

The program allows volunteers to spot fast-moving space objects, or FMOs, by logging onto a Web site and downloading images taken by telescopes at Kitt Peak National Observatory, 90 kilometers southwest of Tucson.

While some observers scroll through thousands of pictures to discover an asteroid, Yu said he had only looked at 27 images before he spotted this one -- named 2005 GT on April 3 by the Minor Planet Center, the official oversight body for such observations. It was the first FMO discovered by a Spacewatch observer on the Chinese mainland.

The asteroid missed the Earth by 6 million kilometers, but experts say it wouldn't have done much more than offer a pretty light show even if it had been aimed directly at Earth, as it would have burned up in the upper atmosphere.

"It's a pleasant surprise indeed," said Yu in an interview with Xinhua on Sunday. "I thought it was an April Fool's joke when I received an e-mail from the University of Arizona to congratulate me on my discovery."

Yu said he majors in theoretical astronomy but is very interested in astronomical observations.

Spacewatch, launched in September, 2003, primarily studies the movement of asteroids and comets. Volunteers fill an important niche, while researchers at the University of Arizona and automated computers track larger objects in space.

The program has used more than 1,000 volunteers worldwide and at least 20 FMOs have been discovered.

The program's major goals include searching for potential destinations for space missions and identifying asteroids larger than a kilometer in diameter and heading toward Earth.

An impact by an asteroid that size could cause a global catastrophe.

### **Bionic symposium convenes experts from different fields**

**(CAS, 2005-04-15)**



On April 6, the CAS Institute of Zoology and the CAS Institute of Biophysics jointly held a symposium on the bionics in Beijing. Experts with varied research backgrounds were invited to give talks on a wide spectrum of the issue ranging from decision-making strategy of organisms, bionic materials with super-hydrophobicity to biological language communication and insect wing bionics. 80 or so scientists from 13 research institutions and universities participated in the symposium. Several scientists initially bolstered to seek new bionic approaches as coworkers at the meeting.

The science of bionics mainly deals with constructions, processes and developmental principles of biological systems and investigations with regard to exploiting the natural experiences for the technical solution of problems.

### **Chinese awarded "Champion of the Earth"**

**(CRI, 2005-04-21)**

Chinese have been awarded the "Champion of the Earth" from the UN.

Chinese Zhou Qiang and the All-China Youth Federation have been awarded the "Champion of the Earth" from the UN's Environmental Program.

The awards were presented to seven winners from all over the world at the United Nations Headquarters in New York.

The prize was awarded to Zhou Qiang in recognition of his outstanding achievements as honorary

chairman of the Federation and leader of the "China Mother River Protection Operation", which mobilized 300 million Chinese youth to protect the environment.

**CAS researcher honored with Otto-Schott Prize  
(CAS, 2005-04-22)**



Together with two Japanese researchers, Prof. Qiu Jianrong of the CAS Shanghai Institute of Optics and Fine Mechanics received the Otto-Schott Awards. The awardees were selected for "their outstanding research achievements in the area of optical materials, especially their pioneering work on femtosecond laser-induced microfeatures in glasses and the application of such novel materials to achieve new functionalities."

The prize was presented by the Germany-based the Ernst Abbe Fund on April 11 at the 2005 International Symposium on Glass in Connection with the Annual Meeting of the International Commission on Glass held from April 11 to 14 in Shanghai.

Presented every the other year, the 25,000-Euro prize is awarded for outstanding achievements in basic research, technology and applications within the field of materials, especially glasses, glass ceramics, other optical materials or components made thereof. Its aim is to make a wider public aware of outstanding scientific achievements in the whole field of glass and glass-ceramics in basic research and application and to promote knowledge about the importance of glass science for technical progress. The work honored reflects the internationally high level in the field of glass science.

Prof. Qiu, 41, obtained his Ph. D in Materials Science from Okayama University, Japan in 1992 and carried out research as a visiting professor in the Department of Applied and Engineering Physics, Cornell University from 1999 to 2000. During the following five years, he served as group leader of photon craft international cooperative research project at the Japan Science and Technology Corporation and Professor of CAS Shanghai Institute of Optics and Fine Mechanics.

Prof. Qiu has made outstanding achievements in his studies into interaction of the external intensive fields with matter. He received the support from the CAS Bairen Program, a prestigious award for distinguished young scholars in 2000. Other prizes Prof. Qiu has received include Kurata Award from the Ceramics Society of Japan in 2002, Adachi Award from the Rare-earth Society of Japan in 1999, Young Scientist and Engineer Award at the 3rd International Symposium on Materials Science and Engineering in 1997 in Besides, and the outstanding young research fund from the National Natural Science Foundation of China in 2001.

**Beijing Sci-tech Fair to be on month's later  
(People's Daily, 2005-04-27)**

According to the report the 8th "China Beijing International Science & Technological Industry Fair" is going to be held from May 23 - 27, 2005 in Beijing. Lasting for 5 days the sci-tech fair, by series of activities of exhibition, forum and seminar on special topics as well as sci-tech trade talks, will display and bring forth the latest sci-tech results of China and of the world today so as to show off the economic development in China and the huge business opportunities brought about by the sci-tech cooperation and the Olympic construction to the whole world. And in the meantime of encounter it is to harvest the latest conception and ideas from a time of new economy and sci-tech industries on the front lines in order to promote the regional and international cooperation of the hi-tech industry.

The sci-tech fair is to make an arrangement of hi-tech and industrialization exhibitions, promotion and trade talks of sci-tech items, forum and special seminars, a total of over 40 thematic topics and some 100 activities. At present, all preparatory activities are being intensely carried out. The booth reservation for the exhibition has been brought to an end in advance. Those sci-tech and industrial and business delegations and groups specially coming to Beijing for the sci-tech fair have already come up to 38 in number and they are respectively from over 20 countries and regions of Hong Kong, Macao and Taiwan and most of them are the business delegations headed by governments and industry and business associations.

### **International Expo and Conference on Fieldbus and Industrial Automation Instrument held (MOST, 2005-04-29)**

In order to promote the international exchange and cooperation in fieldbus technology, 2005 China International Expo and Conference on Fieldbus and Industrial Automation Instrument was held from April 12 to 14 in Beijing.

Contents of exhibition include all kinds of fieldbus, automatic control system and various automation instruments; industrial control systems for petroleum, chemical engineering, metallurgy and electric power; mine safety monitoring system; building automatic control system; household automatic control device; logistics transmission and management systems; relevant development tools and OEM products; network products; changeover gear and accessories; typical examples of application, etc.

Fieldbus technology represents the development trend of modern automation technology and is a revolution of digitized communication and control technology in the field of industrial automation. Therefore, this expo was warmly received by the industries of petroleum, chemical engineering, metallurgy, electric power, environmental protection, instrument manufacturing, and light industry, building users as well as foreign businessmen in general.

Successively 4 such expos sponsored by China Instrument Manufacturer's Association have already been successfully held. Businessmen from 28 countries such as the US, Germany and Japan participated in this expo.

## 6 Information for Coming Workshops in June

### **The Eleventh International Conference on Martensitic Transformations**

**Date:** June 14 - June 17

**City:** Shanghai

<http://www.icomat.sjtu.edu.cn>

### **2nd Forum on Marine Science—New Development and Challenge**

**Date:** June 14 - June 17

**City:** Qingdao

**Organizer:** Ocean University of China

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### **The 10th IEEE international conference on engineering of complex computer system**

**Date:** June 16 - June 20

**City:** Shanghai

<http://www.cs.sjtu.edu.cn/iceccs05/>

### **The First International Conference on Algorithmic Applications in Management**

**Date:** June 22 - June 24

**City:** Xi'an

<http://www.cs.montana.edu/aim05/>

### **ACGA International Symposium on Genome Medicine**

**Date:** June 28 - June 30

**City:** Shanghai

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