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Helmholtz in China

In this month, our office has received Dr. Peter Suppan from the Institute for Meteorology and Climate Research, Atmospheric Environmental Research Division (IMK-IFU), Karlsruhe Research Centre. He was invited by the Institute of Atmospheric Physics, Chinese Academy of Sciences. Both parties have had a long time history of collaboration and they are trying to build up a larger network for air monitoring and climate modeling in the megacities. To our knowledge, some big Chinese cities, such as Beijing, Shanghai and Guangzhou all have had a integrated monitoring stations at over 100 spots. But continuing observation for a large dimension, such as a few hundred kilometers, which is very important for local climate modelling, is not yet available. So far we know China is making efforts to build large research facilities like these in the near future.

Our Helmholtz Office has coordinated a promotion tour to Xiamen and Fuzhou, for the German academic and research institutions. Led by Dr. M. Hack, Science Councilor of German Embassy, representatives from the Helmholtz, Fraunhofer and DAAD (German Academic Exchange Service) Beijing offices, and the Sino-German Centre for Research Promotion (joint-venture between NSFC and DFG) have given presentations in Xiamen and Fuzhou universities. They have also taken the opportunities to visit several key laboratories within or outside the universities, such as the Fujian Institute of Research on the Structure of Matter, which is the most famous institution for research and develop multifunctional crystals. This German delegation has been received with high honor from the local government.

With the assistance of our office in Beijing, Dr. Peter Ruile, manager of Ascenion, a patent management company dedicated for life sciences, was invited by CNCBD (China National Centre for Biotechnology Development) for giving a presentation on the BioEco convention held 26th-28th June in Tianjin. As invited speaker he was offered an eco-class return ticket. He gave a briefing on the history and ways how they had been successful in this field.

Taking the opportunity of accompanying Dr. Ruile to Tianjin, Dr. Hong HE has made also two appointments with the university personals responsible for graduate studies and research in the prominent Nankai and Tianjin University. He met also his old friend, Prof. Zihe Rao, new president of Nankai University. Dr. He gave introductions about Helmholtz Association and it's the programs with China, such as the student exchange program. As both these universities are among those 49 top Chinese universities which are granted for sending 100 top graduate students per year pursuing a PhD abroad, a recently started CSC (China Scholarship Council) program, there is obviously a need to improve the communication between both sides in the future.

As the last days this month, we are very please to hear a news report that a group of Helmholtz GKSS scientists has participated in an EU project for precision weather forecast in Qingdao. Some sports of 2008 Olympic Games, such as surfing and boating, will be carried out in this beautiful harbor city. And it is expected that precision forecast in hours advance could be managed through this cooperation.

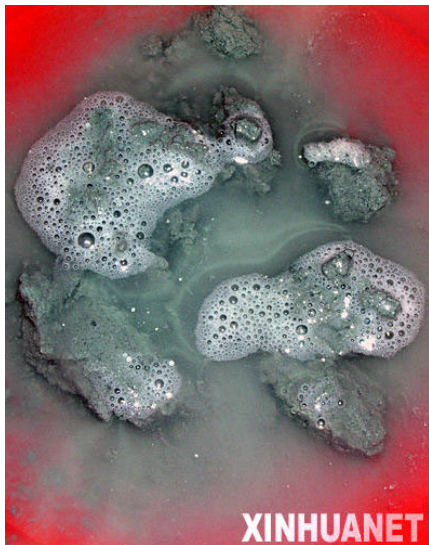
Helmholtz Beijing Office

1 Science News

1.1 Energy

China succeeds in excavating combustible ice

(Xinhua Net, 2006-06-05)



Sample of high-grade fuel for internal-combustion engine from biomass. (left: low boiling-point fuel; right: high boiling-point fuel.)

China has successfully excavated combustible ice--a kind of natural gas hydrate--from below the floor of the South China Sea after nine years of research in this field, a senior official said here Tuesday.

The development could ease China's energy dependence on oil and coal.

Zhang Hongtao, deputy director of the China Geological Survey Bureau, told a press conference held by the Ministry of Land and Resources that on the morning of May 1, China succeeded in collecting samples of combustible ice from the northern part of the South China Sea, making China the fourth country in the world after the United States, Japan and India to succeed in this field.

He said the success also proves that the northern part of the South

China Sea is rich in natural gas hydrate resources. A preliminary survey shows that the volume of natural gas hydrate in the continental slope of the researched sea area could reach 10 billion tons of oil equivalents. Zhang said this makes the Shenhu sea area the world's 24th district from which samples of natural gas hydrate have been extracted.

He said the first sample was drilled 183-201 meters under the seabed, with a hydrate rate of 20 percent. The hydrate-containing sedimentary strata is 18 meters thick, and the hydrate contains 99.7 percent of methane. The second sample was excavated 191-225 meters under the seabed, with the hydrate rate ranging from 20 percent to 43 percent. The hydrate-containing stratum is 34 meters thick and the hydrate contains 99.8 percent of methane.

Natural gas hydrate usually exists in seabed or tundra areas. It is formed by natural gas and water in conditions of high pressure and low temperature. It looks like ice and can be lit up like solid ethanol, hence the name "combustible ice". Approximately 164 cubic meters of natural gas can be released from one cubic meter of natural gas hydrate.

It has been estimated that the total volume of organic carbon in the world's natural gas hydrate is twice the combined volume of the world's proven coal, oil and natural gas reserves.

International scientific circles have predicted that natural gas hydrate is the best replacement for oil and natural gas. Some developed countries have set the year 2015 as a deadline for tackling this new energy.

Use of Clean Energy Gets Scientific Boost

(CRI, 2007-06-13)

The byproducts of steel-making - hydrogen and heat - could be used as clean fuel and energy for power generation. Coal, after liquefaction or gasification, could also become a clean energy.

These were some of the innovative ideas discussed at a scientific gathering in Beijing on Tuesday.

The national scientific innovation alliance system was launched on Monday to maximize resource utilization efficiency and reduce pollution.

The system covers four key industries - steel, coal, chemicals and agriculture, said sources with the Ministry of Science and Technology (MOST).

"Targeting the country's four pillar industries, the system will try to integrate the manpower and resources of enterprises, universities and research institutes in the hope of generating innovative ideas," Vice-Minister Li Xueyong said.

The system was jointly launched by MOST, the National Assets Management Committee, the All-China Federation of Trade Union, the National Development Bank and the ministries of Education and Finance.

The system has brought together 26 top enterprises, 18 first-class universities and nine famous research institutes across the country.

The Shenhua Group, the country's largest coal enterprise, has signed contracts with 17 universities, institutes and enterprises to form a coal industry innovation alliance.

"We hope this cooperation can generate more new scientific ideas which can be directly used on our production lines," said Ling Wen, CEO of the group.

"In the past, we relied heavily on importing costly foreign equipment which restrained our development," Ling said.

The group began to patent its scientific renovations in 2004, and now most of its core technologies are locally developed. A scientific renovation of the hydraulic system of its excavators helped the group save more than 3 billion yuan (US\$392 million) last year.

"The industrial alliances under the system will focus on strategic plans for the country's long-term development," Xu Kuangdi, president of the Chinese Academy of Engineering, said.

"Cooperation between enterprises, universities and institutes in the past was often short-lived and focused on instant benefits, rather than taking a long-term view," he said.

There will probably be more industrial alliances under the new system in the future, Xu said.

New Paths to Reach Green Goal

(CRI, 2007-06-15)

China's top science official Thursday sounded an upbeat note about achieving the country's green goals - innovatively.

"China is exploring a different way of controlling greenhouse gas (GHS) emissions. We will not follow the Western countries' way of high emissions first and then reduction," Minister of Science and Technology Wan Gang said.

China, the world's second-biggest GHG emitter after the United States, released 5.6 billion tons of carbon dioxide (CO₂) equivalents in 2004, according to the national climate change program.

Wan told a news briefing organized by the State Council Information Office that the government is working to turn energy-saving targets into goals for CO₂ emissions.

"We are studying technologies and methods for converting this (energy targets) into goals for cutting carbon dioxide emissions," he said.

Under an ambitious energy-saving blueprint, the country plans to reduce its energy consumption per unit of

gross domestic products (GDP) by 20 percent by 2010 from 2006.

To boost the scientific and technological support for the drive to curb temperature rise, the ministry Thursday released China's Scientific and Technological (S&T) Actions on Climate Change.

The document focuses on energy and the environment as key fields of S&T studies and gives priority to global climate change and policy-making.

"S&T is one of the basic and fundamental approaches to effectively address climate change," Wan said.

China has spent 4.6 billion yuan (\$600 million) since 2006 in the first batch of S&T projects to combat global warming.

Wan said that the technology studies focus on raising energy efficiency, developing renewable and clean energy, exploring and burning coal in a clean way, carbon capture and sequestration, absorbing carbons biologically and cutting GHG emissions through improved farming modes.

The country will cut carbon emissions per unit of GDP, or carbon intensity, by 40 percent in 2020 from 2000 and 80 percent in 2050 from 2000, according to the National Climate Change Assessment Report released last year.

According to the national climate change program, hydropower and coal bed methane utility will make biggest contribution to emission cuts - by 500 million tons and 200 million tons of CO₂ by 2010.

Successful test for mass production of high-grade fuel for internal-combustion engine from biomass (CAS, 2007-06-20)



To address the current energy crisis, people are exploring ways of synthesizing fuels with biomass. As biomass contains nearly 50% of oxygen in addition to hydrogen and carbon in its composition, the key to turning it into high-grade fuel for an internal-combustion engine lies in the technology that could liquefy biomass via deoxidation by making the best use of its hydrogen and carbon without adding any additional hydrogen or generating any water.

Recently, CAS researchers have made breakthrough progress in their attempts in the regard. With the technology and equipment they have developed, Prof. YANG Zhengyu and colleagues from the CAS Technical Institute of Physics & Chemistry have succeeded in their pilot study of a manufacturing facility that could annually synthesize 50 tons of high-quality fuel from biomass.

With the support of the National High-tech Development Program (dubbed "863 Program") and the CAS Knowledge Innovation Program, the team led by Yang completed bench tests and pilot studies, making a series of technological breakthroughs. Experiments show that many parameters of the synthesized fuel excel those from small-scale lab tests. Its biomass conversion rate is up to 80% of the theoretical value while the productivity reaches 12-16%. Its chemical composition is similar to that of the standard mineral diesel and its calorific value is on a par with that of standard diesel products (about 45 billion joules per liter). Its contents of oxygen and sulfur are less than 0.5% and 0.001% respectively.

The scientists have realized the direct deoxidation of biomass, recombination of carbon, hydrogen, one-step synthesis and separation of products in solid, liquid and gaseous states, the temperature of the reaction is lower than 380°C, and the reaction pressure is less than 2.6 mega-pascal. The energy consumption for the production is less than one fifth of its energy output while the solid residue is less than 10% of the intake of the raw material in weight.

The residue has no toxic substance in composition and may be returned to the field as manure or used as a

construction material. The technology features a simple circuit with easy maneuverability. The raw material includes the straw and stem of 15 crop plants such as those withdrawn or processed from rice, wheat, soy bean, maize, peanut, sweet potato, oil-rich plants, wood bits, fruit shells etc. An initial analysis of the scale-up tests shows that the process is feasible viewed from an economic angle.

According to statistics, the waste discarded each year from farming practice and wood-processing industry in this country reaches 1.5 billion tons, including 720 million tons in the form of straw and stems. In addition, there is up to 100 million hectares of land which is unfavorable for grain and oil crops but could be used to grow fat-rich plants. This is a huge trove of biomass exploitable for reusable energy source. It not only can provide a new way for producing diesel, but also can mitigate the pollution caused by our farming production in the vast countryside.

World's 1st coal-to-oil mass converter to start operation

(Xinhua Net, 2007-06-21)

Towering above the sweeping grasslands of Erdos, in north China's Inner Mongolia Autonomous Region, two 60-meter-high cylindrical structures stand out against the skyline.

The structures -- reactors for liquefying coal -- are part of a project to mass produce desperately needed fuel oils from China's rich coal resources.

More than 10,000 workers from across China are constructing the massive project, the first industrial facility in Ejin Horo Banner.

"The project is in its final stage of construction and will start production late in the year," said Wang Yulong, deputy manager in charge of the coal liquefying arm of the Liquefied Coal Oil Company of Shenhua Group Corporation Limited, the country's top coal producer.

Coal liquefaction is a process that converts coal from a solid state into liquid fuels, usually to provide substitutes for petroleum products. Coal liquefaction processes were first developed in the early years of the 20th century but progress was hindered by the relatively low price and wide availability of crude oil and natural gas.

The facility in Erdos will produce mostly diesel oil, plus liquefied petroleum gas (LPG), naphtha (a volatile, flammable liquid hydrocarbon mixture), and hydroxybenzene.

Listed as a key state project to help deal with China's petroleum security concerns, the massive Erdos coal liquefaction facility began construction in August 2004 with the blessings of China's top leaders.

During an inspection tour in June 2006, Chinese Premier Wen Jiabao called the project a major scientific and technological experiment.

With a budget of 12.3 billion yuan and an annual production capacity of five million tons of oil, the project will be completed in two stages. In the first phase, three production lines will be installed.

"We're installing the first production line and its infrastructure," said Wang. "On completion, the line will be able to process annually 3.45 million tons of coal into 1.08 million tons of oil, including 720,000 tons of diesel oil."

Before starting this project, Shenhua successfully trialed technology at a specially built converter in Shanghai, according to Wang.

"The project in Erdos is about 1,000 times the size of the Shanghai model," said Wang, claiming it would be both environmentally friendly and lucrative.

Preliminary estimates show 3.4 to 3.5 tons of coal could produce a ton of oil, and if the price of a barrel of crude remains above 35 U.S. dollars, the facility will be profitable, said Wang.

The coal liquefaction project is big on recycling. Workers have constructed two 100,000-kw power plants for generating electricity from burning grease stain, and a sewage treatment plant that will go into service in October. Industry observers say the Erdos project is significant to China's food and energy security.

"The efficiency of conventional coal use is very low, but the profits from coal-oils can be much higher," said an expert surnamed Wu. "This takes away the need to process grain such as maize into ethanol."

Shenhua Group Corporation Limited is a 100 percent state owned venture that came into being in 1995. Its scope of business ranges from coal, power, heat, coal-liquefied oils, coal-based chemical industries and railways to ports.

It produced 203 million tons of coal last year and was the first enterprise whose coal output exceeded 200 million tons in China.

Coal accounts for more than 84 percent of China's energy reserves. Statistics provided by the Land and Resources Bureau of Inner Mongolia Autonomous Region show that proven coal reserves in the region exceed 500 billion tons, double that of Shanxi Province and elevating Inner Mongolia to the top rank in China in terms of coal reserves. Many believe coal-to-liquid projects are the most practical way for China to achieve self reliance in oil supply.

In the meantime, constantly rising oil prices have prompted the coal-based chemical industry to flourish in a bid to find alternatives for petroleum in China, the world's fourth-largest economy.

To avoid a possible overheating in the coal-based chemical industries, however, China raised the threshold for projects converting coal to liquid fuel last year, for fear that excessive development of the fossil fuel will pollute the environment and strain water supply.

On July 7, 2006, the National Development and Reform Commission (NDRC) issued a circular requiring local governments to tighten control of new coal liquefaction projects prior to the completion of the national development program for the coal liquefaction industry. The government will no more approve coal liquefaction projects with an annual production capacity under three million tons.

**Minister: no timetable for commercial exploitation of combustible ice
(People's Daily, 2007-06-28)**

According to the "China Economic Weekly," Wan Gang, Chinese Minister of Science and Technology, said recently that the scientific research of combustible ice will continue; however, it is still currently unknown when it will be ready for commercial use. In consideration of the special nature of combustible ice, China will be sure to proceed with caution, and will not begin immediate commercialization. In addition, it will prevent commercialization of the resource from damaging the environment.

Huang Yongyang, chief engineer of the Guangzhou Marine Geological Survey, said exploration reveals that only flammable ice reserves in the north of the South China Sea have reached approximately 50 percent of the amount of total oil reserves in China. In addition, the distribution area of combustible ice of 5,242 square kilometers initially encircled the sea of the Xisha Islands, and the resources were estimated to reach an area of 4.1 trillion cubic meters. Although it has an attractive foreground, great challenges lie ahead. Although combustible ice is unstable, it is easy to neutralize under normal temperatures and normal atmospheric pressure. Hence scientists are concerned that the damage caused by the use of combustible ice may lead to the massive release of methane gas into the atmosphere.

1.2 Earth and Environment

China takes effective measures to tackle climate change: minister

(People's Daily, 2007-06-05)

China has worked hard to adjust its economic structure to improve energy saving and cut emissions, Ma Kai, minister in charge of the National Development and Reform Commission (NDRC), said in an article published by The Financial Times Monday.

The minister said from 1991 to 2005, with national energy consumption rising each year by 5.6 percent, China sustained an annual economic growth rate of 10 percent and lowered its energy consumption per unit of gross domestic product by 47 percent, saving 800 million tons of coal and cutting 1.8 billion tons of carbon dioxide emissions.

According to the minister, the central government had by April 2007 approved 383 projects in wind, hydro and biofuel power generation, and the use of methane gas from coal beds, which in total will cut emissions by 1 billion tons. From 1980 to 2005, another 5.1 billion tons were absorbed through extensive reforestation and better forest management, according to the minister.

China's strict family planning policies which will continue to be carried out also contributed significantly to easing the world's population expansion and curbing greenhouse gas emissions, Ma said.

Without the policy, China's population would have increased by 138 million since 1979, which would have in turn resulted in an extra 330 million tons of emissions, he said.

"China is committed to addressing climate change in the context of sustainable development, but it should be on the principle of common but differentiated responsibilities," Ma said.

"China stands for active participation in international forums and multilateral cooperation. We have shouldered our obligation and responsibilities in the past, pushed forward the 'post-Kyoto protocol' negotiations, and made strenuous efforts in all negotiations," the minister said.

China also hopes that the developed countries can take the lead in reducing their greenhouse gas emissions and provide financial and technological support for developing countries to better meet their needs for technology transfer and cooperation, particularly in climate change observation and monitoring, reduction of greenhouse gas emissions and adaptation to climate change, according to Ma.

"We believe that as long as different countries can cooperate with each other on the issue of climate change, their collective efforts can make a greater contribution to the sustainable development of the global economy and humankind," the minister said.

China will act vigorously in developing cleaner energy sources such as wind and solar power, geothermal, tidal, biomass and other renewable technologies, and promote nuclear power with a view to increasing the ratio of renewable energy in the supply of primary energy to 10 percent by 2010, he added.

China will also address its water problems in the light of global warming with the government properly developing water resources and improving distribution, including irrigation and conservation, and strengthening the capacity of the water system to resist climate change, he said.

China will implement key projects in forestation, including returning farmland to forests and grasslands and preserving natural forests, with the aim of increasing forestry coverage to 20 percent of the country by 2010, he added.

On other fronts, China will encourage and support scientific and technological innovation in curbing and adapting to climate change and do more in researching and developing key technologies.

"China is committed to improving its policies in industry, taxation, credit and investment and to using pricing to make the most of environmentally friendly policies. Such measures will also be backed by a solid legal foundation, with the adoption of the energy conservation law and the law on renewable energy as soon as possible," the minister said.

Climate change is an environmental issue, with an impact on the entire global community, but it is also a development issue, which was caused by human development and must be resolved by development, he said.

Glaciers Melting on Himalayan Scale: Experts

(CRI, 2007-06-05)

Himalayan glaciers are retreating fast and could disappear within the next 50 years, warned the experts at a conference in Kathmandu looking at the regional effects of global warming, The Himalayan Times reported on Tuesday.

The melting ice fields have also caused a dramatic increase in the number and size of glacial lakes that now risk bursting and devastating mountain communities, delegates at the conference said at the "World Environment Day" Monday.

"If temperatures continue to rise as it is, there will be no snow and ice in the Himalayas in 50 years time," Surendra Shrestha, the regional director for the United Nations Environment Program Glaciers in the Himalayas was quoted by the daily as saying.

Temperatures in the region have been increasing by between 0.15 and 0.6 degrees Celsius per decade for the last 30 years. The Imja Glacier just south of Mt. Qomolangma has been retreating at a rate of about 70 meters per year, with the water forming huge glacial lakes.

"There are studies showing that the surfaces of some of these lakes have increased by 150 to 200 percent and there is a danger that these lakes will burst," said Andreas Schild, the director general of the International Center for Integrated Mountain Development, the host of conference.

In the 1950s about 12 glacial lakes were recorded in Nepal. "When the inventory was done in 2000 there were 2,400 lakes in Nepal. Out of these, lakes that are about to burst are about 14," Shrestha told reporters.

"If we were to have a very small earthquake, all that water is going to come down. Because of the altitude, as it comes down it will pick up debris and speed, it's like a big bulldozer that wipes everything out," said Shrestha.

He added that the result of the immediate reduction in the emission of the green house gases will be seen only after 100 years, so the focus should be to identify measures that would check the effect in immediate future.

Shrestha stressed on the need of integrating the issue of climate change in the national development plan.

The Nepali government is trying to mainstream the environment in its development plan, said Environment Minister Mahanta Thakur.

"The theme of the World Environment Day 2007 -- 'Melting Ice: A Hot Topic' is therefore very relevant to this region," he added.

Progress made on climate change tech

(People's Daily, 2007-06-08)

China is actively engaged in developing technologies to battle climate change and reduce global warming, a senior official said yesterday.

Lu Xuedu, vice-director of the Ministry of Science and Technology's Office of Global Environment, said China has achieved fruitful results in scientific research through a series of major projects in the past years. The projects include "Global Climate Change and Environmental Policies", "Study on Terrestrial Ecosystems Carbon Cycle and its Mechanism in China", "Research on the Formation Mechanism and Prediction Theory of Severe Climatic Disasters in China" and "The Trend and Influence of China's Climate and Sea Level Change".

His remarks come at a time when climate change is a hot topic at the ongoing G8 summit in Germany. The National Mid-term and Long-term Science and Technology Development Plan (2006-20) issued in February last year and the National Climate Change Program released on Sunday has set the goal of developing climate change technologies.

A relatively complete atmosphere observation network is in place and the satellite environmental monitoring system is being improved.

Besides, China has actively participated in international science and technology collaboration to tackle global warming.

Lu said China would focus on developing technologies for precise climate monitoring, energy-efficient resources, greenhouse gas emission control to slow down climate change.

Lu said climate change can have a severely negative influence on agriculture and animal husbandry, ecosystems, water resources and coastal regions.

For example, warming will turn more semi-arid regions in West China into deserts and considerably reduce wetland areas in the Sanjiang Plain in Northeast China.

It will result in degeneration of frozen soil on the Tibet-Qinghai Plateau, threatening major projects such as the Qinghai-Tibet Railway.

Climate change will also speed up shrinking of inland lakes and aggravate water shortage. The sea level rising will bring more floods and damage coastal regions' ecosystem. Electricity consumption will rise sharply as more air conditioners are needed because of warming.

Zhang Chenyi, a senior researcher with the China Meteorological Administration, said the government should take effective measures to reduce emission of greenhouse gases to avoid climate disasters.

Zhang said clean energies, including solar energy and wind power, should enjoy priority development.

CAS launches ecological studies in Inner Mongolia

(CAS, 2007-06-13)



With an objective of making clear the local ecological conditions and offering countermeasures for its protection, a CAS task force recently visited Alxa League in Inner Mongolian Autonomous Region.

Making up of renowned Chinese experts in environmental sciences and natural resources, such as SUN Honglie, YE Danian and ZHENG Du, the group is commissioned by the CAS Academic Divisions to conduct a consulting research project under the title of "the Ecological Plight &

Countermeasures in the Alxa Area of Inner Mongolia."

The Alxa area is a prefecture (league) in the western part of Inner Mongolia, mostly composed of Badain Jaran, Tengger and Ulan Buh deserts. It is a tableland covered by an arid and vast wilderness, featuring

harsh natural conditions, rampant desertification and ecosystem depletion. The project is aimed at establishing a national special zone for nurturing an ecological remedy by stopping the on-going desertification momentum in the prefecture.

The study tour included field investigations of the current ecological state in the Alxa Right Banner, Alxa Left Banner, Ejin Banner and Alxa Economic Development District under the jurisdiction of the Prefecture, its natural reserve for the forests of diversiform-leaved poplar (*Populus diversifolia*), the restored vegetation in the Salt Lake of Eastern Juyanhai and the Overall Rehabilitation Project for the Heihe River Valley.

The team also visited the Experimental Station for Ecological Monitoring affiliated to the Cold and Arid Region Environmental and Engineering Institute under CAS. They spoke positively of the fieldwork conducted at the outpost. In addition, they gave some on-the-spot instructions on some specific topics arising from the fieldwork.

At the suggestion of its Members, CAS kicked off the project to explore the possibilities of establishing a "national ecological zone" in the local area. Via surveys and analyses, it is expected to reveal the policy reasons behind the ecological degeneration in the area and find new modes of balanced ecological and economic development in the region. The team will also put forward new thinking approaches and new policy suggestions for a long-term and effective mechanism for the ecological protection in the area.

China invests 7.1 bln yuan on sci-tech to cope with climate change (Xinhua Net, 2007-06-14)

China has earmarked more than 7.1 billion yuan (about 930 million U.S. dollars) for technology innovations to cope with climate change since 2001, said Science and Technology Minister Wan Gang on Thursday. Investment rose sharply in 2006 when China adopted its 11th five-year program, said Wan at a press conference.

"China is determined to find answers to climate change through science and technology," said Wan.

China has made big efforts to cope with climate change, said Wan, adding that ministries and local governments had approved a series of environmental protection policies.

He also said some Chinese enterprises were using technology to reduce energy consumption and pollution discharge.

The Ministry of Science and Technology launched on Thursday China's Scientific and Technological Actions on Climate Change. It aims to enhance the role science and technology play in responding to climate change.

China's largest desert 1.8 million years older than thought (People's Daily, 2007-06-18)

The Taklimakan Desert located in China's northwestern Xinjiang Uygur Autonomous Region, the second largest desert in the world, could have been 1.8 million earlier than previously thought, Chinese scientists said in Beijing on Sunday.

Scientists said they've found as testing on samples of loess in a stratum from the Cenozoic Era on the southwest tip of Taklimakan near the Kunlun Mountains, indicates the desert is 5.3 million years old.

Experts believe the loess must have been blown to the region by wind from the Taklimakan Desert, Sun Jimin, a researcher with the Institute of Geology and Geophysics of the Chinese Academy of Sciences said.

Chinese scientists have been studying the formation of the Taklimakan for decades but they have never reached a universally-accepted theory when it was formed.

In 2002, a group of researchers from the Shanghai Tongji University and the Chinese Academy of Sciences concluded that the Taklimakan Desert was likely formed some 3.5 million years ago, after studying sediment and loess in the desert.

Sun said scientists reached different conclusions because they studied different locations in the desert. The stratum studied by the researchers of Shanghai Tongji University was 80 kilometers to the west of the region discovered by Sun's team.

Scientists believe that the study of the formation of the Taklimakan Desert will help them better understand how central Asia became so arid.

Studies kick off on integrated water resources management in Heihe

(CAS, 2007-06-18)

As a component of the CAS Action Plan for the Development of China's West, a research project on integrated water resources management was initiated on 10 June at the Research and Experiment Station for Desert Ecological Hydrology in Alasan, Inner Mongolia, an outpost of the Cold and Arid Regions Environmental and Engineering Research Institute of CAS. CAS Vice President Li Jiayang attended the launching ceremony.

The Heihe River Basin has the second largest inland river in Chinese West, which is the largest river in the arid landmass in the west part of Gansu Province and Inner Mongolian plateau. For the residents in the Hexi Corridor of Gansu Province and Inner Mongolia's oasis-studded vastness in Ejin Banner, the river acts as the lifeline for various endeavors of vital importance in the region such as the protection of the native ecosystem, development of local economy and prosperity of indigenous population. In the wake of the drastic growth of local population in recent years in addition to the large-scale exploitation of the water-and-soil resources and poor management of the hydrologic setting in the valley, a rapid and worsening momentum was seen in the native ecosystem, currently featuring land desertification and degenerated vegetation. Such an ominous development is now especially serious in the river's lower reaches. To introduce a science-oriented management mode and establish a sound pattern of the ecological security for the valley have been a main topic in the limelight of the public concern nowadays being shared by both governmental departments and the circles of scientists.

The research should take a panoramic view of the whole valley, lay stress on the managerial mode, and highlight the presentation and solution of key S&T issues, says Prof. Li. It must cater itself to the demands posed both by the country and locality and offer consulting service to decision makers in the local government as much as possible. At the same time, it must strengthen the up-bringing of young and promising talented people and strategic scientists. After the conclusion of a project, its research results must be popularized to the grassroots and play a demonstrative role in the locality.

Glacier-monitoring station inaugurated in Yunnan

(CAS, 2007-06-21)



The inauguration for a CAS observation station for glacier and environment was held at a symposium on glaciology held in late May at Yulong Xueshan (Jade Dragon and Snow-capped Mountain) in the suburban Lijiang County of southwest China's Yunnan Province. It is China's first observing station designed to study modern marine glaciers. Under the administration of the CAS Cold & Arid Regions

Environmental & Engineering Research Institute, its main research priorities will include the snow-and-ice cap, climate, eco-system, water and hydrological setting, resources for sight-seeing, human activity and sustainable development in a given area such as Yulong Xueshan, which is a low-latitude and picturesque district of glaciers dominated by a marine monsoon climate. Its fieldwork will be especially focused on the observation of the modern glaciers and their snow and ice buildup, altitude meteorology, ecological evolution, impacts posed by human encroachment and the local development.

Successful test on quick sampling technology for pine wood nematode
(CAS, 2007-06-25)



The Provincial Station for Forest Pest Control in Hubei recently announced that, by joining hands with a research team led by SUN Jianghua with the CAS Institute of Zoology, it has successfully developed a technology for quick sampling of the pine wood nematode (*Bursaphelenchus xylophilus*). Experiments show that as short as two hours are needed to identify the pest.

The pine wood nematode has been causing widespread losses to pines in China. To test the pest, conventional methods need as long as two days to get the results. The novel technology featuring simple operation and low cost is expected to raise the control and treatment level of the pest.

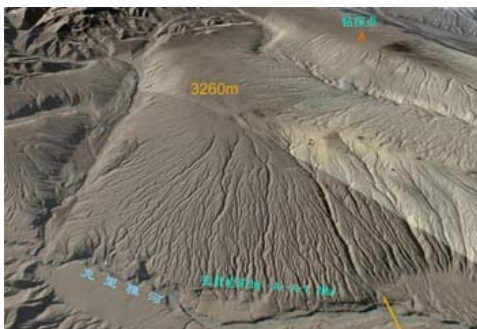
Integrate Latest Technologies to Prevent and Control Desertification
(MOST, 2007-06-25)

The international S&T cooperation project of “Application of New Technological Methods to the Process of Prevention and Control of Desertification” supported Beijing Normal University and the National Agency for New Technologies, Energy and the Environment, Italy (ENEA) in their joint research.

ENEA provided a great deal of aid during the implementation of the project. The Italian experts came to Beijing twice to deliver reports and conduct training with regard to control of wind and sand.

Results of this project will drive and facilitate prevention and control of desertification and the improvement of the early warning system in China.

Loess drilling undergoes smoothly on West Kunlun Mountains
(CAS, 2007-06-26)



CAS researchers have made progress in obtaining loess records through drilling operation on the northern slope of the West Kunlunshan, a mountain chain with the highest point of more than 7,000 meters in elevation that stretches along the southern edge of the Tarim Basin, and Taklamakan and Gobi deserts about 1,100 meters in elevation. This is the first successful drilling operation in the soft sandy loess and the loess-like sand ever attained by Chinese scientists in an extremely arid area.

Supported by the National Natural Science Foundation, a research team led by Prof. Fang Xiaomin at the CAS Institute for the Qinghai-Tibetan Plateau Research has carried out studies on the relationship between West Kunlunshan loess and aridification in Northwest China. The

drilling is an important part of the research project.

After two-year preparations, the researchers have managed to finish the back-breaking task of transporting the heavy and cumbersome drilling equipment along the rugged path to the highest loess terrace up to 3,315 meters above the sea level. So far, the drilling operation is successful and reached over 200 meters in depth. The drilling is expected to be completed at the end of the July to reach about 400 meters.

The composition of the loess on the northern slope of the West Kunlunshan is much coarser than the sediments on the Chinese Loess Plateau, being mostly sandy loess and loess-like sand as it is the direct product of the nearby vast Taklimakan Desert, according to scientists. It is significant to date the loess deposits at its highest terrace in front of the Mountain. If its age is consistent with that of the loess on lower tablelands which has been paleomagnetically dated to about 860,000 years ago, this will mean that the earliest loess in the area was formed at that time, implying a synchronous initiation of the Desert. If it is found to be older than that of the loess on the lower tablelands, it would be regarded as the latest age for the Desert's formation. Through these, it would be known to scientists that the loess core obtained from the drilling operation can be used as a databank to depict the details in the evolutionary process of the current environmental setting in the arid Asian heartland, including the climatic ups and downs in the Taklamakan Desert. The research work is expected to provide important clues for the understanding of the powdery buildup, aridity and rehabilitation of the local ecosystem, both theoretically and practically.

Official Describes Blue Green Algae Bloom on Dianchi Lake as "Normal"

(CRI, 2007-06-26)

Local authorities have confirmed that Dianchi Lake, the largest freshwater lake in southwest China, is suffering from a blue-green algae bloom, similar to the one in Taihu Lake that polluted the water supply for millions of residents in Wuxi City last month.

However, local officials do not seem concerned. "It happens every year and is normal. In fact it is much less serious than last year," said Yang Shuwen, chief of the lake administration's laws and regulations department. "As a matter of fact, the algae bloom has been evident since May, but I don't think it will pose any threat to the water supply of residents of Kunming, the provincial capital," he said.

"All the drinking water of Kunming residents now comes from Yunlong Reservoir, instead of Dianchi Lake, after the former, a water supply facility designed to divert water from the Zhangjiu River, was completed and put into service on March 25," the official explained. Yang said he hoped the bloom would soon be curbed by increasing the rate of water being pumped out of the lake.

With a total area of nearly 300 square kilometers, Dianchi Lake, situated near to Kunming, the provincial capital of Yunnan, has been suffering from severe pollution since the 1980s, threatening temporary water supplies in Kunming.

Inadequate rainfall and high temperatures in recent months have again led to the rampant reproduction of blue green algae, suffocating aquatic life and creating a putrid smell.



CAS, Guangxi to join forces for eco-environmental restoration in Karst region

(CAS, 2007-06-28)

CAS has recently signed a protocol with the Government of the Guangxi Zhuang Autonomous Region to jointly rehabilitate the depleted ecosystem in the local Karst region.

Early and effective partnership has been formed between the two sides to eliminate the local poverty with S&T means and improve the ecological setting in the Karst areas of the region. Since the conclusion of a cooperative pact between the two sides to exploit the stony mountains of the region in 1993, for example, a batch of key research results and effects of applicable demonstration has been achieved.

In response to the novel demands for the regional development and the second stage blueprint in the CAS action plan for the development of China's West, an informal discussion was held in Nanning City, the regional capital, in December 2006 for the jointly remedying the depleted ecosystems in the Karst areas. A consensus was reached by the two sides for research into the Karst landform in southwest China.

The new protocol, which was signed CAS Vice President LI Jiayang and Vice Governor of the Guangxi WU Heng on behalf of the two sides, clarifies the definition of the research realms, possible cooperative modes, working priorities in the bilateral collaboration. In light of the regional requirements for the rebuilding, the cooperative research will cover such topics as changes in the ecological structure of the Karst landscape and its driving mechanisms, an estimation of service functions of the ecosystem, techniques for the ecosystem's restoration and rebuilding, remedy of the polluted land resources, developmental modes for sustainable economic development in the region, their research and demonstrating tests, the construction of related S&T platforms, and joint application for State-commissioned projects. It is expected to further speed up the cooperative tempo between two sides and push the cooperative drive to a new stage.

Scientists find cure for toxic lake algae

(Xinhua Net, 2007-06-28)

Researchers from Fudan University have worked out how to tackle toxic green-blue algae, after an outbreak in Taihu Lake threatened water supplies in the Yangtze River Delta this month.

The method uses algae-killing bacteria, nano-technology and water plants. The plan has been submitted to environmental protection authorities in the city and neighboring areas for larger feasibility studies.

The recent green-blue algae outbreak was caused by eutrophication, which means the water's richness in mineral and organic nutrients promoted a proliferation of plant life such as algae.

After repeated lab experiments, researchers at Fudan's environmental sciences and engineering department managed to discover a bacteria that can soak up excess nutrients in the water.

"Reducing nutrients will naturally hinder the growth of algae," said Wang Xiangrong, a Fudan professor and the research program leader. He added the bacteria was even able to secrete a cellulose-dissolvable enzyme that could directly kill the toxic algae.

Meanwhile, chemistry scholars also tried to fuse copper ions on magnetic nano-materials, as copper ions can bind with algae toxin. By scattering the special nano-material into water and using another magnet to draw it up, people can separate algae toxins from the water and reduce pollution.

Preliminary lab experiments suggested that the nano-magnet technology was able to reduce algae toxins by more than 90 percent. The findings have been published in *Small*, an international academic journal of nano- and micro-sciences, according to Deng Chunhui, professor at Fudan's school of chemistry.

In addition, three undergraduate students at Fudan also worked out a scheme to curb water eutrophication by planting two ornamental plants. The technology of treating water with nutrient-absorbing plants has been awarded a national patent.

1.3 Health

SH-Compound: A new drug against AIDS

(CAS, 2007-06-04)

SH-Compound, a new AIDS drug developed by a research team headed by LUO Shide at the CAS Kunming Institute of Botany recently passed an expert review.

Based on an extended study, LUO and his colleagues have screened the anti-HIV activity of some 1000 medical herbs, using MTT approaches developed by NCI, from which more than 100 herbs are identified with anti-HIV activity, and 20 of them are believed to possess stronger activity. Researchers finally screened out 5 medical herbs from the candidates to be a SH-Compound, made under the principle of traditional Chinese medicinal theory.

The Chinese Ministry of Health inked in May 1997 a Memorandum of Understanding with the Ministry of Health of Thailand for collaborations in the area of health and medicine. Under the framework, Department of Medical Science, part of the Ministry of Health of Thailand further signed in July 1999 a collaborating contract with Kunming Institute of Botany. As a result, the research team headed by LUO, Department of Medical Science, and Yunnan Siate Pharmaceuticals have worked together to roll out the SH-Compound in May 2003. The new drug is the world first AIDS drug made up of natural herb extracts, and approved by the Ministry of Health of Thailand, after a complete range of clinical trials.

Pig clones used for organ transplant experiments

(People's Daily, 2007-06-05)

On June 3rd, two miniature pig clones for organ transplant experiments were born in the city of Tianjin. They were ten days old, respectively 0.55 kilograms and 0.6 kilograms in weight at birth. Currently, they are well-developed, weighing nearly 1.9 kilograms and 2.3 kilograms.

According to researchers, this type of pig, whose internal organs are quite similar to those of human beings, is used for organ transplant experiments. All drug administration agencies in the world authorized the research of this type of pig for diabetes mellitus, heart diseases, hypertension and other human disease.

China Agricultural University, Tianjin Baodi Agriculture and Technology Co., Ltd., Tianjin Academy of Agricultural Sciences and Beijing Jipulin Biotech Company all collaborated on this project. Six mini-pig clones were born, but only two of them survived. Experts believed that the two surviving mini-pig clones will provide new resources to develop organ transplant experiments in China.

Chinese Scientists Prove Tea Can Help Fight Obesity

(CRI, 2007-06-06)

Chinese scientists have proved it -- tea can help make you thin.

Researchers spent five years studying obesity, with the focus on children, the China Daily said.

"They found that the polyphenol compound in tea -- especially Oolong tea -- can help obese people battle the bulge," the newspaper said. "Scientists have proved that drinking tea can help people lose weight."

Guo Xirong, director of the Nanjing Institute for Paediatrics, particularly recommends Oolong tea, the newspaper said.

Chinese have long believed in the link between tea and weight loss, something an Oolong tea Internet home page (www.oolongtea.org) espouses.

"It has been confirmed that the continuous intake of Oolong tea contributes to enhancing the function of fat metabolism and to controlling obesity," it says of a tea produced and consumed primarily in the southeast of the country.

New Vaccine against Blue-ear Pig Disease

(CRI, 2007-06-13)

China on Wednesday formally puts into use a new-type vaccine specially targeting a highly pathogenic blue-ear pig disease that has been haunting Chinese pig farmers for months, said the Ministry of Agriculture (MOA).

The first batch of the new vaccines went off the production lines of two companies in Zhejiang and Sichuan provinces on Wednesday, according to an MOA official.

They are to be dispatched to disease-hit regions and major pig raising areas, said the official.

The vaccines will be offered to pig farmers free of charge, as the government has already allocated 280 million yuan (36.5 million U.S. dollars) to fund the vaccination.

Chinese veterinary officials earlier said they were confident of ending outbreak of the deadly pig disease with the new vaccine.

China first spotted a more virulent form of the blue-ear pig disease in the summer of 2006. In January of this year, researchers concluded that it was caused by a mutated, highly pathogenic variant of the original virus causing the blue-ear disease -- officially named porcine reproductive and respiratory syndrome.

The mutated virus caused higher mortality rates, according to Jia Youling, the country's chief veterinarian.

China successfully developed a vaccine for the new variant and approved 12 companies to produce the vaccine in May.

The output of the new vaccine would total 70 million milliliters in June, 154 million milliliters in July and 189 million milliliters in August, according to the production schedule.

The Ministry of Agriculture hopes a mass immunization of pigs will be completed as early as possible as high summer temperatures and humidity could help spread the outbreak of blue ear pig disease.

The highly pathogenic disease has killed 18,597 pigs and forced another 5,778 pigs to be culled in China.

Cervical Disease Spreads Fast

(CRI, 2007-06-19)

According to Lou Siqian, the director of the Cervical Disease Commission of Chinese Association of Rehabilitation Medicine (CARM), cervical disease has become one of the biggest threats to the health of Chinese people, for there are 50 million cervical disease patients in China, with 1 million joining the group every year.

CARM published the first instructions on the treatment and rehabilitation of cervical disease recently, which will help both doctors and patients gain a better understanding of the disease.

"With the changing of lifestyle in such a demanding society, the incidence of cervical disease has become higher and higher, particularly among office workers, and the age group of the patients has become wider and wider, " said Lou.

Specific HIV-infected people increased

(China News, 2007-06-19)

Wang Pangde, vice health minister and a director of China Integrated Programs for research on AIDS, said

that the situation of AIDS epidemics has become more and more serious in recent years, and that young people have become China's main HIV infected group.

Wang said this at a forum held in the Renmin University of China. According to latest statistics, China has 203 thousand HIV-infected people, and some 16 thousand have died of AIDS. More ordinary people are likely to be infected by AIDS, said Wang.

Pharmacokinetics center established in Shanghai

(CAS, 2007-06-20)

After more than one year preparation, Shanghai Center for pharmacokinetics has been recently established in Shanghai. Its first meeting for board directors was held on 31 May.

Under the management of the S&T Commission of the Shanghai Municipality, the center is jointly set up by the CAS Institute of Material Medica (SIMM), Second Military Medical University, and Shanghai Jiao Tong University. Affiliated to SIMM, Prof. ZHONG Dafang from the SIMM will be its founding director.

Pharmacokinetics is the study of the time course of drug movement in the body during absorption, distribution, metabolism and excretion (ADME). It plays a major role in drug discovery and development, and is an essential requirement not only in predicting therapeutic outcome but also in explaining the toxicity of a drug. The center will offer a comprehensive range of both in vivo and in vitro ADME assays to meet needs of pharmaceutical clients nationwide.

Scientists reveal monkey brain's control over its eye's movement

(CAS, 2007-06-21)



Eyes will be closed in a dust wind, and a dodge will be made when facing danger. Animals will run away or take protective measures by instinct in the face of outside threats. Therefore, from the point of view of adaptation and survival, all sensory information processed in the brain is for the animal to take appropriate actions.

How does the brain control our body, through the movement related neurons, to take actions? A recent study by a research group led by Prof. HU Xintian in the CAS Kunming Institute of Zoology (KIZ), offers some clues to the answers.

It is well known that the brain is a complex system made up of large amount of neurons. Every single movement we make is the result of the activities of thousands of such neurons. In other words, the motor command of a movement control system is the summation of these neuronal activities. However, little is known about the ways in which each command is expressed on the individual neurons in the system, and obviously, this is an important question that must be answered in the field of movement control study.

After developing new analyzing methods, the team carried out a quantitative study on this issue by using the monkey's eye movement control system as a model. Their work has been published on a recent issue of the *Proceedings of the National Academy of Sciences (PNAS)*.

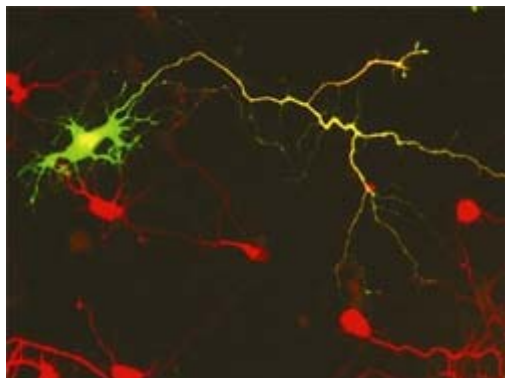
The research results indicate that, every motor command has been expressed in high precision on each of the premotor neurons (neurons that send inputs to the motor neurons which control the muscles directly) located on the eye movement control pathway. "It not only deepens our understanding of the neural mechanism of the movements control in human, but also stirs inspirations for the design of the movement

control in a robotic unit," notes Hu.

The work "is a very simple and extremely elegant study of premotor neurons within the oculomotor control system," comments a *PNAS* reviewer, adding the findings are compelling and absolutely fundamental to our understanding of how saccadic eye movements are controlled.

New findings on neuron development

(CAS, 207-06-25)



A mature neuron receives inputs from multiple dendrites and sends its output to other neurons via a single axon. This polarized morphology requires proper axonal/dendritic differentiation during development. The atypical protein kinase C (aPKC) in complex with PAR3 and PAR6 is required for axonal-dendritic differentiation, but the upstream factors responsible for regulating its activity are largely unknown.

Recent findings of a research team led by Dr. LUO Zhenge from the Institute of Neuroscience under the CAS Shanghai

Institutes for Biological Sciences may add new dimensions to understandings of factors.

As reported on-line by the June 10 issue of the *Nature Cell Biology*, Luo and his colleagues discovered that down-regulation of Dishevelled (Dvl), an immediate downstream effector of Wnt, abrogated axon differentiation, whereas Dvl over-expression resulted in multiple axon formation. Interestingly, Dvl was associated with aPKC and this interaction resulted in aPKC stabilization and activation. Furthermore, the multiple axon formation resulting from Dvl over-expression was attenuated by expressing a dominant-negative aPKC in these neurons and over-expression of aPKC prevented the loss of axon caused by Dvl down-regulation. Finally, Wnt5a, a noncanonical Wnt, activated aPKC and promoted axon differentiation. The Wnt5a effect on axon differentiation was attenuated by down-regulating Dvl or inhibiting aPKC. Thus, Dvl-aPKC interaction can promote axon differentiation mediated by the PAR3-PAR6-aPKC complex. In addition to elucidating the basic mechanisms of neuronal development, the results presented in this paper also provide insight for studies of neuronal regeneration following injury.

In addition to elucidating the mechanism of neuronal development, the work also provides insight for further studies and treatment of nerve injuries and diseases caused by neuronal degeneration.

CAS, local government to jointly set up industrial biotechnology center in Tianjin

(CAS, 2007-06-26)



CAS is to join hands with the Municipal Government of Tianjin in establishing a world-class industrial biotechnology institution in the city's Binhai New Area. The signing ceremony for the new initiative was held on 25 June in Beijing.

Chaired by CAS Vice President LI Jinghai, the event was attended by CAS President LU Yongxiang and the Mayor of Tianjin DAI Xianglong. CAS Vice President CHEN Zhu and Tianjin Vice Mayor YANG Dongliang signed the cooperative agreement on behalf of the two sides.

Named Tianjin Industrial Biotechnology R&D Center, the new institution is to promote China's research and engineering level in the field and upgrade its technology coordination and maturity so as to remarkably raise the country's basic research and technological transfer in industrial biotechnology, says Prof. Chen.

It is expected to play a major role in recruiting outstanding personnel, introducing new technologies and improving the local capacity for innovation and economic growth, notes Mr. Dai.

According to the agreement, the new Center will set up a platform for high-throughput screening and pilot fermentation studies. By making use of micro-organisms and other bio-resources, it will carry out research and development in the fields of biocatalysis, bio-energy, biomaterials, bio-based chemicals, biomedicine and bio-medical materials and tissues, and stem cells. It plans to construct a 20-hectare campus in the Binhai New Area, where a number of R&D facilities, including a 45,000-square-meter research building, will be erected.

The new initiative will be a milestone for the cooperation between CAS and Tianjin Government, stresses Prof. Lu.

Bioindustry outlook bright in China

(Xinhua Net, 2007-06-27)

China's bioeconomy will witness more dynamic development, with its output reaching new heights in the coming years, the country's science and technology chief said yesterday.

"The total output value of the bioindustry will reach 500 to 800 billion yuan by 2010. The industry value will be about 1,600 billion yuan by 2015. By 2020, the value of the segment will hit 2 to 3 trillion yuan, accounting for more than 4 percent of the country's domestic gross product," Wan Gang, minister of science and technology, said in Tianjin yesterday at the opening ceremony of the 2007 International Conference on Bioeconomy.

China will adopt a three-step strategy to strengthen its science and technology muscle, according to Wan.

The first step, from now until 2010, will mostly involve technology accumulation. In the second stage, until 2015, China will emerge as a world power in the area and in the third, until 2020, the country will focus on holding on to the top position.

The minister said China has set 10 priorities, such as agriculture-oriented biotechnology, medical biotechnology, biofuel technology, environmental biotech and marine biotech, in driving its bioindustry.

The country is also attaching more importance to making breakthroughs in 35 categories of key biotechnologies, such as stem cell and genetic modification technology, Wan said.

The science and technology chief contended that to further drive the bioindustry forward, one of the keys lies in improving the financing mechanism and creating a better investment environment.

Echoing Wan, State Councillor Chen Zhili said more favorable fiscal, taxation, financing and intellectual property right protection policies are needed to cultivate a better industrial environment for bioeconomy.

Biotechnology can help lower the cost of agricultural production, facilitate medical revolution, upgrade industrial manufacturing, reduce emission and ease the problem of energy shortage, said Xu Guanhua, former minister of science and technology.

1.4 Key Technologies

Key project on evaporative cooling technology kicks off

(CAS, 2007-06-04)



A research project on the evaporative cooling technology of electric turbogenerators has recently got the support of the National Key Technologies R&D Program.

Headed by the CAS Institute of Electrical Engineering (IEE), the project involves two subcomponents. One is to decode the technical difficulties and produce a pilot machine of 300 megawatt (MW) evaporative-cooled steam turbogenerator. The goals also include the draft and issue of a national industry standard on this kind of turbogenerators, as well as four new patent applications in this regard. In collaboration

with IEE are five corporations and research bodies, i.e. China Power Investment Co., China Huadian Power International Co. Ltd., Shanghai Turbine Generator Co. Ltd., Shanghai Zhenfa Mechanical & Electrical Co. Ltd. and North China Electric Power University.

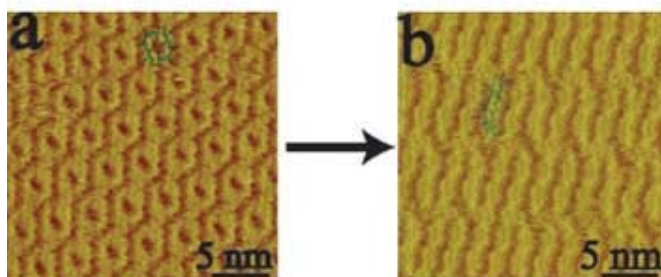
Despite the various ways to cool down a steam turbogenerator by using refrigerants like the air, water, oil and hydrogen, they are in fact rather dangerous and expensive. For instance, the widely-used hydrogen-cooling technology for large-capacity generators has posed serious challenges to the safe production of power plants, and recent years have witnessed hazardous hydrogen leaks in both China's mainland and Hong Kong. Therefore, the revolution of evaporative-cooling technology will not only sharply cut down the consumption of hydrogen and improve production safety, but also save a great deal of cooling water resources, non-ferrous metals, and in turn the investor's input.

For the other subcomponent, researchers will manage to figure out an optimal design and produce a sample machine of 800MW evaporative-cooling water turbogenerator. They will also handle the draft and issue of a national industry standard on evaporative-cooled water turbogenerators, together with three more patent applications in this regard. To achieve these targets, IEE will join hands with the Dongfang Electrical Machinery Co. Ltd. and China Three Gorges Project Co.

Large-capacity water turbogenerators are often harassed by cooling-water leaks and consequent insulation breakdown or accidental shutdown, as a result of the overheated hollow conductors of stator windings. The oxide fouling within hollow conductors can also burn off generators easily. Thus the evaporative cooling technology will largely enhance production safety and prolong the life of water turbogenerators. The evaporative cooling technology is going to play a key role in the Three Gorges project in southwest China.

Surface transforms self-organization

(CAS, 2007-06-06)



Future organic electrical and optical devices could be based on thiophenes, including oligothiophenes, because of their potential for improved and tunable properties. Devices based on these materials also offer the

incentive of easy fabrication via self-organization. However, the assembly of these molecules depends not only their individual properties, but also on their arrangement on and interaction with a surface. A research team led by WAN Lijun from the CAS Key Laboratory of Molecular Nanostructure and Nanotechnology affiliated to the CAS Institute of Chemistry has used scanning tunneling microscopy (STM) to investigate two oligothiophenes on Au and highly oriented pyrolytic graphite (HOPG) surfaces. Their work has been reported in a recent issue of *Proceedings of the National Academy of Sciences* (PNAS).

"Oligothiophenes have a well-defined chemical structure and are used as a model molecule for the study of self-organization," explains Wan. The molecules also have novel properties that are promising for electronic and optical devices. Both types of oligothiophene form adlayers on HOPG and Au(111) but the surface has a marked effect on the self-organization of the molecules. On HOPG, both oligothiophenes form highly ordered adlayers. One molecule forms both linear and quasi-hexagonal adlayers, while the other forms a wave-like adlayer and, very occasionally, a lamella structure. In contrast, both molecules randomly adsorb onto Au (111) surfaces.

"Although the adlayer structure of oligothiophenes has been investigated previously, the structural transition with thermal annealing, substrate effect, and molecular properties are rarely reported," says Wan. So the researchers also observed the adlayers after thermal annealing. For the oligothiophene that exhibits both linear and quasi-hexagonal adlayers on HOPG, thermal annealing results in the disappearance of the quasi-hexagonal adlayers. Ultimately, thermal annealing results in a disordered structure. The affect that temperature has on adlayer structure could be very important for the stability and efficiency of devices.

The researchers explain the differences in adlayer structure in terms of the interaction between the oligothiophene molecule and the surface. There is a weaker interaction between the HOPG surface and the molecules compared with Au (111). Molecules can, therefore, move more easily on the HOPG surface and self-organize into ordered structures. In contrast, the stronger interaction between the Au (111) surface and the molecules reduces their mobility and leads to a more random adsorption.

"The work is a very important step from adlayer observation to adlayer application," says Wan.

China sees soaring development in nano-science and technology (CAS, 2007-06-08)

The National Steering and Coordinating Committee for the Development of Nano-Science and Technology convened a conference to review the R&D advancement and its commercialization in the field on 5 June in Beijing. Present at the meeting included Chinese Minister of Science and Technology WAN Gang, Vice Minister of Science and Technology CHEN Jinpei, CAS Executive Vice President BAI Chunli and Vice President of the National Natural Science Foundation of China ZHU Daoben.

According to the meeting, China has poured about 1.5 billion yuan (about \$197 million) into the research and development of nano-science and technology over the past 15 years, achieving encouraging advances in this regard. For instance, the number of research papers published by Chinese scientists at the international journals in 2006 were on a par with those contributed by their US or Japanese colleagues. The number of patents they have filed for has increased from less than 1,000 in 2001 to more than 4,600 in March 2005.

Under the guidance of the national framework for nanoscience and technology development during the 10th five-year planning period (2001-2005), China made an overall deployment in the fields concerning nano-science and technology, such as materials, information, energy sources, medicine and manufacturing. A flagship nanoscience research program has also been launched.

To step up R&D efforts, the country has set up the National Center for NanoScience and Technology, National Engineering Center for NanoTechnology and its Application, and various centers for nano-technology commercialization. At present, about 3,000 S&T workers from about 50 universities, more than 20 CAS institutes and some 300 enterprises across the country are working for nano-science and technology research and development.

So far Chinese scientists have scored many encouraging research achievements in the field, according to the participants. At the same time, the National Technical Committee on Nanotechnology of Standardization Administration of China was established. So far a total of 15 standards on nanotechnology have been issued.

However, the meeting pointed out the shortcomings in China's nanotechnology development, including unbalanced growth at various research directions, a lack of major breakthroughs, sustainability capacity, and technology transfer.

ChinaNANO 2007 opens in Beijing (CAS, 2007-06-08)



With all-round supports from the Ministry of Science & Technology, the Ministry of Education, the Chinese Academy of Sciences, the National Natural Science Foundation of China as well as China Association for Science and Technology, the International Conference on Nanoscience and Technology, China 2007 (ChinaNANO 2007) opened on June 4 in Beijing.

The three-day meeting was organized by China's National Center for Nanoscience and Technology, and sponsored by National Steering Committee for Nanotechnology. It is the

second time for China to host the conference after ChinaNANO 2005 held in June, 2005.

Chaired by Professor BAI Chunli, CAS Executive VP and Director of the National Center for Nanoscience and Technology, ChinaNANO 2007 invited five internationally distinguished keynote speakers, including Prof. Harald Fuchs from Physikalisches Institut, Westfälische Wilhelms-Universität, Germany, Prof. Wilson Ho from the University of California (Irvine), USA, Prof. Susumu Noda from Kyoto University, Japan, Prof. Mark Welland from Cambridge University, UK, along with Prof. LI Yadong from Tsinghua University.

ChinaNANO 2007 aims at more effective communications and discussions on the forefront of nanoscience researches. The conference will focus on nanoscale materials and structures, self-assembly and surface growth, nanooptics and nanophotonics, nanoelectronics and NEMS, nanobiology and nanomedicine, computation and modeling, and nanometrology.

CAS President LU Yongxiang sent his congratulations to the opening of ChinaNANO 2007. He spoke highly of the development of nanoscience in China. As one of the pioneering nations to explore the nanoworld, he said, China has harvest to date a handful of achievements and recognition among the global nanoscience community. However, Chinese nanoscientists shall make efforts to promote the industrialization of nano researches, which is going to play a more and more important role among the rapidly growing economy for both scientific purposes and people's daily life.

Present at the opening ceremony were state leaders from the S&T section of the Chinese government,

namely Prof. HAN Qidei, vice chairman of the Standing Committee of National People's Congress, chair of China Association for S&T and CAS member, Prof. CHENG Jinpei, vice minister of S&T and CAS member, Prof. WANG Jie, deputy director of the National Natural Science Foundation of China and so on. In his speech, Prof. Han underlined the profound impacts brought forward by nanotechnology to the various aspects of economy and society. The development of nanoscience and technology is on sharp rise at the moment, and shall play an increasingly significant part in interdisciplinary studies and international communication. He hoped that the conference would promote exchanges in the field and make nanoscience better serve the everyday life of the Chinese people.

By early June, the Organizing Committee had received over 1,300 abstracts from scholars both home and abroad. Among the thousand-odd registration forms, nearly half was filled out by overseas researchers. The international conference of ChinaNANO is convened every other year to provide a platform of communication for and enlarge China's influences in the international community.

1.5 Structure of Matter

China's first intense beam proton linac (CAS, 2007-06-28)



China's first intense beam proton linac accelerator has been built at the CAS Institute of High Energy Physics in Beijing, marking major progress in research into accelerator-driven system for developing clean nuclear energy in this country. The accelerator with a radio frequency quadrupole (RFQ) structure was examined at a meeting of expert panel on 23 June. Tests show that its major parameters have reached world advanced level with 3.5MeV output energy, 45 mA peak current, more than 7% duty factor and 3.2 mA average current density.

With a new structure, the RFQ accelerator has many outstanding advantages, according to experts. However, it is very difficult to be manufactured due to the high precision requirements. With the support of Ministry of Science and Technology, the CAS researchers have adopted new schemes in terms of physical design, technological routes, processing and assembly techniques. The seminal efforts have scored good results in both saving investment and cutting research time.

The new feat will lay a solid ground for China's development of clean nuclear energy, the construction of the spallation neutron source and proton cancer therapy in this country, according to the panel.

1.6 Transport and Space

China launches communications satellite "SinoSat-3" (Xinhua Net, 2007-06-01)



China Highlights — June, 2007

China launched on early Friday morning "SinoSat-3", a communications satellite for radio and television broadcasting, aboard a Long March-3A carrier rocket, marking the 100th flight of its Long March series.

The satellite, launched from the Xichang Satellite Launch Center in the southwest Sichuan province at 0:08 a.m. (Beijing Time), separated from the rocket about 24 minutes after lift-off, before entering the geosynchronous orbit, data from the northwest Xi'an Satellite Control center show.

SinoSat-3 and its carrier rocket were mainly developed and manufactured by the China Academy of Space Technology and the China Academy of Launch Vehicle Technology, both under the China Aerospace Science and Technology Corporation.

Its predecessor SinoSat-2, China's first direct-to-home satellite, was launched on Oct. 29 last year. It was revealed a month later that it failed to deploy its solar panels and communication antennae and was deemed inoperable, the Sino Satellite Communications Co. Ltd. (SinoSat), a Chinese satellite operator and the user of the SinoSat series, has said.

A substitute satellite for the failed SinoSat-2 will take at least three years to develop, with more technical upgrades, according to a SinoSat spokesman last November.

It is not clear whether SinoSat-3 will replace part of the service of SinoSat-2.

China has 12.6 million digital TV subscribers and 400 million television sets, suggesting a huge potential market for satellite TV.

SinoSat-1, launched in July 1998, was bought from France mainly to undertake China's radio and TV broadcast and communications services in the Asia-Pacific Region.

China's astronaut outfitters design material for spacewalk suits

(Xinhua Net, 2007-06-01)

Chinese scientists have developed a material that the country's astronauts can wear for the country's first planned spacewalks on the Shenzhou VII mission next year, according to a Beijing newspaper.

The first batch of 300 square meters of the material was being manufactured, the Beijing Daily of Science and Technology said.

"The surface material, made up of advanced synthetic fabric, boasts characteristics such as fire and radiation resistance that meet spacewalk requirements," the newspaper quoted Pang Zhihao, a Chinese space expert, as saying.

The surface material should protect astronauts from extreme heat on the side exposed to the sun at temperatures more than 200 degrees Celsius, and extreme cold on the shaded side, said Pang.

The material can also protect astronauts from injury from floating micro-meteoroids in space, Pang added.

"There will be great differences between Shenzhou VII spacesuits and previous ones," Pang said.

China's next manned space flight Shenzhou VII, the third in its space program, is scheduled to take place in 2008, and three astronauts are expected to undertake spacewalks.

Pang said the Shenzhou VII spacewalk suit was designed to be like a small aircraft with a propeller allowing astronauts to move freely in space, the newspaper report said.

The suit would automatically supply nourishment, oxygen up to seven hours and about 1.9 kilolitres of water, it said, adding a drainage system would let out carbon dioxide and wastewater.

China's first manned spacecraft, Shenzhou V, blasted off in October 2003, making China the third nation after the Soviet Union and the United States to send a human into space. The second, Shenzhou VI, with

two astronauts circled the Earth for five days before returning in October 2005.

China to have more precise weather forecasts with twin-satellite observations

(Xinhua Net, 2007-06-01)

China's meteorological satellite, Feng Yun-2 D, was positioned on Friday to offer dimensional cloud charts for more precise weather forecasts, together with Feng Yun-2 C, which is already in service.

The Feng Yun-2 D, launched in December 2006, would work with Feng Yun-2 C from Friday, and the twin satellites would offer weather observations of the whole country every 15 minutes, said a China Meteorological Administration (CMA) spokesman.

Chinese satellites used to send back cloud pictures for weather forecasts every hour or half an hour at most during the flood season.

The updates of cloud pictures every 15 minutes would allow weather forecasters to have a closer watch over weather changes, said the spokesman.

The cloud pictures provided by both satellites would be better in quality and precision, as charts offered by the twin satellites were more like a moving film while those pictured by a single satellite were slides.

China urgently needed accurate forecasts to take precautions against extreme weather in times of frequent weather-related disasters, a meteorological official said earlier.

Vice Premier Hui Liangyu cited "enhanced forecasts" earlier this week, while calling for greater efforts in flood control and disaster relief amid a season of heavy rain and flooding alongside the Yangtze River.

The Beijing weather bureau has pledged to improve its accuracy in weather forecasting for the looming 2008 Olympics.

China to Develop Its Own Maglev Train in 3 Years

(CRI, 2007-06-10)

China plans to build a 1.5km-long maglev test track in the next 3 years and develop its own "feasible" magnetic levitation train, the Ministry of Construction said on Sunday.

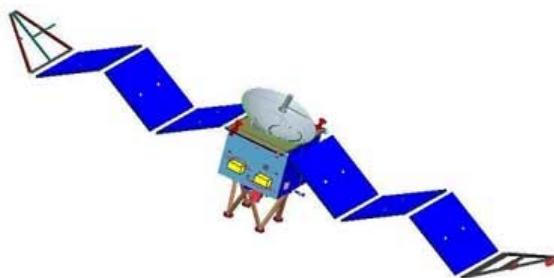
Beijing Morning Post reported that the maglev project is part of the country's 11th "Five-Year Plan."

The maglev contract will be given to a Beijing company and the plan requires the test maglev train to be capable of reaching speeds of no less than 100km/h and to have a minimum load capacity of 12 tons. The technological standards of this maglev train should match those of its international counterparts.

The project also includes the development of suitable power-supply system and control system.

The test track will be built in two cities, but sources from the Ministry of Construction did not reveal which cities.

Preparations initiated for Mars probe



(CAS, 2007-06-14)

The scientific objectives and the payload arrangements of the micro-satellite *Yinghuo-1* (a provisional name) to be launched in the Sino-Russian joint exploration of the Mars in 2009 have passed the scrutiny of a panel of experts at a meeting held on 1 June under the auspices of the CAS Bureau for High-tech Research & Development. According to an

accord reached between China and Russia, Chinese side will be responsible for the design and manufacturing of the satellite in the joint mission to probe Mars and its Phobos.

Chaired by ZHAO Gang, section chief of the CAS Bureau, the meeting was attended by experts and representatives from the State Commission of S&T and Industries for National Defense, China National Aero-Technology Import & Export Corporation, China Meteorological Administration, State Oceanic Administration, Peking University, University of Science and Technology of China (USTC) and CAS. CAS Member WANG Shui from USTC serves as director of the evaluation panel.

After listening to a report give by WANG Chi from the CAS Center for Space Science and Applied Research (CSSAR), the panel came to a consensus, saying the Sino-Russian expedition to the red planet is an innovative attempt with important significance.

Earlier, on 12 May, the first work conference for the application system onboard the Chinese micro-satellite in Sino-Russian joint mission to Mars was held at CSSAR in Beijing.

Chaired by CSSAR Director WU Ji, the meeting was attended by some 40 experts, officials and technicians from the CAS Bureau of High-tech Research & Development and the CAS Bureau of Basic Research, the National Astronomical Observatories at CAS, Shanghai Observatory and CSSAR.

The participants held discussions on the initial plans for the application system, scientific research and organizational set-ups. In addition, arrangements were made on various tasks.

China to launch third Sino-Brazilian satellite in September

(Xinhua Net, 2007-06-14)

China plans to launch in September the third earth resources satellite jointly developed by China and Brazil, said Sun Laiyan, director of the China National Space Administration here Thursday.

Satellite 02B will be soon moved into a space environment simulator and go through a number of tests, said Sun.

Before returning to China in April this year, the satellite underwent a series of tests at the Brazilian National Space Research Institute (INPE).

These included electromagnetic interference tests, and tests to detect propellant leaks.

China and Brazil have cooperated on space projects for 19 years. Satellites 01 and 02 jointly developed by the two countries were launched in 1999 and 2003 respectively.

China and Brazil have also agreed to develop satellite 03 and 04 and launch satellite 03 in 2009.

The satellites will be used to gather information on the Earth's environment, agriculture, urban development planning and water pollution.

China to increase payload capacity of carrier rockets

(Xinhua Net, 2007-06-18)

China plans to develop a new generation of carrier rockets with an increased payload capacity in order to advance its lunar exploration program, according to the China Aerospace Science and Technology Corporation.

The payload capacity of China's Long March series of carrier rockets will be increased from its current weight of 9.5 tons to 25 tons, an official with the corporation said.

"The development will greatly increase China's ability of peaceful uses of outer space," the official said, without specifying when the rockets will be ready for launch.

Huang Chunping, a leading Chinese aerospace expert, said the new generation of carrier rockets would

have a large enough payload from which to launch a space station.

China on June 1 launched "SinoSat-3", a communications satellite for radio and television broadcasting, from a Long March-3A carrier rocket, marking the 100th flight of the Long March series.

China to hold 101st launch of "Long March" carrier rockets

(People's Daily, 2007-06-19)

Sources from the colloquium celebrating the 100th anniversary of the Long March series launch, held by the China Aerospace Science and Technology Corporation on June 15th in Beijing, said that the 101st launch of the Long March carrier rocket is approaching. The "Long March-3B" carrier rocket will put a "China Sat 6B" satellite into orbit.

Zhang Qingwei, general manager of China Aerospace Science and Technology Corporation, said that the Long March series of carrier rockets completed the first fifty launches within twenty-eight years, but the past fifty launches only took nine years.

China's Most Advanced Civil Helicopter Debuts

(CRI, 2007-06-28)

China's most advanced civil helicopter, the H425, has passed its examination by the Commission of Science Technology and Industry for National Defence, thus gaining approval for civil use.

The overseas version of the newspaper People's Daily, reported that the H425 helicopter can fly at a maximum speed of 280 kilometres per hour, carry up-to 13 passengers, and has a payload of 4.25 tonnes.

The H425 helicopter, developed by the Chinese, has multi-skills. It can adapt to bad conditions, such as a complicated terrain and an arduous environment, all at 3,000-meters above sea level.

2 News from Universities

5,000 more students a year to study overseas

(People's Daily, 2007-06-05)

The Ministry of Education has launched a five-year graduate program to send about 5,000 PhD students a year to the world's best universities, including Harvard and Yale in the United States, and Oxford and Cambridge in England.

Vice-Minister Yuan Guiren said yesterday: "The country has expanded its national scholarship program in a bid to cultivate more top-level talents."

The number of graduate students granted a national scholarship this year will be roughly five times that in 2006, Yuan said.

Students will be chosen from the best graduate students at 49 top universities across the country, including Tsinghua and Peking.

"The lack of first-class scientists and research pioneers is the main thing hindering China's innovation capability," Yuan said.

Officials with the China scholarship council, which runs the program, said students applying for national key research subjects, such as energy and natural resources, environment, agriculture, manufacturing, information technology, biology and new materials will be given priority.

The council said it will also finance overseas study for 2,000 talented employees from State organizations and research institutes across the country.

Established in 1996, the council had, at the end of last year, sent more than 27,000 students to study abroad. More than 97 percent of them subsequently returned to China after finishing their studies, statistics showed. Shao Wei, an official with the education ministry's overseas study service center, said that since China opened up to the outside world in 1978, an increasing number of Chinese had chosen to study abroad.

In 1998, just 17,000 Chinese students studied abroad, but that number increased greatly after the country adjusted its policies on self-supported overseas study in 2000.

Today, the majority of Chinese students studying overseas are doing so at their own expense or with an overseas scholarship.

In 2006, more than 134,000 students went abroad to study; more than 90 percent of them were self-financed. Also last year, more than 42,300 students returned to China.

Between 1978 and 2006, some 1.07 million Chinese students studied abroad.

"But less than 30 percent of them returned to China after finishing their studies," Shao said.

"In response, the country has launched a series of favorable policies to attract people to return home. These include higher salaries, senior positions and exemption from the hukou (household registration) system," Shao said.

Massive expansion of university rolls causes problems for China

(People's Daily, 2007-06-06)

University entrance examinations have been a big national event in China ever since they were restored 30 years ago. This year is no different with a record ten million candidates sharpening their pencils in anticipation of the big event starting Thursday.

They will compete for 5.6 million college places.

Xin Huadong, a cadre in east China's Shandong provincial government, said being able to sit for the college entrance examination three decades ago changed his life and saved him from life as a farmer.

Due to the political turmoil of the Cultural Revolution, Chinese universities stopped enrolling students from 1966 to 1976. The exam was restored in 1977, when 5.7 million candidates competed for a measly 220,000 places in the nation's institutes of higher learning.

Xin, one of the 220,000 lucky people, said he was an accountant in a production team in a small town in northeast China's Heilongjiang Province, earning 10 points a day, which he converted into salary at the end of the month.

"If it hadn't been for the college entrance exam, I would have spent my whole life like that -- like so many of my peers," said Xin.

Nearly 60 million Chinese have taken the college entrance exam in the past three decades, and ten million have actually enrolled.

For people like Xin, university entrance exams are a way to change your destiny. "I think they are a pretty fair method for capable young people to prove themselves and get a new start in life," said Xin.

But, 30 years on, the college entrance exam has become a controversial topic for education experts, students, parents, and teachers.

"You can't judge a person's ability just from a piece of paper," said Ren Lijian, a professor from Nanjing University in east China's Jiangsu Province.

He said that the college entrance examinations have exacerbated the exam orientation which is a fundamental problem in China's education system, and which deprives students of their originality, making them learn things by rote.

Ensuring fair access to higher education and finding ways to emphasize originality and creative thinking among students are major dilemmas for education departments.

To give more people access to higher education, China started expanding university rolls.

"It took China just eight years -- from 1999 to 2007 -- to turn a college degree from something special into something more or less mass produced," said Ren Lijian cynically.

Education Minister Zhou Ji, who advocates the expansion of university rolls, maintains that opening the doors of China's universities has led to a broad improvement in the country's human resources.

Statistics from the Ministry of Education show that 1.08 million students graduated from Chinese colleges in 1998, and 4.13 million in 2006. The number is expected to reach five million this year.

The huge number of graduates has created new employment pressures.

"The very day I entered university, I started worrying about a job. I'm not at all confident that I can find something suitable, there are just too many college students around," sighed Liu Qian, a sophomore from Beijing United University, majoring in English.

To cater for more students, many universities had to take out bank loans to expand their campuses or build new ones. There are more than 50 university towns under construction in China, most of which are functioning on bank loans.

Some experts worry that Chinese universities may face difficulties when the banks come calling around 2008. "Some universities may find themselves unable to repay their loans," said Ren.

"Large, beautiful classrooms doesn't necessarily attract good teaching staff, and yet that's the key component of a good university," said Ren.

For the moment the college entrance exams remain an inescapable feature of the social and educational landscape.

Premier Wen Jiabao said in his government work report this year that more emphasis should be given to the quality of higher education, and college enrollment numbers should be stabilized.

"I hope the universities are listening," said Ren.

More than 9.5 million Chinese compete in world's largest examination (People's Daily, 2007-06-07)

More than 9.5 million Chinese students on Thursday started the national college entrance examination, the largest of its kind in the world.

The exam is regarded as one of the most important events for the participants, and could change their lives in a fiercely competitive society.

The examination will last for two days for students in 26 provincial areas, and three or four days in Shanghai, Shandong, Guangdong, Hainan and Jiangsu.

The Ministry of Education said earlier that a record 10.1 million people had applied to take the exam, and 5.67 million would be able to enter college.

It is not only a fight for the candidates, but also an impact on their families and the whole society. In Beijing, nearly 20 sections of road have special traffic controls during the examination to ensure the students can arrive at venues on time. Their parents will be anxiously sweating outside exam places in temperatures expected to exceed 35 degrees Celsius.

In Huangshan City, east China's Anhui Province, an aircraft was required to change route on Thursday afternoon, as parents worried the noise could affect their children's listening comprehension in the English test. Nutritionists are recommending diets that can help students keep energetic, and psychologists are

offering advice on how to relax.

This year marks the 30th anniversary of the restoration of the national college entrance examination, or "gaokao" in Chinese. Chinese universities did not enroll students from 1966 to 1976 through the extensive exam, due to the political turmoil of the Cultural Revolution.

Over the past three decades, almost 60 million Chinese took part in gaokao, with 10 million enrolled at universities.

Chinese mainland receives 160,000 exchange students in 2006

(People's Daily, 2007-06-28)

The Chinese mainland received 162,695 exchange students from 184 countries and regions in 2006, the highest number since the founding of New China in 1949.

Statistics from the Ministry of Education (MOE) show exchange students studied in 519 universities and colleges in 31 Chinese provinces and regions. The number of exchange students was up 15.3 percent from 2005.

The Chinese government awarded scholarships to 8,484 exchange students, up 14.9 percent over the previous year. Self-funded students totaled 154,211, up 13.2 percent.

The number studying for more than six months totaled 119,733, and Asian students accounted for 74.33 percent of the exchange students, the biggest proportion, with 12.71 percent from Europe, 9.6 percent from America, 2.3 percent from Africa and 1.07 percent from Oceania.

The Republic of Korea, Japan, the United States, Vietnam and Indonesia were the five biggest source countries. Students majoring in liberal arts totaled 114,846, more than engineering majors.

An official with the MOE indicated that more students came to China for academic degrees, as the number in 2006 increased by 22.31 percent over the previous year.

He said receiving exchange students was an important part of international educational exchange and cooperation.

In 2006, the MOE expanded the channels for foreign exchange students, urged foreign governments and Chinese enterprises to set up scholarships, and improved management mechanisms for exchange students.

The MOE statistics show China received more than 1.04 million exchange students from 1950 to 2006.

3 Innovation Management

China's Policies on Innovation Management and Protection

(MOST, 2007-06-15)

The key to innovation lies in human resources. The Chinese government, besides improving its laws and regulations, has focused its attention on deepening the S&T system reform as well as introducing policies to promote innovation and technology transfer, so as to motivate entrepreneurship and enthusiasm of all talents for innovation.

Firstly, a market-oriented R&D system has been set up. Over the past two decades, China has reformed its S&T system, with the aim of integrating S&T development with the economy growth so as to make full play the leading role of market in innovation and accelerate commercialization of technology. Since 1998, 376 application-oriented research institutes affiliated to the central government and over 800 to the local government have been restructured and transformed into various types of enterprises or have been

incorporated as R&D sector of an enterprise. Research institutes for basic research and public good are for the most part supported by the government, but enjoy full initiatives and flexibility in terms of operation and management. With the industry-university-research institute collaboration being one focus in China's innovation strategy, the government not only encourages research institutes, universities and enterprises to jointly take on national R&D projects and set up laboratories, but also stimulates enterprises to entrust universities and research institutes with R&D tasks.

Secondly, policies to encourage all kinds of innovation and creation have been introduced throughout the whole society. The central government as well as local ones has set up S&T awards of all levels to commend individuals and organizations that have made outstanding contributions to S&T advancement, which, together with the stimulation from non-governmental organizations, has played an important role in supporting and guiding innovation in China. Meanwhile, the Chinese government has made major adjustment to its IPR management, granting research findings and the subsequent IPR to R&D project contractors. The policy is similar to the 1980 Bayh-Dole Act of the U.S., which will effectively activate the enthusiasm of project contractors and researchers and accelerate the commercialization of research achievements. In order to bring into full play the innovation potentials of universities, the research fellows in universities are allowed to spare one day each week for technology commercialization while university students receive funding for their innovation and start-ups. Our government has also issued policies that a sponsor could contribute his/her share capital in the form of technology or IPR, and shares could be awarded to inventors. In high-tech enterprises, options are available for innovators and managers as incentives.

All these policies and measures have greatly boosted the innovation dynamism of the entire society. In terms of patent application, it took China 15 years to reach 1 million, 4 years to grow from 1 million to 2 million, but only 2 years to 3 million, indicating the effectiveness of these policy tools in stimulating innovation. This is the very period that China has made great progress in IPR protection.

Thirdly, great efforts have been devoted to developing technology markets. In addition to a dozen of regional permanent pillar markets for technological trading established in some cities, China has also set up a number of "on-line technology markets", which have greatly upgraded the efficiency of technology transaction through information and network techniques. In 2006, the volume of technology contract in China increased from US\$39,000 in 1985 to US\$23.7 billion, with a large amount of advanced R&D achievement and technology transfer from universities and research institutes to enterprises.

Fourthly, our government offers policy support to the establishment of high-tech industrial development zones or science parks. At the moment, there are 54 national high-tech industrial development zones and 534 specialized incubators, with ever improving platforms for technological development, achievement commercialization and public services. In 2006, US\$130 million from the central government and US\$343 million from local governments was injected into the Innovation Fund to sponsor over 10,000 Technology-Based SMEs, playing a key role in high-tech SMEs innovation.

Fifthly, the government has developed favorable financial policies to support the innovation of enterprises. This has already been covered in the previous section.

4 China's International Science Cooperation

China and Germany Cooperate to Popularize Digital Factories

(MOST, 2007-06-06)

“Digital Factory: Modeling Method Oriented towards Planning and Design of Complex Manufacturing System and Organization of Production Process” is a project of international S&T cooperation between Tongji University and Germany. On the basis of introduction and absorption of foreign digital factory software and correlated technologies, this project has developed and successfully applied the Tongji digital factory planning and simulation system, which greatly helps lowering the threshold for domestic medium and small-sized enterprises to implement the digital factory system, popularizing the digital factory technology and improving the production system planning and core competitiveness of enterprises.

Nature Publishing Group launches website in China

(People's Daily, 2007-06-09)

In a move to raise the profile of scientific research from China's mainland and Hong Kong, leading publisher of scientific journals Nature Publishing Group (NPG) launched a new website "www.naturechina.com" on Saturday.

"Every week Nature China's editors will select the best research recently published on the Chinese mainland and Hong Kong and provide a short summary of the results," said Phillip Campbell, Editor-in-Chief of Nature.

"By organizing this research into a comprehensive, regularly updated, one-stop web portal, Nature China will help scientists and science policy makers find information on the most significant research coming out of China," he said.

"This new member of the Nature family will increase the international profile of Chinese scientific publications as well as communication between Chinese scientists," said Campbell.

In 2005, Chinese scientists published more than 150,000 scientific papers worldwide, according to the Institute of Science and Technology Information of China. China has become the world's fourth largest producer of scientific papers after the United States, the United Kingdom and Japan.

"Nature China is one of the key components in NPG's strategy to develop publishing initiatives in the Asia-Pacific region," commented David Swinbanks, NPG Publishing Director for the Asia-Pacific region, "Our aim is to raise the profile of region's best science and thereby enhance its further development."

China and Germany Cooperate in the Study of Utilization of Rain-Flood

(MOST, 2007-06-12)

“China-Germany Cooperation in ‘Sustainable Management of Urban Water Resources-Rain-Flood Control and Underground Water Recycling Irrigation’”, an international S&T cooperation project, is the first systematic and demonstrative study on the technology integration for the utilization of urban rain-flood in our country. The project was carried out by China Institute of Water Resources and Hydropower Research in cooperation with 7 other German research institutes such as German ESSEN University and TU Berlin.

The result of this project can be applied to urban construction, municipal administration, environmental protection and water resources utilization. The project has great prospects of commercialization and application. It is ground-breaking efforts of China in utilizing urban rain-flood.

CAS to further cooperation with Novo Nordisk

(CAS, 2007-06-22)

CAS gives priority to the basic research in the field of bio-pharmaceutics, and encourages substantial research cooperation with overseas scientists, stresses CAS President LU Yongxiang during a recent meeting with visitors of Novo Nordisk, a world leading firm of diabetes care in Denmark.

"We look forward to a fruitful cooperation with Novo Nordisk," says Prof. Lu while having talks with the visiting president and CEO of the Danish firm Lars Rebien Sørensen on 17 June in Beijing, adding the collaboration will exploit each other's particular advantages for mutual benefit and train more outstanding young scientists for the progress of the human beings.

Novo Nordisk and CAS recently signed an agreement to establish a joint research foundation in China. The aim of Novo Nordisk-Chinese Academy of Science Research Foundation (NN-CAS Foundation) is to fund or co-fund activities of common interest within the fields of diabetes and biopharmaceuticals including related disciplines and technologies such as protein chemistry, immunology, inflammation, toxicology, oncology, endocrinology and drug delivery. The two sides are also making plans for a joint research professorship in the field of protein research.

EU, China launch project to tackle climate change

(People's Daily, 2007-06-29)

The Clean Development Mechanism (CDM), set up under the Kyoto Protocol, is dedicated to the reduction of emissions and energy-saving projects, and promotes the transfer of advanced technologies as well as sustainable development, to developing countries.

The EU-China CDM Facilitation Project, with objectives of strengthening the capacity of China's Designated National Authority (DNA) and Chinese Designated Operational Entities (DOEs), introducing European and international standards in quality management of the CDM development process, as well as increasing awareness of CDM opportunities in China; was launched in Beijing on June 28th.

With implementation by Chinese and European partners, and supported by grants from the European Commission, the project, with a budget of 2.8 million Euros, is so far the largest capacity CDM-building project in China that will run until 2010.

While speaking at the ceremony of its launch, Nicholas Costello, First Counselor of the Delegation of the European Commission to China and Mongolia, expressed his strong commitment in this project and thanked the project team, particularly the two supporting ministries, the National Development and Reform Commission (NDRC) and the State Environment Protection Agency.

Gao Guangsheng, Director General of the Office of the National Coordination Committee on Climate Change, NDRC; and Yue Ruisheng, Deputy Director General of the Department of International Cooperation, State Environmental Protection Administration (SEPA), also attended and made speeches at the ceremony.

"In terms of the global policy on climate change, the year 2007 is of great importance to China- perhaps the most important year so far. Since the publication of the reports by the Inter-governmental Panel on Climate Changes, there has been a greater need for action. The issue of climate change has been moved to the very top of the international political agenda," said Mr. Costello.

China has been demonstrating its strong commitment to meeting these challenges through the development of a national climate change program, launched three weeks ago. In a recent G8+5 meeting, Chinese President Hu Jintao, and European Commission President Barroso, made very strong commitments to work

together towards a new global agreement in order to attain environmental protection and sustainable development.

"The EU strongly supports this positive development in the climate change policy in China. The EU has committed itself to reducing green house gas emissions, in the EU, by at least 20 percent by the year 2020, from the amount in 1990. In addition, the launch of the project has been praised for being a specific objective of the EU-China Climate Change Partnership established in 2005," further added Mr. Costello.

With this project, China and the EU will be able to facilitate the implementation of the clean development mechanism, to exchange information on the CDM project, as well as to encourage EU companies to engage in the CDM project in China. This will accelerate the process of sustainable development and environmental protection.

5 Miscellaneous

World's highest railway poses no threat to environment

(Xinhua Net, 2007-06-05)

The Qinghai-Tibet Railway, the world's highest railway, has had no adverse effects on the surrounding environment and wildlife after it went into operation last July, according to an assessment by the State Environmental Protection Administration (SEPA).

The landscape, lakes and the frozen earth are well preserved and the wildlife's migration also remains unchanged, concluded the panel of officials and experts from SEPA and the Ministry of Railways based on their continuous monitoring and observation of the Golmud to Lhasa section.

"We have set up a long-term monitoring system and emergency relief mechanism on the water, air, noise and ecology in the hope of assessing the environment at all times," said Zhang Tianhua, vice head of the environmental protection bureau in southwest China's Tibet Autonomous Region on Tuesday.

"Every train running on the Qinghai-Tibet Railway has special tanks for storing garbage and waste water. The waste is collected from the trains and treated in designated stations," said Zhang.

"A total of 60,000 tons of waste collected from the Qinghai-Tibet Railway stations has been treated so far and no pollution incidents have been reported," he said.

The frozen earth on the plateau has also been well preserved thanks to the technology of heat preservation, slope protection and roadbed ventilation in the frozen earth areas, said Tong Changjiang, researcher with the Chinese Academy of Sciences.

"It's the well-preserved frozen tundra that ensures the train's speed at 100 kilometers per hour," Tong said.

The Qinghai-Tibet Railway stretches 1,956 kilometers from Qinghai's provincial capital Xining to Lhasa. Construction of the section from Golmud to Lhasa started on June 29, 2001 and was completed on July 1, 2006, at a cost of more than 33 billion yuan.

The 1.5-billion-yuan investment in the railway's environmental protection project, about 4.6 percent of the total, hit a record high in China's history of railroad construction.

Chinese enterprise wins award for energy efficiency

(People's Daily, 2007-06-22)

China's Beijing Shenzhou Daxu Bio- energy Technology Company was rewarded the UK Ashden Awards for Sustainable Energy, the world's leading green energy prize, in a final competition taking place in

London Thursday.

The Chinese company won the first prize of the Ashden Award for its creation of a stove that burns widely available crop waste as well as wood much more efficiently.

Crop waste is widely available in China yet very few stoves designed have been able to burn this waste effectively. The Daxu stove is designed to not only burn crop waste with 40 percent efficient, but also produce hardly any smoke and cut cooking and heating costs by 50 percent.

If it replaces a traditional coal burning stove, it can save around eight tons of CO₂ emissions per year. With its two hot plates, it also allows families to cook a stir-fry dish and steamed rice at the same time.

Some Daxu stove models also come with a back boiler which provides hot running water and heating to rural families.

Since last September, 25,000 models have been sold, with 10,000 sold in the first three months of 2007.

There is enormous potential for introducing this technology throughout China, since over 20 million wood and coal stoves are sold each year.

The Chinese company is one of the 10 renewable energy pioneers from across the globe, this year mainly from China, India and Peru, selected to enter the final stage of the competition, which took place here.

The Ashden Awards for Sustainable Energy, founded in 2001 by the Ashden Trust, is an annual competition to identify and reward outstanding and innovative projects in the UK and developing countries which tackle climate change and improve quality of life by providing renewable energy and energy efficiency at a local level.

Nobelists to be invited to address environment and energy issues in Beijing (CAS, 2007-06-27)

Under the theme of "environment and energy sources," the Nobel Laureates Beijing Forum 2007 will be held from 11 to 14 September. This was decided at a meeting of Organizing Committee for the event held on 22 June in Beijing.

Chaired by Secretary-General of the Beijing Municipal Government LI Xiaohong, the meeting was attended by CAS Vice President LI Jinhai, Vice Mayor of Beijing LU Hao, officials from governmental departments such as the State Development and Reform Commission, Ministry of Science and Technology, State Environment Protection Administration, and Research Development Center under the State Council and China Association for Science and Technology, as well as reporters from news agencies such as CCTV. With an objective of deepening the understanding of the international S&T development in the fields of environment and energy resources among domestic scholars and entrepreneurs, and promoting their cooperation with overseas partners, the Forum will invite Nobelists and world-renowned experts to give talks on the topics. It is also expected to raise the consciousness of the general public in saving resources and protecting the environment.

This year's event will be mainly made up of symposia on the following four topics: energy resources and environment, strategy, academic exploration, and energy utilization efficiency and greenhouse gas emission reduction. In addition, an exhibition and a series of academic activities will be held.

It will be the third such event in this city. The theme of the last year's Forum was "life science and human health."

6 Information for upcoming Workshops in August 2007

The 5th International Conference on Rare Earth Development and Applications

Date: 1 August **City:** Baotou, Inner Mongolia Autonomous Region

<http://www.cs-re.org.cn/icre2007/>

The International Frontiers of Algorithmics Workshop 2007

Date: August 1 – August 5 **City:** Lanzhou, Gansu Province

<http://iccm.lzu.edu.cn/conference/index.htm>

2007 IEEE International Conference on Mechatronics and Automation (IEEE ICMA2007)

Date: August 5 – August 8 **City:** Harbin, Heilongjiang Province

<http://www.ieee-icma.org/Home/Home.aspx>

The International Symposium on Optimization and Systems Biology (OSB 2007)

Date: August 7 – August 9 **City:** Beijing

<http://www.aporc.org/OSB/2007/index.php>

The First International Conference on Combinatorial Optimization and Applications

Date: August 12 – August 15 **City:** Xi'an, Shaanxi Province

<http://www.cs.montana.edu/cocoa07/>

The 15th International Zeolite Conference

Date: August 12 – August 17 **City:** Beijing

<http://www.15izc.org.cn/invitation.htm>

International Conference on the Frontiers of Statistics: High Dimensional Data Analysis

Date: August 13 – August 15 **City:** Kunming, Yunnan Province

<http://www.sms.ynu.edu.cn/2007sta/>

The 13th International Conference on Atmospheric Electricity

Date: August 13 – August 17 **City:** Beijing

<http://www.casnw.net/icae2007/>

Twelfth International Symposium on Water-Rock Interaction

Date: August 13 – August 18 **City:** Kunming, Yunnan Province

<http://www.wri12.org/>

International Conference on Applied Mathematics and Interdisciplinary Research

Date: August 13 – August 18 **City:** Lijiang, Yunnan Province

<http://icmsec.cc.ac.cn/news/2007/lijiang/index.htm>

Medical Imaging and Informatics (MIMI 2007)**Date:** August 14 – August 16 **City:** Beijing<http://www.mitime.org/>**IEEE 2007 International Symposium on Microwave, Antenna, Propagation and EMC Technologies For Wireless Communications****Date:** August 14 – August 16 **City:** Beijing<http://www.cie-china.org/mape2007/>**The 8th International Conference on Electronics Packaging Technology****Date:** August 14 – August 17 **City:** Shanghai<http://www.icept.org/en/index.html>**The Fifth International Conference on Fluid Mechanics****Date:** August 15 – August 19 **City:** Shanghai<http://icfm5.sjtu.edu.cn/index.html>**8th International Conference on Electronic Measurement****Date:** August 16 – August 18 **City:** Xi'an, Shaanxi Province<http://www.emijournal.com/>**The 6th international conference on grid and cooperative computing (GCC2007)****Date:** August 16 – August 18 **City:** Urumqi, Xinjiang Autonomous Region<http://vega.ict.ac.cn/gcc2007/>**2007 IEEE International Conference on Automation and Logistics****Date:** August 18 – August 21 **City:** Jinan, Shandong Province<http://www.tli.sdu.edu.cn/iee-ical/index.htm>**3rd International Symposium on Engineering Plastics****Date:** August 19 – August 24 **City:** Urumqi, Xinjiang Autonomous Region<http://eplab.iccas.ac.cn/ep2007/>**2007 International Conference On Management Science and Engineering****Date:** August 20 – August 22 **City:** Jiaozuo, Henan Province<http://218.196.243.245/>**The 10th International Meetings on Statistical Climatology****Date:** August 20 – August 24 **City:** Beijinghttp://imsc.iap.ac.cn/10imsc/OtherNews_show.asp?id=1**2007 International Conference on Intelligent Computing****Date:** August 21 – August 23 **City:** Qingdao, Shandong Province

<http://www.ic-ic.org/2007/index.htm>

International Conference on Communications and Networking in China

Date: August 22 – August 24 **City:** Shanghai

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

Fourth International Conference on Image and Graphics

Date: August 22 – August 24 **City:** Chengdu, Sichuan Province

<http://www.icig2007.com/>

International Colloquium on Information Fusion 2007

Date: August 22 – August 25 **City:** Xi'an, Shaanxi Province

<http://icif2007.xjtu.edu.cn/>

The 3rd International Conference on Natural Computation; The 4rd International Conference on Fuzzy Systems and Knowledge Discovery

Date: August 24 – August 27 **City:** Haikou, Hainan Province

<http://210.37.44.253/index.htm>

Geomathematics and GIS Analysis of Resources

Date: August 26 – August 31 **City:** Beijing

<http://www.iamg2007.org/index.asp>

Second China Workshop on Information System for Crisis Response and Management

Date: August 26 – August 31 **City:** Harbin, Heilongjiang Province

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

The 7th International Conference on FEOFS 2007

Date: August 27 – August 30 **City:** Urumqi, Xinjiang Autonomous Region

<http://hy.tsinghua.edu.cn/FEOFS2007web/Chinese.htm>

ISPRS Workshop on Updating Geo-spatial Databases with Imagery & The 5th ISPRS Workshop on DMGISs

Date: August 28 – August 29 **City:** Urumqi, Xinjiang Autonomous Region

<http://isprs-wg41.nsd.gov.cn/>

Abbreviations

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