

Content

Science News from Chinese Media in March 2008
Collected and Compiled by the Helmholtz Beijing Office

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Helmholtz News Concerning China

Prof. Rudi Balling, director of the Helmholtz Centre for Infection Research (HZI in Braunschweig), has signed on 03rd March an MoU with his counterpart Prof. Zhang Kang, director of the Institute of Psychology, CAS, for jointly establishing a [CAS-HZI partner group](#) working on genome sequencing and gene synthesis. Between Dr. Vitor Dos Santos and Prof. Wang Jing there is already an ongoing EU project. Both sides have vowed for further strengthened cooperation on personal exchange, joint efforts for projects and workshops.

Mr. Scherf, managing director of DESY, a member of Helmholtz Association, has visited the Chinese partner institutions for XFEL Project. He was accompanied by Dr. Hong HE, head of the Helmholtz Beijing Office and received by Prof. Jiang Xiaoming, vice director of IHEP and Prof. Chen Jiaer, former president of Beijing University. Coordination on the future action was discussed and the Chinese side forwarded concrete request for assistance from DESY for their improvement on accelerator and superconducting resonator technology. It is made very clear during this combined visit, that China has much more capacity than the 1% promise to invest in FAIR and XFEL; it would be more a political decision concerning these two projects. There are also some more positive changes on the Chinese side: All the Chinese experts are sure their ministry MOST will hold its word and keep in pace for the forthcoming activities; Prof. Zhan Wenlong, the new vice president of CAS, will be a leading person for these two projects. He was the former director of Institute of Modern Physics, traditional partner for GSI. Because of his sudden rise in the Chinese party system, he has already a ranking like a government minister. Besides, the upcoming the minister meeting in April to remark the 30 years' of scientific and technological cooperation will also be another opportunity for Mrs. Schavan and Mr. Wang Gang to work on the final Chinese participation on XFEL and FAIR.

Between 06th to 07th March, Helmholtz Beijing Office has been formally evaluated by a delegation from Germany, led by Prof. Teutsch from UFZ, Vice Helmholtz President for Earth and Environment. The results are generally very positive. Such an office does help a lot to improve the visibility of Helmholtz in China and also following and further supporting different cooperation projects in China. Based on this evaluation, it is decided that this office would be further extended for 3 years of operation. It is wished as well, that the linkage between Helmholtz research centres and the Beijing Office should further be strengthened in the future. There should be more concrete tasks originated from Helmholtz centres and scientists.

Dr. T. Lieckweg, Dr. Dannenberg from Helmholtz Berlin Office and Dr. Subklew from FZJ have taken this opportunity in Beijing to visit some of the Helmholtz partners in Beijing. Under the accompany and arrangement of Dr. Hong HE, they have visited Mr. Xing Jijun and Mr. Li Gang in MOST, Prof. Lu Yonglong and Fang Qiang in MOST (also Prof. Pan, Mr. Li and Mrs. Zhang in MOST), colleagues in the Sino-German Centre for Research Promotion and Chinese Scholarship Council. Especially with CAS, there will be an umbrella agreement prepared for a signing in May or June between Helmholtz and CAS, which will surely stimulate more initiatives in the future.

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1 Science News

1.1 Energy

China to build country's first inland nuclear plant in Hubei

(Xinhua Net, 2008-03-04)

China Guangdong Nuclear Power Group (CGNPG) and the Hubei provincial government on Tuesday signed an agreement here to build the country's first inland nuclear power plant.

The two sides said the project would be located in Xianning City, 421 kilometers southeast of Yichang City where the Three Gorges Dam lies.

The CGNPG declined to reveal the investment and scale of the project, as well as when it would start construction. China currently has 11 nuclear generators in six nuclear power plants, all located along the eastern coast, with a combined installed capacity of 9.07 million kilowatts. The CGNPG's installed capacity is 3.95 million kw, or 43.5 percent of the total.

Faced with an energy crunch resulting from its fast economic growth, China has decided to develop more nuclear power. By 2020, the nation will have an installed nuclear power capacity of 40 million kw, accounting for 4 percent of its total installed generating capacity.

At present, another 12 nuclear generating units have been approved for construction, with a combined power capacity of 12.24million kw.

An R&D center for solar cells established in Shanghai

(CAS, 2008-03-14)

After official registration, the Shanghai-based Research and Development Center for Solar Cells was recently inaugurated under the joint sponsorship of the CAS Shanghai Branch, Shanghai Institute of Technical Physics (ITP), and Zhangjiang Group Co. Ltd. in the Pudong New District under Shanghai Municipality.

Affiliated to the State Key Laboratory for Infra-red Irradiation Physics under ITP, the center is a major component of research initiative of Resources & the Environment "C Technical Application of Green & Reusable Energy Sources" in the Pudong New District-run S&T Park.

The new center's primary task is to conduct research and development on photovoltaic technologies by rallying some CAS institutes, universities in Shanghai Municipality and hi-tech enterprises in the field both at home and abroad.

It will focus on new materials for solar cells, their elements, devices and components in addition to exploration of related testing expertise, applied research, development of new materials for photo-electric transformation and relevant know-how.

Experts call on increasing support to superconducting technology studies

(CAS, 2008-03-19)

The Chinese government should launch a major research project on superconducting technology, as it is of significant importance for ensuring national energy security and raising energy efficiency and reducing emissions, urged experts at a workshop held at the CAS Institute of

Electronic Engineering on 6 and 7 March in Beijing.

With the support of CAS and the State Administration of Foreign Experts Affairs, the meeting was organized by the International Innovation Partnership Program on Supercomputing Technology, an initiative to back up the teamwork of Chinese scholars in this field at home and abroad. Also present at the meeting were some senior experts in this country, including five CAS members.

According to the experts, speeding up the materials research and its application demonstration is the key to promoting the practical use of the technology. They also believed that the development of such technology at room-temperature is critical to upgrade the nations' key competitiveness.

To implement the project, stressed the experts, long-term objectives and development blueprint should be mapped out. It should be conducted step by step and by taking advantages of collective wisdom of Chinese experts at home and abroad.

The meeting suggested that applied and demonstrative research be conducted hand in hand with various basic research projects in the field. Importance should be placed on such topics as the application of a superconducting magnetic system, superconducting power technology, superconducting communication technology, addressing bottleneck issues and building up complete capacity for simulation, design and manufacturing. At the same time, efforts should be made to deal with relevant technical subjects, such as cryogenic technology, refrigeration technology, electric power and electronic technology, low-temperature high-voltage and insulation technology and superconducting power systems, so as to promote the its application in energy, transportation and environment industries.

China's Installed Capacity of Wind Power Hits 10 Mln kw (CRI, 2008-03-24)

China's installed capacity of wind power will hit 10 million kilowatt this year, and the figure is expected to double in 2010, a senior official said on Sunday.

To develop clean energy, China will expand the installed capacity of nuclear power, making it account for more than 5 percent of the national total power installed capacity by the year 2020, said vice chairman of the National Development and Reform Commission Zhang Guobao.

China has vowed to develop nuclear power in its 11th five-year plan for economic and social development (2006-2010), with the aim to realize 40,000 megawatt of operating installed capacity by 2020.

Currently, China's operating installed capacity of nuclear power stations stands at 8,600 megawatt.

1.2 Earth and Environment

China sets up background atmosphere station on Antarctica (Xinhua Net, 2008-03-05)

China has set up a background atmospheric observation site at its Zhongshan station on Antarctica as part of its 24th scientific expedition to the region.

Researchers at Zhongshan station will be able to observe surface ozone and gases like carbon monoxide, carbon dioxide, sulfur dioxide and nitrogen oxides, as well as black carbon aerosol.

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Chinese scientists have monitored the ozone content for 15 years with their ground-based remote sensing system at Antarctica Zhongshan station. This area's lack of human activity provides ideal conditions for research on background atmosphere.

Based on previous studies, they will continue observation and analysis of ozone and UV-B radiation in the area around the station.

According to scientists at Zhongshan station, they are also planning to go further into the Antarctic ice sheet to conduct research on background atmosphere there.

Official: China to monitor land use via satellite

(People's Daily, 2008-03-14)

China will resort to satellite remote sensing technologies to monitor land use and protect the legitimate rights of farmers, an official said in Beijing on Friday.

Ministry of Land and Resources will start using the high-tech devices this year to detect and prevent illegal use of land, particularly arable land, said vice minister Yun Xiaosu at a press conference during the annual parliamentary session.

Yun said his ministry will draw up a satellite map covering the country's 9.6 million square kilometers of territory, to protect arable land from illicit expropriation and safeguard the legitimate land rights of farmers.

"The Chinese government has taken legal and policy measures to protect the farmers' rights in land use, particularly land appropriated for farming and building homes," Yun said in response to a question.

Meanwhile, the central and local governments have also worked to protect the rights of farmers whose land were expropriated, he said without elaborating.

China seized 31,700 land use violation cases in a 100-day campaign starting in September, involving more than 200,000 hectares of land.

The campaign aimed at cracking down on local governments that illegally transferred household land to property developers, and punishing officials who failed to seek permission from higher authorities for land use and those who flouted decrees to expand the size of development zones.

China had 121 million hectares of arable land at the end of 2006, or 0.09 hectares per person, down 8.3 million hectares and 0.02 hectare respectively from 1996, and less than 40 percent of the world's average level.

The country needs at least 120 million hectares of arable land to feed its 1.3 billion people.

"It's vital to the national economy and people's livelihood," said Yun. "But with concerted efforts from all sides, it's quite hopeful to keep the acreage above the minimal line."

The Chinese government has quintupled tax on the use of arable land for non-farming purposes and is charging foreign-invested companies as much as their domestic peers to protect farm land and better control land supply.

The country's landmark property law, adopted last March, was also aimed at better protecting farmers from land seizures, which frequently caused public anger. The law stresses the protection of arable land, promising strict restrictions in the transformation of land from agricultural use to construction projects.

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China sets up space observatory on South Pole's Dome Argus

(Xinhua Net, 2008-03-20)

China's automatic space observatory at Dome Argus, the highest point of the Antarctic ice sheet, has been successfully completed.

The observatory was set up by China's 24th science inspection team on the South Pole at Dome Argus, the Antarctic icecap peak at 4,093 meters above sea level. It has undergone more than one month of tests and examinations and now transfers back nearly 10M of astronomic data every day. "Only when we can get data stably from the observatory, can we take the load off our minds, and see that our efforts at the Antarctic icecap have been successfully completed," said by Zhu Zhenxi, one of the astronomers in the inspection team.

Setting up this observatory is an international project led by China's astronomers in cooperation with astronomers from Australia, the U.S. and Britain. It is a milestone in the development of astronomy in China, said experts in the inspection team.

The past 10 years of scientific research showed that Dome Argus, due to its special geographic site, had great potential to become one of the best places on the earth to set up an observatory.

The observatory will for the first time in the world map the parameters of Dome Argus helping to enable the building of larger observatories at a later date.

Studies offer approaches for environmental-friendly urbanization

(CAS, 2008-03-21)



Hexi Corridor, an important section of the ancient Silk Road and the modern Euro-Asian Railway, is one of the key regions for the drive of "great development of China's west." However, the accelerated urbanization process in this arid area has brought to the forefront a number of key problems, such as resource exploitation and eco-environmental deterioration.

With the support of the National Natural Science Foundation of China, Prof. FANG Chuanglin, a geographer with the Institute for Geographic Sciences and Natural Resources Research, and his colleagues started studies on urbanization and its ecological effects in 2003.

Taking the Hexi Corridor as a case and the water resources restriction as the precondition, the researchers have made explorations on the coupling mechanism of the urbanization process and the eco-environment change process of the region with an area of 276,000 square kilometers falling in five administrative areas.

Using the system integration method and the RS and GIS technology, Fang and his team located the driving factors for the conflictions between the changes of water resources and the urbanization process. They also analyzed the ecological effects caused by the urbanization process and related to water resources. As a result of the four-year hard work, the study sheds new light on the understanding of the mechanism and laws behind the conflictions.

On the basis of Water Resources Carrying Capacity, largest scale of population and economy in a certain area according to the total water resources, the securable technology, and the socio-economic development level within a certain period, the researchers introduced the new

concept of Water Resources Constraint Force, which refers to the pressures of a water resource system on a socio-economic system. It shows that when the population, economic and urban scales approach or exceed the water resources carrying capacity, or the utilization of water resources approaches or exceeds the threshold of natural water resources, the water resources system will be highly stressed by the socio-economic system. Consequently, the water resources system will slow down the socio-economic development, including the process of industrialization and urbanization.

Using a threshold model developed by them, the researchers made predictions on the possible urbanization level of the Corridor over the next 30 years. According to their computation, by 2030, the cities in the Corridor may accommodate additional 870,000 immigrants from the rural areas, enabling the urbanizing level reach 35.14% if no water transfer is carried out into the area. In the scenario of water diversion from other areas, up to 1.58 billion m³ water resources might be exploited, raising the local urbanization level to 47.17%.

Based on the case study, the scientists suggested a model for a sound development of urbanization drive in China, which could harmonize the drive with the ecological setting and water resources in the cities. Scientists believe that the project is of critical significance, both in theoretical and practical terms, in the enforcement of the scientific outlook on development, enriching the disciplinary contents of China's science of urban geography as well as construction of resource-saving and green cities throughout the country.

CAS starts studies assessing ecological impact of the Three-Gorge project (CAS, 2008-03-24)



As a component of the CAS major project to monitor and evaluate the eco-environment effects of large projects using remote sensing technology, a follow-up evaluation has been initiated on ecological and environmental impact of water-storage and operation of the mammoth Three-Gorge Dam.

By highlighting new problems in the wake of water-storage and operation of the Dam, says Prof. YANG Guishan, chief scientist of the research and director-general of the CAS Nanjing Institute of Geography and Limnology, the three-year research project will focus on the living and production conditions of local emigrants, deterioration of water quality in the nearby bays, nooks and tributaries of the Yangtze, scouring of river channels in the downstream of the Dam and changed relations between the mighty river and its lakes, as well as the mainstream's fishing resources.

New discoveries challenge traditional view on the homogeneity of the asthenosphere (CAS, 2008-03-31)

A recent study published in 20 March issue of Nature by Dr. LIU Chuanzhou from Institute of Geology & Geophysics, Chinese Academy of Sciences and his co-workers challenges the conventional wisdom that the Earth's upper mantle is homogeneous.

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In company with his colleagues from both Germany and US, Dr. Liu have conducted mineral, petrological and geochemical studies on abyssal peridotites selected from two dredge hauls in the ultraslow spreading Gakkel ridge, Arctic Ocean. Peridotite samples from one of these two dredge hauls are rarely fresh.

Asthenosphere refers to the layer with long-term slow plastic deformation in between the lithospheric mantle and 660 km discontinuity. Geochemically, asthenospheric mantle has been widely taken as a homogeneous reservoir to discuss the crust-mantle interactions. Furthermore, the mantle convection process in the asthenosphere has been conferred as the 'engine' of plate tectonics. Therefore, the physical and chemical properties of the asthenospheric mantle have always attracted the attentions of earth scientists worldwide.

It has been highly controversial on whether the asthenosphere has a homogeneous composition or not for a long time. Generally, both mantle convection and diffusions occurring in asthenosphere have been thought to be highly efficient in eliminating all heterogeneities in different sizes. Therefore, the asthenosphere has been commonly treated as a homogeneous reservoir, which has also widely supported by studies on mid-ocean ridge basalts.

The results of the study by Dr. Liu and his collaborators, however, put this conventional wisdom into challenge. They discovered that the mantle beneath Gakkel Ridge are highly heterogeneous in Os isotopes, even within a single dredging scale (<5 km). Meanwhile, the harzburgites from both dredge hauls have highly depleted $^{187}\text{Os}/^{188}\text{Os}$ ratios, giving Re-depletion ages of 2 billion years. This suggests that some mantle domains beneath Gakkel Ridge are very ancient and some ancient refractory mantle domains could be preserved through mantle convection for a long term (i.e., billion years). When these ancient refractory mantle domains enter into the ocean ridges, they contribute little to the genesis of mid-ocean ridge basalts.

The results of this study have important implications in the following three aspects:

- 1). Some abyssal peridotites don't have genetic relationships with the associated mid-ocean ridge basalts. Instead, they represent ancient refractory mantle domains survived in the asthenosphere. Their compositions cannot be seen by mid-ocean ridge basalts, because of their little contributions to the genesis of the later. The conventional method that observes the asthenospheric mantle composition by mid-ocean ridge basalts alone without taking these refractory components into account will tend to overestimate the fertility of the upper mantle.
- 2). The long-term survivals of ancient mantle domains in asthenosphere also would blur the difference between the lithospheric mantle and the asthenosphere. Therefore, using osmium model ages to constrain the evolutions of continental lithosphere and ophiolites should be approached with caution.
- 3). Long-term preservations of ancient mantle domains in the asthenosphere also suggest that mantle convection is not so highly efficient as we expected in erasing the heterogeneities and thus some modifications on the conventional wisdom that the asthenospheric mantle has a homogeneous composition are required.

1.3 Health

Underlying mechanism revealed for horsefly as an antithrombotic drug

(CAS, 2008-03-03)

Horseflies are a blood-feeding arthropod, notorious as a common pest of animals and sometimes of humans. While being a target of the biological control in the green farming and animal husbandry, dried bodies of female horseflies, known as mangchong, are used by traditional Chinese medicine (TCM) to treat cardiovascular diseases. Although the unique drug is believed as a source various bioactive substances, little has been known about its biochemical functions in the secretion of its salivary glands and, in particular, on its immune suppressants.

The recent research work of Prof. LAI Ren and his colleagues with the CAS Kunming Institute of Zoology (KIZ) shed new light on the horsefly's blood-feeding mechanism at the molecular level. Their work was reported in the Dec. 17, 2007 issue of the journal *Molecular Cellular Proteomics*.

Using the approaches of proteomics or peptidomics and transcriptome analysis coupling with pharmacological testing, the researchers identified and characterized several families of proteins or peptides, which act mainly on haemostatic system or immune system of the host, from 30, 000 pairs of salivary glands of the horsefly of *Tabanus Yao* (Diptera, Tabanidae).

Their findings include: (1) A novel family of inhibitors against platelet aggregation which involves two members very likely capable of inhibiting platelet aggregation by a novel mechanism and acting on the platelet membrane; (2) A new 12-membered family of immuno-suppressant peptides to stem the production of interferon but increase the secretion of interleukin-10; (3) A serine protease with 56 amino acid residues working as an anticoagulant inhibitor; (4) A serine protease noted for its anti-coagulant activity; v). A protease with fibrinogenolytic activity; (5) Three families of anti-microbial peptides including six members; vii). A hyaluronidase; (6) A vasodilator peptide, an isoform vasotab identified from *Hybomitra bimaculata*; (7) More interestingly, two metallo-thioneins were characterized as the first report about such substances of this kind extracted from an invertebrate's saliva. Scientists believe the substances are capable of regulating the host's immunity system and being resistant to microbes, thrombosis and blood coagulation.

More importantly, the work reveals the molecular mechanism of mangchong as an antithrombotic drug. It also made discoveries on a couple of novel vaccine targets and novel leading pharmacological compounds with potential medical values for blood and immune systems. Experts say the work laid a solid foundation for the modernization of Mangchong as a TCM drug. It is hailed as an outstanding "tour de force" work.

Scientists to sequence giant panda genome

(CAS, 2008-03-11)



Teaming up with their co-workers at home and abroad, CAS researchers launched recently a project to sequence the genome of the giant panda.

"The goal of this project is to finish the sequencing and assembling of a draft sequence within six months," said Dr. Zhu Hongmei, a scientist with the

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Shenzhen branch of the CAS Beijing Institute of Genomics (BIG Shenzhen), a core participant in the project.

Data from the International Giant Panda Genome Project, which was carried out jointly by scientists from China, Britain, the United States, Denmark and Canada, were expected to have an extensive impact on numerous scientific areas -- from ecology to evolution to sequencing technology, according to BGI Shenzhen scientists.

Results of the current sequencing were also expected to contribute to the understanding of the genetic and biological underpinnings of the giant panda, which would subsequently help protect and monitor the endangered species and control diseases that could devastate them.

"The most noteworthy aspect of the project is that it is the first genome project to be undertaken specifically to gather information that will contribute to conservation efforts for an endangered species," said Oliver Ryder of the San Diego Zoo's Center for Conservation and Research for Endangered Species.

"The giant panda is a global conservation symbol and deserving of such an effort," he added.

"The project will help scientists understand the genetic basis for the giant panda's adaptation to its special diet and behavioral style and reveal the history of their population isolation and migration," said Zhang Yaping, a CAS Member and Director of the CAS Kunming Institute of Zoology.

Dr. Lin He, a professor with the Shanghai Jiao Tong University noted that the gene sequence obtained from this project would greatly increase people's understanding of the reduced fecundity of pandas who live under certain environmental conditions.

"The project is really ambitious and we are looking forward to it," said Fan Zhiyong, Species Program Director of the World Wildlife Fund China.

The panda whose DNA will be sequenced for the project will be chosen from among those at the Chengdu and Wolong breeding centers.

Besides producing a high-quality genome sequence, researchers will do a survey of the genetic variations in the panda population.

The genome size of the giant panda is approximately the same as that of humans.

The giant panda, often referred to as a living fossil, has been the focal point of many research projects. It is considered a symbol of China and is one of the mascots for the upcoming Olympics in Beijing. So far, however, little research has been done on panda DNA.

CAS institute, Helmholtz center to set up a joint lab against contagious diseases (CAS, 2008-03-12)

A protocol to co-establish a laboratory was signed on 3 March in Beijing by the CAS Institute of Psychology (IPCAS) and the German Helmholtz Centre for Infection Research (HZI). Leaders of the two sides, IPCAS Director Prof. ZHANG Kan and HZI Director Prof. Rudi Balling, were present at the ceremony.

Co-chaired by Prof. WANG Jing with the IPCAS Center for Behavioral Genetics (CBG) and Dr. Victor AP Martins dos Santos of the Systems & Synthetic Biology Group under HZI, the new lab is to conduct pathological research into various infectious diseases and other major illnesses.

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Chinese scientists' breakthrough in GM-modified rice

(Xinhua Net, 2008-03-22)

China's prestigious Zhejiang University announced that it has developed a method for creating selective terminable GM-modified rice, which could probably lead to the industrialization of the GM-modified crops.

The invention was reported on the latest version www.plosone.org, an open access, online scientific journal from the Public Library of Science, which was published on Wednesday.

The accidental escape of GM-modified crops has been reported in the past few years, which has caused major safety concerns over utilization of GM-modified crops, especially GM-modified crops for industrial and pharmaceutical applications.

"To make GM-modified crops selectively controllable is critical for the full utilization of the plant GM-modified technology," said Zhang Zhitao, former associate director of the Rice Institute of China.

"The principle beneath this strategy is simple: the genes of interest in these GM-modified rice plants are tagged with an RNAi cassette which suppresses the expression of the rice detoxification enzyme against a common herbicide, rendering the GM-modified rice to be sensitive to this herbicide," said Dr. Shen Zhicheng, the project leader.

Shen said this strategy is reliable and inexpensive for implementation, and is particularly useful for development of GM-modified crops as bioreactor for production of industrial and pharmaceutical proteins.

"While all biotech products today are safe and nutritious, this technology could allow certain crops targeted for industrial, energy or health uses to be grown under controlled conditions and keep separate from other channels," said Nick Duck, Vice President of Research for Athenix Corp. in the U.S.

Gifted children found to be shaper in processing external signals

(CAS, 2008-03-28)



Individuals with higher intelligence are found to be able to concentrate their attention more effectively and have stronger memory than the average ones. However, a puzzle haunting scientists is: how the brain's neural activity can support or sustain them to perform these cognitive tasks?

A study conducted by researchers with the CAS Institute of Psychology may add new dimensions to the understanding of the mechanism underlying the course to process auditory signals in intellectually

gifted children. Their work has been published in the latest issue of *Neuro-science*.

Using an event-related potential (ERP) technique, which is an experiment that allows researchers to observe human brain activity that reflects specific cognitive processes, Dr. LU Tongyan and Prof. SHI Jiannong examined automatic auditory processing and novel stimulus in children gifted with or without high intelligence.

In the experiments, the electroencephalograms were introduced to investigate several indexes for

investigating speech perception and learning in children, such as Mismatch negativity (MMN), a specific type of patterns of brain activity generated when a person hears a mismatch, late discriminative negativity (LDN) as well as involuntary attention switch, in which both the peak value's amplitude P3a and early MMN were analyzed.

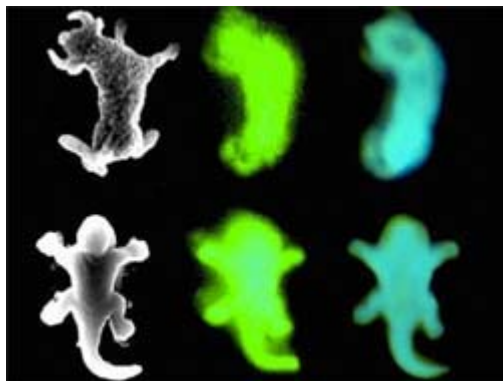
Among the parameters concerning ERP, MMN is believed to be the most critical one when exploring the processing course performed by the cognitive neurons. At the same time, as soon as the test's participants are involuntarily shift their attention to some of new exotic information, another new cardio-electric component P3a will occur. P3a is universally regarded as one of the key sensitive indices for exploration of the physiological basis of human intelligence.

The CAS researchers' tests showed that the gifted children had comparatively higher values of MMN, LDN, early MMN, P3a amplitudes and earlier peak latency in LDN than those shown by the average children. Hence, they manifested that, in some extents, the former have better automated processing capability in treatment of the external stimuli, implying that gifted children can perceive the new or exotic information in a quicker and more effective way.

1.4 Key Technologies

New advances in 3D micro-fabrication of polymer nanocomposites

(CAS, 2008-03-04)



A group of researchers headed by Prof. Duan Xuanming with the CAS Technical Institute of Physics and Chemistry in Beijing has achieved new advances in in-situ synthesis and fabrication of the 3D-microstructures in multi-colored polymer nanocomposites.

With the technique they have developed, as reported on-line on January 30 by the journal of Advanced Materials, the researchers are successful in making fluorescent bull and lizard sculptures not

much bigger than red blood cells. The tiny creatures luminesce either green or blue.

Due to the constraints of traditional optical theories on diffraction limits, it is difficult to carry out the nano-scale 3D structure microfabrication via a conventional lithography technique. By applying the nonlinear optical theorems, however, the multiphoton technology provides a new approach and method for overcoming the limits and raising its nano-scale resolution. Based on this, Prof. Duan's research team had already developed an ultra-fine fabrication system with the aid of nanophotonics.

In collaboration with co-workers at home and abroad, the team realized the fabrication with nanometer scale resolution by taking advantage of femtosecond laser direct writing technology. At the same time, they observed the lasing phenomenon in a 3D nanowire structure of materials with fluorescence dyes.

The semiconducting nanomaterials are noted for their unique optical, electrical and magnetic

properties. However, the high viscosity of the photoresist, which is widely used in 3D multiphoton microfabrication, makes it difficult to evenly disperse the previously synthesized nanomaterials.

To overcome the technical snag, Prof. Duan put forward a new approach for realizing the processing of a 3D microstructure through component preparation which involves the material's precursors. Then, the 3D reprocessing mode was introduced with the aid of the in-situ synthesis to fabricate the nano-composites. In this way, he obtained the lab preparation of the nanocomposites of TiO and CdS in the form of 3D photonic crystals, including the successful observation of the reinforced photonic bandgap effect in the 3D photonic crystals.

Furthermore, the research team realized the size control of the CdS nanoparticles in the in-situ synthesis by regulating the crosslinking molecule's networking density in the light-etching glue and the nanocomposite's fluorescent wavelength might be tunable in the scope between 450nm and 530nm. By making use of the above-listed expertise, the team prepared a lot of 3D microstructures from multicolor nanocomposites in the shape of mini-cattle and discovered that, the lighting intensity becomes stronger in sections with smaller dimensions. The journal Nature makes the following comment in its research highlight published in 21 February, 2008: Their animal creations are offered as proof of principle for a means of making miniature light-emitting electronics.

Cooling down computer chips with liquid metal device driven by their heat (CAS, 2008-03-12)

With the soaring advances in computational speed, thermal management becomes a major concern in computer systems. To remove residual heat generated from computer chips or very large scale integrated circuit raises, a research team headed by Prof. LIU Jing with the CAS Technical Institute of Physics and Chemistry in Beijing has developed a novel liquid metal cooling system that can be powered by the heat produced by computer chips. The feat was reported by the UK Journal of Physics D: Applied Physics as a cover article.

Liquid metal with a low melting point was already established as the most conductive coolant for efficiently cooling the computer chip. By making full use of the double merits of the liquid metal, i.e. superior heat transfer performance and electromagnetically drivable ability, Prof. Liu and his colleagues have demonstrated, for the first time in the world, the liquid-cooling concept for the thermal management of a computer chip using waste heat to power the thermoelectric generator (TEG) and thus the flow of the liquid metal.

Such a device consumes no external net energy, which warrants it a self-supporting and completely silent liquid-cooling module. Experiments on devices driven by one or two stage TEGs indicate that a dramatic temperature drop on the simulating chip has been realized without the aid of any fans. The higher the heat load, the larger will be the temperature decrease caused by the cooling device. Further, the two TEGs will generate a larger current if a copper plate is sandwiched between them to enhance heat dissipation there. This new method is expected to be significant in future thermal management of a desk or notebook computer, where both efficient cooling and extremely low energy consumption are of major concern.

1.5 Transport and Space

China to Launch Fengyun-3 Satellite in May

(CRI, 2008-03-04)

China will launch a second Olympic weather forecasting satellite, the Fengyun-3 (FY-3), in May to provide more precise and longer range forecasts, a chief designer said on Tuesday.

The new satellite will provide accurate and timely information about weather changes to facilitate more precise weather forecasts during the Beijing Olympic Games set to open on Aug. 8, said Zhou Hongling, a designer from Shanghai and deputy to the First Session of the 11th National People's Congress opening on Wednesday.

She said assembly of FY-3 had been completed in Shanghai. "It has passed tests at the factory and is ready for delivery to the launching site, where it will undergo another two months of testing."

The new satellite, with a bigger payload, will provide medium-range weather forecasts up to 10 to 15 days, said Zhou. "It will replace the FY-1D weather forecasting satellite launched in May 2002 to provide primary services for the Games."

According to Zhou, short-range forecasts by existing Chinese weather satellites are partially to blame for the country's heavy losses in the severe winter weather that attacked most parts of central, southern and eastern China starting in mid January.

China Meteorological Administration (CMA) head Zheng Guoguang admitted earlier the country was unprepared that the chaos could last for more than 20 days. "It's extremely hard to tell the weather conditions more than a week away, given China's current forecasting capacity," he said.

China has launched eight meteorological satellites since research started in the 1970s. Its first Olympic weather forecasting satellite, the FY-2D, was launched towards the end of 2006.

The CMA has identified weather forecast services for the Olympic Games as "a priority" for this year as the country may face much more frequent adverse weather.

Yet Beijing's weather bureau said the possibility was only 0.4 percent for the city to experience weathers above 35 degrees centigrade during the Games, when the average temperature would be around 24.9 degrees centigrade.

Spacewalk on course for October

(Xinhua Net, 2008-03-07)

China is planning to conduct its first spacewalk in October from a Shenzhou VII spacecraft, senior space engineers said Wednesday.

They also said a research team had been set up to conduct a feasibility study for a space station.

Wang Yongzhi, former chief designer of China's Manned Space Program, said the launch date had originally been scheduled for after the Olympics (Aug 8 to 24) and Paralympics (Sept 6 to 17).

"The Shenzhou VII will be launched some time in October if everything goes as planned," he said on the sidelines of the ongoing session of the 11th National Committee of CPPCC.

"The exact launch date will be decided according to weather conditions."

Shenzhou VII, to be launched from the Jiuquan Satellite Launch Center in Gansu province, will be the country's third manned mission. Shenzhou VI was launched on Oct 12, 2005, and Shenzhou V on Oct 15, 2003.

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With the launch of Shenzhou V, China became the third country, after the Soviet Union and the United States, to carry out a manned space mission.

Qi Faren, former chief designer of the Shenzhou spacecraft series, said the country is technically ready to carry out its maiden spacewalk.

There will be three taikonauts, as China's astronauts are known, aboard the Shenzhou VII. One of them will be conducting the spacewalk.

"We have achieved breakthroughs in all of the areas needed (for the spacewalk) and also completed all ground tests," Qi, a member of the CPPCC National Committee, said.

"We are now in the final stages of inspections and tests."

The spacewalk requires high technical standards for security and the life support and energy supply systems, as the taikonauts will spend three to five days in space.

In addition to the spacewalk, the crew is expected to perform such extra-vehicular work as installing equipment and tightening screws.

Qi said 14 taikonauts, all male, are undergoing intense training, but the final three have yet to be decided.

Yuan Jie, president of Shanghai Academy of Spaceflight Technology, said earlier this year that the spacewalk might be broadcast live.

He said Shenzhou VII is equipped to record images of the walk, but it has not been decided if the broadcast will be live or a recorded version.

Qi said yesterday the ability to conduct a spacewalk is crucial to establishing a big space laboratory or station.

"As the taikonauts will move out of their spacecraft to swap places with the occupants of other space vehicles, the mission will offer a crucial technical practice for building a large space lab or station in the future," he said.

Wang Yongzhi also said experts had been conducting a feasibility study for a space station.

"Our space station plan is still being appraised and has yet to be approved by the space administration," he said. "So there is no specific timetable."

But he said officials had been pushing hard for the country to build a space station by 2020, the third and final phase of its manned space program.

China launching center says it's getting prepared for Shenzhou VII

(Xinhua Net, 2008-03-08)

China's Jiuquan Satellite Launch Center is getting prepared for the Shenzhou VII spacewalk mission scheduled for late September and early October, said director of the center Zhang Yulin.

"Preparations for the mission are in full swing, and we're confident in its success," said Zhang, a deputy to the 11th National People's Congress, in an interview with Xinhua on Saturday.

The spacewalk of Shenzhou VII taikonauts, Chinese term of astronauts, is crucial to establishing a big space laboratory or station, he said. "The mission is therefore more challenging than the Shenzhou VI."

The spacecraft will also release a small inspection satellite, which monitors its own performance.

The Jiuquan center has developed a large-scale simulation system for the training, consisting ground equipment, surveillance devices and digital emulational rockets with a scale of 1:1, said Zhang.

China began its manned space program in 1999. It successfully sent Yang Liwei into orbit on the Shenzhou V spacecraft in 2003.

Two years later, Fei Junlong and Nie Haisheng completed a Chinese record of five-day flight on the Shenzhou VI. All returned safely.

China's recoverable moon rover expected in 2017

(Xinhua Net, 2008-03-11)

China will have a recoverable moon rover, which will carry back lunar soil samples, by 2017 if technical research "progresses smoothly," said the chief designer of Chang'e-1, the country's first moon probe, here Tuesday.

China plans to land a probe on the moon in 2013, said Ye Peijian, chief commander and designer of probe's satellite system, and an academican of the Chinese Academy of Sciences.

The milestone Chang'e-1 blasted off last October, marking the first step in China's ambitious three-stage moon mission.

"A recoverable moon rover is a must, though it is a much tougher task than a moon lander," said Ye, also a member of the 11th National Committee of the Chinese People's Political Consultative Conference (CPPCC), on the sidelines of the annual full session of the top political advisory body. So far all data the experts have obtained about the moon is collected and processed by remote devices. Having that data examined hands-on by scientists will be an improvement, Ye said.

"A recoverable moon rover is also vital for a manned moon landing," Ye said but added that China so far has no plan to land men on the moon.

Scientists have been working on a recoverable moon rover scheme, he said. "If the government approves it and we start technical preparation now, it will be finished in 2017."

Ye also admitted that technical challenges remain concerning the landing mission.

The soft landing vehicle and moon rover should meet high technical standards as they will have to stay on the moon for three months to a year, he said.

"A night on the moon is equal to 14 days on the earth, during which the solar batteries cannot be recharged. It remains a question how the equipment will be kept warm and working," he said.

The mission also needs a stable and powerful data transmission system as the information will be sent a distance of 380,000 km back to the earth, he said.

The government has approved the scheme to develop a non-recoverable landing moon rover and experts have started working on it, Ye said.

The country will launch another moon orbiter Chang'e-2 around 2009, which is expected to follow an orbit of 100 km above the moon's surface, 100 km lower the Chang'e-1, Ye said.

"We also hope to prolong the service of Change'-1 by three to six months," he said.

China approves second-phase lunar probe program

(Xinhua Net, 2008-03-26)

China's State Council, the cabinet, has approved the country's second-phase lunar probe program, the Beijing Times reported on Wednesday. It cited Luan Enjie, the director-in-chief of the China Moon-orbiting Program.

"We are organizing people to make detailed plans for the program," Luan told a conference on Tuesday.

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He also said that investment in the second phase would exceed that for the first lunar probe but did not give specific figures, the Times said.

China successfully launched its first lunar probe, Chang'e-1, in October. The cost for that project was about 1 billion to 1.4 billion yuan (about 143 to 200 million U.S. dollars).

The launch of Chang'e-1 is the first step in China's three-stage moon mission, which also includes the launch of a lunar rover for a soft landing and a second rover that is to collect lunar soil and stone samples for research.

Many Chinese universities and scientific institutes are developing their own rovers, according to Luan, who said: "The final product will combine the merits of all these rovers."

China plans to land a probe on the moon in 2013, Ye Peijian, the chief designer of Chang'e-1, said earlier this month.

China to Start Making Trial Model of "Long March 5" Carrier Rocket: Official (CRI, 2008-03-28)

China's leading launch vehicle producer said on Thursday it has finished most of the designing work for the country's Long March 5 large-thrust carrier rocket and will soon start to present an initial model.

The China Academy of Launch Vehicle Technology (CALT) has already conducted deliberation and designing for a blue print of rocket development, which also includes formal model making and test flights.

With a maximum payload capacity up to 25 tons, the jumbo rocket is expected to be able to send lunar rovers, large satellites and space stations into space after 2014," Liang Xiaohong, vice president of CALT was quoted as saying earlier in the month.

The new generation rocket, designed to be non-toxic and pollution-free, will be produced at a base in the Binhai New Area of Tianjin, and the rocket is expected to take its first spaceflight in 2014.

It will not only be used for launching national satellites and deep space exploration, but will compete for launching commercial satellites on the international market.

CALT officials also revealed that a new member of the Long March 3 series, "Long March 3C" will have its first test launch next month.

China currently employs its self-developed Long March 3 series rocket for most space missions. A Long March 3A rocket was used to deliver the country's first lunar probe Chang'e-1 in October 2007.

2 News from Universities

China's college teachers to be graded on results

(People's Daily, 2008-03-06)

A new rating system will soon be introduced in China to grade college teachers based on their teaching and research performance, replacing the long-standing practice of seniority-based titles at universities, according to a government notice.

Jointly issued by the Ministry of Education and the Ministry of Personnel, the notice said college teaching staff would be graded according to 13 additional levels, besides the present four positional titles of professor, associate professor, lecturer and teaching assistant, China Daily reported Thursday.

The different levels mean different income and treatment.

The new rating system will guarantee professors and lecturers treatment in accordance with their achievements.

Moreover, schools can also try to set up teaching-oriented and research-oriented posts under a reward system that better reflects the different contributions made by teachers with the same title, the notice said.

The present positional title system for university professors offers life tenure with the same titles enjoying the same treatment. Consequently, a teacher's income does not reflect different teaching and research contributions.

The move is designed to reverse the growing trend among some teachers of concentrating more on publishing academic papers -- an important criteria for becoming a professor -- while neglecting their teaching duties, a spokesman with the Ministry of Education was quoted as saying.

Zhu Longjie, a statistics professor with Nanjing University of Finance and Economics, found that there was a serious shortage of qualified teachers in colleges and universities.

"To make things worse, teachers with high positional titles always tend to reduce the time to give lectures to undergraduates," Zhu said.

A recent survey by Zhu and his colleagues found that in 71 colleges and universities affiliated with the Ministry of Education, 25 percent of professors and 20 percent of associate professors were not teaching undergraduates from behind a podium.

Hong Chengwen, a management professor with Beijing Normal University, said when the rating method is put into practice it must be properly bedded down.

"The rating system needs to be executed in a more detailed way, targeting different types of universities. For example, teaching-oriented universities or research-oriented ones, universities belonging to the central government or belonging to the local government; therefore the system should be more tailored," Hong said.

"The rating system should give schools enough power to make their own decision on staff leveling to encourage their innovative ability in management," he said.

Over 10 billion yuan to be invested in "211 Project"

(People's Daily, 2008-03-26)

The Ministry of Finance will invest 10 billion yuan into the third phase of the "211 Project," according to a statement by Zhao Lu, director of the Education, Science and Culture Department

under the Ministry of Finance on March 25 at the news conference held by the Ministry of Education.

The "211 Project," China's key construction project, officially started construction in 1995. It is also the State's only key construction project in the area of education during the "Ninth Five-Year Plan" and "Tenth Five-Year Plan" period. Zhao Lu said that as the State's financial resources grew, the State continued to increase investment into the "211 Project." In the first phase of the project, China earmarked 2.755 billion yuan in special funds; and in the second phase, allocated 6 billion yuan. For the project's third phase (2007-2011) of construction, the Ministry will set aside 10 billion yuan.

China now has more than 1,700 standard institutions of higher education, and only 6 percent of them are "211 Project" schools. However, "211 Project" schools take on the responsibility of training 4/5 of doctoral students, 2/3 of graduate students, 1/2 of students abroad and 1/3 of undergraduates. They offer 85 percent of the State's key subjects; hold 96 percent of the State's key laboratories; and utilize 70 percent of scientific research funding.

Zhao Lu said that the funding for education shows a daily rising trend, whether it is seen from the growth in China's education funds or from China's investment into the "211 Project." The financial budget for education will be 908 billion yuan this year.

3 Innovation Management

YANG Weiping takes the helm of Beijing Institute of Genomics

(CAS, 2008-03-03)



Dr. Yang Weiping has been appointed the executive vice director-general of the CAS Beijing Institute of Genomics (BIG).

He obtained his B.S. degree in Biology from Hebei Normal University in 1985, and Ph.D. degree in Ecology from the CAS Institute of Zoology (IOZ) in 1996. He went to the United States in 1998 for half-a-year training in biology diversity information system management and worked as a professor of IOZ in 2000. Afterwards he went to Great Britain for an advanced study in administration for projects and organization management. Dr. Yang also holds an MBA certificate from Tsinghua University. In April 2001, he became IOZ vice director-general. In June 2007, he was

appointed as vice director-general of BIG. In January 2008, he was appointed the executive vice director-general of BIG.

ZHOU Zhonghe to head the Institute of Vertebrate Paleontology and Paleognathology

(CAS, 2008-03-04)

Paleornithologist ZHOU Zhonghe, 43, is to take the helm of the CAS Institute of Vertebrate Paleontology and Paleognathology (IVPP) as its executive vice director-general.

Graduated from the Department of Geology, Nanjing University, Dr. Zhou received this PhD from

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the University of Kansas in 1999. In the same year, he joined IVPP with support of the Bairen Program, an initiative of CAS to recruit high-caliber young scholars.

Over the past years, Dr. Zhou and his colleagues have unearthed in western Liaoning Province and the neighboring area several arboreal dinosaurs with feathers, including the Microraptor, the smallest dinosaur known to date, and some early birds that are only slightly more advanced than archaeopteryx. They fill in some important gaps in the evolution tree of dinosaurs and birds, accumulating strong evidence for the theory of birds' dinosaurian origin, and delineating little by little the evolutionary track of birds.

China sets up fund for national key labs

(CAS, 2008-03-04)

The Chinese government has decided to set up a special fund for national key laboratories and the initial 1.4 billion yuan (about 195.8 million U.S. dollars) will be in place this month, sources announced in Beijing Monday.

Minister of Science and Technology WAN Gang said at a national conference that the fund would enable the country's 220 national key laboratories to get access to "stable financial support."

"A lack of stable financial support has become a bottleneck for the development of state key labs," he said.

"The fund will facilitate the building of a research environment that shows tolerance to scientific failures and sinks impetuous attitude," he added.

According to Vice Minister of Finance ZHANG Shaochun, the initial 1.4 billion yuan covered by the central budget will be used on the labs' maintenance and scientific research in individually-picked topics. More fund will be allocated in the near future to upgrade scientific research facilities.

China has built 220 national key laboratories, employing more than 10,000 people, since 1984. They serve as key bases for the country's advanced basic research as well as frontier science research.

2008 Evaluation of State Key Labs in Engineering and Material Begins

(MOST, 2008-03-18)

The opening ceremony of the evaluation of state and sectoral key laboratories in the field of engineering and material was held in Beijing recently, together with the meeting for the setting of on-spot evaluation standard.

China National Natural Science Foundation is responsible for the organization of the evaluation for 50 state key labs and 4 sectoral key labs.

In stead of quantitative assessment, the evaluation will focus on the general operation of the lab and highlights the typical achievements. Through though understanding, it will urge and guide the development of the labs and standardize its management as well as provide evidence for decision making.

CAS brain-gain initiative pays off

(CAS, 2008-03-19)

Talented people are the key to success and development. To send people abroad for advanced

studies and attract qualified overseas professionals are an important aspect of the CAS efforts for building an innovative research team. Over the past years, the brain-gain efforts are making sound progress, according to Prof. LIU Yi, director of the CAS Bureau for Personnel and Education.

With an objective to establish a highly innovative research contingent, CAS has launched a number of talent-recruitment and training schemes since the initiation of its Knowledge Innovation Program in 1998, namely, Engaging Outstanding Overseas Talents, Overseas Review Experts, Overseas Supervisors for Doctoral Candidates, Fund for Overseas Outstanding Scholars, Academic Seminars, Einstein Visiting Professorship, and Research Fellowship for International Young Researchers.

In recent years, CAS has made some changes in this regard in line with the national regulations and its own development, says Prof. Liu in an article published by Beijing-based Science News.

First, adjustment has been made to the programs for overseas studies, a CAS initiative to send its staff member and students abroad for further studies. To make it successful, the candidates are chosen by sticking to the principle of institute recommendation, peer review, fair competition and merit-based selection. Priority is given to backbone researchers. Schemes in this aspect include Senior Researcher Fellowships, Fellowship for Returned Visits of Einstein Professorship, and K.C. Wong Education Foundation Senior Visiting Scholarship. A Group Package Scheme has been set up to train professionals for priority areas, major research projects and mega-science R&D tasks.

Second, modifications have been made to the International Innovation Partnership Program. The State Administration of Foreign Experts Affairs is invited to cover the international travel expenditure and domestic allowances per diem for the first-year trial operation of the program. In addition, it will provide necessary conveniences for their work and stay in China. Each project will be evaluated at the end of the trial operation. Those pass the scrutiny will be further supported by the scheme of the Established Oversea Scholars.

Third, in order to attract eminent foreign young scientists to come as visiting scholars or postdocs in CAS, Research Fellowship for International Young Researchers was launched in 2006. From 2006 to 2010, 50 international PhD holders will be supported each year to work at CAS.

In addition, special arrangements have been added to the CAS project to dispatch young scholars abroad and K.C. Wong Education Foundation Senior Visiting Scholarship, such as the special funds for young R&D backbones, for competent women scientists, for specialists in coping with issues in natural resources and the environment, for qualified personnel in commercialization of R&D results and for interdisciplinary studies.

Since the introduction of the reform and opening-up policies in 1978, CAS has sent a total of 14,000 people to study abroad, of whom, more than 10,000 have returned. During the past decade, CAS has dispatched about 3,500 people (including 3,000 visiting scholars and 500 post-graduate students) to study in more than 40 countries or regions across the world, of whom, about 2,800 have come back.

In the aspect of attracting overseas talented people, CAS has recruited some 1,000 overseas experts through Bairen Program, 51 research teams have been formed via International Innovation Partnership Program, and more than 300 research professionals have joined CAS with the support of Established Oversea Scholarship.

According to statistics, more than 95% of the current leaders of CAS and its institutes have been trained in foreign countries.

**Prof. BAI Chunli: A review of work over the past year
(CAS, 2008-03-25)**


The year 2007 witnessed that CAS achieved remarkable progress in various undertakings, said Executive Vice President of CAS Bai Chunli at the annual work conference opened on 24 March in Beijing.

Thanks to the efforts, CAS researchers achieved major S&T achievements, including the accomplishment of the science ground segment, the payload sub-system of the spacecraft as well as the Very-Long- Baseline-Interferometry (VLBI) subsystem for China's first lunar probe, Chang'e; the construction of a synthesized monitoring system for regional atmospheric environment, providing scientific support to air quality control strategy of the 29th Beijing Olympic Games in 2008; the development of Loongson-2F, marking a milestone in the industrialization of this latest version of China's homegrown high-performance general-purpose processor; the output of high-performance all-solid state laser devices reaching 7kw; the discovery of a giant bird-like dinosaur from an 80 million-year-old late Cretaceous formation in Erlian Basin in Inner Mongolia; the completion of a function-oriented zoning scheme of China, providing a guidance for State or provincial administrative division across the country; the establishment of a demonstrative line for degradable poly-lactic-acid (PLA) resin production, capable of operating with an expected average yielding at 5, 000 tons per year; the development of a new drug delivery method using nano-sized molecules to carry the chemotherapy drug doxorubicin to tumors; the discovery of world first non-peptidic glucagon-like receptor-1 agonist, shedding light on the long-standing puzzle of B-type G-protein-coupled receptor agonism, which may hold the key to a more convenient treatment of Type 2 diabetes and obesity; the first glimpse of the circuitry within a fruitfly's nervous system for visual pattern recognition; the identification of short-term memory traces, helping demystify the operational principals of human brain; the development of Cu-Zr based single-phase amorphous alloy materials (or metallic glasses) which exhibit high strength and enhanced plasticity; the realization of Shor's algorithm on a optical quantum computer, the establishment of the advanced invariant theory in classical algebra; in-situ synthesis and fabrication of the 3D-microstructures in multi-colored polymer nanocomposites; and the realization of the 3GeV electron beam storage at the Shanghai Synchrotron Radiation Facility (dubbed Shanghai Light Source Project or SSRF), a third-generation synchrotron radiation light source.

While highlighting achievements, Prof. Bai pointed out that there are still some problems demanding prompt solution. First, the number of major original innovative achievements and key technological breakthroughs is on the low side and the capacities for scientific cognition in a systematic way and for major system integration are still weak.

Second, the number of proposals initiated by CAS researchers for major national S&T programs is few. An effective mechanism for jointly conducting national S&T tasks is not in place. Efforts should be made to strengthen the initiative and planning for future development.

Third, S&T management lags behind the rapid development of S&T innovation. Further efforts should be made to optimize structures for resources distribution and to set up a system for

classified management according to different S&T tasks.

Fourth, cooperation with other elements of the national innovation system should be further beefed up, and more work should be done to explore an effective a mechanism capable of promoting mutual development among cooperative partners.

4 China's International Science Cooperation

Chinese, German scientists meet to address science frontiers

(CAS, 2007-03-18)

The First Sino-German Frontiers of Science Symposium (SINOGFOS) was held from 13 to 16 March in Beijing, bringing together 60 or so young scholars from research institutions and universities of the two countries.

Co-organized by CAS and the Alexander von Humboldt Foundation (AvH), it is a series of interdisciplinary conferences, which are slated to convene in China and Germany alternately beginning in 2008.

According to an agreement inked by CAS President LU Yongxiang and AvH Secretary General Georg Schuette in May 2006, the meeting series will focus on the following six fields: astrophysics, ecology, molecular biology, nanotechnology, neuroscience and quantum mechanics.

The topics are carefully selected to promote cross-disciplinary discussions and generate new ideas, says Prof. ZHANG Zhong, Chinese co-chair of the symposium and a researcher from the CAS affiliated National Center for Nanoscience and Technology of China. Participants are encouraged to hold discussions without using technical jargon to ensure that non-specialists are able to understand and contribute to the meeting.

SINOGFOS is a new collaborative approach between CAS and AvH on talent training and exchanges with an objective of encourage them to address cutting-edge issues by breaking boundaries of different academic disciplines, says Prof. Lu, who is also vice chairman of the Standing Committee of China's top legislature NPC.

Using such a symposium as a platform, young scientists are expected to make explorations on science frontier says Dr. Georg Schuette.

Seminar on Sino-European S&T Cooperation and EU'Marie Curie'Program Held Successfully in Guangzhou and Beijing

(MOST, 2008-03-22)

In order to celebrate the 10th anniversary of the signing of the China-EU Science and Technology Cooperation Agreement and to promote the indigenous innovation competence of China through the participation in the EU'Marie Curie' Program, the Department of International Cooperation of MOST held the Seminar on Sino-European S&T Cooperation and EU 'Marie Curie' Program on March 7 and March 10, 2008 respectively in Guangzhou and Beijing.

Participants included over 500 representatives and scholars from MOST, Ministry of Education, domestic universities, research institutes and enterprises. Officials from MOST, EU Mission in China and European Commission delivered keynote speeches on the EU FP7,'Marie Curie' Program and Sino-EU sci-tech cooperation and answered questions.

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The seminar provided a good information channel and an exchange platform for China's research staff to know and take part in the 'Marie Curie' program as well as the Sino-European S&T cooperation.

WAN Meets German Parliamentary State Secretary Caspers-Merk (MOST, 2008-03-26)

Minister WAN Gang met with visiting German Parliamentary State Secretary Marion Caspers-Merk of the Federal Ministry of Health on March 19, 2008. The Minister updated the German delegation on China's efforts to build up the international S&T cooperation in traditional Chinese medicine (TCM) and expressed willingness to consult with Germany on cooperation in specific TCM projects and the 7th Framework Program of the EU. Mme. Caspers-Merk echoed that Germany stood ready to further team up with China in the TCM field. WAN also asked the State Secretary to kindly convey his greeting to Mme. Annette Schavan, German Federal Minister of Education and Research and said he looked forward to the Minister's visit to China.

CAS sets up award to promote international cooperation (CAS, 2008-03-27)

Scott Douglas Rozelle and Lothar Reh are both scientists but their disciplines are as different as chalk and cheese - the only thing in common is their long association with China.

On 28 March, they had another thing in common when they became winners of the CAS Award for International Cooperation in Science and Technology.

Presented by CAS, the awards - given for the first time - recognize their contributions to China's international cooperation in science and technology over the past decades, said LU Yongxiang, CAS president.

Speaking fluent Chinese, Rozelle - from Stanford University and an agricultural economist who has been involved in rural development research - attributed his strong interest in China to his father who spent six months in Shanghai in 1945.

"My father used to tell me that China would one day become an important player on the international arena," said Rozelle.

He took his father for his word and started learning Chinese in 1966; and when he became an agronomist in the late 1980s, chose China for his focus of research.

Since 1995, Rozelle has collaborated with the CAS Institute of Geographical Sciences and Natural Resources Research in conducting research on China's agriculture and rural development.

Over the years, he spent four to five months annually in the country, visiting villages, doing research and giving lectures to fellow scientists and university students.

He has published dozens of theses and reports on China's agricultural development and rural reform, among which is the report "Why China will not Starve The World" co-authored by him in 1996.

"He has made outstanding contributions to promoting academic research in China's agricultural economics and policy, improving the world's understanding about China's rural reform, and fostering young scientists for the institute," Lu said.

Looking back, Rozelle said it was "all pleasant" even in the remotest and poorest village of China since "all Chinese are excellent cooks."

"China has entered a special era when its environment for scientific research and development has never been better," said Rozelle, also a winner of a Lifetime Achievement Award bestowed by the American Economics Association.

Reh's first contact with China dates back earlier than Rozelle's, to 1975, when he gave a lecture at an industrial exposition in Beijing.

Reh, from the Swiss Federal Institute of Technology (ETH Zurich) is a pioneer in the development of circulating fluidized bed (CFB) technology, which has been widely applied in the combustion of solid fossil fuels, particularly in the power generation industry for pollutant emission control.

He has been facilitating cooperation between China and Europe in the research, development and industrial application of the technology.

One of his efforts is the joint research cooperation agreement signed in 1998 between the CAS Institute of Process Engineering (IPE) and ETH.

Recalling his first impression of Beijing in 1975, Reh said it was an airport surrounded by extensive farmland and home to a sea of cyclists.

Over the past three decades, while Beijing has developed into an international metropolis, Reh said he is happy to see that sustainable development has been included as part of China's national development plan.

Reh, 77, said he would press the message of energy efficiency and environmental protection to the younger generation.

5 Miscellaneous

China to launch second Olympic weather forecasting satellite in May (People's Daily, 2008-03-04)

China will launch a second Olympic weather forecasting satellite, the Fengyun-3 (FY-3), in May to provide more precise and longer range forecasts, a chief designer said on Tuesday.

The new satellite will provide accurate and timely information about weather changes to facilitate more precise weather forecasts during the Beijing Olympic Games set to open on Aug. 8, said Zhou Hongling, a designer from Shanghai and deputy to the First Session of the 11th National People's Congress opening on Wednesday.

She said assembly of FY-3 had been completed in Shanghai. "It has passed tests at the factory and is ready for delivery to the launching site, where it will undergo another two months of testing."

The new satellite, with a bigger payload, will provide medium-range weather forecasts up to 10 to 15 days, said Zhou. "It will replace the FY-1D weather forecasting satellite launched in May 2002 to provide primary services for the Games."

According to Zhou, short-range forecasts by existing Chinese weather satellites are partially to blame for the country's heavy losses in the severe winter weather that attacked most parts of central, southern and eastern China starting in mid January.

China Meteorological Administration (CMA) head Zheng Guoguang admitted earlier the country was unprepared that the chaos could last for more than 20 days. "It's extremely hard to tell the weather conditions more than a week away, given China's current forecasting capacity," he said.

China has launched eight meteorological satellites since research started in the 1970s. Its first

Olympic weather forecasting satellite, the FY-2D, was launched towards the end of 2006.

The CMA has identified weather forecast services for the Olympic Games as "a priority" for this year as the country may face much more frequent adverse weather.

Yet Beijing's weather bureau said the possibility was only 0.4 percent for the city to experience weathers above 35 degrees centigrade during the Games, when the average temperature would be around 24.9 degrees centigrade.

Eleven Beijing Medical Institutions Allowed to Provide Test-tube Baby Tech (CRI, 2008-03-06)

Beijing has designated 11 medical institutions to provide assisted reproduction service, or test-tube baby operations, said an official Thursday.

Deng Xiaohong, vice director of the municipal health bureau, said that all these institutions have carried out more than 6,000 successful operations, among nearly 20,000 people who received the treatment.

These institutions include the No.3 Clinical Hospital attached to Beijing University, where the first baby conceived via external fertilization and embryo transplantation was born on March 10, 1988.

The other ten organizations are: the No.1 Clinical Hospital attached to Beijing University, Beijing Maternity Hospital, Beijing People's Hospital, Beijing Union Medical College Hospital, Beijing Chaoyang Hospital, the Women and Children Health Hospital of Haidian District, Beijing Jiaen Hospital, the Naval General Hospital, the General Hospital of Chinese People's Liberation Army Beijing Command, and the Technology Service Center of the State Family Planning Reproduction Health.

Deng notes that any other medical organizations of the city are forbidden to provide the assisted reproduction service, which is demanding in both technology and ethics.

CAS formulates strategy to address global change (CAS, 2008-03-07)

As research into global change holds a critical bearing on China immediate concerns and vital interests, CAS, as a national S&T taskforce, should maintain a research team to carry out long-term research into the issue so as to provide scientific grounds for the national decision-makers, says CAS Vice President DING Zhongli.

Prof. Ding made the remarks at a CAS workshop to address global change, which was held on Feb. 21 in Beijing. Co-chaired by FU Bojie, director-general of the CAS Bureau of Science and Technology for Resources and Environment, and Prof. MA Yang, director-general of the General Office for Academic Divisions of CAS, the meeting brought together more than 30 senior leaders and renowned scientists from the CAS headquarters and its research centers, including the Institute of Atmospheric Physics, Institute of Geographic Sciences and Natural Resources Research, Institute of Theoretical Physics, and Institute of Policy and Management.

The participants made in-depth discussions on such issues as the national demands for addressing the global change, new tendencies and cutting-edge issues in the field, as well as CAS research strategy and approaches to update core competitiveness in this aspect.

In his conclusion remarks, CAS Vice President LI Jinghai reviewed consensus reached by the participants. Most scholars agreed that more efforts should be made to systematically collect and

analyze data and information so as to have a systematic understanding of the global trend. Energy saving and pollution reduction, which are an inevitable tendency for the S&T development, should be the major countermeasures to maintain the sustainable development. Interdisciplinary studies are the main approach to deal with the challenge and various actions should be proposed for diplomatic, political, economic and S&T aspects.

China's Third-largest Hydropower Plant Finishes Dam Building (CRI, 2008-03-11)

Construction has been finished on the dam at the Longtan Hydropower Project, the third-largest project of its type in China, the project manager said on Tuesday.

Workers poured 7.36 million cubic meters of concrete into the main wall of the project, completing the 216.5-meter high, 832-meter long dam early this month. The first batch of concrete was poured in August 2004.

The concrete placement of the dam's main section was completed eight months ahead of schedule, which would enable the dam to start its role in power generation, flood control and shipping improvement this year, said Daibo, general manager of the Longtan Hydropower Development Co. of China Datang Corporation (CDT).

Located on the Hongshui River, a major tributary of the Pearl River in the southern Guangxi Zhuang Autonomous Region, the Longtan project was a key component of the government's campaign to develop the western regions and bring electricity to the energy-demanding eastern and coastal areas.

With an installed capacity of 6.3 million kilowatts, the 30 billion yuan (4.2 billion U.S. dollars) project is China's third-largest hydropower project, after the Three Gorges Project built on the middle reaches of the Yangtze River and the Xiluodu hydropower project on the Jinsha River, a Yangtze tributary.

Three generators of the plant went into operation last year; the other six are to start generating power in 2009.

Construction began in July 2001 and was scheduled to finish at the end of 2009. It would be capable of generating 18.7 billion kwh of electricity annually upon completion.

Embracing a new "spring of science" (CAS, 2008-03-20)



The date 18 March this year has a special meaning for Chinese S&T community. A national science conference held 30 years ago in Beijing is regarded as a milestone event for China's S&T development. At the meeting, late Chinese leader DENG Xiaoping pronounced the strategic guidelines for development of China's S&T enterprise, which brought the "spring of science" to China and became a prelude to the reform and opening drive across the country.

In an article marking the event, CAS President LU Yongxiang says the theory "S&T constitute the

primary productive force," which was put forward by Mr. Deng, lays a solid foundation for ensuring the key role of science and technology in the national development strategy.

Over the past 30 years, stresses Prof. Lu, dramatic changes have taken place in this country. Chinese government and people have recognized that innovation is a never-exhaustible source of driving force for the prosperity and development of a country and that establishing an innovative country is the only approach for the rejuvenation of the Chinese nation. Chinese scientists are embracing the arrival of a new spring of science in the new century.

China's first Expedition Robot launched over Antarctica

(People's Daily, 2008-03-21)

During China's 24th Antarctic scientific exploration, China's expedition team successfully launched a field experiment for the expedition robot: the first in China's more than 20 years of Antarctic exploration. Training a robot as a human "substitute" to support scientific research is also a task being competitively researched in many countries.

The photograph shows an on-site, test of the low-altitude aerial robot. This low-altitude aerial robot has a 3.2 meter wingspan; weighs 20 kilograms; can carry 5 kg of scientific instruments; and can fly at a speed of 90-110 km per hour; and can fly at a minimum of 150 meters above ground while on automatic pilot.

CAS issues 2007 prizes for outstanding achievements

(CAS, 2008-03-27)

One individual and three research groups have been honored with the prestigious CAS Awards for Outstanding S&T Achievements for 2007. CAS President LU Yongxiang conferred the awards to the laureates at the closing ceremony of the Academy's annual work conference held on 26 March in Beijing.

The winners include Dr. YANG Xueming from the Dalian Institute of Chemical Physics (DICP), the research group on national mega-science project EAST from the Institute of Plasma Physics (IPP) under the CAS Hefei Institutes of Physical Science, the research group on selected problems at the frontiers of high field physics from the Institute of Physics (IoP), and the research group on advanced silicon-on-insulator materials from the Shanghai Institute of Microsystem and Information Technology (SIMIT).

The following is a brief introduction to the laureates and their main contributions.

Dr. YANG Xueming from DICP has made an outstanding contribution to chemical reaction dynamics, especially the dynamics of quantized transition states and reaction resonances by using advanced molecular beam instruments developed at his own laboratory. With the help of versatile experimental methods such as H-atom Rydberg i° tagging i^{\pm} TOF techniques, molecular beams, laser and ion imaging techniques, he and his colleagues investigated the dynamics of elementary bimolecular reactions and unimolecular dissociation processes at the quantum state-to-state level. His research into the dynamics of quantized transition states and reaction resonances in elementary chemical reactions has advanced our understanding of chemical reactivity at the most fundamental level. With papers published in Science, Nature, PRL and JACS, Dr. Yang's work is well received worldwide. He was elected APS fellow in 2006, and his study on reaction resonance was selected by CAS members into China's top-ten S&T achievements (2006). Dr. Yang also plays a leading

role in the development of the State Key Laboratory of Molecular Reaction Dynamics, an important international center for chemical dynamics research.

Focusing on the Experimental Advanced Superconducting Tokamak (EAST), a major national mega-science project, the IPP team has constructed the world's first full-superconducting tokamak fusion experimental device with noncircular section, whose major components (the superconductive magnet, large-scale refrigeration, etc.) were designed and manufactured by CAS scientists on their own, and obtained high-temperature plasma discharge with divertor configuration on the EAST. Prof. WAN Yuanxi, general manager of the EAST project, headed the feasibility demonstration and advanced physical design, and put forward solutions to many technological problems. WENG Peide, deputy manager and general engineer, presided over the design of superconducting tokamak and the cryogenic system to successfully develop the biggest domestic 2kw/4.5K helium cryostat and cryogenic system by far. Participants of the project also include LI Jiangang, GAO Daming, WU Songtao, WAN Baonian et al. EAST has won high praise from an international panel of renowned experts, saying the facilities is to exert sound impacts on the world's nuclear fusion research.

Headed by Prof. ZHANG Jie, the IoP team has been carrying out cutting-edge research into high field physics (HFP). By renovating a series of unit technologies, the scientists developed high-performance power laser systems as well as various experimental diagnostic devices and numerical simulation codes to establish an HFP research platform. They identified the transition processes of different absorption mechanisms for ultra-short intense lasers in plasma, and proposed new mechanisms of electron acceleration such as stochastic heating and acceleration. The team also realized the collimated directional emission of fast electrons and its control. After testifying the focusing effect of a cone target, they worked out a new scheme in the fast ignition concept in laser fusion and on fast electrons to explain the phenomena of increased neutron yielding with cone target. In addition, a new theory for high power THz emission was proposed and validated by experiment. Prof. Zhang, a Member of CAS and of German Academy of Natural Sciences Leopoldina, serves the director of the Key Laboratory of Optical Physics. SHENG Zhengming, Zhang's colleague, is in charge of the theoretical and simulation research. WEI Zhiyi, Zhang's colleague, is in charge of the building and maintenance of the laser systems for HFP research. Other scholars involved are LI Yutong, LU Xin, DONG Quanli et al.

Advanced silicon-on-insulator (SOI) materials and related technologies comes into the limelight of the microelectronics industry in recent years thanks to its unique features such as high speed, low power consumption and radiation hardness. The research team at SIMIT has carried out comprehensive and in-depth research and development on SOI materials technology, and realized the industrialization of SOI wafers. First of all, the researchers studied the physical and chemical procedures of SOI structure by implanting extremely high dose of ions, making breakthroughs on key technologies for the commercialization of wafer products, for instance, the innovative SLD process studies to yield high quality SOI wafers at a low cost. Secondly, the team invented an original technology dubbed $\text{i}^\circ\text{SIMBOND}_{\pm}$ combining both advantages of SIMOX and the conventional bonding technologies. Thirdly, the radiation hardness of SOI materials was improved by ion modification, and materials with novel structure were developed to overcome its self-heating effect. Meanwhile, Shanghai Simgui Technology Co., Ltd. has been kicked off as a commercial spin-off of the Institute as well as an international supplier for high-end silicon

materials. In 2006, the SOI project was granted the first prize of State Science and Technology Award. Participants of the project are WANG Xi, LIN Chenglu, CHEN Meng, ZHANG Miao, YU Yuehui, ZHANG Feng et al.

The biennial awards were initiated in 2002 to recognize individual scientists and research teams for their significant achievements in S&T innovation. As a major reform of the CAS awarding system, it replaced three major prizes which had lasted for decades, highlighting researchers rather than the projects. Designed as an honorary title, its laureates are rewarded with no premium but a 90-gram gold medal.

After recommendation by CAS institutes and evaluation of an award jury, selection of the winners is finalized at the CAS president meeting.

Altogether, five scientists and eight research groups had won the Awards for 2003 and 2005. Individual laureates are mathematician CHEN Xikang, pattern recognition expert LIU Yingjian, physicist PAN Jianwei, catalysis specialist LI Can and structural biologist CHANG Wenrui. Teamwork were awarded for precise measurement of R-value between 2-5 GeV, hybrid rice genome sequencing, Jehol Biota studies, R&D of Godson CPU, controlled growth and quantum engineering of nanostructures, constructing technologies of Qinghai-Tibet Railway, high performance computers and indirect coal liquefaction technologies.

6 Information for upcoming Workshops in May

9th International Workshop on Positron and Positronium Chemistry

Date: May 11 – 15 **City:** Wuhan, Hubei Province <http://aff.whu.edu.cn/whuppc9/>

iCBBE: Environment Pollution and Public Health Track (EPPH 2008)

Date: May 16 – 18 **City:** Shanghai <http://www.icbbe.org/epph2008submission/website/epph/>

The 2nd IEEE International Conference on Bioinformatics and Biomedical Engineering (iCBBE2008)

Date: May 16 – 18 **City:** Shanghai
<http://www.icbbe.org/icbbe2008submission/website/icbbe/index.aspx>

The Third International Conference on Rough Sets and Knowledge Technology

Date: May 17 – 19 **City:** Chengdu, Sichuan Province
<http://sist.swjtu.edu.cn/imc/itw06/rskt2008/>

CAS International Symposium on Developmental System Biology

Date: May 18 – 20 **City:** Beijing <http://hanlab.genetics.ac.cn/isdsb2008/index.htm>

2008 IEEE International Conference on Communications

Date: May 19 – 23 **City:** Beijing <http://www.ieee-icc.org/2008/>

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IEEE 2008 International Conference on Circuit and Systems for Communications

Date: May 26 – 28 **City:** Shanghai <http://www.ieee-iccsc.com/2008/index.html>

The 9th ACM International Symposium on Mobile Ad Hoc Networking and Computing

Date: May 26 – 30 **City:** Hongkong <http://www.sigmobile.org/mobihoc/2008/>

The 9th International Conference on Mobile Data Management (MDM'08)

Date: May 26 – 30 **City:** Beijing <http://idke.ruc.edu.cn/mdm2008/>

The 10th Shanghai International Forum on Biotechnology & Pharmaceutical Industry

Date: May 28 – 30 **City:** Shanghai <http://www.bio-forum.com/en/index.asp>

2008 International Conference on BioMedical Engineering and Informatics

Date: May 28 – 30 **City:** Sanya, Hainan Province <http://210.37.44.251/>

2008 International Congress on Image and Signal Processing

Date: May 28 – 30 **City:** Sanya, Hainan Province <http://210.37.44.250/>

The 2nd International Conference On Geotechnical Engineering for Disaster Mitigation and Rehabilitation (GEDMAR08)

Date: May 30 – June 2 **City:** Nanjing, Jiangsu Province
<http://www.geohohai.com/news/english/2008/1.shtml>

Abbreviations

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