

Content

Science News from Chinese Media in October 2007
 Collected and Compiled by the Helmholtz Beijing Office

Helmholtz News Concerning China.....	4
1 Science News.....	5
1.1 Energy.....	5
China sets up expert panel to advise on int'l fusion energy project.....	5
A stand-alone power system to integrate wind, wave and solar energy.....	5
Wind power to become 3rd largest conventional power in China.....	6
Reports on developing a sustainable energy system in China.....	7
China still open to French, Russian N-power technologies.....	9
1.2 Earth and Environment.....	10
A nationwide survey starts on lacustrine resources.....	10
Tianshan-1 won't be gone within 100 years.....	错误! 未定义书签。
China to build automatic observatory in S. Pole.....	11
CAS robots first employed to serve Antarctic expedition.....	12
Working Meeting on Survey of Lake Resources Held.....	12
Int'l Research Ship Operators' Meeting held in Qingdao.....	35
The 3rd trip to Hoh Xi sets out in mid-October.....	12
Dry-hot valley ecosystem research outpost in the pipeline.....	13
Major research project starts on mineralization in South China landmass.....	13
1.3 Health.....	14
Low doses of a red wine ingredient fight diabetes in mice.....	14
H5N1 mother to fetus link.....	15
Scientists map out first Asian genome.....	16
China has ethical guidelines for research on stem cell, genetic modification.....	17
Body cell cloning pig born in Guangxi.....	17
China plans to draw gene maps for 99 people.....	18
China issues guidelines for biosafety.....	18
11% Chinese Adults Suffer from Osteoporosis: Survey.....	18
AIDS vaccine put to 2nd-stage clinical trial.....	19
Insomnia the 2nd Most Serious Neurological Problem.....	38

China Highlights October, 2007

Novel progress in the molecular motor assembly of a biomimetic system	19
Seafood diet might lead to thyroid cancer.....	19
Living kidney transplant surgeries to treble last year's, expert	20
Neural activity regulates bilateral wiring during brain development	21
1.4 Key Technologies.....	22
Meeting convenes to discuss self-assembly and nanotechnology	22
A hollow polyanilin sphere that is both conducting and superhydrophobic.....	22
1.5 Structure of Matter	23
Major progress scored on heavy ion research facility development	23
Booster ramping at Shanghai Light Source successful	23
China begins construction of cutting-edge neutrino experimental facility.....	24
Construction for neutrino experiment starts at Daya Bay	25
Stern-Gerlach effect goes chiral	25
1.6 Transport and Space.....	26
China plans to launch another ocean satellite in '09.....	26
Ministers of communications discuss intelligent transportation	27
Lunar Satellite May Hit Moon Surface After Mission	27
Space program eyes farther frontiers	27
Hainan Spaceflight Launching Center to be completed by 2012.....	28
China to release latest space development plan	28
China's largest communications satellite ground facility takes shape in Beijing	29
Launch of China's first lunar probe "great effort" on space exploration	29
Scientists activate 1st probing equipment on Chang'e-1 lunar orbiter	30
Six thousand people to be resettled to make way for new space launch center 错误! 未定义书签。	
China developing new heavy-duty carrier rockets	30
China looks for breakthroughs in deep space exploration.....	31
2 News from Universities.....	32
Chinese government to sponsor 5,000 graduates abroad next year.....	32
25 million students at university in China.....	33
3 Innovation Management	34
China sees sharp rise in patent grants.....	34
CAS to receive 4.8b yuan for innovation drive from State	34
China to allocate 80 bln yuan for high-tech development.....	34
73 Projects under "973" Program Approved in 2007.....	35
4 China's International Science Cooperation	35
China hopes to join Int'l Space Station project.....	35

China Highlights October, 2007

The 4th Sino-US expedition into Hengduan Mountains fruitful	35
Coordination Conference for China-Germany ITS Cooperation Convened in Beijing	36
5 Miscellaneous	37
More than 7,200 grads receive degrees at CAS in 2007	错误! 未定义书签。
Chinese reforestration project has made great contributions	37
Nuclear Power Is the 'Way Forward'	37
RoboCup China Open 2007 Kicks off	38
Prof. LU Yongxiang meets with former MPG vice president	39
6 Information for upcoming Workshops in December	39
Mainstreaming Wetland Biodiversity Conservation.....	39
International Workshop on Numerical Analysis and Computational Methods for Functional Differential and Integral Equations	39
The 2nd International Workshop on Science and Technology of Crystalline Solar Cells.....	39
Ninth International Conference on Information and Communications Security (ICICS 2007)	39
The 3rd International Conference on Mobile Ad-hoc and Sensor Networks (MSN'2007)	39
International Workshop on Molecular Structure and Dynamics of Interfacial Water	39
The 2007 International Conference 2007 on Information Computing and Automation	40
2007 International Conference on Robotics and Biomimetics (ROBIO 2007).....	40
2007 International Conference on Computational Intelligence and Security (CIS'2007)	40
Abbreviations	40

Helmholtz News Concerning China

On the 30.09 a ceremony was held in the Grand Hall of People's Congress. Prof. R. Kuehne, from the Institute of Transportation Research in DLR, has received a Chinese Friendship Award together with other 49 foreign experts. Vice Premier Zeng Peiyan and his high ranking colleagues presented a medallion for each of them for their recognized contribution to China. This is another honor for Prof. Kuehne after having received a Yellow Mountain Award from Anhui Province last year. He and his German colleagues have been acting as a project coordinator for a BMBF sponsored 3 years Megacity project with some cities including Hefei. This project might be expanded into the next years.

At the first week of October, Prof. E. Wichmann, director of the Institute of Epidemiology, GSF, paid a visit to China. Under the assistance of the Helmholtz Beijing Office, he has not only has the possibility to polish his proposal with his partner group in the School of Public Health, Beijing University, but under the accompany of Dr. Hong HE to have visited Chinese groups in Research Centre for Eco- and Environmental Sciences (CAS), the School of Environmental Sciences in Beijing University, Chinese Academy of Environmental Sciences in Beijing and also a group in Fudan University, Shanghai. This fruitful visit opens much more opportunities for his institute collaborating with China in the future.

On the 20th Oct, KIT Alumni China Branch was announced for its formal establishment in Beijing. Prof. Hippler, President of University Karlsruhe led a delegation of about 10 people, including many professors such as Prof. H. Hahn from the Institute of Nanotechnology, FZK, accompanied him to attend this event. Under the umbrella of KIT, a joint-venture of the University and Karlsruhe Research Centre FZK, there is now the largest German Alumni organization in China: over 100 alumni and 80 of whom are settled in Beijing. This establishment was congratulated by Mr. Jiang Feng, Vice Director General from the International Department, Ministry of Education, Dr. Hong HE, head of Helmholtz Office in Beijing and Mr. Hase-Bergen, head of DAAD.

From the 19th to 23rd Oct. Dr. C. Stein, CEO of Ascenion attended the Beijing 11th Health Care Industry Forum. He also chaired the roundtable session of technology transfer. His activities in Beijing has been coordinated and assisted by the Helmholtz Beijing Office. Over 10 technology offers from Ascenion were printed free in the conference booklet. As one of the German most successful IPR management company, Ascenion is looking forward to expand its business into the rapid growing China market.

During the *German Week* held in Nanjing, a Leipzig delegation led by its mayor paid a visit to China. Dr. A. Schmidt, managing director of UFZ, Helmholtz Environmental Research Centre, was within the delegation. Helmholtz Beijing Office has helped him to arrange academic appointments with the Chinese colleagues in the Environmental Science Department, Nanjing University, Institute of Soil Sciences (CAS) and also the Department of Environmental Sciences, Tongji University. The parties briefed their own activities and ideas for further strengthening cooperation were discussed. Dr. Schmidt is impressed by this information tour and believes the first priority is working with Hohai University in the field of water engineering. Both parties are in the final stage in preparing a MOU, which will be signed soon.

Helmholtz Representative Office in Beijing

1 Science News

1.1 Energy

China sets up expert panel to advise its participation on int'l fusion energy project (Xinhua Net, 2007-10-09)

China on Tuesday set up a national expert committee on magnetic confinement fusion energy to ensure its implementation in the landmark multinational fusion energy project.

The International Thermonuclear Experimental Reactor (ITER) has been the largest ever scientific research program under multinational collaboration. The 11-billion-euro project is aimed at developing a sustained solution to energy production.

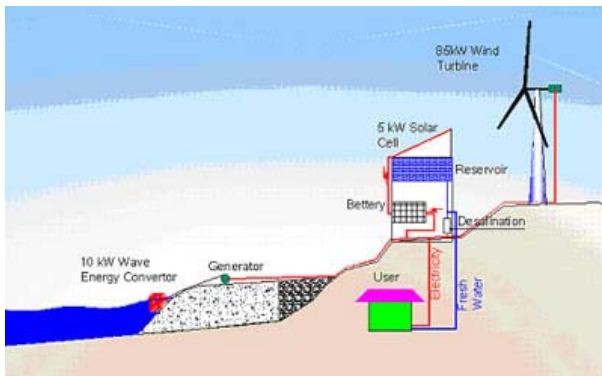
The committee, established by the Minister of Science and Technology (MST) and other government agencies, will supervise the implementation of China's share of ITER tasks and domestic research into fusion energy.

China is responsible for 9.1 percent of the total ITER budget, which is equal to the percentage shared by each of the other five participating countries. The EU will pay 45.4 percent of the budget.

Participation in the ITER project was part of China's systematic plan for developing cutting-edge fusion technologies, said Huo Yuping, China's chief coordinator in the project.

"The international collaboration will lay a solid basis for our own efforts in building bigger experimental reactors at home," said Huo, a Zhengzhou University professor and academician of the Chinese Academy of Sciences.

A stand-alone power system to integrate wind, wave and solar energy (CAS, 2007-10-19)



On 12 October, an agreement on the construction of a stand-alone renewable energy (RE) system at the Dangan Island was inked between the CAS Guangzhou Institute of Energy Conversion (GIEC) and the Wanshan Exemplary Marine Development Zone in Zhuhai, a coastal city in south China's Guangdong Province.

Located at the mouth of the Pearl River, Dangan Island, with 13.2 square kilometers in size, is the largest island in the Wanshan Zone with the longest coastline. With about 300 residents, the villages there are the most remote ones in the South China Sea. Currently the local people are using power produced by diesel generators, which is of low efficiency and high cost. When the new project is completed within the next year, according to Prof. YOU Yage, director of the Ocean Energy Division of GIEC, they will be using electrical power jointly produced with clean ocean energy, cutting the cost by half.

Ocean energy often refers to the renewable energy housed in the sea, including power from tides, waves, currents, thermal and salinity gradients as well as ocean wind and solar energy, says Prof. You,

China Highlights October, 2007

who is leading a 3.8 million yuan (about \$506,000) research project on a stand-alone RE system with the support of the National High-tech Development Program (863 Program). While technologies for tidal, wind and solar energy could be utilized commercially, others are still under research and experiment.

At present, small-scale wave power generation system is a practical technology and stand-alone wind and solar utilization technology are relatively mature. However, it will be the first time in the world to integrate the three.

With a total investment of about 6.86 million yuan (or \$913,000), the system at the Dangan will be the first stand-alone RE power system using wind, solar and wave energy sources at the same time, says Prof. You.

The bottlenecks for the project are to provide power to unstable users with a stand-alone system using three kinds of unstable energy sources. Therefore, large capacity batteries with strong charging and inverting capabilities are needed. In addition, powerful energy adjustment approaches, for instance to consume surplus energy produced to desalinate sea water to fresh water, should be available.

By adopting several patented technologies, the project is pioneering and innovative in terms of systems integration and optimum, energy efficiency and typhoon resistance, notes the expert.

The construction of the project is to be kicked off by the end of 2007. With an installed capacity of 200kW, the system will each year produce 10,000kWh, 80% of which will be provided by RE. Apart from providing enough power for lighting for the island, it will also be used for providing 10 thousand tons of fresh water each year by sea water desalination.

Wind power to become 3rd largest conventional power in China

(China News, 2007-10-20)

As a type of clean energy, wind power will become the third largest conventional power in China, only next to thermal power and hydropower, said experts at the China Wind Power Association at a work meeting held in Shanghai on Wednesday.

Chinese government has attached great importance to the exploitation of wind power. It has issued a whole battery of policies to boost the use of wind power. By the end of last year, the wind power installation capacity in China had reached 2.6 million kilowatts, the six largest in the world. In September this year, China publicized its mid- and long-term development program for the use of renewable energy resources. According to this program, China's wind power installation capacity will reach 5 million kilowatts by 2010 and 30 million kilowatts by 2020.

China has one billion kilowatts of wind power resources (250 million kilowatts of wind power on land and 750 million kilowatts at sea). By devoting great efforts to the exploitation and development of wind power, China tries to improve technologies related with wind power and boost the industrial development in wind energy use. The country hopes that it can produce wind power facilities by its own efforts and wind power can become a more competitive form of energy in the market.

China's coastal area has taken an initiative in wind power use. In Shandong, for example, there are 67 million kilowatts of wind power resource, an amount 3.68 times the installed capacity of the Three Gorges Dam. Shandong ranks third in China in wind power resource. Located in the middle part of the coastal area, Jiangsu has the world's largest radiation sand ridges and it is rich in wind power resource, too. By the end of this year, Jiangsu might become one of the few provinces in China capable of generating one million kilowatts of wind power every year. Shanghai also has rich wind power resource.

China Highlights October, 2007

At present, the country's first ocean wind field is being built near Shanghai's Donghai Bridge. When completed, the field will have a total installed capacity of 100,000 kilowatts.

Two jointly released reports on developing a sustainable energy system (CAS, 2007-10-22)

An energy report entitled *Lighting the Way: Toward a Sustainable Energy Future* by the InterAcademy Council (IAC), and the other one entitled *Addressing the Challenge: Developing a Sustainable Energy System* by the Chinese Academy of Sciences (CAS), were jointly released recently. The Sustainable Energy Forum: Panel Discussions on IAC/CAS Energy Reports, organized by the Chinese Academy of Sciences and held in Beijing on the afternoon of 22 October 2007, attracted around 50 distinguished participants, including senior governmental leaders, experts, and industrial representatives from both domestic and foreign energy-related organizations.

Professor YAN Luguang, IAC Energy Study Panel Member, outlined the main points of IAC's energy report, while Professor ZHAO Zhongxian, Chairman of the Consultation and Review Panel of CAS Academic Divisions, outlined the main points of CAS' energy report. In-depth discussions were conducted among the participating experts, including Professor ZHOU Dadi (former Director, Institute of Energy, National Development and Reform Commission), Professor NI Weidou (Tsinghua University) and Prof. WANG Naiyan (China Institute of Atomic Energy), on strategic issues concerning the development of sustainable energy in China, fundamental role of S&T innovation in securing sustainable supply of energy, and further actions to be taken for mobilizing national scientific and technological forces to enhance innovation in support for the development of China's sustainable energy system. The Forum was chaired by Professor LI Jinghai, Vice President of CAS. Professor LU Yongxiang, Vice Chairman of the Standing Committee of the National People's Congress of China, President of CAS and Co-Chair of IAC, delivered a speech at the meeting.

Created in May 2000, IAC is a multinational organization coordinating the exchanges and cooperative activities of the world's science academies. Prof. LU Yongxiang, President of CAS, and Prof. Bruce Alberts, former President of US National Academy of Sciences, are currently the co-chairs of IAC. The mission of the organization is to mobilize the world's best scientists, engineers and medical experts for providing knowledge and advices to national governments and international bodies including the United Nations, UNESCO and the World Bank on such critical issues of global and regional concern as economic globalization poverty reduction, anti-hunger and disease, and sustainable use of natural resources.

At the 5th IAC Board Meeting held in Amsterdam in January 2005, IAC decided to launch the research project *Lighting the Way: Toward a Sustainable Energy Future*. The study was carried out by experts from the member academies of IAC. Prof. Steven Chu, 1997 Nobel Laureate in Physics, and Prof. Jose Goldemberg, former Minister of Science and Technology of Brazil, were invited to co-chair the IAC Energy Study Panel. The energy report comes out after two and a half years of research. It gives an in-depth analysis of the various options for technology and resource development, which may play an important role in achieving the transition toward a sustainable energy system, from the perspectives of energy efficiency, energy supply, and role of S&T innovation and energy policy, and proposes some policy measures and research priorities for addressing the challenge.

The report reaches the following conclusions as well as recommendations and proposals for actions to be taken by governments, industries and NGOs.

China Highlights October, 2007

1. Meeting the basic energy needs of the poorest people on this planet is a moral and social imperative that can be pursued in concert with sustainability objectives.
2. Concerted efforts must be made to improve energy efficiency and reduce the carbon intensity of the world economy.
3. Technologies for capturing and sequestering carbon from fossil fuels, particularly coal, can play a major role in the cost-effective management of global carbon-dioxide emissions.
4. Competition for oil and natural gas supplies has the potential to become a source of growing geopolitical tension and economic vulnerability for many nations in the decades ahead.
5. As a low-carbon resource, nuclear power can continue to make a significant contribution to the world's energy portfolio in the future, but only if major concerns related to capital cost, safety, and proliferation are addressed.
6. Renewable energy in various forms offers many opportunities for technological progress and innovation.
7. Bio-fuels hold great promise for simultaneously addressing climate-change and energy-security concerns.
8. Development of cost-effective energy storage technologies, new energy carriers, and improved transmission infrastructure can substantially reduce costs and expand the contribution from a variety of energy supply options.
9. Scientific community together with the general public has a critical role to play in promoting sustainable energy system.

The Chinese Academy of Sciences has completed its report *Addressing the Challenge: Developing a Sustainable Energy System* based on the achievements of the Academy's knowledge innovation program and the consultation programs organized by the Academic Divisions. Experts on energy, environment, climate and S&T policies from the Academy have made contributions to the report. The Chinese report recognizes that moderate and clean use of fossil fuels has come to the consensus within the global community. The report also says, to assort with their capabilities, developed countries should take a due share of the responsibility in energy saving and greenhouse gas emission reduction, and should disseminate and transfer advanced energy technologies world-widely. At the same time, developing countries should also take effective measures in accordance with their actual capability to develop a sustainable energy system, drawing on the experiences and lessons from developed countries in their early development stages, and trying to make active contribution to dealing with environmental problems and climate change. Countries and regions at various development stages are different in their economic capability. Only under the principle that every country shares its own responsibility according to its economic and technology development level, accumulated emission, and development demand, and only through diversified, multi-layered and multi-phase measures can we find out the solutions. Only when responsibility matches rights and measures match abilities can equity be realized, consensus reached, and international concerted actions taken, can equitable and sustainable development goals be gradually achieved.

The Report believes that the strategic goals of China's energy development by 2050 should be more foresighted in order to ensure the achievement of stable transition from the current fossil fuel-based energy system to a sustainable energy system. There should be no more than 50% increase in total consumption of fossil fuels by 2050 as compared to that in 2005; the then per GDP unit energy consumption level should be equivalent to that of a moderately developed country; the proportion of

China Highlights October, 2007

hydropower and nuclear power should be raised to more than 20% of the total electricity generation capacity; and non-hydraulic renewable energy sources should be explored to reach the proportion of around 25% to the total volume of primary energy. Recognizing that this is a very difficult task to achieve, the Report further suggests the following immediate actions be taken for the development of a sustainable energy system:

- continuing to promote clean use of coal;
- exploring new sources while conserving the existing ones to secure the supply of petroleum and natural gas;
- developing more hydropower and secure, reliable and advanced nuclear power;
- developing non-hydraulic renewable energy sources on large scales; and
- supporting the research and development of future technology for new energy source exploitation.

Through in-depth analysis on the current challenges and countermeasures taken accordingly, the Report points out that addressing the challenges of energy and climate change requires national and global concerted efforts, resources and wisdom, and research on energy and global change should be regarded as an undertaking of public welfare for all humankind. To this end, the Report proposes that an energy fund be established to support national initiatives and international cooperation in the following priority areas:

- Climate Change and Effective Countermeasures
- Development of Advanced Appropriate Technology for CO₂ Capture & Storage
- Research, Development and Industrialization of Renewable Energy and Energy Saving Technologies
- Applied Research on New Generation Nuclear Energy
- Statistical Studies of Carbon Balance and Emissions
- Research and Development of New Energy Technology

To further strengthen the Role of Policies and Market Mechanism in addressing the challenge, the Report proposes the following suggestions:

- While changing the traditional statistical methods of ton of standard coal equivalent (tce) and ton of standard oil equivalent (toe), new statistical indexes and evaluation criteria should be established based on the scarcity of resources and the emission intensity of greenhouse gases and pollutants to separate the non-fossil fuels from fossil fuels in statistics;
- Energy pricing system with due consideration of environmental cost and resource scarcity should be established, measures such as favorable taxation and governmental subsidies be taken to encourage the development of clean energy sources;
- Research on sustainability science should be strengthened and sustainable life style be encouraged;
- International exchanges and cooperation should be encouraged and promoted on policies regarding the transfer and commercialization of relevant technologies;
- Greater efforts should be made in publicity, education and policy implementation to raise the public awareness of resource/energy saving and environmental protection, and make them take a more active part in the whole process.

China still open to French, Russian N-power technologies (China News, 2007-10-29)

China remains open to the third- generation nuclear power technologies of France and Russia though it has adopted AP 1000 developed by U.S.-based Westinghouse, said a senior executive of the State

China Highlights October, 2007

Nuclear Power Technology Corporation (SNPTC) on Sunday.

China's first third-generation pressurized water reactors adopting Westinghouse technology will be put into commercial operation at the end of 2013, Ma Lu, vice president of the SNPTC, the state-authorized third-generation nuclear power generation developer, said at the China-ASEAN Power Cooperation and Development Forum.

The reactor, located in Sanmen City of East China's Zhejiang Province, will also be the first one in the world using AP 1000 technologies.

While choosing bidders for supply of third-generation nuclear power facilities and technologies, China puts into consideration factors concerning commercial use, technology and laws, and stresses technology transfer and localization, said Ma Lu.

China launched bidding in 2003 for its nuclear power stations of the third generation. Foreign companies including Westinghouse, France's Areva and Russia's AtomStroyExport are major bidders.

Westinghouse became the winner after China signed a memo with the United States on the introduction and transfer of 3rd generation nuclear power technologies in December 2006.

The final agreement was inked between the SNPTC and Westinghouse in July 2007, according to which China will buy four third-generation pressurized water reactors from Westinghouse, including technology transfers to China.

The four pressurized water reactors will be installed two in Sanmen City and two in Haiyang City, Shandong Province. Preliminary preparations for the AP 1000 projects have finished at both sites.

After importing the AP 1000 technology from Westinghouse, the SNPTC will try its best to absorb it and make innovations, said Ma.

By the year 2020, China will have 40-million-kilowatt installed capacity of nuclear power, accounting for 4 percent of the country's total. However the current installed capacity of nuclear power is only about eight million kilowatts.

As there is still a large room for China to develop its nuclear power capacity, China remains open to nuclear power generation technologies from other countries including France and Russia, said Ma.

China now has 11 nuclear power reactors in operation. Among them, three use domestic technologies, two are equipped with Russian technology and four with French technologies, and two are Canadian designed. All the 11 reactors employ second-generation nuclear power technologies.

Established this May, the SNPTC is jointly funded by the State Council, or cabinet, and four large state-owned enterprises. It is authorized by the State Council to sign contracts for the transfer of third-generation nuclear power technologies from other countries on behalf of China.

1.2 Earth and Environment

A nationwide survey starts on lacustrine resources

(CAS, 2007-10-08)

As a key component of the national initiative for basic S&T data and infrastructure, a nationwide survey on the lake water quality, volume and bio-resources has recently been initiated. The move marks the systematic implementation of the second-round investigation of the country's lacustrine resources.

The first such survey was carried out by researchers with the CAS Nanjing Institute of Geography and Limnology and their co-workers from various institutions from 1958 to 1987, initially making clear the

China Highlights October, 2007

background situation of the lakes and obtaining a huge amount of data. Its results were found applications in the sequent research programs and socio-economic development. However, due to the changes in the mode and intensity of human activities, and the differences of the lakes' natural evolution in terms of speed and direction, dramatic changes have taken place in the lake resources and environment over the past two decades.

The new survey strives to picture the status quo and changes of Chinese lakes in a systematic and all-round way, providing reliable, standardized and precise data for decision makers for the country's sustainable development and ecological security.

It will not only provide data for limnology, environment science, ecology and their interdisciplinary studies, according to scientists, but also provide updated information for applied studies on the water bodies' hydrology, relevant water resources, flooding and water-logging calamities, and the interaction between man and the earth.

Based on the previous findings, the current project will be carried out by means of field survey, monitoring station observation and remote-sensing technology. Remote sensing survey will be conducted to find out the number, coverage and distribution of the lakes larger than one km². Priority will be given to major lakes with an area greater than 10 km² in middle or lower reaches of the Yangtze, in Huaihe River Valley and northeast China, which have vital impact on national economic development and people's life. Survey will also be conducted on the Yunnan-Guizhou Plateau, Inner Mongolian & Xinjiang steppes and Qinghai-Tibet Plateau.

The project is divided into seven components to work on five regions (the Yangtze & Huaihe valleys, northeast China, Yunnan & Guizhou, northwest China and the Qinghai-Tibet Plateau) and two technical tasks (remote-sensing survey and data coordination and analysis). To standardize its operation, a manual has been compiled with a textual length up to hundreds of thousand Chinese characters. To make preparations for the project, a conference for training and coordinated work was held from 14 to 16 September at the Taihu Station of Chinese Ecosystem Research Network.

The field-survey will be completed by the first half of 2010. At present, the work has begun along the Yangtze Valley and in Yunnan and Guizhou provinces.

China to build automatic observatory in the South Pole (China News, 2007-10-15)

China plans to send its 24th science inspection team to the South Pole at the end of this month and build an automatic observatory there next year.

The observatory will be set up at Dome Argus, the highest point of the Antarctic ice sheet, where scientists can obtain the data including the global climate changes and an extraordinary natural phenomenon, which is otherwise unavailable in other places in the world, said experts with the China Antarctic Astronomy Center.

The inspection team also recruited two astronomers from the National Astronomical Observatory and Purple Mountain Observatory under the Chinese Academy of Sciences. They will be the first Chinese astronomers who land the Antarctic area.

The two astronomers, along with the other team members, are scheduled to make it to Dome Argus at the end of December, where they will install and adjust the facilities of the observatory.

The observatory is aimed for astronomical addressing and defining the astronomical addressing parameters, said the experts with the center.

China Highlights October, 2007

In 2005, a Chinese science inspection team made it to Dome Argus for the first time, which represented a breakthrough in the scientific research in the Antarctic area.

CAS robots first employed to serve Antarctic expedition

(CAS, 2007-10-17)

Robots will be used for the first time in China's Antarctic expedition. A brainchild of CAS researchers, a robot that can glide across ice will aid Chinese scientists for their 24th Antarctic expedition slated for this October.

Developed by the CAS Shenyang Institute of Automation (SIA), the tank-like robot weighs 200 kilograms and can carry 40 kg of burden and pull 100 kg of objects with a maximum working radius of 25 kilometers. The most outstanding point of this 'teammate' is that it can work under all-weather conditions, note SIA experts.

Another robot that can fly like a mini-helicopter will also come along. With a speed of 50 to 100 kilometres per hour, it will be equipped with a camera and an infrared radiometer for observing ice on the sea.

Working Meeting on Survey of Lake Resources Held

(MOST, 2007-10-19)

A working meeting was held on the field survey of lake resources lately with an aim to facilitate the research project on the water quality, quantity and bio-resources of lakes in China. The project is a priority of China's scientific groundwork.

Experts at the meeting believed that since lakes encompass the eco-environment of valleys, this survey required a significant amount of field studies and should be done in a scrupulous manner. Groundwork of this kind would help enhance the knowledge of lake evolution, solve existing problems, and bolster China's economic growth.

The 3rd trip to Hoh Xi sets out in mid-October

(CAS, 2007-10-23)



The 2007 Scientific Expedition of Hoh Xil (Kekexili), China's largest uninhabited area in the heartland of the Qinghai-Tibet Plateau, started on 15 October, announced a recent press conference in Beijing.

This will be the third such trip with the support of a CAS project on "intracontinental-subduction and orogeny of Qinghai-Tibet Plateau." Coordinated by the CAS Institute for Tibetan Plateau Research, the exploration involves researchers from several CAS institutes, including the Institute of Geology &

Geophysics, the Northwest Institute of Plateau Biology and the Nanjing Institute for Geology & Paleontology.

Over the past two years, the expeditions have collected a large number of first-hand data and specimens during their field investigations on geology, glaciers, lakes, climate, fauna, flora and minerals according to Prof. DING Lin, the project's chief scientist.

China Highlights October, 2007

The upcoming trip will be the last expedition for the project. The scientists will spend one month on the following four aspects:

1. The Plateau's intracontinental-subduction and orogeny, history of the Plateau's uplift, and the composition and properties of the deep-lying masses beneath the vast zone of wave-speed anomaly in northern Tibet;
2. The collection & establishment of a germplasm databank in the wilderness of Hoh Xil;
3. To reveal the ecological & environmental changes occurring in the region over the past 15 years and the Plateau's protective role as a ecological screen for the country;
4. To explore the interaction between the Hoh Xil Highland and the Tarim Basin in Xinjiang Uygur Autonomous Region.

Dry-hot valley ecosystem research outpost in the pipeline

(CAS, 2007-10-25)



A panel of experts has recently given the nod to the proposal and feasibility study to set up a research station of dry-hot valley ecosystem in Yuanjiang of southwest China's Yunnan Province, which was presented by the CAS Xishuangbanna Tropical Botanical Garden.

Covering about one hectare, the station will be located in Pu Piao, a place about 2 km to the south of the Yuanjiang County proper. Featuring typical dry-hot valley vegetation with rich biodiversity, it is considered as an ideal place for long-term ecological studies.

Major research project starts on mineralization in South China landmass

(CAS, 2007-10-26)

Supported by the National Basic Research Program (dubbed "973" Program), a research project on intracontinental metallogensis on the South China Block recently kicked off. The launching meeting was held from 19 to 20 October in Guiyang, capital of southwest China's Guizhou Province.

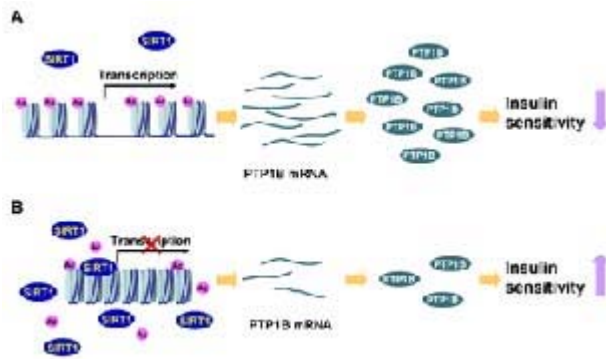
With a planning budget of nearly 14 million yuan in the first two years, the project is coordinated by the CAS Institute of Geo-chemistry in Guiyang, with participation of six domestic geology-related institutions, including three institutes under Chinese Academy of Geological Sciences (the Institute of Mineral Resources, Institute of Geophysical and Geochemical Prospecting and Institute of Geology) and two from CAS (the Guangzhou Institute of Geochemistry and the Institute of Geology and Geophysics) and Nanjing University.

The project strives to reveal the major continental dynamics process and mineralization effect, and develop a theoretical system for intracontinental metallogensis on the South China block, establish new prospecting theories and methods in the region and locate prospecting targets.

1.3 Health

Low doses of a red wine ingredient fight diabetes in mice

(CAS, 2007-10-10)



A research group led by Prof. ZHAI Qiwei from the Institute for Nutritional Sciences under the CAS Shanghai Institutes for Biological Sciences has discovered that even relatively low doses of resveratrol--a chemical found in the skins of red grapes and in red wine--can improve the sensitivity of mice to the hormone insulin, according to a report in the October issue of *Cell Metabolism*. As insulin resistance is often characterized as the

most critical factor contributing to the development of type 2 diabetes, the findings "provide a potential new therapeutic approach for preventing or treating" both conditions, the researchers said.

The research group also confirmed that increased levels of an enzyme called SIRT1, which earlier studies had linked to longevity, DNA repair, and insulin secretion, improve insulin sensitivity in mice. Resveratrol is known to activate the SIRT1 enzyme.

The results suggest that "red wine might have some benefits for insulin sensitivity, but it needs to be confirmed by further investigation," said Zhai. Given the potential complications of drinking alcohol, "an even better option may be to find other natural foods enriched with resveratrol or foods supplemented with resveratrol," he added, noting that the chemical is also an active ingredient in other plants, including one called *Polygonum cuspidatum* used in traditional Chinese and Japanese medicine. Diabetes mellitus, the most common endocrine disorder, currently affects more than 170 million people worldwide and is expected to affect more than 353 million by the year 2030, Zhai said. Type 2 diabetes, which accounts for more than 90 percent of diabetes cases, is characterized by the resistance of body tissues to stimulation by the peptide hormone insulin. Insulin normally lowers blood glucose levels by facilitating the sugar's uptake, mainly into skeletal muscle and fat tissue, and by inhibiting glucose production in the liver. Currently, alleviating insulin resistance is still one of the key avenues to treating type 2 diabetes.

Earlier studies had reported a connection between SIRT1 and the processes of glucose metabolism and insulin secretion. However, whether SIRT1 was directly involved in insulin sensitivity remained largely unknown, the researchers said.

Now, the researchers report that SIRT1 levels are reduced in insulin-resistant cells and tissues and that treatments that block the enzyme's function lead to insulin resistance. Furthermore, increased SIRT1 activity improved insulin sensitivity. Similarly, resveratrol--at a dose of just 2.5 mg/kg/day--enhanced insulin sensitivity in cells. That low dose of resveratrol also reduced insulin resistance in animals fed a high-fat diet, the researchers showed.

"We found SIRT1 improves insulin sensitivity, especially under insulin-resistant conditions," Zhai said. "Furthermore, we found that resveratrol, at a very low dose compared with many previous studies, improves insulin sensitivity via SIRT1."

China Highlights October, 2007

The findings suggest that those who drink red wine for the health-promoting benefits of resveratrol might "think about drinking less," Zhai said. Previously, he noted, the effects of resveratrol seen in mice had implied that humans might need to drink about 120 liters of red wine each day to get enough resveratrol to enjoy the same benefit. "According to our findings, people might need to drink about three liters of red wine each day to get sufficient resveratrol--about 15 mg--for its biological effects."

H5N1 mother to fetus link

(People's Daily, 2007-10-10)

Chinese researchers have discovered that the H5N1 strain of the bird flu virus can pass through the placenta of pregnant women to the unborn fetus and can infect organs other than the lungs in adults. The findings were published in the medical journal Lancet last month.

Professor Gu Jiang and colleagues of Peking University in Beijing studied post-mortem tissues of one man and one pregnant woman who were confirmed to have been infected by H5N1 virus when they were still alive.

They also tested the fetus of the dead woman. They investigated how the H5N1 virus, an emerging infectious disease that causes respiratory symptoms and a high fatality rate, affects different organs in the body.

"The transmission of the virus from mother to fetus has been established by our study. This is the first established report of human to human transmission as the fetus is a different individual from the mother," says Gu.

Little damage was found in the fetus examined by the researchers. However, any long-term problems or permanent damage to the fetus are not known at this time, according to Gu.

"The speculation about the fate of the fetus if the mother survived is interesting. With the development of antibodies in the mother and their transplacental crossing into the fetus, pathological lesions in the fetus may result," says Dr Wai Fu Ng of the Department of Pathology at Yan Chai Hospital in Hong Kong.

The major damage of H5N1 infection is still in the lungs as most patients died of respiratory failure, says Gu. However, so far, little is known about the specific effects in organs and cells targeted by the virus, which is an important question Gu and his colleagues tried to answer in their studies.

The researchers detected viral genetic material and antigens in the lungs, certain cells in the trachea, the T cells of the lymph node, and neurons in the brain. Viral genetic material was also detected in the intestinal mucosa, but no H5N1 viral antigens were found there.

"Our next goal in research is to ascertain the organs and cell types that can be infected by this new virus. In particular, we are not sure if bone marrow, thymus, and a number of other immune organs are infected," says Gu.

A major obstacle for their studies should be a lack of the tissue samples available for molecular investigation.

Up to now, owing to the difficulties to obtain complete autopsy of bird flu victims, only eight autopsies have been done worldwide and some of them were only partial autopsies, according to Gu. In particular, most of the studies did not perform molecular technique on the samples.

Funding is urgently needed for this and other studies on bird flu topic, according to Gu.

"Our group at Peking University has obtained many very important results in the research of bird flu and SARS with very limited funding. Our results have been published in a number of important

China Highlights October, 2007

international journals that has established China's strong position in the field of pathology and pathogenesis of research of newly emerged infectious diseases," he says.

Scientists map out first Asian genome

(CAS, 2007-10-12)

Scientists have successfully completed the first sequence map of the diploid genome of an Asian individual.

The sequence was worked out by a group of scientists in Shenzhen and is now on display at the Ninth Annual China Hi-Tech Fair in the city.

The results, based on a Chinese, represent only the third human genome to have been sequenced in the world. The sequence map was created using advanced sequencing technology.

American scientists earlier this year created the first two genome sequence maps, of two Caucasian people.

The Chinese project was undertaken by the Shenzhen branch of the Beijing Genomics Institute (BGI), along with the National Engineering Research Center of Systematic Bioinformatics and the Chinese Academy of Sciences.

Exploring genetic codes has become a basic and essential part of the life sciences.

Wang Jun, the leader of the project and vice-director of BGI's Shenzhen branch, said that all people share the vast majority of genetic information that makes us human beings.

However, small differences, corresponding to just a fraction of the whole genome, determine traits such as skin color, height, susceptibility to diseases and responses to therapies and environments.

"We can never change our genes, but we can understand our genetic structure better by creating a fine map of our genome sequence. This is very helpful in preventing or controlling diseases, such as cancers," Wang said.

The project picked a normal Chinese man of Han nationality, and spent half a year analyzing his genome sequence.

Wang said that if all of the copies of the printed reports were stacked up, they would reach more than 300m high.

Now that the first diploid reference genome of an Asian has been completed, the next step of the project will be to sequence the genomes of more individuals to identify genetic variations in Asian populations and explore the essential mechanisms behind many diseases.

Wang said the researchers would soon select 99 Chinese people for the project. The number of research subjects will be expanded to 10,000 in the following couple of years.

"Everyone will have his genome sequenced in the near future for better healthcare," he said.

At the same time, the project is trying to lower the cost to popularize the technology, Yang Huanming, director of the Beijing Institute of Genomics of the Chinese Academy of Sciences, said.

Yang said the first two genome sequences made in America cost about \$3 billion. The project in Shenzhen, however, has lowered the cost to 5 million U.S. dollars.

It is expected that the cost will drop to 200,000 yuan (26,300 dollars) by 2010.

"Our final goal is to reduce the cost to less than 10,000 yuan, so that the technology will benefit more people," Yang said.

He said he hoped that in the near future genome sequencing for patients would become as common as a physical examination.

China Highlights October, 2007

The Ninth China Hi-Tech Fair ends next Wednesday.

China has ethical guidelines for research on stem cell, genetic modification

(Xinhua Net, 2007-10-16)

China has worked out bio-safety and ethical guidelines to regulate the research on stem cell and genetic modification, said Vice Minister of Science and Technology Li Xueyong on Tuesday.

"We attach great importance to moral and ethical issues in the research on stem cell and genetic modification," said Li, a delegate to the 17th National Congress of the Communist Party of China (CPC), on the sidelines of the five-yearly CPC conference.

"The Chinese government has a clear-cut stand on the research of stem cell and genetic modification and pays much attention to bio-safety while actively and carefully promoting the industrialization of the technologies," the official said.

However, Li did not elaborate on the details of the guidelines.

With regard to international cooperation on space exploration, Li said China hopes to become the 17th nation joining the International Space Station project.

"China sincerely wants to cooperate with the United States in space exploration and join the International Space Station project that has already involved 16 nations," said Li.

Body cell cloning pig born in Guangxi

(China News, 2007-10-16)

After it successfully produced the body cell cloning ox in 2005, Guangxi has made another achievement in its cloning technology. Recently, a body cell cloning pig was born in Guangxi. This is the first cloning pig produced through the body cell technology, said Lu Shengsheng, a professor at the Guangxi Zoological Technology Institute under Guangxi University, on Monday.

At present, the cloning pig is very healthy. It is also the fifth body cell cloning pig ever produced in China.

In 2004, Guangxi University and Guangxi Animal Husbandry Research Institute jointly conducted a research program on the nuclear transplantation in Bama mini pigs. Lu Shengsheng, who was responsible for the research program, used the body cell of a Bama mini pig as the donor cell and the oocyte of the pig as the recipient cytoplasm. Through the enucleation, re-injection and activation process, scientists obtained a cloned embryo cell. With three years research, scientists injected the embryo into the womb of a local pig type called Luchuan pig. The embryo had been stayed in the pig's womb for about 110 days and at nine o'clock on October 13, a cloned pig was born at the Luchuan Pig Farm at Guangxi Animal Husbandry Research Institute.

Arriving at the scene, this reporter saw that the pig weighed 0.7 kilogram and its body length was about 20 centimeters. The cloned pig was safe and sound and it walked around its mother from time to time wanting to have some milk.

The birth of the first cloning pig in Guangxi has laid a solid foundation for the research of transgenic pigs, which has a scientific significance in that it can provide a way for scientists to do organ transplantation through animal organs. The first cloning pig might also provide some scientific clues for the protection of the Bama mini pig, a pig that has high economic value in Guangxi. It shows that the body cell cloning technology is quite mature in Guangxi now, said researchers at Guangxi Animal Husbandry Research Institute.

China plans to draw gene maps for another 99 people**(China News, 2007-10-18)**

The Beijing Genomics Institute-Shenzhen (BGI-SZ), which successfully drew the first genome sequence for a Chinese, declared in Shenzhen on Monday that it planned to draw the genome sequence for another 99 Chinese people, to gather the genome information from 99 Chinese volunteers, the *Shanghai Evening Post* reported.

Although the research institute completed the first genome sequencing for Chinese, the gene information gathered so far is still not rich enough to support related research about diseases. In order to obtain more information, the Shenzhen institute now plans to draw the genome maps for another 99 Chinese people.

In choosing the appropriate volunteers, the Shenzhen research institute will try to make sure that the volunteers can display the features of a typical Chinese. It will also try to make sure that people from the south region and from the north, the Han majority and the ethnic minorities can all take up a certain proportion in the volunteer group, said a person in charge of the project.

Normally, it takes at least 5 million yuan to finish the genome sequencing of a person. In order to complete this project, the Shenzhen genomics institute hopes that people in society can set up a fund to sponsor the project.

China issues guidelines for biosafety**(China News, 2007-10-18)**

Chinese government has issued some guidelines to make sure that biological researches, especially those on transgenic biological products, are ethical and safe, said Li Xueyong, vice minister of science and technology, in a CPC 17th National Congress press conference held on Tuesday.

In answering reporters' questions, Li said that China had a very clear stance on the development of stem cells and transgenic biological products, that China would actively promote related researches and attach great importance to biosafety. At the same time, China would work hard to promote the industrialization of biological researches.

However, these researches might sometimes involve ethical issues, an issue to which Chinese government has also attached great importance. On this question, Chinese government has already issued some guidelines to make sure that biological researches, especially those on transgenic biological products, are ethical and safe, Li noted.

11% Chinese Adults Suffer from Osteoporosis: Survey**(CRI, 2007-10-21)**

Over 11 percent Chinese above the age of twenty suffer from osteoporosis, according to a survey done by Chinese researchers.

The survey, the largest on osteoporosis in Asia by now, said 11.5 percent of Chinese over 20 years old suffer from osteoporosis. The rate of incident is 4.3 percent among males and 18.7 percent among females.

The survey, conducted by a group of researchers headed by Zhu Hanmin, has investigated 7,000 Chinese of Han ethnic group, in nine Chinese provinces.

Zhu, a professor with the Shanghai Huadong University, said "the survey is helpful to formulate

China Highlights October, 2007

measures to prevent osteoporosis in China and rationally distribute medical resources to cure osteoporotic."

Zhu said "There are about 35 million to 40 million osteoporotic patients nationwide, based on the survey."

He said "people, especially over middle age, should have regular health check-up and osteoporotic patients should consult doctors timely."

"Among the urban residents surveyed, only 60 percent are aware that they suffer from osteoporosis, and among those who know they have the disease, only 18 percent consult doctors," he said.

AIDS vaccine put to 2nd-stage clinical trial

(China News, 2007-10-23)

China has completed the first-stage clinical research work on its AIDS vaccine. The work, the first of such kind officially approved by the State Drug Administration, has now entered into the second-stage clinical trial period.

During the second stage, the Changchun Baike Pharmaceutical Company, a medical body responsible for the research, will try to improve the immune intensity of the vaccine, based on the scientific findings it has made earlier. The pharmaceutical company will also try to include more diversified groups of people to take the vaccine as volunteers, so as to test the vaccine's immune antigenicity and make sure that the vaccine is safe to more people. Scientists will see how long the specific immune reaction will last. They will also try to solve the problems emerging during the first stage by adjusting the vaccine dosage and the vaccine-taking procedure, said a researcher at the Changchun Baike Pharmaceutical Company on Monday.

In the 1990s, China kicked off the research work on AIDS vaccination. Many scientific bodies in China participated in the work. By 2006, Changchun Baike Pharmaceutical Company had made a breakthrough in its research work on AIDS vaccination. Later, the company successfully completed the first stage of its research work. From March 12, 2005 to June 11, 2006, 49 volunteers took the AIDS vaccine for the first-stage clinical test. Scientists later closely watched their reactions to the vaccine for 180 days. During the 180 days of observation period, scientists found that no volunteers had displayed any serious side effects from the vaccine. Scientists also found that vaccine takers could have specific cell immune response to the vaccine 15 days after they took it.

The antigen gene for the AIDS vaccine produced by Changchun Baike Pharmaceutical Company was chosen from the AIDS virus strain commonly seen among Chinese people. So the vaccine is more applicable to the Chinese people. The completion of the first-stage clinical research work on the AIDS vaccine shows that China's research work in this field has reached advanced international level, experts at Changchun Baike said.

Seafood diet might lead to thyroid cancer

(China News, 2007-10-30)

In China's eastern coastal region, young women have become a highly risky group for thyroid cancer because of their preference for seafood, the *Shanghai Morning Post* reported.

Last week, the first International Thyroid Surgery Forum was concluded. At the forum, the Fudan University Affiliated Tumor Hospital released a set of statistics to reveal that in China, the incident of thyroid cancer had increased 300% in ten years. The number of young women who were under the age

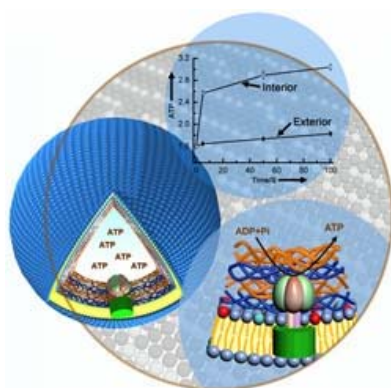
China Highlights October, 2007

of 40 and suffered from thyroid cancer was 2-5 times that of men. Many of these women liked to eat a lot of seafood that contained a high level of iodine.

Most seafood contains a high level of iodine, a substance that will easily induce thyroid disease. Women have their special physical conditions and their health is often disturbed by sex hormone release, endocrine imbalance and radiation. This will make them more vulnerable to thyroid cancer. Of all the 53 patients that stayed at the Head and Neck Disease Department of the Fudan University Affiliated Tumor Hospital, 80% came from the eastern coastal region and most of them were women, said Ji Qinghai, professor at the Head and Neck Disease Department.

Since thyroid cancer does not show any symptoms during the early stage, doctors suggest that people whose family members got similar disease before or young women who eat a lot of seafood in their diet should go to hospital to check their thyroid once every year, as these people are regarded as the highly risky group for thyroid cancer.

Novel progress in the molecular motor assembly of a biomimetic system (CAS, 2007-10-29)



A scheme of a CFoF1/lipid modified microcapsule and ATP biosynthesis as a function of reaction time

Active biological molecules and functional structures can be fabricated into a bio-mimetic system by using molecular assembly method. Such materials can be used for the drug delivery, disease diagnosis and therapy, and new nanodevice construction. With the financial supports of CAS, the Ministry of Science and Technology and the National Natural Science Foundation of China, researchers with the CAS Key Laboratory of Colloid Interface Science and Chemical Thermodynamics and their colleagues with the Max Planck Institute of Colloids and Interfaces have made progress in the molecular motor assembly of a biomimetic system. The work has been published in the recent issue of *Angew. Chem. Int. Ed.* (2007 46 6996-7000).

Over the last few years, the group has made advances in constructing biomimetic membrane by using "self-assembly" and "layer-by-layer assembly" techniques (*Angew. Chem. Int. Ed.* 40 (2001) 891; *Chem. Eur. J.* 9 (2003) 2589; *Chem. Eur. J.* 10 (2004) 5848; *Biomaterials* 28 (2007) 3083; *Angew. Chem. Int. Ed.* 46 (2007) 2431). Such biomimetic membranes have potential applications in gene, and drug delivery and controlled release. (*Chem. Eur. J.* 10 (2004) 5848; *Biomaterials* 28 (2007) 3083; *Angew. Chem. Int. Ed.* 46 (2007) 2431).

They also reported a novel biomimetic system with the assembly of FoF1 ATPase in lipid-modified microcapsules. The well-defined microcapsules may serve as containers for the storage of the synthesized ATP as an energy currency. By using this system it becomes possible to study the function of ATPase as a biomimetic unit in detail. Furthermore, the synthesized ATP could be released from the assembled capsules to provide energy on demand. Hence a micrometer-size energy-storage device has been built up.

Living kidney transplant surgeries to treble last year's, expert (China News, 2007-10-30)

China Highlights October, 2007

“My life quality hasn't changed. However, I donated my kidney to save my sister's life. I think it's worth it,” a kidney donor said with a smile, the Shanghai-based *Youth Daily* reported.

Last Sunday, Shanghai Changzheng Hospital held a seminar for living kidney donors and receivers. At the meeting, Wang Liming, director of the Changzheng Hospital Kidney Transplant Center, who is also member of the Organ Transplant Committee of the Chinese People's Liberation Army, said that many people donated their kidneys to their sick relatives out of affection. He expected that this year, there might be more than 1,000 living kidney transplant surgeries taken across the country, which will be three times last year's.

In 2006, about 200 people came to Changzheng Hospital because of kidney failure. However, only 11 of them were able to get living kidneys as donated by their relatives. On the other hand, many patients were waiting for the appropriate kidney source in despair. Some patients had even died because of lack of kidney source, according to information released by Changzheng Hospital.

On the one hand, people are willing to save their sick relatives out of the family tie. On the other hand, people's idea about organ donation is also changing with the times. As a result, more and more people are willing to donate their organs now.

“When we talked with the patients' relatives, 70% of them expressed their willingness to donate their kidneys,” Wang said.

In 2007, about 19 kidney transplant cooperative projects were undertaken between the Ministry of Health and Roche Company and all these projects were assisted by Changzhen Hospital. The hospital also obtained the medicine needed for kidney receivers after the surgery. This reporter learned that last year, Changzheng Hospital carried out 11 living kidney transplant surgeries, whereas during the first ten months of this year, this number had already reached 30.

Neural activity regulates bilateral wiring during brain development (CAS, 2007-10-31)

The callosum corpus, the largest commissural system in the brain, is responsible for the communication between two hemispheres. However, the mechanism that regulates their growth to the contralateral cortex is not well understood. Recent studies made by CAS researchers may add new dimensions to the understanding of the issue.

A research team led by Prof. DING Yuqiang from the CAS Institute of Neuroscience, Shanghai Institutes for Biological Sciences, reports that neuronal activity is necessary for the normal development and maintenance of callosal projections in the mouse somatosensory cortex. Their work was published on the 17 Oct. issue of the *Journal of Neuroscience*.

Utilizing in utero electroporation to label layer II/III pyramidal cells in the somatosensory cortex on one hemisphere, WANG Chunlei, a graduate student in Ding's lab, and colleagues revealed a region- and layer-specific callosal projection in the contralateral somatosensory cortex, and found that their development is dependent on both electrical activity and synaptic transmission.

Prenatal suppression of neuronal excitation was achieved via overexpression of the inward rectifying potassium channel, Kir 2.1. This manipulation resulted in abnormal callosal projections with many axons extending beyond layers II-III to terminate in layer I and also a great reduction of the axons at the border between the primary and secondary somatosensory cortices. Blocking synaptic transmission via misexpression of a tetanus toxin light chain (TeNT-LC) led to a more pronounced reduction in the projections to the border region, and an eventual disappearance of callosal projections over the entire

somatosensory cortex.

These results reveal the critical roles of neural activity in wiring the neuronal circuitry between the two brain hemispheres. Furthermore, this study also identifies an *in vivo* model system in which axonal development can be clearly visualized and molecularly manipulated using utero electroporation of cerebral cortical neurons.

1.4 Key Technologies

Meeting convenes to discuss self-assembly and nanotechnology

(CAS, 2007-10-24)

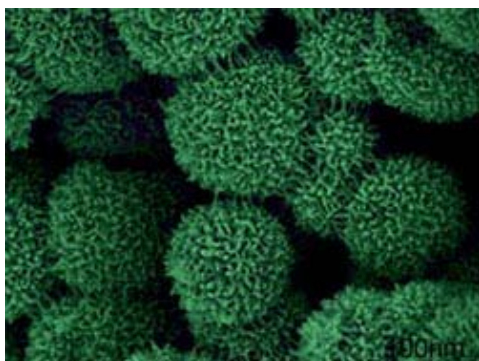
Under the theme of functional supramolecular systems: Self-assembly and nanotechnology, the 311th session of Xiangshan Science Conferences (XSSC) was held from 22 to 24 October in Beijing. The meeting was jointly chaired by Helmut Ringsdorf from Mainz University in Germany, David N. Reinhoudt from University of Twente in the Netherlands, SHEN Jiacong from China's Jilin University, TUNG Chen-ho from the CAS Technical Institute of Physics and Chemistry, and ZHANG Xi from Tsinghua University.

Beyond the molecule, supramolecular chemistry aims at developing highly complex chemical systems from components interacting by noncovalent intermolecular forces. As initiated by J. M. Lehn, 1987 Nobel Prize winner in chemistry, the field was and is the basis for most of the essential biochemical processes of life. It has grown over the past 20 years into a major domain of modern teaching, research and technology. It has fueled numerous developments at the interfaces with biology, physics, materials science and biomedicine: thus giving rise to the emergence and establishment of supramolecular science, today a broad multidisciplinary and interdisciplinary domain, providing a highly fertile ground for creative cooperation of scientists from very different backgrounds.

Following the successful its four previous sessions on functional supramolecular systems held in May 1994, October 1998, October 2001, September 2004, respectively, XSSC has become a distinguished gathering for supramolecular studies. The new session on the subject drew scholars from various disciplines and countries. Their discussions were focused on self-assembly at all scales; biological self-assembly and biomimics; self-assembling nanomaterials and devices; and driving forces for self-assembly.

A hollow polyanilin sphere that is both conducting and superhydrophobic

(CAS, 2007-10-29)



Polyanilin micro- or nano-scale hollow spheres of conducting polymers have recently attracted wide attention owing to their application potentials in various fields. In addition, their super-hydrophobic surfaces with water contact angle higher than 150° are arousing much interest for their possible applications in coating gene delivery micro-fluidic channels and non-wetting liquid transfer.

With support of CAS and the National Natural Science

China Highlights October, 2007

Foundation of China, a research team led by Prof. WAN Meixiang and JIANG Lei from the CAS Institute of Chemistry recently made progress in the self-assembly of multi-functionalized polyaniline micro/nanostructures.

The researchers showed that the conductive and superhydrophobic rambutan-like polyaniline hollow spheres can be prepared by a self-assembly process in the presence of perfluorooctane sulfonic acid as the dopant, according to their report in *Adv. Mater.* (19 2007 2092-2096).

They also demonstrated that the perfluorooctane sulfonic acid has dopant soft-template and brings about superhydrophobic functions at the same time. The conductive rambutan-like hollow spheres with a large specific area and superhydrophobic property may find potential applications in biosensors, drug delivery without losing its activity, drug controllable separation and controlled drug release. In particular the superhydrophobic surface of the hollow spheres may protect their conductive properties as well as the materials encapsulated within.

1.5 Structure of Matter

Major progress scored on heavy ion research facility development

(CAS, 2007-10-09)



CAS scientists have made significant headway in work on the Heavy Ion Research Facility in Lanzhou-Cooling Storage Ring (HIRFL-CSR), a national mega-science project built by the CAS Institute of Modern Physics (IMP) in Lanzhou, capital of northwest China's Gansu Province.

On 7 Oct, the stored beam current intensity at the experimental ring of HIRFL-CSR surpassed its design parameters, making new records in terms of ion species, maximum energy range and beam intensity among the

similar systems in the world. "It is a result of indigenous innovation, meticulous scholarship, hardworking and collaboration," praises CAS President LU Yongxiang in his congratulatory message to IMP researchers.

With an investment of nearly 300 million yuan (US\$40 million), the construction of HIRFL-CSR was formally started in 2000. It consists of two rings: the main ring (CSRm) and the experimental ring (CSR_e). The former is used to accelerate, cool and accumulate heavy ion beam while the latter is used as an experimental terminal. The facility could serve as a state-of-the-art experimental platform both for basic research in the fields of nuclear physics, hadrons physics, atomic physics, and high energy density physics and for applied research into heavy ion irradiation materials, heavy ion cancer treatment, and space radiation.

Booster ramping at Shanghai Light Source successful

(CAS, 2007-10-10)

The booster beam commissioning process of the Shanghai Synchrotron Radiation Facility (dubbed Shanghai Light Source Project or SSRF) has made landmark progress. On 5 October, the electron beam

China Highlights October, 2007

was successfully accelerated to 3.5 GeV, marking the success of the energy ramping in the booster synchrotron, which is considered an important process that will affect the beam parameters, the time structure and the injection efficiency of the storage ring.

The feat demonstrates once again that Chinese scientists could also score world-class achievements in mega-science projects by mainly relying on own efforts in an opening environment, applauds CAS President LU Yongxiang in his congratulations to the researchers and engineers of the project.

A third-generation synchrotron light source, SSRF consists of a 100 MeV linac, a 3.5 GeV booster, a 3.5 GeV storage ring and seven beam lines and experimental stations. With a total investment of 1.2 billion yuan (about US\$144 million), which is equally shared by the central government, Shanghai Government and CAS, it is expected to be completed and put to operation in the first half of 2009.

China begins construction of cutting-edge neutrino experimental facility

(Xinhua Net, 2007-10-13)

Construction began Saturday on an experimental facility which will offer a platform for Chinese and foreign scientists to work together for discovering a new kind of neutrino oscillation in Shenzhen, south China's Guangdong Province.

It was the second biggest cooperation program Chinese high energy scientists ever conducted with other foreign counterparts since October 1988 when the positive-negative electron collider was built in Beijing.

Through the collider, scientists from China and the United States have cooperated and carried out legions of scientific research.

Saturday's construction commencement function was attended by more than 100 people, including government officials and foreign diplomats, such as Dr. Robin Staffin, Associate Director of Science in the U.S. Department of Energy.

Neutrino Oscillation is an intriguing behavior of a sub-atomic particle called neutrino.

And the new facility is being built in the mountain near Daya Nuclear Power Plant, which has four reactors with a combined thermal output of 11.6 million kw in operation, and Ling'ao nuclear power plant is not far away. Both nuke power plants will serve as sources of anti-neutrinos for the experiments when the facility is finished.

Workers will build three underground experimental halls which will be connected by long tunnels in the mountain that shields the experiment from unwanted cosmic radiation.

Each hall will feature a 10-m deep water-pool within which eight anti-neutrino detectors will be deployed. The water protects the detectors from nearby radiation that interferes with the measurement, and helps identify surviving cosmic radiation.

And the first experimental hall is expected to be ready by the end of 2008. Commissioning of the detectors in this hall will take place in 2009.

Civil engineering construction is anticipated to last about two years, with installation of the last detector scheduled for 2010.

Upon completion of the new facility, more than 190 scientists from six countries and regions including China, Hong Kong, Taiwan, the United States and Russia will come over to do research work, according to Chen Hesheng, Chief of the Institute of High Energy Physics with the Chinese Academy of Sciences (CAS).

The facility will have a budget of 250 million yuan (about 31.25 million US dollars). And China will be

China Highlights October, 2007

responsible for infrastructure construction and making of four detectors. And the United States will be responsible for making of the rest of the detectors.

Wang Yifang, chief scientist on the experiment, said he was confident that the program would make an important contribution to finding a new breakthrough in China's research efforts in particle physics, starting a new horizon in world's neutrino research, and to improving the overall strength of China in science and technology.

Construction for neutrino experiment starts at Daya Bay (CAS, 2007-10-15)

On 13 October, the ground-breaking ceremony for the Daya Reactor Neutrino Experiment, China's largest single international collaboration in basic science as well as the biggest one between US and China, was held at Daya Bay Nuclear Power Base in Shenzhen.

Chaired by CHEN Hesheng, director of the CAS Institute of High Energy Physics (IHEP), the ceremony was attended by high-level officials, including CAS Executive Vice President BAI Chunli, Vice Minister of Science and Technology CHEN Jinpei, Vice Governor of Guangdong Province ZHONG Yangsheng, Vice President of the National Natural Science Foundation of China SHEN Wenqing, Associate Director of Office of Science under the US Department of Energy Robin Staffin, Vice Mayor of Shenzhen City LI Ming and General Manager of the Guangdong Nuclear Power Group HE Yu. Nobel laureate T. D. Lee sent his congratulations to the ceremony.

The neutrino, one of the fundamental particles in nature and building blocks of our universe, has a very important role in both the microscopic view of particle physics and the macroscopic view of evolution of the universe, says Prof. BAI Chunli. "As its enforcement and administration body, CAS will render support to the project, as in the past."

The Daya Experiment has involved about 190 researchers from more than 30 institutions in China (including Hong Kong, Taiwan), US, Russia, and the Czech Republic, according to Chief Scientist of the Experiment and IHEP Vice Director WANG Yifang. At present, the designs of the detectors for the experiment and their prototypes have been completed, and its building will be soon started. It is expected that the first detector will be in place in 2009, and the first data-taking with final configuration in late 2010, according to Prof. Wang.

Stern-Gerlach effect goes chiral (CAS, 2007-10-18)

Prof. SUN Changpu from the CAS Institute of Theoretical Physics and co-workers from University of Basel in Switzerland have worked out a way -- at least in theory -- to split a beam of molecules according to their chirality. The technique involves passing the molecules through three different laser beams and is similar to the famous Stern-Gerlach effect, whereby a beam of atoms passing through a magnetic field is split in two according to the atoms' spin states (*Phys. Rev. Lett.* 99 130403).

Chiral molecules exist in one of two structures that are mirror images of one another, usually described as "right-handed" and "left-handed" enantiomers. Chirality can be very important in medicine because a right-handed drug molecule may have the desired biological effect while the left handed molecule does not, for example. As a result, a great deal of effort has gone into developing ways to sort molecules according to their chirality.

An important feature of chiral molecules is that they can respond differently when exposed to light.

China Highlights October, 2007

Now Christoph Bruder and Yong Li at the University of Basel along with Chang-Pu Sun of the Chinese Academy of Sciences have worked out how to separate enantiomers using the "Rabi transitions" that can happen when a molecule is exposed to laser light. Such transitions occur when a laser beam causes a molecule to oscillate between two energy levels at a frequency corresponding to that of the laser light. Their technique involves a chiral molecule with three possible Rabi transitions at three different laser frequencies. Two of the transitions would have to be identical for left- and right-handed molecules, but the third would have a phase difference of 180 degrees between the oscillations that occur in the two enantiomers.

According to the team's calculations, if these molecules were all oriented in a similar way and then sent directly into the three laser beams, the phase difference would cause right-handed molecules to be deflected off course more than left-handed molecules. Moreover, the direction of deflection would depend on which of the two spin states - up or down - the molecules are in. The upshot is that the molecules would be sorted into four groups according to chirality and spin: right-up, right-down, left-up and left-down.

While some molecules could have appropriate three-level systems, Bruder told physicsworld.com that the experiment would be challenging for several reasons. For one thing, it would require three lasers operating at three very specific frequencies. Also, the molecules would have to be very cold for the effect to be noticeable and the molecules would have to be oriented beforehand in a specific way.

Although these difficulties mean that the technique will probably not lead to a practical way of separating real molecules, Bruder is hopeful that experimental physicists will work out a way to confirm the team's calculations.

1.6 Transport and Space

China plans to launch another ocean satellite in '09

(China News, 2007-10-08)

The project for the making of Haiyang No.2 (HY-2) satellite had been registered by the state in January this year. China plans to launch the satellite in 2009, according to information released by the Commission of Science, Technology and Industry for National Defence (COSTIND).

COSTIND said so at a handover ceremony for the use of Haiyang-1B (HY-1B) satellite held in Beijing recently.

The making of HY-2 satellite is included as an important project in China's Space Programme for the Eleventh Five-Year Plan Period (2006-2010). In order to implement this program, China will put in more efforts in coming years on the research and engineering work for HY-2 satellite so that the country's ocean satellites construction work can be upgraded to a new scale, said Sun Laiyan, vice director of COSTIND, who is also director-general of the China National Space Administration.

In addition to HY-2, the State Oceanic Administration (SOA) has also devoted efforts to the research work of other ocean satellites. It is SOA's goal that by building a comprehensive and well functioning system for the application of ocean satellites, SOA can supervise Chinese coastal areas more effectively, said Sun Zhihui, SOA director-general .

During the Eleventh Five-Year Period, China Space Technology Group will undertake the tasks for the research work of various civil use satellites. At present, HY-2 project has been registered and related

China Highlights October, 2007

production scheme is being discussed. In addition to HY-2, China Space Technology Group is conducting a feasibility study of the HY-3 satellite project, said Ma Xingrui, the new president of China Space Technology Group.

HY-1 and HY-2 ocean satellites have different functions and their functions are complimentary to each other. HY-2 ocean satellite is mainly used to monitor the dynamics movement at sea. Through active microwave detection, it can gather information about the wind conditions at sea, as well as the changes about sea heights and ocean temperatures. It can, in some way, provide useful information on the weather conditions at sea and prevent ocean disasters, experts say.

Ministers of communications discuss intelligent transportation

(China News, 2007-10-08)

The 14th World Congress on Intelligent Transportation Systems will be kicked off on October 9, 2007 in Beijing, with the ministers of communications from China, Japan, South Korea, India, the EU, Norway and Sweden taking part in it.

The Congress will also include a special forum for city mayors from said countries to discuss solutions to traffic jam and air pollution as well as the effect of the application of intelligent transportation systems on global weather pattern, the reduction of greenhouse-gas emission and the sustainable development of cities.

This will be the first time ever for the Congress to be held in a developing country. At present, participants from more than 50 countries have registered, and it is estimated that there will be 20,000-plus visitors.

Lunar Satellite May Hit Moon Surface After Mission

(CRI, 2007-10-08)

China's first lunar satellite, Chang E I, is expected to soon receive a descent order to land on the surface of the moon, after a year-long orbiting mission, to help with further study of the sphere.

Xiao Naiyuan, an astronomic professor at Nanjing University, released the details on Sunday, saying that the final landing will offer scientists a rare chance to learn about the geological status on the moon.

Xiao outlined the whole lunar expedition process to listeners at a lecture on the theme of "Marching Towards the Moon". He also introduced other information related to the country's longest ever outer space tour, one that's covered more than 380,000 kilometres.

A multi-stage rocket will boost the satellite to an orbit 200 kilometres away from the moon's surface, Xiao said.

All observation facilities in the country and Yuanwang space survey ships will trace the satellite in the early stages of its lift-off. Meanwhile, four radio telescopes installed in Beijing, Shanghai, Urumqi and Yunnan Province will monitor the flight through to the mission's end.

The satellite will take off later this year.

The main tasks of the satellite will include graphing a three-dimension map of the moon, detecting resource distribution and measuring the depth of soil on the surface.

Space program eyes farther frontiers

(People's Daily, 2007-12-12)

Major breakthroughs are expected by 2010 in the country's ambitious space programs - from manned

China Highlights October, 2007

flights to the lunar probe - a senior space administrator said yesterday.

Scientists are working toward astronaut space walks, and spacecraft rendezvous and docking procedures by the end of the decade, said Sun Laiyan, chief of the China National Space Administration.

The deep space exploration program aims to achieve the first phase goal of the lunar probe, which is to have the orbiter Chang'e I circle the moon, he said.

"Chang'e I has already reached the launch site in Xichang of Sichuan Province, and is ready for launch due before the end of the year," he said in an online interview at www.gov.cn.

The launch date was not specified but earlier media reports have suggested it is likely by the end of this month.

Also by 2010, research work will begin on the moon probe project's second and third phases, which are landing on the moon and returning to Earth, he said.

In addition, research and development of a new design of a carrier rocket will be in full swing during the same period, he said.

Using non-toxic and non-polluting engines, the new generation carrier rockets are expected to be able to carry up to 25 tons to near-earth orbits and 14 tons to geosynchronous orbits, giving China the same launch capabilities as developed countries, he said.

The current indigenously-developed Long March series of rockets can carry 9 tons to an orbit 300 km from Earth, or send satellites of 5 tons to a geosynchronous orbit 36,000 km away.

In 2003, China launched its first manned space mission, making it the third country to send a lone human into orbit, after Russia and the United States.

Hainan Spaceflight Launching Center to be completed by 2012

(China News, 2007-10-16)

According to Shen Rongjun, an expert on spaceflight engineering, Hainan Spaceflight Launching Center will be completed by 2012, when it will be one of the most advanced of its kind in the world, particularly ecologically, and it will also serve as an attractive scenic spot.

The Hainan Spaceflight Launching Center will be used to launch earth-orbiters and massive polar orbiters for other countries, and it will greatly enhance China's competitiveness in this aspect.

Hainan is located on the south end of China. Thus it will require 15% - 19% less energy to send up earth orbiters from here than from Jiuquan in Gansu Province.

"Xichang Satellite Launching Center in Sichuan Province has received more than 1.6 million visitors, and Hainan Launching Center will attract more visitors than Xichang with its unique space-themed amusement park," said Shen.

In a word, the building of the launching center will boost Hainan's economic development greatly, particularly property industry, hi-tech industry and tourism.

China to release latest space development plan

(China News, 2007-10-16)

Sun Laiyan, the director of the National Space Administration, released some detailed information about China's space development procedure during the 11th Five-Year Plan Period (2006-2010), which will be publicized very soon.

Sun released it at the Shenzhen Hi-Tech Fair.

China Highlights October, 2007

According to Sun, China will carry further manned-spacecraft experiments, including spacewalk and spacecraft docking. A space laboratory will also be launched. China also plans to launch its own lunar orbiters before 2010 to examine the space environment around the moon. In 2013, it might send its lunar surveyor to patrol the surface of the moon and collect samples of lunar materials.

The building of a hi-resolution terrain observation system will also be included in the plan. The system will consist of satellites, aircraft and stratospheric airships. It will be completed in the next 13 – 15 years.

Sun also talked about the Compass, China's next-generation satellite navigation system, which will be expanded to a network with 30 satellites, and cover all the regions on earth.

China is also developing new launch vehicles, which will not only be huge, but also be eco-friendly and highly stable.

China's largest communications satellite ground facility takes shape in Beijing

(People's Daily, 2007-10-21)

Beijing has established China's largest communications satellite ground facility which covers the whole country and connects with more than 200 countries and regions in the world, said sources with a symposium marking the 35th anniversary of China's satellite communications on Friday.

The satellite communications station in Beijing is a major communications hub in China. It has been serving civil needs and safeguarding national security through a multi-level broadband platform, said experts attending the symposium.

The live broadcasting of the 2008 Olympic Games will be transferred by the station to all over the world, according to China Network Communication Co., the fixed telecommunications service partner for the games.

China's satellite communications industry started in 1972. The nation's first satellite communications institution for civil purposes was built in Beijing in Oct. 1972.

Launch of China's first lunar probe "great effort" on space exploration

(Xinhua Net, 2007-10-25)



The successful launch of China's first lunar probe is the great effort on space exploration of the international community, Foreign Ministry spokesman Liu Jianchao said here Thursday.

Liu told a regular press conference that the outer space is the common wealth of mankind, which should be utilized entirely for peace purposes and benefit mankind to the utmost extend.

"We believe that with the cooperation and efforts of the international community, mankind can have a clearer and better understanding of

the outer space," said Liu.

China launched its first lunar probe Chang'e-1 on Wednesday, the first step of its ambitious three-stage moon mission, marking a new milestone in the country's history of space exploration.

China Highlights October, 2007

For more information, please refer to:

<http://www.chinaview.cn/rygc/index.htm>

Scientists activate 1st probing equipment on Chang'e-1 lunar orbiter (CAS, 2007-10-26)



A high-energy solar particle detector

Chinese scientists have successfully activated the first probing equipment on the Chang'e-1 lunar orbiter on the evening of 25 October to start exploring the space environment between earth and moon.

The high-energy solar particle detector, which was positioned on board the satellite with seven other probing facilities, will collect data on the space expanse between 40,000 kilometers and 400,000 kilometers from earth to moon, said Li Chunlai, chief designer of the ground application system of the lunar probe.

The information it gathers will enable scientists to learn about the environment and ensure the safety of future spacecrafts, Li said, adding that a payload data processing system has also been activated, but other equipments remain "dormant" to save energy. Emergency measures have also been designed to handle any hitch to the payload equipments, including placing spare parts and circuits in key equipments, Li said.

The 2,300-kg satellite has just completed its first orbital transfer around 5:57 p.m. Thursday afternoon, a step further in its 380,000-km journey to the moon.

Chang'e-1 needs to conduct ten orbit maneuvers during its flight, and is expected to enter earth-moon transfer orbit on Oct. 31 and arrive in the moon's orbit on Nov. 5. It will relay the first pictures of the moon in late November and will then continue scientific explorations of the moon for a year.

Chang'e-1, named after a mythical Chinese goddess who, according to legend, flew to the moon, blasted off on a Long March 3A carrier rocket at 6:05 p.m. on Wednesday from the Xichang Satellite Launch Center in the southwestern province of Sichuan.

It carried eight probing facilities, including a stereo camera and interferometer, an imager and gamma/x-ray spectrometer, a laser altimeter, a microwave detector, a high-energy solar particle detector and a low-energy ion detector.

Its major scientific objectives include a three-dimensional survey of the moon's surface, analysis of distribution and amounts of elements on the lunar surface, an investigation of the characteristics of lunar mantle rock and the powdery soil layer on the surface, and an exploration of the environment between the Earth and the Moon.

China developing new heavy-duty carrier rockets (Xinhua Net, 2007-10-31)

China is building a new range of carrier rockets designed to send heavyweight satellites into space, boosting the current carrying capacity by nearly three times, a space expert has said.

The Long March 5 rockets will be able to carry payloads of up to 25 tons for low earth orbit satellites, up from the current limit of 9.2 tons, said Wu Yansheng, president of the China Academy of Launch Vehicle Technology (CALT), which is developing the new series of launch vehicles.

China Highlights October, 2007

"Meanwhile, the carrying capacity can reach 14 tons from the current 2.6 to 5.4 tons while sending satellites into geosynchronous orbit, like Chang'e-1," Wu said.

China's first lunar probe, Chang'e-1, named after a legendary Chinese goddess who flew to the moon, blasted off on a Long March 3A carrier rocket at 6:05 p.m. on Oct. 24 from the Xichang Satellite Launch Center in southwestern Sichuan Province.

In addition to bigger capacity, the Long March 5 rockets will be designed using pollution-free technologies, Wu said.

"The new generation of carrier rockets is expected to blast off within six to seven years," said Ma Xingrui, general manager of the China Aerospace Science and Technology Corporation.

The Long March 5 rockets will lift off from a new space launch center in Wenchang, in the southern island province of Hainan. The new center, the fourth in China, is expected to be completed in 2012 and formally put into use in 2013.

The new series of rockets will be made in a new base located at the Binhai New Area in the northern port city of Tianjin, and construction on the base has kicked off on Tuesday.

The first phase of the carrier rocket base, to cover 3,000 mu (200 hectares) in area, will be completed at the end of 2009. A total of 4.5 billion yuan (600 million U.S. dollars) will be invested in the project, said Yu Liegui, deputy head of the Commission of Science Technology and Industry for National Defense.

"After completion, the base will meet the demands of China's space technology development and peaceful use of space for 30 to 50 years, and help achieve a rapid development for China's launch vehicle technology and a sustainable development for the country's aerospace," Yu said.

China has launched 103 Long March carrier rockets since April 24, 1970, when the Long March-1 successfully sent Dongfanghong-1 satellite into the space.

China looks for breakthroughs in deep space exploration

(Xinhua Net, 2007-10-31)

China's space program needs to build up technical expertise and make further breakthroughs in rocket technology before the country can launch a recoverable moon rover, say scientists.

Sun Jiadong, chief designer of China's lunar probe project, told Xinhua that as far as technical standards were concerned, China's space exploration equipment was much heavier than that made by developed nations, though the Chinese products were of the same quality, met the same criteria and performed the same tasks.

The lunar probe project had been developed on the basis of former scientific research results, including piloted space flights, Sun said.

China's first lunar orbiter Chang'e-1 -- named after a mythical Chinese goddess who, according to legend, flew to the moon -- blasted off on a Long March 3A carrier rocket on Oct. 24 from the Xichang Satellite Launch Center, in the southwestern province of Sichuan.

The 2,300-kg satellite, representing the first stage of the three-phase lunar probe project, would enter the earth-moon transfer orbit on Wednesday, a crucial step forward in its 1,580,000-km journey towards the moon.

It will relay the first picture of the moon in late November and will then continue scientific exploration of the moon for a year

Ye Peijian, the chief designer of Chang'e-1, said technical research had begun for the second phase of

China Highlights October, 2007

the moon exploration project.

"A soft landing vehicle needs a variable thrust engine, whereas the current engines all have fixed thrust," Ye said.

Sun said a dozen or so institutions were involved in the development of lunar rovers needed for the second and third phases of the project.

In line with the current design, one kilogram of lunar soil and rocks at most could be collected in the third stage, Ye said.

In the three-phase mission, a soft moon landing and launch of a moon rover will be completed around 2012, and another rover will land on the moon and return to the earth with lunar soil and stone samples for scientific research around 2017.

The moon rovers and the soft landing vehicle should meet high standards, as they were expected to stay on the moon for three to 12 months, Ye said.

"Since it takes time for China to develop and build new-generation carrier rockets, Chang'e-2 for the second-stage exploration will most likely lift off on the existing Long March 3A," Ye said.

However, earlier reports suggested the Chang'e-2 and 3 were possibly to blast off on new carrier rockets.

Some other scientists echoed Ye, pointing out that the limited thrust of Chinese rockets posed a major challenge for China's moon probe project, especially a manned mission.

Luan Enjie, chief commander of China's lunar probe project, told Xinhua that existing carrier rockets only had a thrust of 600 tons, whereas a thrust of 3,000 to 4,000 tons was needed to send humans to the moon. The larger thrust would allow a rocket to carry at least 100 tons.

Ye said China had no timetable for a manned moon landing.

Other challenges included monitoring antenna and limited human resources.

Ye said the United States had arranged monitoring antenna around the world, while China was limited to its own territory. Even at home, antenna for deep space exploration had yet to be installed.

Ouyang Ziyuan, another senior scientist in the moon probe project, said it suffered from a dearth of technical talent needed for a much larger capacity of carrier rockets and monitoring antenna.

China has already announced plans for the development of a new family of rocket launchers and the building of a space launch center.

The Long March 5 carrier rockets will be made in the northern coastal city of Tianjin while the new launch center will be located in the southernmost province of Hainan.

Media reports said the next-generation rockets would be able to lift 25 tons of payload to near-earth orbit, up from the current nine tons; and 14 tons of payload to geosynchronous orbits, up from five tons.

As the launch center in Hainan will not be ready until 2012, the new generation rockets will not blast off before 2013, media reports said.

2 News from Universities

**More than 7,200 grads receive degrees at CAS in 2007
(CAS, 1007-10-08)**

China Highlights October, 2007



A total of 3,186 and 4,034 students received their master's and doctoral degrees respectively at the 2007 Commencement of the Graduate University of CAS (GUCAS) held on Sept. 27 at the Yuquan Campus in Beijing. GUCAS President BAI Chunli, who is also CAS Executive Vice President, was present at the ceremony.

Chinese government to sponsor 5,000 graduates abroad next year (People's Daily, 2007-10-10)

The Chinese government will sponsor 5,000 graduate students to further their studies abroad next year, the Ministry of Education (MOE) announced on Monday.

The graduates will specialize in a wide range of subjects including energy, environment, agriculture, information technology, biology, nanotechnology, humanities and social sciences.

The program, co-launched by MOE and the Ministry of Finance in January, has sponsored 3,952 graduates abroad so far and most of them have been admitted by world-famous colleges and research institutions.

"The core issue of building world-class universities is to cultivate high-quality faculties and innovative talents," said Education Minister Zhou Ji. "It is a significant measure to select top students and send them to study abroad."

25 million students at university in China (People's Daily, 2007-10-17)

The number of students studying in Chinese universities has reached 25 million, a five-fold increase in only nine years, said Zhou Ji, Chinese Education Minister.

"In only a few years, Chinese higher education has transformed from an education for the elite to one for the public, a process commonly taking several decades to accomplish in many countries," said Zhou at a press conference. He added: "It is a marvelous development."

Since 1999 China has expanded enrollment in higher educational institutions and this year about 5.4 million freshmen students enrolled in universities and colleges, statistics from the Ministry of Education show.

3 Innovation Management

China sees sharp rise in patent grants

(Xinhua Net, 2007-10-07)

China approved 168,000 patents in the first half of this year, up 40.5 percent on last year, according to the State Intellectual Property Office.

More than 142,000 patent rights were granted domestically, up 44.5 percent, and 26,000 were granted overseas, up 22 percent, it said.

The number invention patents reached 32,000, up 15.3 percent and there were 71,000 designs patents, up 53 percent, according to the office.

"The sharp increase shows a greatly-improved efficiency and capability in patent examination and approval," said Wang Xiaohu, an official with the office.

Statistics show the state office received 268,926 patent applications in the first half of this year, up 7.3 percent. By the end of June, the office had granted 1.9 million patent rights out of the 3.6 million applications it had received.

CAS to receive 4.8b yuan for innovation drive from State

(CAS, 2007-10-12)

The central government will inject 4.8 billion yuan into CAS to support its third-phase implementation of the Knowledge Innovation Program during the 11th Five-Year Plan period (2006-2010), says a senior government official.

It is among a series of novel efforts of the Chinese government to further enhance its financial support to the innovation capacity building, in an attempt to facilitate the further development of high tech industry, according to Mr. ZHANG Xiaoqian, vice minister of the State Development and Reform Commission (SDRC).

Meanwhile, China will tap up more investment channels to raise the needed money for the development of high tech industry. During the period, SDRC will also earmark 6 billion Yuan to support 12 key S&T infrastructure projects, including ocean expedition boat, and icing wind-tunnel, and 2 billion Yuan for special proprietary innovation projects. The money will benefit the construction and development of 100 national engineering labs, some 50 national engineering centers, and 300 certified industrial centers.

China to allocate 80 bln yuan for high-tech development

(Xinhua Net, 2007-10-13)

The China Development Bank (CDB) will provide 80 billion yuan (10.7 billion U.S. dollars) to support the development and innovation of high-tech enterprises in upcoming five years.

According to a memorandum of understanding recently signed by the National Development and Reform Commission (NDRC) and CDB, the fund will be used in high-tech innovation, key projects, small-and medium-sized high-tech firm development and etc.

It is an effort initiated by the National Development and Reform Commission (NDRC) to formulate efficient finance channels for the high-tech industry at China Hi-tech Fair being held in Shenzhen.

Apart from government supportive policies, the industry still needs other effective financing methods such as venture capital investment, bank loans and public listing.

China Highlights October, 2007

The NDRC will work with the CDB and Shenzhen Stock Exchange to promote cooperation between high-tech enterprises and the capital market in a bid to solve financial difficulties of high-tech enterprises.

73 Projects under “973” Program Approved in 2007 (MOST, 2007-10-20)

In 2007, 73 projects have been set up under the “973” Program in eight fields, including agriculture, energy, information, resources and environment, population and health, materials, cross-disciplinary areas and key science frontiers. This deployment is made to combine national goals with scientific frontiers so as to tackle the major S&T bottlenecks of socio-economic development.

4 China’s International Science Cooperation

China hopes to join Int’l Space Station project (Xinhua Net, 2007-10-16)

China hopes to become the 17th nation joining the International Space Station (ISS) project, Vice Minister of Science and Technology Li Xueyong said on Tuesday.

"China sincerely wants to cooperate with the United States in space exploration and join the International Space Station project that has already involved 16 nations," said Li, a delegate to the 17th National Congress of the Communist Party of China (CPC), on the sidelines of the event.

The Chinese government has been pursuing a policy of peaceful use of airspace, Li said.

The International Space Station is a joint project of 16 nations including the United States, Russia, Japan, Canada, Brazil and 11 countries from the European Space Agency.

The station's first segment, the Zarya control module, was brought to orbit by a Russian Proton rocket in November 1998 to provide the infant station's battery power and fuel storage.

The station is located in orbit around the Earth at an altitude of approximately 360 kilometers, a type of orbit usually termed as low Earth orbit.

Due to the ISS, there is a permanent human presence in space, as there have always been at least two people on board the station since the first crew entered it on Nov. 2, 2000.

China will soon launch its first circumlunar satellite as part of its ambitious moon exploration program enters the stage of implementation. Development of the satellite, called Chang'e I after the legendary Chinese goddess Chang'e who flew to the moon, and the carrier Long March 3A has been completed after numerous tests.

Int’l Research Ship Operators' Meeting held in Qingdao (CAS, 2007-10-22)

Organized by Institute of Oceanology, the 21st International Research Ship Operators' Meeting was held from 17 to 20 October in Qingdao, a coastal city in east China's Shandong Province.

An informal annual gathering for managers of ocean research ship fleets to discuss subjects and solving problems of mutual interest, the meeting was held for the first time in China, drawing more than 50 scholars from 16 countries.

Main topics and objectives of the annual agenda included the exchange of ship time between countries; co-operation in the support of marine research; and developments in national research fleets.

**The 4th Sino-US expedition into Hengduan Mountains fruitful
(CAS, 2007-10-23)**

A group of Chinese and US botanists recently completed their one-and-half- month survey of plant biodiversity in the Hengduan Mountains in southwest China, one of the richest gene pools on earth. By trekking more than 10,000 km, the botanists collected the primary data in the northern Sichuan areas noted for their floral diversity fragility and of crucial significance.

Supported by the National Natural Science Foundation of China and US National Science Foundation, the expedition was jointly led by Prof. SUN Hang with the CAS Kunming Institute of Botany and Dr. David Boufford, Assistant Director for Collections of Harvard University Herbaria.

The members of expedition were from the CAS Kunming Institute of Botany and the CAS Institute of Botany in Beijing, the Harvard University, Field Museum of Natural History in Chicago, and the Kochi Prefectural Makino Botanical Garden in Japan.

This survey covered seed plants, fern, bryophytes and higher fungi with emphasis on various types of native vegetation in dry-warm and dry-hot valleys, alpine screes, alpine meadows, primary or secondary forests.

The researchers successfully completed their expedition by overcoming various difficulties causing by natural snags, such as flooding spells, water-logging, capricious weather, high-altitude anoxia, and highroad breakdown. In the course of the expedition, both the provincial government and the prefectural bureaus of forestry rendered rear-service supports.

Started in 2004, the project will last for five years. Up to now, four rounds of the joint investigation have been carried out in Tibet's Qamdo Prefecture, the prefectures of Liangshan, Garzê, Aba in Sichuan Province, and Diqing Prefecture in Yunnan Province.

Through sampling some basic materials from floral species with eco-fragility, the mountainous region's bio-geography has been specifically explored, laying a solid foundation of probing the local flora's origin and its hidden evolutionary mechanism. The project offers a sound theoretical framework and policy suggestion for the preservation of the endangered species and the construction of natural sanctuaries in the region.

**Coordination Conference for China-Germany ITS Cooperation Convened in Beijing
(MOST, 2007-10-31)**

On October 11, 2007, the Coordination Conference for China-Germany ITS Cooperation was convened in Beijing.

Officials from the Ministry of Communications briefed on the status of supporting cooperative projects and transport infrastructure in China. The German counterparts expressed willingness to share their experience in Electronic Toll Collection (ETC) Technology. The two sides will further cooperate in developing a pilot ETC system using GPS-GSM technologies in the Beijing-Tianjin-Tanggu Expressway.

On the 14th World Congress on Intelligent Transport Systems held on October 9-13 in Beijing, the delegation from German Federal Ministry of Transport presented the GPS Toll Collection System, which was put into operation in their country.

5 Miscellaneous

Chinese reforestation project has made great contributions

(China News, 2007-10-12)

China's efforts to convert cropland to forests have been highly praised by the international community. At present, China has turned about 364 million mu ($2.42666679 \times 10^{13}$ square meters) of farmland into forests. These forests have absorbed the carbon dioxide to an amount equivalent to emission by 3 million cars in 11 years, said Li Yucai, deputy director-general of the State Forestry Administration in a briefing held on Wednesday.

When an EU delegation visited the State Forestry Administration, they knew little about China's reforestation project and asked us to for explanation. After they learned about it, all the 35 EU delegates praised that we were a responsible country, Li said.

According to scientists' calculation, whenever a tree grows by one cubic meter, it can absorb an additional 1.83 tons of carbon dioxide and release 1.62 tons of oxygen. At present, China has turned about 364 million mu ($2.42666679 \times 10^{13}$ square meters) of farmland into forests, said Li Yucai.

Chinese reforestation project not only has benefited the Chinese people, it has also made great contributions to the world in that it has greatly reduced gas emissions and slowed down the global warming process, Li noted.

Nuclear Power Is the 'Way Forward'

(CRI, 2007-10-16)

The growth of nuclear power in China and India over the next two decades will outpace other countries, a senior International Atomic Energy Agency (IAEA) official said Monday.

"China has developed quite fast in the nuclear power industry in the past 20 years," said Yury Sokolov, IAEA's deputy director-general and head of the department of nuclear energy.

"In China, in India, you have very definite plans for increasing the nuclear capacity six to 10 times for 20 years, this is really fast growth.

"The growth of the world is not so fast."

Sokolov said he remained positive about the future of nuclear power.

"Now nuclear power exists in 30 countries," he said.

"And 30 to 40 other countries have expressed their willingness to explore nuclear power."

He made the remarks on the sidelines of an IAEA symposium on nuclear power plant management, which opened on Monday.

China started nuclear power operations in 1991, when Qinshan-I, a 300-megawatt (MW) pressurized-water reactor unit, independently developed by China, plugged into the grid.

China has fast-tracked development of nuclear power in recent years with a target to take its nuclear power capacity from about 9,000 MW in 2007 to 40,000 MW by 2020, according to China's long-term development plan for the nuclear power industry.

The Indian Department of Atomic Energy also had plans to increase the country's installed nuclear power capacity, expected to reach 20,000 MW by 2020.

Some Chinese experts said nuclear power was the best choice for China to satisfy its thirst for clean power amid pressure to sustain economic growth.

"The needs for energy consumption as well as for environmental protection are both pressed," Zheng

China Highlights October, 2007

Mingguan, vice-president of Shanghai Nuclear Engineering Research and Design Institute, said.

"Nuclear power is the most suitable choice to meet both needs."

Sun Libin, a scholar with the Institute of Nuclear and New Energy Technology of Tsinghua University, said: "Other forms of new energy, such as wind power and solar power, carry energy density much lower than nuclear power, and are unable to meet the tremendous power demand in China".

Insomnia the 2nd Most Serious Neurological Problem

(CRI, 2007-10-25)

Chinese people don't seem to be catching much sleep. Experts say insomnia has become the second most serious health problem after headaches in neurological diagnoses over the country, afflicting most people between 30 and 50.

According to a study last year on adult sleep quality in six large Chinese cities, about 57 percent of respondents have had sleep disorders over the year. And many of them have insomnia.

Over the past four years, the number of patients treated at the insomnia clinic of the Sleep Disorders Institute at the Shanghai TCM Hospital has increased 3.5 times every year. Last year, it treated more than 18,000 people with sleeping problems, about 50 every day.

People complain to their doctors that when they cannot sleep well at night, they don't feel good during the day. And then they can't sleep well again that night. It's a vicious cycle that haunts people with sleep disorders.

Traditional Chinese Medicine (TCM) doctors are telling people to go to bed early in autumn and winter. Most Chinese believe it is a golden rule for good health.

But new research indicates uninterrupted sleep is more important than the length of time in bed.

Fragmented sleep causes health problems, which could affect the quality of sleep at night.

Different seasons make different times appropriate for going to bed and waking up, TCM doctors say.

And in both autumn and winter, it's better to sleep early and eat certain dishes to keep healthy.

They suggest it's better to fall asleep between 11 pm to 1 am and massage the feet before sleeping if possible.

A new research in the United States indicates sleep does not change much from age 60 onwards; and poor sleep is not because of aging, but mostly because of illnesses or medications used to treat them, says a report in the New York Times.

For the elderly, back pain and arthritis can disrupt their sleep; stomach disorders, emotional states, as well as palpitations and breathing problems brought by cardiovascular diseases can all cause sleeping problems.

RoboCup China Open 2007 Kicks off

(CRI, 2007-10-27)

RoboCup China Open 2007, the top event of intelligent robots in China, kicked off on Friday in Jinan, capital of east China's Shandong Province.

Website sina.com reports that aquatic robot games are new in this year's event, in which robot mermaids will compete with real fish. Aerial robot games are also in RoboCup China Open for the first time. Various aerial robot soldiers will carry out challenging flights and aerial search tasks.

RoboCup China Open is an international event to promote robot research, education and competition in China. The event hopes to foster interests in the development, research and application of applied

China Highlights October, 2007

sci-tech for the young people, and to promote modern sci-tech development and the innovation and development of artificial intelligence and robotics research.

RoboCup China Open 2007 will last till this Sunday.

Prof. LU Yongxiang meets with former MPG vice president (CAS, 2007-10-31)

CAS President LU Yongxiang met with Prof. Gerhard Wegner, former vice president of the Max Planck Society (MPG), on 29 October in Beijing. They reviewed the fruitful progress of cooperation between the two sides over the past three decades, and discussed the possibilities of new cooperation modes in the future.

When talking about the CAS-MPG Partner Institute for Computational Biology, Prof. Lu stressed that CAS will join hands with MPG in promoting the further development of the institute. They also talked about issues such as graduate student systems in the two countries.

Prof. Wegner came to Beijing as a member of international evaluation panel of the CAS Institute of Chemistry (ICCAS). Also present at the meeting was Director-general of the CAS Bureau of International Cooperation LV Yonglong and ICCAS Director WAN Lijun.

6 Information for upcoming Workshops in December

Mainstreaming Wetland Biodiversity Conservation

Date: December 1 – 4 **City:** Yueyang, Hunan Province

<http://www.wetland-gef-cpr98.org/>

International Workshop on Numerical Analysis and Computational Methods for Functional Differential and Integral Equations

Date: December 3 – 6 **City:** Hongkong

<http://www.math.hkbu.edu.hk/budde/>

The 2nd International Workshop on Science and Technology of Crystalline Solar Cells

Date: December 9 – 12 **City:** Xiamen, Fujian Province

<http://phys.xmu.edu.cn/cssc/>

Ninth International Conference on Information and Communications Security (ICICS 2007)

Date: December 12 – 15 **City:** Zhengzhou, Henan Province

<http://www.icics2007.org.cn/EnglishIndex.aspx>

The 3rd International Conference on Mobile Ad-hoc and Sensor Networks (MSN'2007)

Date: December 12 – 14 **City:** Beijing

<http://conference.bjtu.edu.cn/>

International Workshop on Molecular Structure and Dynamics of Interfacial Water

Date: December 14 – 18 **City:** Shanghai

China Highlights October, 2007

<http://www.sinap.ac.cn/Water07/>

The 2007 International Conference 2007 on Information Computing and Automation

Date: December 14 – 17 **City:** Chengdu, Sichuan Province

<http://www.icica.org.cn/>

2007 International Conference on Robotics and Biomimetics (ROBIO 2007)

Date: December 15 – 18 **City:** Sanya, Hainan Province

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

2007 International Conference on Computational Intelligence and Security (CIS'2007)

Date: December 15 – 19 **City:** Harbin, Heilongjiang Province

<http://cis2007.hit.edu.cn/>

Abbreviations

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