

Content

Science news from Chinese media in March 2009
 collected and compiled by the Helmholtz Beijing Office
 (Released: 10.April 2009)

1 Science News	3
1.1 Energy	3
Chinese Expert Warns of Nuclear Talents Vacuum	3
Test run of China's large-scale crop stalk biogas project declared a success.....	3
Independent Renewable Energy Station Built in Zhuhai.....	4
China Develops World's First "Synthesis Glycol from Coal" Technology	4
Green Energy: Tailor Made Catalysts.....	5
1.2 Earth and Environment	5
China's New Geo-stationary Weather Satellite Finishes Testing.....	5
Zhejiang Province launches pilot program for pollutant emissions rights trading	6
CAS Opens Key Laboratory of Tropical Forest Ecology.....	6
China Plans Manned Plunge to 7,000 Meters below Sea Level.....	6
Dam Construction Affects Ecosystem in Three Gorges Area.....	7
Scientists Seeking Truth Behind Birds Immigrating East	7
Large deposit of tungsten ore found in east China	8
1.3 Health	9
China launches second phase AIDS vaccine clinical trial.....	9
Individualized Diagnosis: How Far Away Is It?.....	9
1.4 Key Technologies	10
New Infrared Horizon Sensor Succeed in On-orbit Test	10
New Alloy Produced by Joint Research Team	10
1.5 Structure of Matter	11
In-Vacuum Undulator Developed in SSR.....	11
Shanghai Synchrotron Radiation Facility to Start Service in April	11
China to Launch First Space Telescope in Two Years	12
1.6 Transport and Space	13
Unmanned space module to be launched in 2010, await space docking	13
China's Lunar Probe Chang'e-1 Impacts Moon.....	14
Shenzhen to build 4 to 5 satellites every year	14

China Highlights March 2009

Scientists: China should integrate space resources to improve emergency response	15
China's jumbo rocket "carrying capacity factor" world's second largest: expert.....	16
China to Land Probe on Moon at Latest in 2013.....	17
China selects taikonauts for first space station.....	17
Chang'e-2 to Take Photos of Moon Pit Made by Chang'e-1	18
China Plans to Launch Shenzhou-8, Shenzhou-9 Spacecraft in 2011	18
China to Launch 15 to 16 Satellites in 2009.....	19
China's Shenzhou-8 Spacecraft to Carry Bio Sample for European Space Agency	19
China Able to Send Man to Moon around 2020: Expert	20
Aerospace becomes new growth area for China's economy.....	20
Satellites Will Help Predict Disasters.....	22
2 News from Universities.....	23
Chinese company establishes scholarship for aerospace research.....	23
University to Open Special Class for Mathematic Talents	23
Survey: Gap between China's rural and urban education levels huge	23
China sends 180,000 students overseas in 2008.....	24
3 Innovation Management.....	25
Getting to the root of the problem of academic plagiarism	25
4 China's International Science Cooperation	26
CECO Meets with Director of International Affairs & Innovation, EUR	26
China, Russia Establish Joint Mars Exploration Team.....	27
Brazil, China to cooperate in developing genetically-modified cassavas	27
Nigeria, China sign pact to replace faulty satellite by 2011	28
5 Miscellaneous.....	28
China launches most advanced maritime patrol ship	28
China's first panda disease control center to be complete by 2010	错误! 未定义书签。
China's Silicon Valley to set up national innovation zone.....	26
China releases fish into Yangtze River to replenish ecosystem.....	29
"China Tomorrow" innovation & technology initiative launched in UK.....	29
China's manned space flight team rewarded U.S. Space Achievement Award.....	30
Abbreviations.....	31

1 Science News

1.1 Energy

Chinese Expert Warns of Nuclear Talents Vacuum

(CAS, 2009-03-04)

China is in great need of nuclear science talents from the young generation, a nuclear physicist said here on Tuesday.

Zhu Zhiyuan, director of the Chinese Academy of Sciences Shanghai Branch, said China must step up efforts to attract and cultivate more young nuclear talents, in order to meet the demand of the country's future development.

China, realizing the huge potential of the nuclear power as a "clean energy", has already strengthened nuclear science education in recent years, said Zhu, who is here to attend the annual session of the National People's Congress, China's top legislative body.

However, these efforts could not at once make up for the lack of nuclear specialist education in the country caused by previous insufficient attention towards the field for more than a decade.

"Many young people at the time were simply afraid of nuclear technologies, while others assumed the prospect of nuclear power as unpromising," Zhu said.

Even now, few of the students enrolled in nuclear physics departments of Chinese universities or research institutes chose the field as their top choice, Zhu said, adding that he himself chose the subject inspired by Nobel Laureate Lee Tsung-Dao and Yang Chen-ning back in the 1970s along with many youths of his age.

He said the country's development of nuclear power and the civil or medical use of nuclear technologies are both indispensable from the cultivation of nuclear talents.

"China now needs a batch of young ambitious people to devote themselves to the nuclear science, to explore the world of physics," Zhu said.

Test run of China's large-scale crop stalk biogas project declared a success

(People's Daily, 2009-03-10)

A large-scale crop stalk biomass gasification project, which owns China's own proprietary intellectual property rights, has had a successful trial run, according to the Ministry of Agriculture.

The Ministry of Agriculture has also fully initiated evaluations on crop stalk resources. Based on this, a national database for crop stalk resources is to be established.

The crop stalk gasification aims to convert crop stalks into biogas, through microorganism fermentation under anaerobic conditions. Raw materials from abundant resources can be utilized and blended together in a flexible way. Stalks from rice, wheat, corn and other crops, as well as rural domestic garbage and organic waste from fruit and vegetables can be used in this project.

China has a large quantity and a vast variety of crop stalks, which are widely distributed across the country, said Bai Jinming, director-general of the Science and Education Department of the Ministry of Agriculture.

China's annual output of crop stalks is nearly 700 million tons. Therefore, fully utilizing the stalks

can help save resources, prevent environmental pollution, promote structural readjustment and increase farmers' income. In addition, it can also help to provide raw materials for gasification to farming families that do not raise pigs.

Experimental projects using crop stalk gasification technology have been established in 12 provinces nationwide in recent years. Several major techniques worthy of promotion have been chosen from these trial programs. For instance, a Shandong-based experimental project adopted fermentation technology developed by the Beijing University of Chemical Technology, and can now produce 400 cubic meters of methane in one day for 375 households.

Independent Renewable Energy Station Built in Zhuhai

(CAS, 2009-03-12)

An independent power station which integrates solar, wind and tidal power went into service on Langan Island near Zhuhai, Guangdong Province.

The Guangzhou Institute of Energy Conversion (GIEC), Chinese Academy of Sciences (CAS) designed and built the station, the first of its kind in the world which combines the three renewable energy.

The station is superior and innovative in terms of system integration, withstanding typhoon and energy utilization efficiency thanks to many patented technologies of GIEC.

The station has a power generation capacity of 105KW (wind power 90kw, tidal power 10kw and solar power 5kw), and a standby diesel generator set with power generation capacity of 100kw.

With an annual energy production of 100, 000 kwh, it could provide enough electricity for about 300 permanent residents on the island round the clock. At the same time, energy is also used to produce fresh water out of sea water. 100, 000 ton of fresh water is produced annually.

The station's operation data showed that wind power alone generates enough electricity for spring, autumn and winter, yet diesel generator set is needed to yield electricity to complement energy supply in summer.

However, the station could meet the electricity demand of the entire island after the tidal and solar power generation settings were set in full performance.

Such a station benefits not only the island's economy but also its environment. Statistics showed it could decrease the consumption of diesel by 42 ton and the emission of carbon dioxide by 130 ton each year.

China Develops World's First "Synthesis Glycol from Coal" Technology

(CAS, 2009-03-25)

Researchers at the Chinese Academy of Sciences (CAS) have developed for the first time in the world a technology, which can produce glycol in ten thousand tons. CAS invited an expert committee recently to evaluate the result.

The technology can synthesize oxalate through phase catalysis of CO gas and then synthesize glycol by catalytic hydrogenation of oxalate, according to researchers at Fujian Institute of Research on the Structure of Matter (FIRSM), CAS.

Application of the technology, which synthesizes glycol from coal instead of petroleum ethylene, suits the situation of energy structure in China. The country lacks oil and gas resources, while having abundant coal resources.

The technology takes CO, NO, H₂O₂ and ethanol as raw materials, and could help build glycol production on large scale, experts said.

The first of its kind in the world, the technology will help relieve the imbalance between glycol supply and demand in China and bring positive effect to the country's energy and chemical industry.

Green Energy: Tailor Made Catalysts (CAS, 2009-03-30)

Titanium dioxide (TiO₂) catalysts are widely used for producing hydrogen gas for fuel cells. TiO₂ is a photoactive material that converts sunlight into electronic charge, and then uses these charges to electrochemically split water into hydrogen and oxygen gas. Now, Jingbo Li and colleagues at the Chinese Academy of Science in Beijing and collaborators in the USA have designed a way to enhance TiO₂ catalytic efficiency by doping the crystal with pairs of atoms¹.

Electrons in semiconductors such as TiO₂, can only exist within certain allowed energy ranges, known as bands. To generate charge, a photon of light must excite an electron from the valence band—which is full of electrons—to the mostly empty and higher energy, conduction band. In TiO₂, most wavelengths of light do not have sufficient energy to excite electrons across the gap between bands, thereby making the catalytic splitting of water inefficient.

Experiments have shown that substituting atoms, such as nitrogen for oxygen, or a new transition metal for titanium, into the TiO₂ crystal structure reduces the optical bandgap. However, efficiencies remain low because these single chemical dopants localize the excited charges and prevent the electrochemical reaction from proceeding.

Using detailed theoretical analysis, Li's team discovered that specific pairs of chemical dopants, such as molybdenum and carbon (Mo+C), created new electronic bands in TiO₂ that improved the water-splitting efficiency.

"In our calculations, one Ti atom and one O atom were substituted simultaneously by (Mo+C) pairs in a 48-atom supercell representing the entire crystal," says Li. While the researchers examined many types of dopants, only the (Mo+C) pair decreased the bandgap by more than a third while retaining high catalytic activity.

The researchers found that pairing dopants stopped any localization effects, allowing charge to be transferred to the water-splitting reaction. "We expect the carrier lifetime in our passivated codoped system should be longer than in unpassivated systems with single dopants," says Li.

The design principle outlined by Li is applicable to many other semiconductors and catalysts. "Due to developments in first-principles theory and computational power, computer-aided, knowledge-based design of materials is now possible. This has become a vital tool for accelerating scientific discovery," says Li.

1.2 Earth and Environment

China's New Geo-stationary Weather Satellite Finishes Testing (CAS, 2009-03-03)

China's new geo-stationary meteorological satellite, Fengyun-2E, finished in-orbit testing at the end

China Highlights March 2009

of February, the China Meteorological Administration (CMA) said Monday.

"Fengyun-2E demonstrated stable operation and successfully performed all its functions, including image capture and broadcast, data collection and space environment monitoring," said CMA official Zhao Licheng.

Compared with its predecessors, Fengyun-2E showed improvement in 32 key technologies, said Zhao.

Test results showed the quality of visible light images captured by the new satellite were an improvement over those of its predecessors, while the scattered radiation on infrared images was reduced by 30 percent to 40 percent compared with Fengyun-2D, said Zhao.

Fengyun-2E would enter into in-orbit save-and-back-up mode. It would replace Fengyun-2C, which was due for retirement after four years of service, said Zhao.

The satellite, designed to monitor weather and natural disasters, was launched on Dec. 23 on a Long March-3A carrier rocket from the Xichang Satellite Launch Center in southwestern Sichuan Province.

The 1,390-kg craft was developed by the Shanghai Academy of Space flight Technology, affiliated with the China Aerospace Science and Technology.

Zhejiang Province launches pilot program for pollutant emissions rights trading

(People's Daily, 2009-03-06)

On March 2, Zhejiang Province launched a pilot program for the compensated use and trade of emissions rights for major pollutants, announced the Ministry of Finance.

The pilot program includes the emissions rights for chemical oxygen demand (COD) in Hangzhou, Jiaxing and Huzhou, all in the Taihu Lake Basin, as well as in the Qiantang River Basin, and the emissions rights for sulfur dioxide throughout Zhejiang.

Prior to this, Jiangsu Province and Tianjin municipality have carried out pilot programs for the compensated use and trade of pollutant emissions rights.

The goal of this pilot program is to raise resource allocation efficiency, increase the reduction of pollutant emissions and improve the quality of the environment.

CAS Opens Key Laboratory of Tropical Forest Ecology

(CAS, 2009-03-09)

Chinese Academy of Sciences (CAS) set up the Key Laboratory of Tropical Forest Ecology in Xishuangbanna Tropical Botanical Garden (XTBG) CAS in southwest China's Yunnan Province on March 1.

A ceremony and an academic symposium were held to mark the opening of the lab.

At the first academic meeting, Prof. Cao Min introduced the research orientation, teams and medium and long-term plans of the Laboratory. Prof. Chen Jin conferred appointment letters to members of the Academic Committee.

After the ceremony, four scientists including Prof. Feng Yulong, Prof. Chuck Cannon, Prof. Chen Jin and Prof. Douglas W. Yu made lectures on their recent research advances.

China Plans Manned Plunge to 7,000 Meters below Sea Level

(CAS, 2009-03-10)

China Highlights March 2009

While preparing to launch its first space station in 2011, China is also working on an ambitious ocean exploration program that may send men to 7,000 meters deep into the ocean, for the first time in the world.

Sun Zhihui, director of the State Oceanic Administration, said on Monday that a deep-sea manned submersible for the mission has been assembled last year and the test would begin this year.

If successful, the China-made submersible would be the first manned vehicle to reach such a depth. So far, manned submersibles could only descend to 6,500 meters below the sea level.

According to Sun, the submersible could carry a crew of up to three people, and would play an important role in deep-sea exploration of natural resources and polar researches.

Sun did not give a specific timetable for the test, saying it was still in discussion.

The average depth of the world ocean is about 3,790 meters below the sea level.

Dam Construction Affects Ecosystem in Three Gorges Area

(CAS, 2009-03-11)

Chinese researchers have discovered that dam construction could damage the ecosystem in a long period of time through a case study at a branch of the Yangtze River in Three Gorges Area.

Wu Naicheng from Institute of Hydrobiology, Chinese Academy of Sciences (CAS) published his findings in the Journal of the North American Benthological Society with the title "Changes in benthic algal communities following construction of a run-of-river dam".

Wu and his colleagues examined the responses of the benthic algal communities in downstream reaches of a tributary of the Xiangxi River, which was located in the Three Gorges Area in central China's Hubei Province to the construction of a small run-of-river dam.

They monitored benthic algae, chemical factors, and habitat characteristics both at the upstream and downstream of the dam site from February 2003 to August 2006.

It was found that the overall algal assemblage structure downstream of the dam sites was similar to that of upstream control sites before dam construction and for one year afterwards. However, sites belonging to upstream and downstream reaches became quite different in the algal structure in the 2nd and 3rd years after dam construction.

The results suggest that the impact of dam construction on benthic algal communities took 2 to 3 years to emerge. Based on this finding, the research provided reference for building and managing small dams in mountainous areas and approved the importance of long-term observation of ecosystem.

This research constitutes part of the NSFC (National Natural Science Foundation of China) key program--ecosystem damage caused by dam clusters and its restoration mechanism--a case study of Xiangxi River.

The program was carried out by Field Station for Ecosystem in Xiangxi River that was supported by CAS and the China Three Gorges Project Corporation.

Scientists Seeking Truth Behind Birds Immigrating East

(CAS, 2009-03-25)

It was reported weeks ago that *Carduelis chloris*, an originally European bird, had become the breeding and resident birds in Xinjiang Autonomous Region. Further details and discoveries focused experts' attention on the biological invasion this phenomenon could possibly stand for and its causes

and consequences.

There are many other birds that have become the breeding and resident birds in Xinjiang. Among them are *Emberiza citronella*, Common Myna, *Carduelis spinus*, Pied Flycatcher *Ficedula hypoleuca*, European Robin *Erithacus rubecula*, Rufous Bush-Robin *Cercotrichas galactotes*, *Fringilla montifringilla* and *Fringilla coelebs* Chaffinch.

At the same time birds that originally live in Yili Valley, Xinjinag Autonomous Region are also immigrating eastward, for example, Lesser Grey Shrike *Lanius minor*, *Merops apiaster* and Common Starling. Among them, Common Starling was even spotted in Heilongjiang Province in the northeast of China.

"*Carduelis chloris* ranks top 10 of European main birds. Its expansion in Xinjiang is typical biological invasion", said Ma Ming, researcher from Xinjiang Institute of Geography and Ecology (XIEG), Chinese Academy of Sciences (CAS).

Birds usually fly to the south in winter and fly back to the south for breeding in spring, but in the case of the birds mentioned above, they are traveling on the same latitude across the longitude. Usually tropical birds cannot survive in Xinjiang's cold weather, but it was observed that some tropical birds were spreading in Xinjiang, for example, Common Myna. It used to live in the oriental region. Years ago, it was brought to Almaty City, Kazakhstan and then release to the wild. Recently it crossed the borderline and immigrated to Xinjinag.

Ma Ming speculated that these birds might have been moving from where it originally lived in a radical pattern, in Xinjiang's case, eastward. But the reason for such immigration remains unknown.

Another riddle puzzled the bird experts more. The exotic birds even show more adaptive skills than the local birds. It is hard to find a Goldfinch *Carduelis carduelis* after the invasion of *Carduelis chloris*, and the invasive Common Myna marginalizes Common Starling.

It is still open to research how xinjiang can host such birds no matter they are from Europe or tropical areas. It might be able to provide proof for global climate change and shed light on species selection, noted Ma.

Large deposit of tungsten ore found in east China

(Xinhua Net, 2009-03-26)

A large deposit of tungsten ore with a proved reserve of 96,200 tonnes has been verified in east China's Anhui Province, local geologists said Thursday.

The finding in Qimen County is an important one for the country as only 144,000 tonnes of tungsten ore have been found between 2001 and 2007, said Hao Changrong, head of No. 332 Geology Team that prospects ore in the south of Anhui Province.

China's tungsten reserve is mainly in the provinces of Hunan, Jiangxi and Henan, which jointly account for 61.37 percent of the total national reserve.

The deposit in Qimen indicates that more ore could be found in the southern parts of Anhui, Jiangxi's neighbour, Hao said.

China, along with Russia, Canada and the United States, is a major tungsten producer in the world. It holds 40.5 percent of the world's proved reserves.

1.3 Health

China launches second phase AIDS vaccine clinical trial

(Xinhua Net, 2009-03-21)

Chinese scientists said on Saturday that they need to enroll more volunteers for a human test of the AIDS vaccine, as the research has moved into the second phase.

An inauguration ceremony of the second-phase research was launched on Saturday in this capital of south China's Guangxi Zhuang Autonomous Region, where the first group of 49 volunteers received the AIDS vaccine in May 2005.

"The recipients of the vaccine do not show any signs of adverse affects. Immune tests for the vaccine have also proved favorable results," said Professor Kong Wei, one of the team leaders of the program, at the event.

He said the first group of volunteers was aged between 18 and 50 when they received the vaccine. More than half of them were students from the Guangxi University of Medical Science, and others were government employees.

Dong Baiqing, head of the Guangxi Center of Disease Control and Prevention, which takes charge of the research, said researchers planned to enroll another 30 volunteers for the second-phase vaccine trial.

According to scientists, AIDS vaccine must undergo three phases of clinical trials before going into production. The first phase is focused on safety, the second phase on assessing both safety and the immunity rate of the vaccine, and the third on assessing the protection it offers for high-risk groups.

China's AIDS vaccine research started in 1996. The Ministry of Science and Technology announced the country's first phase AIDS vaccine passed clinical test in August 2006.

Figures from the Ministry of Health showed that by the end of 2008, China had reported 276,630 AIDS cases with 38,100 deaths.

Individualized Diagnosis: How Far Away Is It?

(CAS, 2009-03-23)

Scholars gathered to discuss individualized diagnosis and treatment of diseases at the 344th Session of the Xiangshan Science Conferences (XSSC), which convened from 17 to 19 March in Beijing.

The meeting aimed to enhance the understanding of individualized treatment, explore its concept and development, and provide scientific basis for decision-makers to promote the preventive treatment.

The concept of individualized treatment represents the future trend of medical science. It has been gradually accepted by medical practitioners, and become a common concern in western medicine, traditional Chinese medicine and integrated medicine. Yet its implementation depends on finding appropriate methods and approaches.

Traditional Chinese medicine regards "treatment based on different syndrome" as a major approach to individualized treatment while modern medical science addresses the issue from the perspective of genetics. However, neither of them catches its full meaning. The key question is: what is individualized treatment? The answer involves individual differences, group convergence, and relevance between various individuals and diseases. In recent years, the constitution theory of the traditional Chinese medicine divides people into groups of different physical conditions, and thereby

probes the relationships between individual constitution and physical health as well as the mechanisms of the disease prevention via physical constitution interference. These attempts somehow shed light on how to promote large-scale individualized treatment.

Scholars and experts of various disciplines discussed at the meeting the significance and development of individualized treatment, ideas and methods for its implementation, key techniques and practice, and its relations with traditional Chinese medicine.

The XSSC was initiated by the former State Science and Technology Commission, now the Ministry of Science and Technology of China (MOST). It was officially inaugurated in 1993 under the joint sponsorship of MOST and the Chinese Academy of Sciences (CAS).

XSSC stands for a series of small-scale academic workshops, with the objective of promoting free academic exchanges and discussions, fostering interdisciplinary cooperation and integrated studies in various areas of excellence and exploring new frontiers.

1.4 Key Technologies

New Infrared Horizon Sensor Succeed in On-orbit Test (CAS, 2009-03-04)

A new infrared static earth sensor boarded on No. 3 testing satellite has successfully transmitted world's first IR picture of the earth with a wave-band of 13.5 μ m-16.25 μ m recently.

The sensor was developed by Shanghai Institute of Technical Physics, Chinese Academy of Sciences. The test proved that it was superior to common scanning horizon sensor in measuring accuracy.

Based on the FPA infrared detector technology, the infrared static earth sensor is one of the testing items boarded on the No. 3 testing satellite. It weights 2kg and the power consumption is less than 5W.

New Alloy Produced by Joint Research Team (CAS, 2009-03-17)

Combining different metals could create alloy with properties superior to both metals, but that is not true of all metals. Recently an international research team discovered that previously impossible alloys can be created by subjecting atoms to high pressure.

Carnegie Institution 's Mao Ho-kwang, also academician of Chinese Academy of Sciences (CAS) and Jiang Jian-zhong of the International Center for New-Structured Materials, Zhejiang University, China, led the research. The related paper was published in the Proceedings of the National Academy of Sciences.

Previous studies have shown that at pressure thousand of times larger than atmospheric pressure atoms will undergo properties change and form new alloys. Both cerium and aluminum form many useful alloys with other metals, but a cerium-aluminum alloy appeared to be mission impossible. However, Metallic glass began to show the properties of an alloy when high-pressure experiments on a sample of cerium-aluminum. The net result is that both size and electronic structure are put in range that the cerium and aluminum atoms form an alloy.

A lot of high pressure materials can be made, but once the pressure is reduced they go back to their original form. People cannot make anything useful from those materials. But this alloy is quenchable,

meaning that the alloy persists when the pressure is gone, and that creates possibilities, noted Mao. The researchers are currently investigating the properties of the new alloy.

Mao notes that the success in producing this new alloy implies that other potentially useful combinations can be made under high pressure. It opens up possibilities for new materials in the future.

1.5 Structure of Matter

In-Vacuum Undulator Developed in SSR (CAS, 2009-03-03)



Commissioning of the Hard X-ray Microfocus Beamline (BL15U1), which is the first in-vacuum undulator beamline at Shanghai Synchrotron Radiation Facility (SSRF), began at 19:00pm on February 6, 2009. The X-ray beam was observed immediately on the fluorescent screen and XBPM at beamline. At 21:30pm, a monochromatic beam at 5.4 keV (the third harmonic) was detected at the endstation, denoting the success of the first step commissioning.

In the following days, the harmonic spectrum of undulator light source was measured. Tests of the near K-edge absorption of copper foil and X-ray fluorescence for standard reference samples of trace elements, SRM610 (500ppm) and RM614 (1ppm), have been carried out.

As a light source equipment of this beam line, the undulator is the first in-vacuum type undulator developed in China.

The design, assembly and shimming are carried out in the Shanghai Institute of Applied Physics, Chinese Academy of Sciences (CAS). The in-vacuum undulator is complex equipment combined with many high techniques, including high quality magnet, ultra high vacuum, high precision mechanical driving and control, etc. This undulator has a hybrid type magnet arrangement with a period length of 25mm and a number of periods of 80. The minimum operation gap is 7mm and the maximum peak magnetic field is 0.95T. All the magnet blocks and poles, as well as the holders and girders are located inside of the vacuum chamber. Double motors driving system is adopted to adjust the gap in parallel mode and taper mode.

The development of the undulator was started at the beginning of March 2008 and completed in January 2009. It was installed in the storage ring on January 28. A brilliant quasi-monochromatic hard X-ray to eleventh harmonic was obtained in the detector at the end of the beam line. The commissioning results show that the phase error of the undulator is around 4 degrees.

Shanghai Synchrotron Radiation Facility to Start Service in April (CAS, 2009-03-17)



Shanghai Synchrotron Radiation Facility (SSRF), a third-generation of synchrotron radiation light source, will be completed and put into use in April, according to Shanghai Institute of Applied Physics (SINAP) of Chinese Academy of Sciences (CAS).

Three accelerators of the project, a 150MeV electron LINAC, a booster that can increase the electron energy from 150MeV to 3.5GeV in 0.5 second, and a 3.5GeV electron storage ring have all been installed, and passed tests and adjustment.

SSRF is the biggest scientific platform for science

research in China up to now. The construction of the project started on Dec 25th, 2004 in Shanghai, and cost 1,200 million yuan.

The project also includes 7 initial beamlines and experimental stations. These 7 beamlines are used for macromolecular crystallography, XAFS, hard X-ray microfocus, X-ray imaging and biomedical application, soft X-ray spectromicroscopy, diffraction and small angle X-ray scattering respectively. The former five beamlines are based on insertion devices, and other two based on bending magnets.

More than hundreds of scientists and engineers from universities, institutes and industries in domestic and even overseas will be able to use the facility to do research and experiments. SINAP has received more than 140 applications for using the beamlines and experimental stations.

The mega experimental platform will then help carry out research on life sciences, medicine and pharmacy, new material, physics, chemistry, petrochemical industry and biotechnology.

China to Launch First Space Telescope in Two Years (CAS, 2009-03-26)

China will launch its first space telescope in 2010 or 2011. The Hard X-ray Modulation Telescope (HXMT) will have the highest sensitivity and space resolution among all the space telescopes in the world.

It will perform an all-sky hard X-ray survey, and observe important cosmic X-ray sources including black holes and neutron stars.

A solar space telescope was also included in the country's national scientific research plan to help boost space astronomical observation, said Su Dingqiang, a member of the Chinese Academy of Sciences (CAS).

The launch of HXMT will help China achieve a breakthrough in astronomical observation. The Ministry of Science and Technology of China, the CAS and Tsinghua University began to support the first phase of study on the HXMT mission in 2000.

So far, all the key technical difficulties of the telescope have been conquered, and the ground model of HXMT has been constructed. The balloon borne flight tests were also completed.

"There is no key technical difficulty that needs to be tackled. Therefore, HXMT is almost ready for launch," said Su.

Atmosphere layer of the earth will block traditional ground astronomical observation. Perturbation of the atmosphere will affect the resolving capability of the telescope, and the atmosphere layer may barrier radiation of many celestial bodies, explained Su.

However, a telescope can receive signals of all wave bands when launched into the space and provide observation more comprehensively and more exactly.

China has made great progress in construction of ground telescopes. The country built the Large Sky Area Multi-Object Fiber Spectroscopic Telescope (LAMOST), the world's biggest optical telescope in November, 2008. A Five-hundred-meter Aperture Spherical Telescope (FAST), the largest in the world, started construction last year and will be accomplished in 2014.

The country is even planning to launch a telescope with the caliber of 15 to 30 meters in Dome Argus of Antarctic. The telescope will carry out automatic observation in three wave bands of optics, infrared and sub-MM.

1.6 Transport and Space

Unmanned space module to be launched in 2010, await space docking (CRI, 2009-03-01)

China plans to launch an unmanned space module into orbit as early as the end of 2010.

It is expected to meet with another unmanned spacecraft, Shenzhou-8, which is scheduled to be launched in early 2011. It would be the country's first space docking.

A spokesman with China's space program said Saturday that scientists on the ground would control the space docking between the orbiter and the unmanned spaceship.

The module, named Tiangong-1, is designed to provide a "safe room" for Chinese astronauts to live and conduct scientific research in zero gravity.

Weighing about 8.5 tonnes, Tiangong-1 is able to perform long-term unattended operation, which will be an essential step toward building a space station.

Xinhua has learned that a prototype of the module is almost completed and scientists have started to upgrade and renovate ground service equipment for the unmanned space module.

After successfully sending spacecraft Shenzhou-5, piloted by the country's first taikonaut (a Chinese term for astronaut) in 2003, China has sped up its space program. Its goal is to run its own space station.

Chinese scientists began prototype research the space docking in 2007.

The priority for this year is to assemble prototypes of Tiangong-1, Shenzhou-8 and their carrier rocket. They also plan to build a new Long March 2F, which was used to propel three astronauts in the Shenzhou-7 mission last year.

The space program, carried out by the People's Liberation Army's General Armament Department, also aims to finish experiments on coordination of different systems of the Tiangong-1 mission this year.

Space docking technology has been widely recognized as one of the most sophisticated space skills as it requires precise controlling of two high-speed spacecraft which meet and dock in space.

China has already tested launched unmanned space orbiters. Before the Shenzhou-5 mission, in which then Yang Liwei made China the world's third country to master manned spaceflight, four other unmanned experimental spaceships had been tested.

Paralleling research of the space module, China achieved a major leap in its manned space activity in the third manned mission Shenzhou-7 last year when Zhai Zhigang made the country's first

spacewalk.

To realize the ultimate goal of building a permanent space laboratory that allows astronauts to conduct larger scale experiments, Chinese scientists will encounter further obstacles such as to produce its own reusable spacecraft.

During China's latest space mission, the chief designer of the spacecraft system Zhang Bainan said China would begin the mass production of its Shenzhou spacecraft starting from the Shenzhou-8 mission.

Zhang said the mass-produced model would serve as a space shuttle between China's space station and the ground, and may also transport astronauts and cargo for other countries.

The transportation vehicles currently in use between space stations and the ground are mainly space shuttles of the United States and Russia's Soyuz spacecraft.

China's Lunar Probe Chang'e-1 Impacts Moon

(CAS, 2009-03-03)

Chang'e-1, China's first lunar probe, impacted the moon at 4:13 p.m. Beijing Time (0813 GMT) Sunday, said sources with the State Administration of Science, Technology and Industry for National Defense.

The satellite ended its 16-month mission Sunday when it hit the lunar surface at 1.50 degrees south latitude and 52.36 degrees east longitude.

Chang'e-1 began to reduce its speed at 3:36 p.m. Beijing Time (0736 GMT) under remote control by two observation and control stations in east China's Qingdao and northwest China's Kashi.

This was the first phase of China's three-stage moon mission, which will lead to a landing and launch of a rover vehicle around 2012.

Chang'e-1 was launched into space on Oct. 24, 2007, and sent the first full map of the moon's surface back to China one month later.

A dozen performance tests were carried out while Chang'e-1 was in orbit to find out its orbit adjustment capability.

The planned impact was designed to accumulate experience for landing of China's second lunar probe.

"The second phase of the space program aims at soft landing, and the preparation is currently in progress", said Wu Weiren, chief designer of the country's lunar probe program.

In the third phase, another rover will land on the moon and bring back mineral samples for scientific research in 2017.

"Chang'e" is named after a legendary Chinese moon goddess.

Wu noted the success in the mission of Chang'e-1 had realized the dream of the whole nation and pushed forward the development of science and technology. It also proved China was capable of exploring the outer space, he added.

China is the third nation, after the U.S. and Russia, to launch people into space after Yang Liwei was put into orbit aboard the spaceship Shenzhou-5 on October 15, 2003. Another three astronauts were sent into space in Shenzhou-7 and carried out the country's first space walk in September of last year.

Shenzhen to build 4 to 5 satellites every year

(Xinhua Net, 2009-03-03)

China Highlights March 2009

The aerospace industry is expected to one day become the new growth engine of Shenzhen's economy with the establishment of a satellite manufacturing company on Sunday.

Upon completion, Shenzhen Aerospace Spacesat Co. Ltd. is expected to develop six to eight types of satellites and produce four to five satellites every year. The satellites will be used for global navigation, telecommunications, remote sensing and space exploration.

The enterprise was jointly founded by China Spacesat Co. Ltd., Harbin Institute of Technology and Shenzhen Aerospace Science and Technology Research Institute. It will be part of a research, development and manufacturing base for the aerospace industry in Shenzhen, company officials said Sunday.

A research institute subordinate to China Aerospace Science and Technology Corp., the main contractor for the Chinese space programs, will also move into the base in Shenzhen. On Sunday, national and city government officials broke ground for the Satellite Building, an infrastructure project at the base in the Shenzhen Hi-Tech Industrial Park. Costing 160 million yuan (23.39 million U.S. dollars), the 250,000-square-meter building will be used for research, development, designing, packing, testing and manufacturing related to satellites.

"Shenzhen has always attached great importance to the aerospace industry, which can gradually become the new growth engine of the city's economy," said Mayor Xu Zongheng. "With the backdrop of the global financial crisis, this new project can turn challenges into opportunities with the joint efforts of the three parties involved."

An aerospace industry chain will be formed in Shenzhen after the research institute of China Aerospace Science and Technology Corp. moves into the base, analysts said. The base in Shenzhen will also be capable of developing and testing some core components and accessories of satellites, according to Ma Xingrui, general manager of China Aerospace Science and Technology Corp.

It was reported previously that the State-owned company will gradually move its core business of space manufacturing and aerospace technology applications to Shenzhen.

Scientists: China should integrate space resources to improve emergency response

(Xinhua Net, 2009-03-03)

China's space scientists have urged the country to create a national emergency response system against natural disasters based on integrated use of space technology resources.

Space installations could play an important role in time of emergency, while ground facilities are vulnerable to damage in natural disasters, Ye Peijian, chief designer of China's first moon probe, said Tuesday.

He made the remarks on the sidelines of the annual session of the National Committee of the Chinese People's Political Consultative Conference (CPPCC) on Tuesday.

The top political advisory body opened the session Tuesday afternoon.

Space installations can keep unaffected in natural disasters, but ground facilities-supported communication signals could be disturbed in case of mud-rock flow, earthquake or typhoons, the CPPCC National Committee member said.

The May 12 earthquake last year in southwest China has fully demonstrated the function of space technologies, said Ye, citing the use of communication, navigation and remote sensing satellites in quake relief efforts.

Qi Faren, former chief designer of China's Shenzhou spaceships, said the No. 1 Beidou Navigation

China Highlights March 2009

Satellite terminal made it possible for rescue teams to enter the quake center after the quake cut off roads and communication.

Divided management of the satellites among different departments, however, may hamper the full play of such space resources in natural disasters prevention and relief, said Ye.

For example, weather satellites are managed by the China Meteorological Administration, and oceanic satellites by the State Oceanic Administration, according to Ye.

"Under such divided management, it's impossible to efficiently coordinate all the satellites in a short notice in case of natural disasters, and it would take a long time to collect necessary information from the satellites to do the analysis," he added.

Qi, also a member of the CPPCC National Committee, echoed Ye's view.

"China now has more than 30 satellites in space, and the country should speed up the integration of the resources to serve economic development and help improve people's life," Qi said.

Ye, Qi and some of their colleagues have jointly submitted a proposal to the session, urging the integration.

China's jumbo rocket "carrying capacity factor" world's second largest: expert (Xinhua Net, 2009-03-03)

A Chinese space expert said here on Tuesday that China's Long March 5 large-thrust carrier rocket, currently under development and scheduled to be put into service in 2014, uses less fuel for the same load than any other rocket in the world except Boeing's Delta 4 Heavy.

The jumbo rocket's "carrying capacity factor" -- a key parameter reflecting rocket's performance -- was "the world's second largest", said Liang Xiaohong, vice president of the China Academy of Launch Vehicle Technology.

The Long March 5's "carrying capacity factor" is 0.0146 while Boeing's Delta 4 Heavy is 0.0175, the world's largest, he said.

When carrying the same load, a rocket with a higher factor needs less fuel, said Liang, also a member of the 11th National Committee of the Chinese People's Political Consultative Conference (CPPCC), China's top political advisory body, which opened its annual session on Tuesday.

With a maximum payload capacity of 25 tonnes, Long March 5 is expected to be able to send lunar rovers, large satellites and space stations into space after 2014.

Liang said "the rocket is currently China's best with the largest payload among the nation's rocket lineup" and was expected to deliver astronauts onto moon.

He said last year the first launch of the Long March 5 is most likely to happen in Wenchang of the southernmost island province of Hainan, where a new satellite launch center is under construction.

The new launch center, scheduled to be put into operation in 2014, is close to the equator and hence save rocket fuel.

Liang said the development of the carrier rocket would produce a "leap forward" in China's rocket technology, in terms of performance and payload.

The Chinese government approved the development of the rocket in 2007 following two decades of feasibility study. It will be manufactured at a facility in Tianjin, a coastal city near Beijing.

China currently employs its self-developed Long March 3 series rocket for most space missions, including delivering the country's first lunar probe Chang'e-1 in October 2007.

The country's first spacewalk by Zhai Zhigang greatly inspired the nation in September. Earlier

China Highlights March 2009

reports said the priority for this year is to assemble prototypes of Tiangong-1, an unmanned space module to be put into orbit "as early as the end of 2010," the Shenzhou-8 spacecraft and their carrier rockets.

Chinese scientists also plan to build a new Long March 2F rocket, which carried the Shenzhou-7 manned spacecraft into space last year.

China to Land Probe on Moon at Latest in 2013

(CAS, 2009-03-04)

China plans to land Chang'e-3 on the moon at latest in 2013, Ye Peijian, chief designer of Chang'e-1, the country's first moon probe, said here Monday.

The mission of Chang'e-3 is to make soft landing and probe the moon, said Ye, a member of the 11th National Committee of the Chinese People's Political Consultative Conference (CPPCC), China's top political advisory body.

Before the mission, Chang'e-2 will be launched at the latest in 2011 to test key technologies of soft landing and lower technical risks, he said.

The timetable was revealed as China concluded the first phase of its three-stage moon mission with a controlled impact of Chang'e-1 on the moon Sunday.

Ye said China's three-stage moon mission could be defined as "orbiting", "landing" and "returning".

A Chang'e-4 will also be launched during the second phase, which will be concluded before 2017, said Ye. But he didn't detail the task of the fourth probe.

Ye said the third phase will last from 2017 to 2020, during which China will launch recoverable moon rovers.

"Chang'e" is named after a legendary moon goddess. But Ye said the recoverable moon rovers may not continue to be named after the goddess. "The name hasn't been decided yet," he said.

China's space program claimed a new landmark with its first space walk last year. It is the third nation, after the U.S. and Russia, to launch people into space.

China selects taikonauts for first space station

(Xinhua Net, 2009-03-05)

China has started a new round of taikonauts selection, and five to seven will enter the final list, said an officer of the country's space program on Thursday.

"The new taikonauts will mainly take missions related to China's planned space station," Zhang Jianqi, deputy chief commander of the manned space project, told Xinhua on the sidelines of China's parliament annual session.

Zhang, a deputy to the National People's Congress (NPC), is attending the NPC annual session which opened Thursday at the Great Hall of the People in downtown Beijing.

"Like the first batch of taikonauts, the new taikonauts will be selected from among air force pilots," said Zhang.

He also confirmed that taikonauts including Yang Liwei, the first Chinese ever sent into space, will not retire, and might take missions if duty calls.

"We will give full consideration to the strong call for female taikonauts, especially the wish expressed by our women compatriots" Zhang said, while responding to the question whether there will be a female among these taikonauts.

China Highlights March 2009

China sent its first astronaut Yang Liwei into space in 2003 riding self-developed spacecraft Shenzhou-5. It was followed by a two-man mission that carried Fei Junlong and Nie Haisheng in 2005.

The trio of Shenzhou-7 taikonauts Zhai Zhigang, Liu Boming and Jing Haipeng orbited the earth for three days last year.

Zhai became the first Chinese to "set foot" on outer space on Sept. 27, 2008. His spacewalk lasted about 20 minutes and was believed to help pave the way for the country's next space mission-- the launch of a space lab or space station.

Chang'e-2 to Take Photos of Moon Pit Made by Chang'e-1 (2009-03-09)

China's second lunar probe Chang'e-2 is to take photos of the pit on the moon Chang'e-1 made a week ago when it hit the planet, discloses Ye Peijian, chief commander and designer of Chang'e-1 project.

Chang'e-1, the country's first lunar probe, ended its 16-month mission by crashing into the moon. Original design of the satellite did not include hitting the moon. Therefore, no module existed to carry out real time observation of the crash or take photos of the impact pits.

Observatories across the country carried out astronomical observations during the crash. But the moon was hardly visible due to strong daylight. However, the pit formed by the crash will remain there for Chang'e-2 to take photos, said Ye.

Meanwhile, Chang'e-3, which is planning to land on the moon with land rover, is under construction. Favorite landing area will be around the Bay of Rainbow near equator of the moon. It's flat and well-illuminated, easy for researchers to carry out observation, Ye explained.

Bid for land rover on the moon is in progress. According to Ye, soil snatcher for grabbing soil on the surface of the moon will adopt technology from Prof. Yung Kai Leung with Hong Kong Polytechnic University.

Ye also said that China is constructing two mega astronomical ground stations in east and west China. The newly-built stations will be able to observe planets as far as Mars, making it possible for China to launch Mars probe project.

China Plans to Launch Shenzhou-8, Shenzhou-9 Spacecraft in 2011 (CAS, 2009-03-10)

China plans to launch the Shenzhou-8 and Shenzhou-9 spacecraft in 2011, a former chief designer of China's manned-space project said here Saturday.

Wang Yongzhi, who is also a member the National Committee of the Chinese People's Political Consultative Conference (CPPCC), made the remarks on the sidelines of the annual session the top political advisory body.

China plans to launch an unmanned space module into orbit as early as the end of 2010, which is expected to dock with the unmanned Shenzhou-8 in 2011. It would be the country's first space docking.

If the space module and spacecraft dock successfully, the country will launch in the same year the Shenzhou-9 spacecraft with taikonauts aboard, Wang said.

Liang Xiaohong, vice president of the China Academy of Launch Vehicle Technology, told Xinhua

China Highlights March 2009

Saturday the module and two spacecraft will be carried by Long March 2F rockets and launched between the fourth quarter of 2010 and October, 2011.

Shenzhou-9 will also dock with the module, Liang said.

"The two dockings, one unmanned and one manned, will lay a solid foundation for the setup of a space station," Liang said.

Taikonauts for Shenzhou-9 will be chosen from the first 14 taikonauts of the country, which include six taikonauts who had entered space before, Wang said.

China will soon start selecting a new batch of taikonauts, which may include the country's first female taikonaut. However, they need a long time of training and will not catch up with the Shenzhou-9 mission, he added.

China sent its first astronaut Yang Liwei into space in 2003 riding self-developed spacecraft Shenzhou-5. It was followed by a two-man mission that carried Fei Junlong and Nie Haisheng in 2005.

The trio of Shenzhou-7 taikonauts Zhai Zhigang, Liu Boming and Jing Haipeng orbited the earth for three days last year.

Zhai became the first Chinese to "set foot" on outer space on Sept. 27, 2008. His spacewalk lasted about 20 minutes and was believed to help pave the way for the country's next space mission-- the launch of a space lab or space station.

China to Launch 15 to 16 Satellites in 2009

(CAS, 2009-03-10)

China plans to launch 15 to 16 satellites this year, Zhang Jianqi, deputy chief commander of the manned space project, said here Monday.

"Though the global financial crisis is taking toll on world economy, it has no impact on China's space programs," Zhang, a deputy to the National People's Congress (NPC), the country's top legislature, told media.

China is at present "batch-producing" the three spacecraft, Shenzhou-8, Shenzhou-9 and Shenzhou-10, according to Zhang.

"This is the first time for the country to conduct researches and production on three spacecraft at the same time," he said.

China plans to launch Tiangong-1, an unmanned space module, into orbit by the end of 2010, he said. The country plans to launch the Shenzhou-8 and Shenzhou-9 spacecraft in 2011, a former chief designer of the manned-space project said earlier.

Zhang said the country is selecting a new batch of taikonauts, which may include the country's first female taikonaut.

China has sent an average of eight satellites into space annually during the first two years of its 11th five-year-plan (2006-2010), and the number was 1.5 before its ninth five-year-plan (1996-2000), figures from the China Academy of Space Technology showed.

China's Shenzhou-8 Spacecraft to Carry Bio Sample for European Space Agency

(CAS, 2009-03-10)

China has agreed to carry a bio sample for the European Space Agency on the country's Shenzhou-8 spacecraft, Zhang Jianqi, deputy chief commander of the manned space project, said here Sunday.

China Highlights March 2009

"China is actively gearing up international cooperation in the field of manned space," Zhang told reporters on the sidelines of China's parliament annual session, citing the agreement with Europe as an example.

The country plans to launch the Shenzhou-8 and Shenzhou-9 spacecraft in 2011, a former chief designer of the manned-space project said a day earlier.

Zhang stressed China welcomes and will continue cooperation with other countries in exploring the space, adding the country's space endeavors are always open to the outside.

"China will definitely work with the International Space Station, once the country sets up its own space station," said Zhang, a deputy to the National People's Congress (NPC), the country's top legislature.

He said it's necessary for astronauts to be able to offer mutual aid in case of emergency during their relatively long stay in the space.

"The United States and other countries have agreed to this and said they are willing to start such cooperation," he added.

Zhang said Thursday the country is selecting taikonauts for the country's planned first space station.

China Able to Send Man to Moon around 2020: Expert

(CAS, 2008-03-12)

A Chinese astronautics professor said Tuesday the country is capable of sending astronauts to moon around 2020.

"The key technology problem is the 'returning'", said Xu Shijie, a professor from the Beijing University of Aeronautics, explaining that the country's three-stage moon mission could be defined as "orbiting", "landing" and "returning".

The third stage will last from 2017 to 2020, during which China will launch recoverable moon rovers.

Many countries, including China, target to sending astronauts to the moon, said Xu, member of the Chinese People's Political Consultative Conference (CPPCC), who is in Beijing attending the annual sessions of the political advisory body.

China's moon mission timetable was revealed as the country concluded the first phase of its three-stage moon mission with a controlled impact of Chang'e-1 on the moon on March 1.

China plans to land Chang'e-3 on the moon at latest in 2013, Ye Peijian, chief designer of Chang'e-1, the country's first moon probe, said on Monday.

The mission of Chang'e-3 is to make soft landing and probe the moon, said Ye, a CPPCC national committee member.

Before the mission, Chang'e-2 will be launched at the latest in 2011 to test key technologies of soft landing and lower technical risks, he said.

Chang'e-4 will also be launched during the second phase, which will be concluded before 2017.

China's space program claimed a new landmark with its first space walk last year.

Aerospace becomes new growth area for China's economy

(People's Daily, 2009-03-24)

With the launch of Shenzhou-7, China has achieved a spacewalk using Chinese-made equipment. This shows that China's technology and industry chains have extended to the world's upper end of

China Highlights March 2009

science and technology. China has not only fulfilled the necessary conditions to earn its self a place in the high-tech market, it will earn more right to speak in a wider range of markets.

Comprehensive aerospace industry chains

So far, China has conducted 20 space flight experiments, carrying over 300 crop varieties on recoverable satellites and on the Shenzhou spacecraft. These crops, which have traveled in space, saw their market prices multiply. Retail prices of space vegetables are around 20 percent higher than regular vegetables, and the prices of space flowers are between 30 and 300 percent higher than normal flowers. Considerable profits are involved with these items.

As early as 1987, China's first batch of "space seeds" was sent into outer space on its ninth recoverable satellite. At that time, while the whole nation was focusing on the "shopping basket" and "rice bag" projects, Jiang Xingcun, a research fellow at the Chinese Academy of Sciences, proposed the idea of conducting breeding experiments using outer space methods. The results were unexpected. After the seeds that were brought to outer space were cultivated on the ground, rice grains were plump and green peppers were noticeably larger.

Since then, the nation has attached importance to "space breeding" research. Pumpkins larger than 1 meter in diameter, squashes as tall as people, and sesame seeds grown on benne plants that have eight times the amount of branches than they did before are now no longer regarded as uncommon. In addition, paddy rice can have tall seedlings and ears and feature a resistance to rice lodging, while tomatoes and chili peppers can contain multiple times more vitamin C, carotene and lycopene without their appearances changing.

"After being brought to outer space on a satellite, plant seeds may change into new species with remarkable advantages. In a space environment they undergo space mutagenesis, and are bred and screened for several years after returning to the ground." Liu Luxiang, Director of the Center for Space Breeding under the Chinese Academy of Agricultural Sciences Institute of Crop Science said, "This is a new world for plant breeding."

In fact, from a tiny crop seed carried on a space shuttle and a small static-free ground tile adhered to a satellite launch center, to the new materials for the cabins of a manned spaceship and the 160-million-yuan spacesuit worn by the taikonauts, the industry chain of space economy involves a wide variety of fields. One aerospace mission can involve nearly all areas of our daily lives. It is not hard to imagine that space-related scientific and technological achievements will bring industry value when they turn to civilian use.

A very broad commercial satellite launching market

On October 31, 2008, the Venezuela 1 Telecom Satellite, partly developed and researched by the Yantai 513 Institute, was successfully launched. It was the first time that China had offered the service of launching commercial satellites to Latin America.

Some European and American economists have issued statistics saying that the direct input-output ratio in the aerospace industry is around 1:2, and that in aerospace-related sectors the ratio is between 1:8 and 1:14. This means that if 1.5 billion yuan is invested, a profit of 3 billion yuan will be directly gained.

Han Liyan, professor of the School of Economics and Management at the Beijing University of Aeronautics and Astronautics, says that the aerospace industry is one that China has been investing

China Highlights March 2009

heavily in for a long time, and since it is not a cyclical industry, it is not closely connected with the macro economy. So, the influence of the aerospace industry on the macro economy takes a long time to appear, however, the existence of the aerospace industry will inevitably drive the long-term development of the Chinese economy.

Some reports within the industry show that, in 1996, the profit that the global aerospace technology industry generated was 75 billion USD; in 2000, this had increased to 125 billion USD; and in 2010, the total income of the world's commercial aerospace activities is expected to reach between 500 billion and 600 billion USD, of which, the market size of the global satellite industry is expected to reach between 200 billion to 300 billion USD.

In the next 10 years, it is expected that around 700 commercial satellites will be launched in the whole world. As a country with the ability to launch satellites, China will inevitably acquire a share.

Satellites Will Help Predict Disasters

(CAS, 2009-03-31)

China's first two satellites dedicated to environment and disaster monitoring were delivered to their users yesterday.

Both Huanjing-1A and Huanjing-1B have two charge coupled device cameras, with a 30-m resolution and a 720-km width, each on board, the State Administration of Science, Technology and Industry for National Defense said in a statement.

The Ministry of Civil Affairs, in charge of disaster relief and reduction, and the Ministry of Environmental Protection are the users of the two satellites.

They can jointly form the image of China's entire territory in two days, "which not many other satellites with 30-m resolution cameras in the world can achieve", it said.

This enables the two satellites to monitor a designated area repeatedly, fast and inform government agencies of the latest disaster development, it said.

In February, on the Australian government's request to help fight a rare forest fire, the satellites, then under-testing, provided images, Chen Qiufa, the administration chief, said.

Luo Pingfei, vice-minister of civil affairs, said the two satellites would provide a stable, long-term data source to help China fight against disasters.

The two satellites will provide data through the soon-to-open Beijing office of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response for global disaster reduction, Chen said.

The satellites were launched atop the Long March-2C launch vehicle on Sept 6, 2008, from the Taiyuan Satellite Launch Center in Shanxi province. They passed in-orbit testing in February.

Next year China will launch a small radar satellite to work with these two optical satellites, the statement said.

Eventually, a total of eight small satellites will be launched to form a constellation for all-weather, 24-hour monitoring and environment and natural disasters forecast, forming a complete image on China once every 12 hours.

2 News from Universities

Chinese company establishes scholarship for aerospace research

(Xinhua Net, 2009-03-09)

China Aerospace Science & Industry Corp. (CASIC) announced on Sunday the establishment of a scholarship worth 5 million yuan (about 714,280 U.S. dollars) for aerospace research in five prestigious domestic universities.

The five universities are Tsinghua University, Harbin Institute of Technology, Beihang University, Beijing Institute of Technology and Northwestern Polytechnical University.

The scholarship will be open to both undergraduate and postgraduate applicants. Winners will be offered payment ranging from 5,000 to 10,000 yuan per person.

Xu Dazhe, general manager of CASIC, said the company would this year employ more than 2,000 fresh graduates to help reduce unemployment despite a shrinking market demand amid the global financial crisis.

CASIC is a centrally administered state-owned enterprise which is engaged in the research and development of missile systems, launch vehicles and other aerospace products.

University to Open Special Class for Mathematic Talents

(CAS, 2009-03-20)

The University of Science and Technology of China (USTC) and the Academy of Mathematics and Systems Science (AMSS) CAS will jointly open a special class for students talented in mathematics and try to cultivate more outstanding mathematicians for the country.

The class, which is named after the noted Chinese mathematician Hua Luogeng, will open this year and will recruit about 30 students each year.

The class will be selected from the newly enrolled undergraduate students and will cover undergraduate studies in the first three years, and devote the fourth year to research and thesis writing at the graduate school.

Both USTC and AMSS will appoint supervisors and tutors to guide students' study and provide help to their life and research activities. Mathematicians from various research institutes will give talks and brief the students with latest scientific development in their own fields.

Hua Luogeng is one of the major founders of the contemporary mathematics in China. He and American Chinese mathematician Shiing-Shen Chern were dubbed the most eminent Chinese mathematicians of their generation. Hua initiated and developed China's modern mathematical research and taught in fields including Analytic theory of Numbers, Theory of Classical Groups, Geometry of Matrices, Theory of Automorphic Functions and Theory of Function of Several Complex Variables.

In collaboration with relevant CAS institutes, USTC also plans to open classes named after other scientists including physicist Yan Jici and biologist Bei Shizhang, and train talents in those fields, said Xu Wu, vice president of the university.

Survey: Gap between China's rural and urban education levels huge

(People's Daily, 2009-03-06)

A survey made public Tuesday by Peking University shows that China is seeing an increasingly large

China Highlights March 2009

gap between the education levels of people holding urban and rural permanent residency permits, or "hukou" in Chinese.

The survey, carried out in Beijing, Shanghai, and southern Guangdong Province, found that only 0.7 percent of the 2,732 rural respondents have university degrees or higher as opposed to 13.6 percent among the 3,253 urbanites polled.

Liu Shiding, one of the main participants of the survey, told Xinhua Thursday that the figures only reflect a general picture in the three areas, and situations in the less developed central and western regions could be still worse.

China's permanent residency permit is not just a record of people's addresses, but closely attached to the living standards and social welfare one can enjoy - a rural hukou mostly means low income, poor social welfare coverage.

The permanent residency permit system is very strict in that a rural hukou normally cannot be transformed into an urban one except when there are temporary government policies allowing it.

"Even the 0.7 percent people with university degrees may not all be working and living in the countryside," said Liu, also a professor of Peking University.

The survey, conducted by Peking University in cooperation with local governments and universities in Shanghai and Guangdong, also showed that only 20 percent of the rural hukou holders have been to high school while the percentage for the urbanites stands at 85.

"Although the education level among people in the countryside is higher than before, it is likely to lag farther behind that in the cities," Zhang Fangping, director of the Hunan Provincial Department of Education, was quoted as saying by Wednesday's China Youth Daily. Zhang is in Beijing to attend the annual session of the National People's Congress (NPC).

Wang Shiqi, another NPC deputy who is the director of a middle school in Hunan Province, was quoted as saying the gap was due to an "unreasonable distribution of educational resources".

Wang said that school teachers in the countryside often tend to seek better-paying jobs in cities, which leaves only the academically poor ones to rural students.

The survey also showed that only 26.8 percent of the students in the countryside continued schooling after finishing junior high, which is covered by China's nine-year compulsory education plan and qualifies for subsidies.

China sends 180,000 students overseas in 2008

(People's Daily, 2009-03-26)

A record high of 179,800 Chinese students went abroad for overseas study in 2008.

That figure was revealed Wednesday by Zhang Xiuqin, an official in charge of international cooperation with the Ministry of Education.

Zhang said the number of Chinese studying abroad has increased since 2004 due to stable growth of the national economy, a flexible policy for going overseas and a surging demand to receive education.

The ministry does not have detailed information about Chinese students' destinations for overseas studies.

However, according to the Beijing OZ Enrollment Center of International Education, a leading overseas studies agency, the top three destinations for Chinese last year were the United States, Australia and the United Kingdom.

China Highlights March 2009

Meanwhile, the number of Chinese returning home after overseas studies in 2008 reached 69,300. That's a 55.95 percent increase from 2007, according to the ministry.

Zhang said that the global financial crisis had made it more difficult for overseas Chinese students to find jobs outside China. Also, the ministry set up a special fund to support short-term research by Chinese overseas scholars to help them make a long-term career plan when they return home.

Ministry statistics show that from 1978 to the end of 2008, more than 1.39 million Chinese studied abroad, of those, 390,000 returned home.

So far, China has 401 licensed agencies to operate overseas study services.

China has also decided to send 5,000 government-sponsored students abroad each year from 2007 to 2011. It also offers a 5,000-U.S. dollar scholarship each to 300 students every year who pay overseas tuition themselves.

In 2008, 90 percent paid for their own schooling.

3 Innovation Management

Getting to the root of the problem of academic plagiarism

(People's Daily, 2009-03-19)

Chinese academic journals have started using anti-plagiarism software to deter rampant academic plagiarism, according to a recent Xinhua report.

This news came in the wake of a statement on Sunday by Zhejiang University that it would fire an associate professor guilty of plagiarism.

The Oriental Morning Post also reported yesterday that Shanghai would hold a conference this week to announce the disciplinary measures taken against some researchers guilty of plagiarism.

The use of anti-plagiarism software suggests human naivete in an age of increasing technological sophistication, and could not be a more depressing commentary on the state of human affairs.

A single-minded determination to secure promotion and prestige at whatever cost is at the root of the growing number of academic scandals.

China has experimented with market reforms for nearly three decades, but ironically the most thoroughgoing market-oriented reforms are manifested in the monetization of education, the judiciary and medicine.

This is deplorable, because educators, legal workers, and medical practitioners are expected to be guided by their conscience and their heart.

As a result of the specialized nature of their service, these people can be dangerous if their "holy fire" of idealism is extinguished.

As a consequence, a teacher can moralize with his hands in his pupils' pocket, a lawyer can defend a criminal for a fee, and a doctor can extort money from a dying patient.

The other day my wife told me some elementary school teachers give after-class tutoring at their own homes, including a supper, as a consideration for busy parents - of course, at no modest an investment by parents.

This is a clever way of extorting "cash for scores," for who has a better say than a teacher in deciding their pupils' scores?

Hangzhou-based Qianjiang Evening News reported on Monday that from 2004 to 2007 authorities at

China Highlights March 2009

a middle school affiliated with Guangxi University had built a pile of 16 million yuan (US\$2.4 million) just by encouraging parents to buy scores for their children.

Some recommend a severe punishment for the guilty as effective deterrents, but it is easy to see that it is extremely difficult, and expensive, to punish these people.

Occasionally a corrupt official may face the death penalty if he steals too much. For instance, former Suzhou vice mayor Jiang Renjie was sentenced to death last year for taking over 100 million yuan in bribes, but I have not heard of any researchers imprisoned, not to say executed, for academic thefts.

Fraud and theft among academics and lawyers are a low-risk, high-return investment.

Statistics from Sweden suggest that in 2001 local authorities dealt with 100 cases of academic frauds. The figure doubled three years later, and soared to 480 in 2006.

But even given our current degree of depravity, we should still resist the temptation of software.

As a matter of fact, an assessment method superstitiously believed to be "scientific and objective" is partly to blame for fueling the Sanlu contaminated milk scandal, and this fact has not been appreciated sufficiently.

So far, the overwhelming public ire has been directed at the "black-hearted" milk collectors who added melamine to the milk to inflate the protein readings.

I have yet to see any fingers pointing at the testing method that calculates protein content indirectly by testing the amount of the nitrogen in the milk.

Similarly a researcher steals because the number of the articles published are seen as the indicator of his professional excellence.

There is an urgency to scrap this scientific but distorting assessment regime.

China's Silicon Valley to set up national innovation zone (CAS, 2009-03-23)

The State Council has reached a decision to back the building of a national independent innovation demonstration zone in the Zhongguancun Science Park (Z-Park) in Beijing, said Minister of Science and Technology Wan Gang here Friday.

Some Chinese people like to call the Z-Park "China's Silicon Valley".

A series of policies will be adopted to support construction of the zone, the first national level independent innovation demonstration zone in China, according to the decision of the State Council, revealed at a meeting of the Beijing Municipal Government.

Wan said the move aims to boost innovation of the Z-Park to a higher level to make it a scientific and technological innovation center with worldwide influence.

Preferential policies include stock option incentives, financial support and access to major national technology projects, according to a State Council document.

Z-Park, which began as the "Electronics Street" in the early 1980s, was officially established as the first national science park in 1988. There are nearly 20,000 high-tech enterprises in the park.

4 China's International Science Cooperation

CECO Meets with Director of International Affairs & Innovation, EUR (MOST, 2009-03-13)

China Highlights March 2009

Accompanied by assistant S&T counselor of the Netherlands Embassy in China, Ms Marjolein J.H.van Griethuysen, the director of Erasmus University Rotterdam (EUR) visited CECO on March 3rd, 2009. CECO expressed its warm welcome to Ms Marjolein's visit; then both sides exchanged views on how to jointly enhance EUR's R&D cooperation with its Chinese counterparts within FP7. EUR, established in 1913, is a worldly-renowned comprehensive university, famous for its application-oriented academic and R&D strengths. It is the curdle of many outstanding governmental figures and senior administrators in Neterhland. Ms Marjolein, during the meeting, further introduced CECO to excellent research capability of EUR, and expressing the strong willingness to team up with Chinese counterparts in the areas of biotechnology, clinic trials, water governance, medicine and pharmaceutics and health for FP7 funding. She hoped to jointly work with CECO so that CECO can help identify appropriate Chinese researchers or Chinese universities for EUR's project ideas.

CECO briefed Ms Marjolein on mandates and business scope of CECO and CSTECH as well, the organization CECO belongs to, and highlighted its nature as a non-profit organization, jointly sponsored by MOST and EC to serve China-EU cooperation and specifically to serve the interests of researchers from both sides. As to the director's expectation on CECO, CECO responded by stating its commitment to bridging EUR with their Chinese counterparts through providing information and consultation especially when EUR and Chinese researchers join hands for FP7 funding.

The meeting was proceeding productively. As a follow-up, detailed EUR project ideas and resumes of high-caliber EUR research staff will be delivered to CECO. CECO will accordingly identify Chinese researchers to crystallize substantive joint work between EUR and Chinese universities and researchers.

China, Russia Establish Joint Mars Exploration Team (CAS, 2009-03-16)

China and Russia established the first joint Mars Exploration (Firefly-1) Team on Mar. 6 in Beijing, to speed up the Mars probing mission being carried out by both countries.

The Mars probe Firefly-1 has four purposes, which include exploring the distribution and variation law of space magnetic field, ionosphere and particles of Mars, exploring escape rate of Mars air ion, exploring terrain, landform and sandstorm of Mars, and exploring gravitational field in the equatorial area of Mars, said Wu Ji, leading scientist of the joint project and director of Center for Space Science and Applied Research, Chinese Academy of Sciences.

Research and developing of Firefly-1 step to dielectric properties test, environmental test and EMC test of the whole satellite final-model. The probe will be produced in mid 2009.

CHINA and Russia agreed to jointly send a probe to Mars and its moon, Phobos, two years ago. According to the agreement, Russia will launch an explorer Phobos-Grunt carrying a Chinese-made exploration device to take samples of Phobos soil.

The agreement is a milestone in space cooperation between the two countries.

Brazil, China to cooperate in developing genetically-modified cassavas (Xinhua Net, 2009-03-28)

Brazil and China signed this week an agreement on cooperation in researches to develop genetically-modified cassavas, announced the Brazilian Agricultural Research Corporation (Embrapa) on Friday.

China Highlights March 2009

The agreement aims to develop cassavas that contain more glucose and less starch which can be used in the production of ethanol, the Embrapa said in a statement.

Embrapa, which is considered as one of the world's leading institutions in the development of genetically-modified species, has a cassava germplasm bank, which has over 500 varieties of cassava.

Embrapa expected cooperation with the Chinese side to help it advance in the project to obtain the cassava's genetic sequence.

The two sides started negotiations on the agreement in October when Embrapa President Silvio Cretana visited Beijing.

Nigeria, China sign pact to replace faulty satellite by 2011 (Xinhua Net, 2009-03-25)

Nigeria and China have signed a contract for a new communications satellite that will replace one sidelined by a power failure, a newspaper reported Wednesday.

According to the contract signed in Beijing on Tuesday, the replacement satellite has been named NIGCOMSAT-1R and is due to be launched by 2011 with no cost to Nigeria, the Lagos-based Guardian reported.

The new space vehicle will replace NIGCOMSAT-1, which was launched on May 14, 2007, but was displaced on Nov. 10, 2008, because of a solar power failure that occurred on one edge of the satellite.

The contract underscores the relationship that has existed between China and Nigeria, which has been further strengthened by the agreement to replace the satellite at no cost to Nigeria, said Nigerian Minister of Science and Technology Zaku.

Zaku expressed Nigeria's gratitude to China for the satellite on behalf of President Umaru Musa Yar' Adua.

The minister said the satellite was of great importance to Nigeria because it was supposed to lead to economic emancipation, bridge the digital divide and lower communications costs in the country.

5 Miscellaneous

China launches most advanced maritime patrol ship (Xinhua Net, 2009-03-01)

China has launched its most advanced maritime patrol ship off the coast of Weihai city in eastern Shandong Province, said an official with the Ministry of Transport Sunday.

It is a 114-meter-long patrol vessel equipped with a helicopter.

Nicknamed "Haixun 11", the ship was completed Saturday.

It will be put into use in June, said Liu Gongchen, deputy director of the maritime bureau under the ministry.

The ship is capable of carrying out maritime search-and-rescue missions, monitoring coastal waters, and serving as a command post, he said.

The launch of the vessel would enable the country to expand its maritime patrol scope and have longer and more regular patrols.

China Highlights March 2009

"Haixun 11" can sail as far as 6,000 nautical miles (6,900 miles) on one fuel supply. Its top speed reaches more than 40 km per hour.

China releases fish into Yangtze River to replenish ecosystem

(Xinhua Net, 2009-03-26)

A total of 70,000 fish were released in to the Yangtze River, the longest in China, from Wuhan, capital of Hubei Province, Thursday.

Tang Tao, deputy governor of Hubei, said at a specially organized ceremony to mark Thursday's release, that the move was just a prelude of his province's plan to replenish the Yangtze with 500 million fish this year.

Released were 10,000 head of Chinese paddle fish, or sturgeon, which is classified for protection in China, along with 20,000 mullet and carp, said Xu Hantao, chief of the Hubei Provincial Bureau of Aquatic Products.

"The fry release plan will be helpful in restoring the Yangtze's ecosystem," said Xu, who added that a three-month fishing ban would also be imposed starting April 1.

Xu didn't give an exact value of the fish released Thursday. Nor did he give a price tag for the total 500 million fish to be released this year.

According to Xu, more fry will be released into the Yangtze from other locations such as the Three Gorges Reservoir, as well as tributary Hanjiang River.

The Yangtze, with a length of 6,403 kilometers, originates in Qinghai, and flows eastward through Sichuan, Tibet, Yunnan, Chongqing, Hubei, Hunan, Jiangxi, Anhui and Jiangsu. It empties into the East China Sea in Shanghai.

Wuhan is the most important industrial city on the middle reaches of the Yangtze.

"China Tomorrow" innovation & technology initiative launched in UK

(CAS, 2009-03-27)

An initiative aiming at bringing UK-Chinese innovation expertise together for business collaboration was launched on Wednesday here in the British capital.

The "China Tomorrow" innovation & technology initiative, first announced by British Prime Minister Gordon Brown during Chinese Premier Wen Jiabao's visit to Britain at the end of January, was launched jointly by China-Britain Business Council (CBBC), the Department for Innovation, Universities & Skills and the UK Trade & Investment.

"It is just over seven weeks since the most recent visit to the UK by (Chinese) Premier Wen Jiabao. But he has set in train a flurry of activity that has already seen a procurement mission to the UK led by China's Minister of Commerce Chen Deming; and another Mofcom (Ministry of Commerce) delegation last week exploring the opportunities to invest in the UK," said Peter Budd, CBBC vice chairman.

He noted that these events signify "the urgency with which China is responding to help avert what could become a prolonged economic recession."

According to Budd, "innovation" has become a much-used word in China's policy statements, which set to spend 2.5 percent of the country's gross domestic product on research and development by 2020.

Budd believes that UK commercial and academic organizations are well placed to work with China

China Highlights March 2009

in the fields of knowledge transfer, intellectual property rights (IPR) protection, funding and commercialization.

"In the long run, such collaboration will greatly enhance the opportunities for sustainable business for the economic benefit of both countries," noted Budd.

Ian Pearson, economic and business minister at the Department of Business, Enterprise and Regulatory Reform, hailed the "sheer scale" of contacts between the two countries since an agreement on science and technology cooperation was signed three decades ago.

Citing the strong bilateral ties, Pearson said the win-win approach taken by the two sides has been "unprecedented" and business relations will work to enhance "our strategic partnership."

During the launch, Chinese Ambassador to the UK Fu Ying briefed the hundred or so participants on the progress of IPR protection in China as well as the role of innovation in fighting an economic downturn.

She urged businesses and academics to use the current economic climate as an opportunity to boost innovation collaboration and take advantage of Britain's experiences in research and science.

The launch event also offered workshop and discussions for business and enterprise representatives to share their experiences in China in the aspect of science and technology cooperation, while experts provided their views on how to enter the Chinese market.

Chris Cotton, CBBC director, said the initiative will serve as a bridge for British and Chinese businesses to look for long-term collaboration with the help of the Chinese government.

China's manned space flight team rewarded U.S. Space Achievement Award (Xinhua Net, 2009-03-31)

The team of China's Shenzhou-7 manned space flight mission, which marked a number of "firsts" for the Chinese space program in a single mission, was rewarded Monday the 2009 Space Achievement Award from the U.S. Space Foundation.

A delegation from China led by Dr. Zhou Jianping, chief designer of the China Manned Space Program, and Taikonaut Zhai Zhigang accepted the award at the opening ceremony of the 25th National Space Symposium, a Space Foundation-sponsored annual gathering of the global space community, in Colorado Springs.

Dr. Zhou will also participate in the symposium's panel discussion on April 2 where he will discuss China's current and future plans for manned space flight.

"The Shenzhou-7 mission was a significant leap ahead for China's space program," said Elliot Pulham, chief executive officer of the Space Foundation.

"In only its third manned mission, China achieved a half-dozen landmark accomplishments, including the flight of a three-person crew, an impressive first space walk and capabilities for orbital rendezvous and docking. The Shenzhou-7 Mission demonstrated both modern technical capability and the good old-fashioned spirit of exploration."

Zhou said despite all the progress, China is still a newcomer and willing to cooperate with other countries in this field.

Launched on Sept. 25, 2008, Shenzhou-7 was China's third manned space mission and first three-man mission. Taikonaut Zhai performed a 20-minute spacewalk, making China the world's third nation to independently carry out a spacewalk.

The crew conducted a number of experiments, including releasing a miniaturized satellite that took

China Highlights March 2009

photos and videos near the spacecraft, maneuvered to about 120 miles away and then returned to orbit the spacecraft after the return module had separated and re-entered the atmosphere.

The Space Achievement Award is presented annually to an individual or organization for significant contributions in advancing the exploration, development, or utilization of space.

Previous recipients include the United States Air Force, the Arianespace-CNES Ariane 4 Launch Team, the Hubble Space Telescope Team, NASA/Industry Galileo Space probe team and the International Space Station Team, etc.

Founded in 1983, the Space Foundation is an international nonprofit organization. The 25th National Space Symposium, held from March 30 to April 2, is expected to bring together over 7,500 delegates from all sectors of space -- civil, commercial, national security, new space entrepreneurship, and finance, to highlight accomplishments and address opportunities and challenges facing the global space.

Themed The Next Space Age, this year's meeting looks at major shifts in the economies, philosophies, and mechanics of the global space industry.

Abbreviations

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