

Content

Science News from Chinese Media during February 2007
Collected and Compiled by the Helmholtz Beijing Office

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Helmholtz News Concerning China

The whole China has experienced a warm winter. There is no snow in Beijing from January to the end of February. Just a sudden cold wind on the first Sunday of March brought the second snow, the previous one right before Christmas, has reminded us the winter is not away yet.

At the beginning of February, an international conference on high energy Physics was held in the Inst. of High Energy Physics (IHEP). Over 10 Helmholtz DESY colleagues came for the conference. On the 08.02, the International Committee for Future Collider announced the blue-print of ILC (International Linear Collider) during a press conference in Beijing. With [7 billion USD investment](#), it will be the biggest international cooperation project. You find also a report from *China Daily* in this edition of Highlights.

The application for a Helmholtz-CSC programme has come in February to an end. From the information we have collected, there are over 64 independent applicants who have submitted their materials to 40 Helmholtz scientists, either for a PhD position, or just as Postdoc or Sandwich Student. For the most of time in this month, my colleague Tong Liu and I were answering various inquiries and giving different guidance, both to the students and also to our colleagues in Germany. Just for an example, we exchanged over ten emails each with several scientists, to help them identify the background of his/her applicants; we helped also several students to get the official approval from their university needed by the CSC regulation. Some university staff refused to accept them, simply with an argument that they have already finished their MSc last year. So far we can be very glad that this first round call for Chinese students has been moving forward successfully. We are expecting, there will be more Helmholtz scientists aware of this programme in the coming round and we can get more positive response from the Chinese universities and the outstanding students.

As the last, we would like to mention the recently released statistics: China has again achieved 10.5% GDP growth rate in 2006. The government income from the taxation increased again over 20%; the average salary increase was again 8-9% for the whole society. It is really not able to overestimate the dynamic of Chinese economy, although there are some many controversial problems in the Chinese society. One thing is but for sure, China is intending to spend more money for education, for science and technology. In 2006, China claimed of having spending 30 billion euros for R&D activities, including government spending over 70 billion euros. This figure will again be growing 20% in 2007.

According to a say from an authoritative organization for international education, over 1 million Chinese have gone abroad to pursue an education in the last 30 years, you find [this report as well](#). This tendency is speeding up, also with more governmental sponsorship. From this year, all the 985 universities (top 35 universities in China) have all been granted with 100 positions with government scholarship studying abroad. We heard that there are suddenly fast 5000 Chinese students with a promise of scholarship looking for a position everywhere in the world. What will China tomorrow?

1 Science News

1.1 Energy

China shares control of nuclear fusion reactor

(Xinhua Net, 2007-02-07)

Chinese scientists have allowed their counterparts in the United States to start up and control a thermonuclear fusion reactor in eastern Anhui Province.

The test lasted nearly five seconds after scientists with General Atomics USA working in their labs started up the fusion reactor at the Institute of Plasma Physics under the Chinese Academy of Sciences (CAS) in Hefei, provincial capital of Anhui, Wu Songtao, deputy director of the institute, told Xinhua.

"The test has laid a foundation for joint study of fusion reaction with different countries," said Wu, adding that the U.S. scientists were provided with all real-time data during the test.

"We have plan to carry out more such tests in the future and more countries are expected to be involved," said Wu.

Wu's institute spent eight years and 200 million yuan (25 million U.S. dollars) building the Experimental Advanced Super Tokamak (EAST) fusion reactor, which replicates the energy generating process of the sun.

Unlike traditional nuclear fission reactors, which split atoms to create energy and produce dangerous radioactive waste, the EAST uses nuclear fusion to compress atoms at extremely high temperatures to generate energy that would produce very little pollution.

Scientists theorize that a fully functional fusion reactor would provide cheaper, safer, cleaner and endless energy and reduce the world's dependence on fossil fuels.

The problem scientists continue to face is that starting a fusion reaction takes more energy than can be produced from the reaction.

The EAST is part of the International Thermonuclear Experimental Reactor (ITER) program, which was initiated by the United States, France and Russia in the 1980s with a purpose of establishing a thermonuclear fusion reactor.

“EAST” discharged in transnational experiment

(People’s daily, 2007-02-08)

China recently conducted a transnational remote controlled plasma discharge experiment with its new generation device, formally known as an Experimental Advanced Superconducting Tokamak (EAST), which has been built in Hefei, Anhui province. Through a dedicated data network, experts from General Atomics USA were easily able to start the nuclear fusion experimental installation from the other side of the globe with the click of a mouse.

Wu Songtao, deputy director of the Institute of Plasma Physics under the Chinese Academy of Sciences, said that the remote controlled plasma discharge has laid the foundation for broader joint research into nuclear fusion in the near future, and set an example for multinational experimentation with international thermonuclear fusion experimental reactors (ITER).

It was reported that the data and discharge images received by experts in the DIII-D experimental

nuclear fusion laboratory at General Atomics USA are exactly the same as those obtained by the Chinese scientists in the control room. In this first international operation, the plasma discharge lasted close to five seconds and generated an electrical current of 250 kilo-amperes.

According to Wu, due to the time difference between the continents, EAST physical experiments can be carried out by remote operation around the clock. The Chinese can do experiments during the daytime and the Americans can work the night shift. A suitable time can also be arranged for the Europeans to get involved, said Wu. This way, scientists will be able to accelerate fusion research enabling people to channel the energy produced by nuclear fusion as early as possible.

Wu also noted that the next ITER, another experimental device developed by China, the EU, the United States, South Korea, Japan, Russia and India will be built in France. By adopting the same means of experimentation, scientists will not need to work on site.

On September 28, 2006, after eight years of construction at a cost of around 200 million yuan, the EAST was completed and put into operation. In the first round of experiments, scientists realized circular high temperature plasma discharge which lasted nearly for five seconds and generated an electrical current of 500 kilo-amperes. The EAST is the world's first nuclear fusion experimental installation with a superconducting magnet and active cooling system. China thereupon marched into the ranks of advanced countries in the field of magnetic confinement fusion.

Fuel from forests is new clean energy goal

(People's Daily, 2007-02-08)

Money may not grow on trees but they could help power cars, thanks to a path-breaking effort to develop biofuel from forests.

By 2010, China plans to plant an area the size of England, or 13 million hectares, with trees from which biofuel can be extracted as a source of clean energy, according to the State Forestry Administration (SFA).

Jatropha, also called physic nut, is currently grown on around 2 million hectares across the country and produces non-edible oil for making candles and soap.

Now, it will be the main ingredient in the production of biodiesel.

The 13-million-hectare forest mostly spread over southern China is expected to produce nearly 6 million tons of biodiesel every year.

Vehicles account for a third of all oil use in the country.

Biodiesel is a clean-burning diesel made from natural, renewable sources such as agricultural products like palm oil, soybeans and sugarcane with Brazil, in particular, being a global leader.

The jatropha trees can also provide wood fuel for a power plant with an installed capacity of 12 million kilowatts about two-thirds the capacity of the Three Gorges Dam project, the world's biggest.

This amount of bio-energy will account for 30 percent of the country's renewable energy by 2010, according to the SFA.

Cao Qingyao, spokesman for the SFA, said: "This plan will not only help the country enlarge its green coverage (currently at about 130 million hectares) but also meet increasing demand for energy."

"And most importantly, it provides clean energy to meet the country's target of sustainable development," he said.

Currently, the country relies mainly on fossil fuels for energy production. To ease the pressure and

reduce pollution and greenhouse gas emissions, a renewable energy target has been set: By 2010, it will make up 10 percent of the energy structure; and 16 percent by 2020.

China National Petroleum Corporation, one of the country's three energy giants, has started collaboration with the SFA to develop biofuel.

Jiang Jiemin, head of the corporation, said last month that the group would, by 2010, build a commercial production base with an annual capacity of 200,000 tons of biodiesel by planting more than 400,000 hectares of trees.

Large-scale gardens for energy-rich plants to be set up at CAS

(CAS, 2007-02-12)



A research under the title of "Screening & Assessment of Energy Plants & Core Technology for Large-Scale Plantation of the Physic Nut Tree" has recently been initiated as an important project of the CAS Science Cluster for Advanced Industrial Biotechnology.

Organized by the CAS Xishuangbanna Tropical Botanical Garden (XTBG), the project is to set up platforms for the studies of energy plants in central, southeast and southwest China by evaluating and protecting the rich plant germplasm resources housed in the CAS botanical gardens.

As the physic nut tree (*Jatropha curcas* L.) is considered a favorite species for the production of biofuel, the researchers will make efforts to provide superb

germplasm resources and technical guarantees for the industrialization of the plant.

The project is to make preliminary investigations on various energy plants, including those rich in carbohydrate and with high content of fat, so as to provide scientific basis and research schemes for the future utilization and strategic reservation of biomass energy sources in China, says XTBG Director CHEN Jin, adding it will also offer optional plans to address energy problems in this country and carve a niche for China's research at the frontier of the field.

At the same time, the researchers will focus on know-how for large-scale plantation of the physic nut tree by establishing three gardens of considerable size as experimental platforms in central, southeast and southwest China. The studies will involve collecting and assessing of germplasm resources of the plant from different regions, defining its core germplasm, renovating new ones, and cloning key genes featuring anti-adversity and fat metabolism functions, as well as developing cultivation techniques of high-yield breeds and development, according to Chen.

The project strives to make breakthrough progresses on key technologies to address some of the problems in the manufacturing of bio-fuel from the plant, such as low per unit production, unstable oil-yielding rate, limited distributions, high ignition points of its biofuel, low-temperature jellification, and lower economic returns in comparison with petroleum derivatives.

Over the next three years, CAS will construct three sanctuaries for energy plants with a considerable size at its botanical gardens in Xishuangbanna, Wuhan and Guangzhou. The researchers will make

observations on biological properties of some 100 varieties of such plants, and carry out analyses on their components. Demonstrative bases for their bumper harvest will be set up. Outstanding strains or mutants noted for their high-yield, fatty seed and strong adversity resistance will be selected and bred. It is expected to obtain, and file for, patents on some functional genes concerning the fat metabolism and endurance against frigid temperatures.

"We are now fully confident of making the physic nut a model plant for such studies in China by joining efforts with business sectors and farmers," Chen stresses.

15 Institutions take part in the "Solar Thermal Energy" project

(Science Daily 27. Feb.)

A kick-off meeting and workshop on "Solar Thermal Energy Technology and its System Demonstration" was held in Hehai University on February 10. This is one of the national key projects of China's Hi-Tech Research and Development Programme (863 Programme).

The total ministry funding of the project is more than 5 million Euros and is channeled for 5 research topics, which are taken jointly by 15 research institutions, such as the Institute of Electrical Engineering of CAS, Hehai University, etc. The first topic is the whole design and system integration of the solar thermal tower energy system; the second topic is the research on high-accuracy sunshine positioning and the development of the whole set facilities; the third topic is the research on thermal absorption, transmission, storage with high efficiency; the fourth topic is the development of a full scale centralized control technology; and the fifth topic is the construction of a trial testing platform for solar thermal experiments.

1.2 Earth and Environment

China plans third research station at South Pole

(People's Daily, 2007-02-01)

China is working on the construction plan for a third research station on the South Pole, said Sun Zhihui, director of the State Oceanic Administration (SOA) in Beijing on Wednesday.

Speaking at a SOA meeting, Sun stressed the need to enhance China's competitiveness in the exploration of polar region and ocean. So far, the name of the new research station is still undecided.

The international community has named this year as the "International Polar Year (IPY) 2007/2008 which runs from March 1, 2007, to March 1, 2008.

"China should seize the opportunity brought by the event to carry out wide-ranging international cooperation in the field of polar region exploration," Sun said.

It will be the first time China has participated in IPY activities.

Sun vowed to continue supporting scientific research at the South Pole and North Pole, and organizing study on strategy of polar region exploration and polar region laws.

According to him, the Chinese government last year approved to invest 520 million yuan (around 65 million U.S. dollars) in polar region scientific research. China has launched 22 Antarctic expeditions since 1984 and built two permanent exploration stations named Changcheng (Great Wall) and Zhongshan.

They were both located at the border district of the Antarctica.

Sun revealed that China's third work station at the South Pole will be located at the hinterland of the Antarctica.

It now possesses nearly 10,000 Antarctic aerolites including the priceless Lunar and Martian aerolites, the third largest collection in the world.

China has also carried out two arctic expeditions and built the Huanghe (Yellow River) exploration station in the Arctic in July 2004.

IPY 2007-2008, to be launched by the International Council for Science (ICSU) in conjunction with the World Meteorological Organization (WMO), is the fourth since the first joint polar expedition was organized in 1882/1883.

Experts indicated that the Antarctica at the South Pole is the 5th largest continent with the highest altitude. Despite the cold weather and storm snow, it has rich mine and energy resources.

China to set up plane meteorological observation system

(People's Daily, 2007-02-01)

China will have finished establishing a plane meteorological observation system by 2020 to help emergency services deal with meteorological disasters, China Meteorological Administration announced recently.

Plane observation, combining direct and remote satellite observations, can target areas exposed to disasters such as typhoons, forests fires, floods and more, and help to improve emergency worker's ability to deal with disasters, according to China Meteorological.

Experts say the system will also help to develop cloud water resources and study the mechanism of thunder.

China to test world's 1st DSV with a range of 7,000 meters

(Xinhua Net, 2007-02-01)

China will test the world's first ever Deep Submergence Vehicle (DSV) capable of plunging depths of 7,000 meters in the second half of 2007.

"The development of the manned deep sea diving machine, which can cover 99.8 percent of the world's sea bed, will help enlarge the range of China's deep sea research," said Jia Yu, a researcher with the State Oceanic Administration (SOA).

The United States, Japan, France and Russia are the only countries that currently own DSVs, but their maximum range is 6,500 meters.

The process to select the personnel to man the DSV is underway in the eastern coastal city of Qingdao. Fifteen candidates have passed the first round of assessment and six of them will be chosen to receive special training.

The development of the DSV was launched in 2001 as a key national science project.

The research was mainly undertaken by the No. 702 Research institute of the China Shipping Industry Corporation.

Roof of the World sends warning signs about climate shift

(Xinhu net, 2007-02-01)

The rising temperatures on the Roof of the World will have a rippling effect on climate and environmental changes, Chinese researchers said Wednesday.

The data collected from the Qinghai-Tibet Plateau show that its temperature has risen by up to 0.42 C each decade since 1980s.

"The rising temperature has made us look for answers to a series of questions: how will the change affect the climate in the vicinity, the rest of China, Asia and even the world?" Xu Xiangde, a senior researcher at the Chinese Academy of Meteorological Sciences, said.

While Xu was speaking to China Daily, about 500 scientists and officials were huddled together in Paris to iron out a report on how fast the world was warming, how serious global warming was and how much were humans to blame for that.

Xu said decades of research on the plateau had found that a change or move in water vapor or clouds above the plateau would create an impact, immediate or remote, on weather conditions in other parts of China, and even the world.

For instance, based on analyses of satellite data, Xu and his colleagues have traced the cloud clusters that caused the floods in the summer of 1998 the worst in decades in China back to the strong movement of clouds above the plateau in July that year.

Researchers have partly attributed the scorching weather to the temperature on the plateau, which was 2 to 4 C higher in 2005-06 winter, according to a report of the National Meteorological Center.

Snow cover on the plateau dropped up to 10 percent compared with other years, it said.

One of the worst results of the rising temperature on the plateau could be an ultimate change in the volume of water flowing into the Yangtze, the Yellow and other rivers that originate in the mountainous region, Xu said.

But meteorological data from the Qinghai-Tibet region were not sufficient, he said.

China and Japan are cooperating on a four-year meteorological research project to build new generation observation stations on and around the plateau to get a forewarning on possible climatic disasters.

Aside from Japan, China has also worked with the United States, the Republic of Korea and other countries to better understand climatic changes on the plateau, said Li Yueqing, director of the Chengdu Institute of Plateau Meteorology under the China Meteorological Administration.

Already, researchers at the China Aero Geophysical Survey and Remote Sensing Center for Land and Resources have found that the plateau's glaciers have been melting at an average of 131.4 square kilometers a year over the past three decades.

And they have estimated that rising temperatures would be largely responsible for the reduction of the glaciers by a third by 2050. Plus, the rising snow line and shrinking glaciers are likely to influence temperature changes in the plateau region, Xu said.

Fang Hongbin, an official of the center, said melting glaciers would increase the flow of water in rivers and lakes in a short term, but in the long run, downstream rivers would gradually dry up, and there would be more droughts, desertification and sandstorms.

China Pledges Efforts to Protect Wetlands (CRI, 2007-02-02)

China has promised to put more wetlands under state-level protection and to spend more than a billion

U.S. dollars protecting them from destruction.

Jia Zhibang, director of the State Forestry Administration (SFA), said that China boasts 38.48 million hectares of wetlands, the largest in Asia and the fourth-largest in the world.

The government poured 366 million yuan (45.75 million U.S. dollars) into wetland protection last year. By 2010, a total of 9 billion yuan will be spent on wetland protection.

China's wetlands are home to more than 2,200 wild plant species and more than 1,770 species of wild animals, Jia told a ceremony marking the 11th World Wetland Day on Friday.

However, Jia said, China's wetlands have been shrinking in recent years due to irrational development, water pollution and draining. Plundering wildlife resources of the wetlands is threatening their bio-diversity and local fishery resources, Jia said.

China plans to put 50 percent of its total wetlands and 70 percent of its important wetlands under effective protection by 2010. Hunting is strictly banned in wetlands and people who destroy wetland will be harshly dealt with.

Jia said China has established more than 470 wetland protection zones, putting about 45 percent or more than 17 million hectares of its total wetlands under strict protection.

Wetland protection is included in China's 11th Five-year Plan for economic and social development.

Wetlands are considered a "kidney of the earth" as they prevent flooding, promote water conservation and purify water.

Studies offer insight into the understanding of mechanism of red tide formation

(CAS, 2007-02-06)



Harmful algal blooms (HABs) in coastal waters, popularly known as "red tides" in China, have become a serious marine environmental problem and an ecological disaster, arousing grave concern of government, public and scientists worldwide.

With an objective of understanding, predicting and mitigating HABs in China, under the support of the National Basic Research Priority Program (dubbed national "973 Program"), a research team led by Prof. ZHOU Mingjiang from the Qingdao-based CAS

Institute of Oceanology and Prof. Zhu from the First Institute of Oceanography of the State Oceanic Administration (SOA) has carried out studies on the ecology and oceanography of HABs over the past five years. Recently it has passed the accept check under the auspices of a panel of experts organized by the Shandong Provincial Bureau of Science and Technology.

The project has achieved some key and innovative results via a multidisciplinary approach, including an understanding of the mechanism for the large-scale occurrences and the impacts of the HABs caused by *Prorocentrum donghaiense* in the East China Sea, a tentative plan for the control of massive algal blooms in this region, and the emergency countermeasures for their mitigation.

The studies make an essential and substantial contribution to the government's goal of HAB prevention, control and mitigation, according to the evaluation panel. As an example of the regional projects listed in the "Global Ecology and Oceanography of Harmful Algal Blooms (GEOHAB)," it could also offer a

typical case study for the HAB researches in the world.

From 2002 to 2006, the researchers scored a number of remarkable achievements via in situ investigations and lab experiments.

First, the large scale dinoflagellate blooms in the East China Sea, a major area where large scale HABs repeatedly occurred, were comprehensively studied from the points of biology, chemistry and oceanography. The research team worked on representative HAB causative species, such as *Alexandrium catenella* and *Prorocentrum donghaiense*, to study their morphology, molecular characteristics, ecological distribution, physiological features, population dynamics, life history, inter-species competition, the cyst's layout and germination, and their interaction with zooplankton populations. The concentration, composition, distribution and influx of nutrients in regions often hit by HABs, and their relations with the scourges' outbreaks, were also studied. They also took the lead in making a systematic study on the key physical oceanographic factors in the outbreak of large scale HAB events in this area.

Based on the studies of large scale *Prorocentrum donghaiense* bloom in the East China Sea, the scientists proposed a hypothesis on the causes, distribution pattern, timing, control factors of the re-occurring blooms, laying a solid foundation for its prediction research. A numerical model for depicting HAB dynamics was then developed. The model was re-examined and successfully validated in the following two consecutive years.

An in-depth analyses was made on the potential impacts of large-scale HABs caused by *Alexandrium catenella* and *Prorocentrum donghaiense*, through the laboratory studies about their toxic effects on native aquatic organisms at various trophic levels, the *in situ* toxicity testing in the field, the investigation on paralytic shellfish poison (PSP) contamination in local shellfish products, and the toxin transfer in the simulated marine food-chains. Their studies showed the mechanism and routes for the jeopardizing impact of the outbreak on a coastal ecosystem. Experts say that the work is of important significance in assessing an outbreak's ravage.

Furthermore, the scientists pinned out the causes for the changes of large scale HABs from diatom type to dinoflagellates type on the basis of long-term variation pattern of nutrient concentration and composition in this region, as well as the different nutrient-utilizing characteristics of dinoflagellates and diatom. The idea offered a scientific ground for the decision makers to curb the marine hazard in coastal China.

A number of countermeasures for controlling HABs, such as the use of organo-modified clays with higher algae-removing efficiency and environment-friendliness, were also developed by the research team. The technique was ratified as the primary approach for emergency treatment of potential red tide outbreak in seawaters where the water sports tournaments will be held in the 2008 Beijing Olympic Games, such as sailing and yachting. It was also proved to be an effective means in controlling freshwater algal blossoms in the country's inland lakes.

Global warming results in extreme weather events in China (Xinhua Net, 2007-02-06)

It's too early to state categorically that China is experiencing another "warm winter" this year, but the world's fourth largest economy is definitely suffering the impact of global warming, a senior meteorological official said on Tuesday.

Qin Dahe, director of the China Meteorological Administration, told a press conference in Beijing that global warming had made extreme weather -- such as high temperatures, drought and hurricanes -- more common in China.

Beijing temperatures reached 10.8 degrees Celsius on Sunday, the first day of spring according to China's traditional lunar calendar, and surged to 16 on Monday, the highest temperature at this time of year for the past 167 years.

Yulan Magnolia trees on Chang'an Avenue in downtown Beijing -- which normally blossom in late March -- are already in bud.

High temperatures in Beijing this winter are "obviously" related to global warming but the final verdict on the city's "warm winter" will only be given at the end of February, Qin said.

Beijing has had 20 "warm winters"-- where average December to February temperatures are at least 0.5 degrees Celsius higher than the average-- in a row since 1986.

This year, signs of a warm winter have not been limited to Beijing. In Nanjing, capital of east China's Jiangsu Province, sweet-scented osmanthus is already in blossom.

In the northeast, the average January temperature is up 4.1 degrees Celsius on normal years and up 2.7 degrees in the southwestern Qinghai-Tibet Plateau.

Citing the latest report of the intergovernmental panel on climate change (IPCC), Qin said that if a temperature increase of 1.9 to 4.6 degrees was sustained for a millennium, the Greenland ice sheet would melt completely and result in a sea-level rise of 7 meters.

Qin, who co-chairs IPCC working group I, said that, under the influence of human activities, the global climate had been warming since 1750, as evidenced by higher average air and ocean temperatures, the widespread melting of snow and ice and rising sea levels.

Last summer's severe drought around Chongqing Municipality in southwestern China and typhoon attacks in east coast both occurred against a background of global warming, he said.

Qin said that meteorological disasters caused direct economic losses of 200 to 300 billion yuan (25 to 37.5 billion U.S. dollars) in China annually, which was equivalent to two to five percent of China's gross domestic product.

Greenhouse gas emissions, and carbon dioxide discharges in particular, are widely considered to be the prime factor in global warming. China, the world's second largest greenhouse gas emitter after the United States, may have to face the challenge of declining grain output and increasingly scarce water resources.

The government has backed the UN-brokered Kyoto treaty, and committed itself to improving its energy efficiency by setting the goal of cutting its energy consumption by 20 percent per unit of GDP in the period from 2006 to 2010, Qin noted.

China reduced emissions by some 800 million tons of coal equivalent from 1991 to 2005. The country's forests, grasslands and natural reserves have helped absorb another 3.06 billion tons, he said.

Geological map of the Qinghai-Tibet Plateau finished (People's Daily, 2007-02-13)

China Geological Survey says it has finished mapping virgin territory on the Qinghai-Tibet Plateau. On a scale of 1:250,000, the map marks the completion of the mapping of the Chinese mainland.

A total of 340 million yuan was invested in the project, in which topographers mapped 1.52 million

square kilometers. The project kicked off in 1999.

Achievements have been made in the latest round of land and resource surveying, which began seven years ago.

A total of 110 subdivision maps on a scale of 1:250,000 have been completed. These will be instrumental in resource exploration, land layout, environmental protection, key project planning and construction, as well as scientific research in geology.

More than 600 sites have been found to have mineral deposits. This is the basic information necessary to begin exploring mineral resources.

New discoveries and developments have been made.

Evidence of geological disasters has been found, which is extremely important in planning, constructing and managing key projects as well as disaster prevention.

Over 700 tourist spots have been discovered, precious information for the development of Qinghai-Tibet tourism.

China Accelerates 1st Survey on Soil Pollution

(China News, 2007-02-22)

China is speeding up its first survey on soil pollution, which is costing the country more than 20 billion yuan (US\$2.6 billion) a year, according to the State Environmental Protection Administration (SEPA) recently.

However, the administration did not provide any details of the ways in which they might complete the survey more quickly.

The investigation focuses on farmland protection areas, main grain-producing areas, the Yangtze Delta Region, the Pearl River Delta Region, and areas around Bohai Bay.

China launched two nationwide investigations into its soil quality respectively in the 1950s and 1970s, both investigating the fertility of the soil rather than soil pollution.

The central government is to allocate 1 billion yuan (US\$129 million) for the national survey, which began last July and will be concluded in 2008.

After the survey, plans will be drafted for soil pollution prevention and pilot projects on rehabilitating and treating the soil will be carried out. A soil quality supervision and management system will also be built.

SEPA director Zhou Shengxian has said that China faces serious soil pollution that jeopardizes the ecology, food safety, people's health and the sustainable development of agriculture.

It is estimated that 12 million tons of grain are polluted each year by heavy metals that have found their way into soil. Direct economic losses exceed 20 billion yuan, according to SEPA figures.

World's Roof Affected by Global Warming

(CRI, 2007-02-23)

Global warming has affected the permanent snow on Mount Everest at the heart of the Himalayas, according to the results of a new study carried out by Chinese, French and American researchers and published in the European journal *Climate of the Past*.

The Himalayas and the Tibetan plateau are among world regions whose climatic changes are not well documented.

Nevertheless, in 2000 and 2002, Chinese scientists managed to drill three ice cores into the snow at the summit of the East Rongbuk glacier covering the northern collar of Mount Everest, with an altitude of 6,518 meters.

The analysis of these ice cores, carried out by the Chinese researchers in collaboration with their French counterparts, leads to the discovery of the existence of a new climatic indicator, the content of gas in the ice, and therefore it was possible to retrace the evolution of summer temperatures at the site with such a high altitude.

By accurately measuring the gas content of the two of the three cores, the researchers were able to learn about its evolution going back 2,000 years and they were able to observe a very profound reduction in the amount of gas trapped in the 20th century snow compared with the oldest snow at the site.

These results point to a recent escalation in the melting of snow during summer on the surface of the glacier. This research clearly indicates that climatic warming has also affected the permanent snow on the roof of the world, according to the researchers.

Only 50,000 hectares of wetlands left in Beijing (China News, 2007-02-27)

Beijing used to be famous for its more than 200 rivers, and wetlands covered 15% of the city area. However, accelerated urban planning and drought these years have drained many rivers and wetlands. Latest statistics show that only 50, 000 hectares of wetlands remain so far, covering some 3% of the city area.

The situation is worse downtown, as only 2.08% of the area there is covered with wetlands, allowing for even artificial lakes and rivers.

“The coverage of wetlands in a city should be between 3% and 4%, thus there is a lot to be done in Beijing to that end,” said Wei Mingjie, an engineer from Beijing Municipal Institute of Urban Planning.

“Some former wetlands have been transformed for construction, which must not happen in the future,” added Wei.

1.3 Health

Sino Cord Blood bank to extend to 50,000 units by 2010 (China News, 2007-02-02)

It is estimated that Sino Cord Blood Bank will collect some 50,000 units of umbilical cord blood by 2010, when it will be able to help 80% of patients who need stem-cell transplantation.

Sino Cord Blood Bank's Shanghai sub-branch announced on February 1 that it would donate 300,000 yuan to help 5 patients who need stem-cell transplantation in 2007.

Sino Blood Bank was initiated in the 1990s, and it has been growing very fast since then. Currently it even ranks among the tops of the world. However, communications among its sub-branches should be enhanced to improve the utilization of the umbilical cord blood in the bank.

At present Sino Cord Blood Bank is negotiating with China Marrow Donor Program, to provide help to

those who have failed to find marrow stem-cell donors.

Key gene identified to combat leukemia

(CAS, 2007-02-06)

CAS researchers and their U.S. collaborators have successfully identified the gene that may hold the key to fight against myeloid leukemia tumor.

Leukemia, which literally means "white blood" in Greek, is the prevailing blood cancer in the world today. Acute or chronic, it is a neoplastic disease of the bone marrow in which unrestrained proliferation of white blood cells occurs, and is usually accompanied by anemia, impaired blood clotting and enlargement of the lymph nodes. For adult patients, the most common type of leukemia is acute myelogenous leukemia (AML) caused by interstitial loss of all or part of the long (q) arm of chromosome 5.

Although a major commonly deleted region (CDR) had been described on the chromosome band, attempts to identify tumor suppressors within this band were unsuccessful. In the present study, scientists compared the expression of 28 candidate tumor suppressors in the CDR between primitive leukemia-initiating cells with or without the 5q deletion, and normal hematopoietic stem cells. Results showed that a gene called "alpha-catenin" was expressed at a much lower level in leukemia-initiating stem cells from AML sufferers than in hematopoietic stem cells free from 5q deletion.

Further analysis revealed that the α -catenin promoter of the retained allele of 5q is suppressed by both methylation and histone deacetylation, when the restoration of α -catenin tumor suppressor in 5q deletion cells could effectively reduce their proliferation and apoptotic cell death.

As another case of the famous "two-hit model", this research re-testified the essential role of epigenetic disorder in the transformation of leukemia stem cells.

Joint efforts came from the Institute of Health Sciences (IHS) under CAS Shanghai Institutes for Biological Sciences, Shanghai Jiao Tong University School of Medicine as well as Dana-Farber Cancer Institute under Harvard Medical School, the Rockefeller University, the University of Chicago, Stanford University, etc., with Prof. LIU Tingxi from the IHS Laboratory of Development and Diseases as first co-author of this study published in *Nat Med*, 2007, 13(1).

Liu got his doctoral degree from Shanghai Institute of Hematology, Ruijin Hospital and worked as a post-doc at the Department of Pediatric Oncology, Dana-Farber Cancer Institute during 1999 to 2004. He was recruited to IHS as a Bairen Program talent on May, 2004 and received the National Fund of Outstanding Young Scientists the next year. His research interests lie in the molecular genetic explanation of self-renewal and development of normal hematopoietic stem cell and leukemia stem cell by using zebrafish (*Brachydanio rerio*) as a genetic model.

Cardiovascular disease top killer of adult

(China News, 2007-02-06)

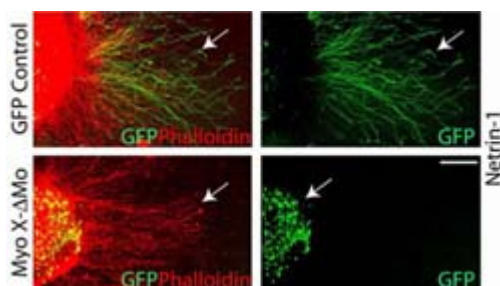
Cardiovascular disease takes about 3 million lives in China every year, some 45% of the total deaths. Doubtlessly, the disease has become the top killer of adult Chinese.

A research conducted by Peking Union Medical College Hospital jointly with several American researchers, finds that the incidence of cardiovascular disease and cancer has leaped with the aging of the population. However, cardiovascular disease has started to haunt people in their 30s or 40s, too.

We can't treat cardiovascular disease merely as an elders' disease," said Hu Dayi, an expert in this field. Actually, cardiovascular disease cost Chinese some 13 billion yuan in 2003, about 22.65% of the total medical expenses of the country that year, and the expenditure on cardiovascular disease had been growing at an average annual rate of 17.33% from 1993 to 2003, while the GDP growth of China in those 10 years was only 8.95%.

A new intracellular pathway for Netrin signaling

(CAS, 2007-02-09)



During the development of a nervous system, axons, a threadlike extension of a nerve cell, undergo a long and complex targeting process to reach appropriate brain areas, so as to establish synaptic connections and build functional neural networks. Thus, correct axonal guidance and targeting are essential for normal brain function, while defects in axonal growth and guidance

lead to neurological disorders such as mental retardation and epilepsy. Although neuroscientists have discovered that netrin is a secreted protein with important roles in axonal growth and guidance in the developing nervous system, they are puzzled about the mechanisms behind it.

A collaborative study between Dr. DING Yu-Qiang from the Institute of Neuroscience, the CAS Shanghai Institutes for Biological Sciences, and Dr. XIONG Wen-Cheng from the Medical College of Georgia (USA) has revealed a new intracellular pathway for Netrin signaling. As reported online in *Nature Cell Biology* on January 21, they discovered that an unconventional myosin, Myosin X, directly interacts with intracellular domain of DCC, the Netrin receptor, and cargos DCC to the tips of growing axons for sensing Netrin levels. The scientists observed that both *in vivo* and *in vitro* data clearly indicate that disruption of the interactions between Myosin X and DDC results in a failure of Netrin-induced axonal growth and projections.

Feasibility Study of “National Research Center of Nano-Pharmaceutical Engineering” Approved **(MOST, 2007-02-26)**

MOST recently organized Nano-Pharmaceutical experts and specialists of managing national research centers to conduct the feasibility study on the construction of National Research Center of Nano-Pharmaceutical Engineering in Changsha, Hunan province.

According to the experts, the central government should make up its mind to establish such a research center. From the feasibility report, the plan demonstrates a clear thinking, explicit objective, workable organizational structure, reasonable budget and existing match-up funds. 13 experts approved the feasibility study of the planned “National Research Center of Nano-Pharmaceutical Engineering” with high rating.

1.4 Key Technologies

Research into Two-stage Pulverized Coal Gasification Progressing (MOST, 2007-02-04)

The research into two-stage dry pulverized coal pressurized gasification technology made new progress. In the 10th Five-Year Plan Period, the 863 Program sustained its support on this technology with a total fund of more than 30 million Yuan, which laid a solid foundation for its development. There are seven project contractors, including Xi'an Thermal Power Research Institute Co., Ltd. and Weihe Coal Chemical Group Co., Ltd.

The development and demonstration of 2000t/d dry pulverized coal pressurized gasification technology was part of the major 863 project Coal-gasification-based Poly-generation Demonstration in the 11th Five-Year Period. The research work is expected to be finished by 2009 and applied in China Huaneng Group's Green Coal-based Power Generation Program, Phase I 250MW IGCC Demonstration Project.

Studies kick off on lubricating materials in harsh conditions (CAS, 2007-02-08)

Headed by LIU Weimin from the Lanzhou Institute for Chemical Physics, a flagship project on basic research into lubricating and wear-resistant materials in harsh conditions was started recently with the support of the national "973" Program.

Various hi-tech sectors, such as astronautics, aeronautics, informatics, military armament and advanced manufacturing, are progressing toward integration, miniaturization, high precision, long life-span, high reliability in their performance. Their moving parts and dynamical systems are working in harsher and harsher conditions, featuring ultra high-vacuum, radiation, variational temperatures, high electric currents/field, high velocity and heavy payloads. The circumstance poses challenges to the lubricating and anti-wear materials, which has a lot to do with the operational reliability, efficiency and service life of a mechanical and dynamical system.

The project is composed of the following six topics: Development patterns of the composition, structure, and property of lubricating and wear-resistant materials under vacuum and radiation; Mechanisms behind lubrication failure and material wear in extreme temperatures; Mechanism behind the wear of materials in a strong oxidizing condition; Lubrication & its size effect in a high-pressurized micro-clearance; Anti-wear and lubricating property and its control of material's surface/interface structure; and Molecular design, structural control and preparation technology for high-performance lubricating and wear-resistant materials.

The project is expected to notably raise China's research and development capacity and level in the field, providing theoretical grounds and technical guarantee for developing up-to-date lubricating materials for China's hi-tech industries, involving its aeronautic and astronautic undertakings.

1.5 Structure of Matter

CAS researchers create largest ever photonic "Schrödinger cat"

(CAS, 2007-02-08)



CAS researchers are successful in their experimental entanglement of six photons in graph states: a "Schrödinger cat" state, and a "cluster" state. By creating two important examples of such states, according to experts, the studies have paved the way for the research into the fundamental issues in quantum computing, quantum error correction and quantum mechanics.

In 1935, Erwin Schrödinger proposed a famous thought experiment in which a cat was somehow both alive and dead at the same time. The experiment involves a sealed box (allowing no interference from the outside), which contains a cat, and a closed canister of poisonous gas. Attached to the gas canister is a mechanism containing a radioactive nucleus. When the nucleus decays, it emits a particle that triggers a mechanism which opens the canister, thereby killing the cat. Since the nucleus, as long as it remains unobserved, is in a superposition of the "decayed" and "not decayed" states, then it logically follows that the cat must also be in a superposition of "alive" and "dead" states -- until the moment when the box is opened.

Although the principle of superposition doesn't extend to such large objects and the Schrodinger cat state is no where to find in the macroscopic world, physicists are able to making hypothetical cats from small groups of photons or atoms.

Recently, as reported in a recent issue of Nature Physics, PAN Jianwei and his colleagues from the Hefei National Laboratory for Physical Sciences at Microscale at the CAS affiliated University of Science and Technology of China and institutions from Germany and Australia have created two types of six-photon graph state: a six-photon Greenberger-Horne-Zeilinger state, which is the largest photonic Schrödinger cat so far, and a six-photon cluster state, which is a state-of-the-art 'one-way quantum computer. Both of these break records for the number of photons entangled in such a manner: the cat state was previously five photons, and the cluster state was previously four.

However, the six-photon cluster state is likely to be of more importance, says LU Zhaoyang, lead author of Nature Physics article and a physicist from USTC. Standard quantum computation is based on sequences of unitary quantum logic gates, where a major difficulty lies in the implementation of dynamical operation, Lu was reported as saying. "Cluster-state quantum computation does not need any dynamical operation."

Entanglement, an exotic phenomenon in quantum physics, is a state when particles are mixed that the measurement of one affects the state of another. In addition to the fundamentals for the quantum mechanics, it is a core technology for quantum information processing. Scientists have discovered that the entanglement of multi-photon entanglement is necessary for the development of a quantum computer with super computability. In a large extent, the level of such manipulation represents the

capacity of a country for quantum computing.

**CAS, Guangdong to co-establish a spallation neutron source facility
(CAS, 2007-02-14)**



CAS is to join hands with South China's Guangdong Province in the joint construction of Chinese Spallation Neutron Source (CSNS) in Dongwan, a booming city in the province. On 13 February, CAS President LU Yongxiang and Guangdong Governor HUANG Huahua signed a Memorandum of Cooperation on behalf of the two sides.

As a key mega-science facility during the 11th Five-Year Plan Period (2006-2010), the 1.2 billion yuan (or US\$137 million) CSNS project was approved by the

central government in 2005 and has been listed in the National Long- and Medium-term Plan for S&T Development.

According to the blueprint of the CAS-Guangdong cooperation on the project, the facility will take seven years to complete with financial support from the State. Guangdong will provide the construction site, as well as matching funds for its operation and for the establishment of a national laboratory for such a research subject.

According to the agreement between the two parties, the CAS Institute of High Energy Physics (IHEP) will join forces with the CAS Institute of Physics to set up an IHEP branch in Dongwan as the corporate body for the CSNS construction project and the future national lab.

The CSNS accelerator is the first large-scale, high-power accelerator project to be constructed in China according to WEI Jie, one of its chief designers and a physicist from IHEP and US Brookhaven National Laboratory. It is designed to accelerate proton beam pulses to 1.6 GeV kinetic energy at 25 Hz repetition rate, striking a solid metal target to produce spallation neutrons.

The future CSNS will be a world-class facility for a new generation of neutron sources, which is characterized with high-flux, broad-wavelength, and is safer and more efficient, says Prof. ZHANG Jie, a CAS Member and director-general of the CAS Bureau for Basic Sciences. As a state-of-the-art platform for the application of multidisciplinary studies, it could be employed in a range of basic and applied realms, such as solid state physics and chemistry, materials science, life sciences, informatics, nuclear physics and nuclear medicine.

The establishment of CSNS in Guangdong will be of strategic importance for scientific research in China, says Prof. Lu, who is also vice chairman of the Standing Committee of China's top legislator, the National People's Congress. It will further rationalize the geographical layout of China's mega-science facilities, giving a new impetus to the sustainable development of basic and applied research capacities in south China, Hong Kong and Macao special administrative regions, and even in Southeast Asia, he adds.

1.6 Transport and Space

China to launch 2nd series of oceanic survey satellites

(Xinhua Net, 2006-02-01)

China's State Council has endorsed plans to launch the second-generation of the country's oceanic survey satellites, the state's top ocean research official said on Thursday.

The "Haiyang-2" (Ocean 2) series of satellites, a crucial component of China's civil spacecraft program, would be used to collect data on offshore wind fields, ocean circulation, tides, and sea surface temperatures, said Sun Zhihui, director of State Oceanic Administration.

China launched its first oceanic satellite "Haiyang-1A" (Ocean 1A) in 2002, to monitor ocean color and temperature through remote sensing technology.

The monitoring range of the "Haiyang-1A" covered the Bohai Sea, the Yellow Sea, the East China Sea and the South China Sea.

Sun told a national conference on oceanic administration that the country's second oceanic satellite -- the "Haiyang-1B" (Ocean 1B) the successor of the "Haiyang-1A" -- would be launched "very soon", but he did not reveal the specific timetable.

Off-shore environmental monitoring via satellite technologies win support

(CAS, 2007-02-02)

A research project to monitor the off-shore environment via satellite surveying technology proposed by Dr. ZHOU Xuhua from the CAS Wuhan Institute of Geodesy and Geophysics has recently received the backing of the National High-Tech Research and Development Program (dubbed the "863 Program") in the marine technology section.

Entitled "Satellite gravity surveying and altimetry technologies for off-shore environmental monitoring," the project will focus on new multi-information methods of studying various geophysical phenomena in China's off-shore areas by combining the new-generation satellite gravity surveying technology with earth observation data such as satellite altimetry. It aims at producing relevant algorithm and software, with independent intellectual properties, to enhance the measurement precision of the gravity field, submarine landforms, sea-level anomalies and average sea-level in targeted regions. The research is expected to effectively enlarge the R&D and application scopes of satellite surveying technologies in China, and to develop a competitive edge against global rivals.

China puts new navigation satellite into orbit

(Xinhua Net, 2007-02-03)

China successfully put a navigation satellite into orbit early Saturday from the Xichang Satellite Launch Center in southwest China's Sichuan Province.

The carrier rocket, Long March 3-A, blasted off at 0:28 a.m. (Beijing Time). The satellite separated from the rocket about 24 minutes later.

Data from the Xi'an satellite monitoring center showed that the satellite had accurately entered its orbit. It is China's fourth Beidou (Big Dipper) navigation experimental satellite in orbit. The previous three were sent in space on Oct. 31, 2000, Dec. 21, 2000 and May 25, 2003 respectively.

Experts said the Beidou satellite navigation experimental system is operating well and has played a significant role in cartography, telecommunications, water conservation, transportation, fishery, prospecting, forest fire monitoring and national security.

The fourth Beidou navigation satellite, serving as a backup satellite for the Beidou satellite navigation experimental system, may replace the first Beidou satellite, when necessary, continuing to provide all-weather and all-day navigation and positioning information.

Experts said China is establishing the Compass Navigation Satellite System on the basis of the Beidou satellite navigation experimental system. The compass system will in 2008 fully meet the demand of satellite navigation for clients in China and neighboring regions.

The Compass Navigation Satellite System will gradually extend to be a global satellite navigation and positioning system after network building and experiments, experts said.

The compass system will be mainly used for economic purposes, providing efficient navigation and positioning services in transportation, meteorology, petroleum prospecting, forest fire monitoring, disaster forecast, telecommunications and public security, among others.

China is one of the several countries in the world capable of developing such a system on its own.

The system can help clients know their location at any time and place with accurate longitude, latitude and altitude data.

The satellite and carrier rocket were developed respectively by the China Academy of Space Technology and China Academy of Launch Vehicle Technology, which are under the China Aerospace Science and Technology Corporation.

The launch represents the 95th flight of China's Long March series of rockets.

China to build 4th satellite launching center in Hainan

(Xinhua Net, 2007-02-06)

China is to build a new satellite launching center, the fourth of its kind in the country, in its southernmost island province of Hainan, said Luo Baoming, acting governor of Hainan, on Tuesday.

Luo, who is attending this year's session of Hainan Provincial People's Congress, said the feasibility research on the center started in 2002 and the long-awaited plan will be materialized soon.

Currently, China has three satellite launching centers located, respectively, in Xichang in southwest China's Sichuan Province, Jiuquan in northwest China's Gansu Province and Taiyuan in north China's Shanxi Province.

The site of the new satellite launching center is confirmed to be Wenchang, about 60 km from provincial capital Haikou. Covering an area of 20 sq km, the Wenchang Satellite Launching Center will cover a space launching port, a space theme scientific park, a rocket assembling plant, a rocket launching base, and the command center.

Hainan was selected as new base of China's satellite launching mainly for its geographical advantages, said Long Lehao, an expert in carrier rocket and member of Chinese Academy of Engineering.

The lower the latitude of the launching site is, the larger is the centrifugal force, and the lower is the cost of the launch. "Hainan is China's closest site to the equator, so much energy could be saved if a satellite base is built in the place," said Long.

Wenchang is centered at 11 degrees east longitude and 19 degrees north latitude in northeastern Hainan. Due to the low latitude, the load efficiency of the rocket will be high, according to the expert.

Long estimates the actual load efficiency will increase by 7.4 percent at Wenchang base, compared with the Xichang base centered at 27 degree north latitude. The new base can add 300 kg more rocket load, saving six million U.S. dollars in load expenses (cost on rocket load is about 20,000 U.S. dollars per kg in the world).

China's new-generation rocket is expected to be put into use in 2010 and the Wenchang satellite launching base is likely to serve the launching of the new carrier rockets, Long said.

China makes all devices for lunar probe project on its own

(China News, 2007-02-06)

Chinese lunar project is being developed amid great challenges from other countries, some leading ahead of China in this aspect while others trying to catch up with China in their space technology. With no help from other countries, China will design and produce all devices needed for the lunar probe project on its own, said Ouyang Ziyuan, chief scientist of China's lunar exploration project.

Ouyang Ziyuan, who is a pioneer in the field of cosmochemistry in China and an academician at the Chinese Academy of Sciences, made the statement at a forum held by the Association of Senior Engineers, Scientists and Technologists, the Science Technology Daily reported.

Since the moon has strategic importance to a country's development in military and energy resources fields, many countries in the world are devoting great efforts to their lunar probe projects. Developed countries such as the United States, Britain, and Japan spend large amount of money to develop their lunar probe projects. India, which is also ambitious to develop its own lunar probe project, claims that it wants to send manned spacecraft into the moon four years ahead of China. Under this situation, it is impossible for China to get any help from other countries in developing its lunar probe project, Ouyang Ziyuan said.

China intends to put 1.4 billion yuan in three years to complete the first stage of its lunar probe project. Compared with other countries, such economic input was not big for China, the scientist said, for the United States has spent a total of 25.6 billion US dollars in its Apollo Program, which has proved fruitful since the program has greatly boosted the U.S. technologic and economic development.

"As a matter of fact, the lunar probe project is one that China can't afford to miss. If China doesn't do it now, it will lag behind others and will be subjected to 'bullying and beating' in future," he said.

He also stressed that in order to develop the lunar probe project, China will not only make use of private funds, but also take advice from the public. "We will definitely do that (respect public opinions)," the scientist said.

China to test own 500kph maglev trains by 2010

(Xinhua Net, 2007-02-11)

China will develop its own magnetically levitated (maglev) trains that can travel at speeds of up to 500 kilometers per hour, according to a government report.

A 30-kilometer-long test line will be built before 2010, said a report from the Ministry of Science and Technology.

The maglev trains are listed in the "national scientific and technological support projects" of the 11th Five-Year Plan period (2006-2010) that aims to "solve crucial science and technology problems that hamper China's economic and social development", said Wang Xiaofang, director of the ministry's

planning bureau.

From 2006 to 2010, the "support project" focuses on 11 sectors that include energy, resources, environment, agriculture, materials, manufacturing, transport, IT and modern service industry, population and public health and urban development.

China built a 30-kilometre-long maglev link from Shanghai to the city's main airport, Shanghai Pudong International Airport, in 2003 using German technology. China has just put 15 of its new "bullet" trains into service to help deal with the crush of passengers before and after the Chinese Lunar New Year's Day, which falls on Feb. 18. The current "bullet" trains have a maximum speed of 200kph.

CAS official: China to establish "world class" observatory

(Xinhua Net, 2007-02-13)

Construction of a "world class" observatory could start in western China within the next five years, an official with the Chinese Academy of Sciences (CAS) said on Tuesday.

Two sites for the observatory are currently under consideration- Karasu, on the Pamir Plateau in Xinjiang, and Oma, in southwest Tibet - but the search for the exact site is expected to take at least three years, according to Xue Suijian, director of Science and Technology section of National Astronomical Observatories under CAS.

"When the location is chosen, we hope to set up the world's most advanced optical science facilities through international cooperation," Xue said.

"The current observatories in China do not meet the country's research needs in the field of astronomy," he said.

He said scientists had installed some observatory equipment at the two sites to examine whether or not the location was up to standard for a "world class" observatory.

2 News from Universities

1 million Chinese have studied overseas from 1978 to 2006

(People's Daily, 2007-02-28)

The number of the Chinese who had studied abroad over the past three decades between 1978 and the end of 2006 topped one million, and more than 70 percent of them are those who had left China for overseas after the year 2000, discloses Fang Maotian, director of the Chinese Service Center for Scholarly Exchange, at a press briefing of the 12th China International Education Exhibition Tour on Tuesday.

According to Fang, the relevant authoritative department of the Chinese government has stepped up its work to send more government-funded students overseas, whereas there is also an apparent rise in number of the Chinese who go abroad to study at their own expenses.

In order to provide a fast, objective and accurate information consultancy service for those going abroad for a study, either with a government scholarship or at their own expenses, the 12th China International Education Exhibition Tour (CIEET) will be held in Beijing, Chongqing, Shanghai, Wuhan, Nanjing and Guangzhou from March 3 to 20, with more than 300 partaking overseas colleges, universities and educational institutions from such leading destinations as Australia, Japan, New Zealand, the United States, Canada and Hong Kong.

CIEET has played a vital, important role in publicizing the Chinese government policy in this regard, providing much balanced information service for those going abroad to study; guiding, standardizing and ensuring the healthy growth of the overseas education market for the Chinese to study at their own expenses; while spurring the exchanges and cooperation between Chinese institutions of higher learning and relevant agencies and their overseas counterparts.

3 Innovation Management

Organizations and Working Mechanism Set to Combat Research Misconducts

(MOST, 2007-02-01)

The 11th Decree of MOST, Trial Measures against Research Misconducts in National S&T Program, was put into effect on January 1, 2007. MOST has made various preparations for setting up specific organizations and the working mechanism to carry out the Measures. Efforts were thus made to establish Department Joint Meeting for Research Integrity and Expert Consultancy Committee as well as to formulate specific rules of implementing the Measures. Besides, MOST will soon publish on its website the channels, procedures and working regulations on reporting research misconducts.

Measures have won positive responses from S&T community and other social circles. It is hoped that Measures will promote research integrity in an all-round way so as to create a favorable culture for indigenous innovation.

Three more national labs to be set up at CAS

(CAS, 2007-02-05)

Chinese Ministry of Science and Technology has recently given green light to the establishment of another 10 national laboratories in 2007, among which three will be at CAS.

The three CAS-affiliated laboratories will be the National Laboratory of Magnetic Confinement and Nuclear Fusion at the CAS Institutes of Physical Sciences in Hefei, the National Laboratory of Clean Energy at the CAS Dalian Institute of Chemical Physics and the National Laboratory of Protein Science at the CAS Institute of Biophysics. The key laboratories are built to meet national strategic demands and hunt for leaders and PIs across the world.

The newly approved laboratories cover a wide range of scientific fields, including marine, aeronautics, health and population, nuclear and new energy sources, advanced manufacturing, optimum system manipulation, protein and rail traffic. The construction will be co-headed by the Ministry of Education, State Commission of Science Technology and Industry for National Defense, the Ministry of Health as well as CAS. In addition to CAS institutes, other institutions involved are the Chinese Academy of Medical Sciences, Shanghai Jiao Tong University, Nanjing University, Beihang University.

250 mln yuan earmarked for 30 basic scientific programs

(Xinhua Net, 2007-02-08)

The Chinese government is to allocate 250 million yuan in financial support to 30 basic scientific research programs.

The 30 projects were declared at the launch of a series of national basic scientific research programs, held by the Ministry of Science and Technology on Wednesday in Beijing.

The programs include research on glacier resources and changes in China, a survey on the characteristics of mental development of teenagers, and research into agricultural biotic resources in Yunnan and adjacent areas.

The government attaches great importance to basic scientific research. A platform of basic research programs and basic research conditions was established since 1999.

In 2006, with support of the Ministry of Finance, a special project was launched with respect to basic scientific works. The project focuses on the weak points of basic researches, including scientific investigation and the comprehensive processing of scientific data.

However, basic scientific research requires longer periods of time before results can be seen in terms of papers and patents. The country still faces the lack of effective and stable supports with respect to basic research. Basic scientific research provides resources for further scientific research and technological developments. They play an importance role in the country's scientific progress, its social and economic development, as well as its national security.

China to invest 30 bln yuan in 147 key science projects

(Xinhua Net, 2007-02-09)

China will invest 30 billion yuan in 147 key science programs, such as developing maglev trains and wind power stations or seawater desalination technologies.

7.35 billion yuan has already been allocated from the central budget and the remaining funds are expected to come from companies, local governments and institutes, the Ministry of Science and Technology (MST) announced on Friday, as it launched the five-year project.

The Ministry drew particular attention to 50 high-profile projects. They included 2-3 megawatt wind power stations, magnetically levitated trains running at 500 km/hour and highly efficient seawater desalination equipment.

The science programs cover about 11 fields such as energy, environment, population, health care, public security and urban planning.

"These programs will try to solve critical science and technology problems that are hampering China's economic and social development," said Wang Xiaofang, director of the MST Planning Bureau.

He said the programs were designed to enhance China's competitive capability in key industries and the independent innovation capacity of Chinese companies.

China's political advisors calls for tightened scrutiny of scientific research funds

(People's Daily, 2007-02-14)

China should tighten scrutiny over the use of public funds for scientific research, as an estimated 50 percent of the money has been wasted or misused, according to a proposal by a local advisory body.

More than half of scientific research funds were spent on unnecessary things, such as organizing meetings unrelated to research projects or being paying bonuses, according to the proposal submitted at a session of the Hubei provincial committee of the Chinese People's Political Consultative Conference (CPPCC).

It urged local authorities to standardize the procedure of examining and approving scientific research projects, keep a close eye on the use of allocated funds and remain vigilant over academic plagiarism, China Youth Daily reported.

It suggested that related departments should monitor the research teams who apply for the funds, including their experimental facilities, research plans and experience of team leaders.

The public funds for scientific research should be carefully managed and supervised to avoid false reporting, padding out of expenses, embezzlement and waste, the proposal said.

Shan Ping, former president of a Tianjin university, was expelled from the National People's Congress, China's top legislature, in December last year for misuse of research funds.

Shan was accused of investing 100 million yuan (12.8 million dollars) of university funds in stocks and shares between 2000 to 2001, causing a loss of 37.6 million yuan (4.7 million U.S. dollars).

For many years, China had thousands of "major scientific projects" launched annually by many organizations, but little progress was achieved. The waste of funds and scientific resources was criticized by the public.

China's investment in science and technology last year was estimated at 71.6 billion yuan (8.95 billion U.S. dollars), up 19.2 percent from 2005, according to the Ministry of Science and Technology.

CAS sets up an innovation research center

(CAS, 2007-2-15)



The inaugural celebration for the CAS Center for Innovation and Development (CID) was held on 14 February in Beijing. Vice Chairman of the National Development and Reform Commission (NDRC) ZHANG Xiaoqiang and Member of CAS Presidium FANG Xin jointly unveiled the nameplate for the new center.

The center will render support to governmental decision-makers and business leaders by launching research on innovation, says CID Director MU Rongping, who also

heads the CAS Institute for Policy and Management (IPM).

Affiliated to IPM, CID is an unincorporated research body under the joint auspices of NDRC and CAS, says Prof. Mu. The center will pool resources in the field via establishing collaborative platforms among industry, universities and research institutes. Beginning from 2007, it will release an annual report on China's innovation.

China to build 12 major technological infrastructure projects

(People's Daily, 2007-02-26)

China will build 12 major technological infrastructure projects and about 30 national science centers and labs, aiming to enhance its innovative capability, according to a plan released by the State Development and Reform Commission (SDRC) on Sunday.

The 12 major technological infrastructures, such as spallation neutron source (SNS) and large-sized astronomical telescope, cover areas like aviation, bio-tech and life science, the plan shows.

However, SDRC didn't specify in the plan the amount of money China will invest in the projects.

In 2006, China implemented the national guidelines for medium and long-term science and technology development and the 11th five-year plan for science and technology.

Governments to favor China-made innovative products**(People's Daily, 2007-02-27)**

China plans to give priority to innovative products produced by Chinese-owned or -controlled enterprises in government procurement, an official said in Beijing on Monday.

Such innovative products needs to be certified before they can be recommended for government procurement and major engineering projects, according to new regulations issued at the end of 2006 by the Ministry of Science and Technology (MOST), the National Development and Reform Commission and the Ministry of Finance.

Qin Yong, a deputy director with MOST, said companies, including joint-ventures that are majority owned by Chinese, can register their products with the National Innovative Products List which is scheduled to be issued later this year. The products must be high quality with registered intellectual property rights, according to the regulation.

MOST is preparing an application and evaluation process which will be completed this year, said Qin.

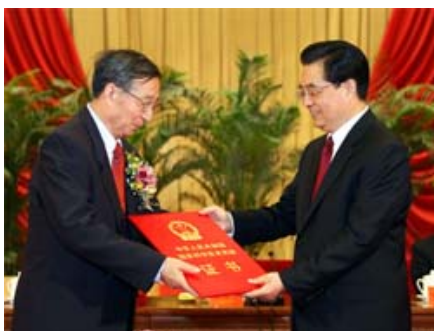
30 CAS research projects receive national S&T awards**(CAS, 2007-02-27)**

Nationwide, 326 research projects were honored with the 2006 national S&T awards, including 29 with the National Award for Natural Sciences (two first prizes and 27 second ones); 56 with the National Award for Technological Invention (one first prize and 55 second ones) and 241 with the National Award for Science and Technology Progress (one special prize, 20 first prizes and 220 second ones).

Among the 326 projects, 30 were headed by CAS scientists.

The research project "generation and transfer of hot electrons in the interaction between extra-intense laser and plasma" is the second place winners of the National Award for Natural Sciences in 2006.

They include 12 winning the second prize of the National Award for Natural Sciences, five winning the second prize of the National Award for Technological Invention and 13 winning the National Award for Science and Technology Progress (two first prizes and 11 second ones).

CAS geneticist honored with top S&T award**(CAS, 2007-02-28)**

China granted its State S&T awards to scientists and engineers that have made remarkable progress in technological innovation. The ceremony was held on 27 February at the Great Hall of the People in Beijing.

Chinese President HU Jintao and other senior leaders WEN Jiabao, ZENG Qinghong and LI Changchun were present at the awarding ceremony, which was jointly held by the Central Committee of the Communist Party of China and the State

Council.

The National Supreme S&T Award in 2006 goes to Prof. LI Zhensheng, a geneticist from the CAS Institute of Genetics & Developmental Biology. At the awarding ceremony, Prof. Li, also a CAS member, received the certificate for the prestigious award, which comes with a five million yuan (about \$650,000) prize, from Chinese President HU Jintao.

Among the 326 research projects honored with the 2006 national S&T awards nationwide, 30 were headed by CAS scientists, receiving 12 second prizes of the National Award for Natural Sciences, five second prizes of the National Award for Technological Invention and two first prizes and 11 second ones from the National Award for Science and Technology Progress.

LI Zhensheng & his academic achievements (CAS, 2007-02-28)



Prof. Li Zhensheng, a geneticist and an expert on wheat breeding from the CAS Institute of Genetics and Developmental Biology, was born in Zibo City, Shandong Province in February 1931. He graduated from Shandong Agricultural College in 1951, and was elected as a fellow of the Academy of Sciences for the Developing World in 1990 and a CAS member in 1991.

1. Breeding a series of new cultivars, named *Xiaoyan*, via intergenous crosses between common wheat (*Triticum aestivum*) with the wheatgrass (*Agropyron elongatum*= *Thinopyrum elongatum*, $2n = 70$).

In the early 1950s, the stripe rust, a fungi disease of wheat, caused serious epidemic in the winter wheat crop in northern China, leading to heavy yield losses. To identify new resistance sources, Prof. Li carried out systematic studies of the intergenous hybridization between wheat and wheatgrass by overcoming three stumbling blocks: low compatibility during crossing, poor hybrid fertility and wide segregation of hybrid offsprings. He succeeded in transferring the genome, chromosomes and chromosomal segments of wheatgrass into common wheat, and developed many new valuable cytogenetic lines and varieties, including octoploids, alien-addition lines, alien-substitution lines, translocation lines and three commercial varieties (*Xiaoyan-4*, *Xiaoyan-5* and *Xiaoyan-6*) that were featured with high yielding, stripe rust-resistant and good quality. The wheat cultivars developed by Prof. Li have been widely and extensively cultivated in China, including a dozen of provinces and autonomous regions, and has brought massive socio-economic returns, which has set a successful example in the development and utilization of wheat varieties by intergenous hybridization between common wheat and its wild relatives.

2. Development of a new wheat chromosome engineering system.

In order to improve the accuracy and efficiency in transferring the genes from wild germplasms into common wheat, Prof. Li developed a new blue-grained wheat monosomic (BGM) system and fertile nullisomic lines using blue endosperm gene(s) from *Agropyron* as genetic marker. The monosomic chromosomes in these lines were each engineered to contain a translocated wheatgrass chromosomal segment, which possesses the gene(s) producing a blue pigment in the seeds. In hybridization using the blue-grained monosomic lines, the genomic compositions (i.e., chromosomal number, integrity of the monosomic chromosome) could be visually judged in the field by examining the blue pigmentation in

the seeds, thus reducing the labor examinations of the individual progenies by microscopy. Using the nullisomic lines derived from the blue-grained monosomic wheats, Prof. Li established the nullisomic backcross method, a novel wheat chromosome engineering approach, for efficient generation of new substitution lines, which could be further bred into new commercial varieties.

3. Pioneering a new direction in breeding wheat varieties with high nutrient efficiency.

In consideration of China's need to feed a huge population with inadequate farmland and limited mineral resources, Prof. Li advocated and pioneered a new direction in wheat breeding, e.g., development of mineral nutrient efficient wheat varieties, in the early 1990s. To this end, he discovered phosphorus (P) and nitrogen (N) efficient wheat germplasms, and studied the mechanisms underlying the high P and N efficiencies of these materials. As a result, he bred two new wheat varieties *Xiaoyan-54* and *Xiaoyan-81*, which are highly efficient in utilizing soil P and N nutrients. Based on the success in nutrient efficiency breeding, Prof. Li has proposed a set of new guidelines for crop breeding research in China, the essence of which is: obtaining more output of yield with less input of natural resources, promoting the protection of environment and sustainable development of agriculture.

In addition to the academic achievements listed above, Prof. Li has made many important and influential suggestions to national policies on enhancing farm's productivity at the different developmental stages of Chinese agriculture. The adoption of his suggestions by the central government has aided the strengthening of food security in China. For example, in 1987, he advocated an upgrading scheme for comprehensive remediation of the medium and low-yield farmlands on the Huang-Huai-Hai plain. In 1994, he masterminded an initiative for increasing the country's annual grain yield by 10%, from 450 to 500 million tons. Furthermore, in response to the decrease of national grain yield in five consecutive years from 1998 to 2003, he proposed a set of effective measures that has greatly promoted the recovering of grain production in China in recent years.

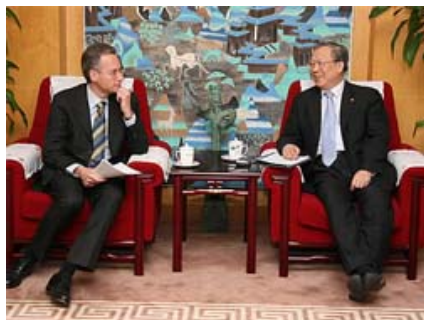
Over the past several decades, Prof. Li has assumed many important administrative posts, i.e., director of the former Northwest Institute of Botany, head of the CAS Xi'an Branch, president of Shanxi Academy of Sciences, chairman of the Shaanxi Province's Association for Science and Technology, vice president of CAS, and vice president of the China Association for Science and Technology. He was elected as a delegate to attend the 12th & 13th CPC National Congress, a member of the standing committees of the 8th and 9th CPPCC, president of Chinese Genetics Society, and model worker at both national and provincial levels.

He has received a number of major prizes and honorary titles, including a prize from the National Conference for Science & Technology, a first-grade prize from the National Awards for Technical Inventions, Tan Kah Kee Science Prize in Agriculture, the HL-HL Prize for Science & Technology Progress, China Agriculture Elite Award, and the Supreme Award of Science and Technology of China in 2006.

4 China's International Science Cooperation

CAS President gives an interview to *Der Spiegel*

(CAS, 2007-02-09)



CAS president Lu Yongxiang, who is also vice chairman of the Standing Committee of the National People's Congress, granted an interview to Martin Doerry and Andreas Lorenz, deputy editor-in-chief of *Der Spiegel* and its reporter in China, on 7 February in Beijing. The talk covers various topics ranging from the Sino-German S&T cooperation to positioning of CAS and distinctions of the two countries' educational systems.

Der Spiegel, a world-renowned journal on political affairs published in Germany, is preparing a special issue on the S&T

developments worldwide.

During the interview, Prof. Lu gave an overview on the history of the S&T cooperation and exchanges between China and Germany. In the early half of the 20th century, many Chinese youngsters went to Germany for advanced studies and then returned to serve their motherland, including WANG Ganchang, ZHOU Peiyuan, BEI Shizhang and LI Guohao. In the late half of the century, CAS has kept close ties with main scientific institutions in Germany, signing cooperative protocols with Max Planck Society (MPS) in 1974 and Alexander von Humboldt Foundation in 1978. At present, MPS is a major collaborator of CAS, and the cooperative models between the two sides include guest labs, junior research groups, independent partner groups and partner research institutes. Each year, CAS researchers make about 600 trips to MPS for scientific collaboration and exchanges.

Prof. Lu also briefed the German journalists about the CAS history and its current development, high-lighting the attainments in its Knowledge Innovation Program (KIP). CAS is to gear itself to China's national strategic demands as well as the S&T frontiers of the world today. CAS strives to make fundamental, strategic and forward-looking contributions to China's economic growth, national defense and social progress by enhancing its capacity of proprietary innovation, key technology integration and storming the heights of world science. Since the implementation of KIP, CAS has entered a stage of all-round development.

In comparison of Chinese educational system with that in Germany, Prof. Lu maintains that both have its own distinctions. As China is now in the stage of development, it is advisable for the country to learn from the strong points of other countries and make them serve its current actualities.

Prof. Lu also replied questions posed by the German journalists regarding the protection of intelligent properties, the roles played by political parties and their policies on promoting the constructive roles of S&T and education.

China-Germany Steering Committee Meet for Renewable Energy in Traffic

(MOST, 2007-02-09)

The third China-Germany steering committee meeting for renewable energy in traffic was held on January 26, 2007 in Beijing.

It was noted by the steering committee to hold a seminar on hydrogen technology to engage enterprises

and research institutes in substantive collaboration across a spectrum of areas, including fuel cell technology, hydrogen production and storage, and research on hydrogen standards. The two sides also reached consensus on the demonstrative project of “Renewable Diesel Vehicles in Metropolitan City”. It was agreed that the fourth steering committee meeting would be held in Germany in April 2008.

5 Miscellaneous

Project to establish a clean development mechanism launched

(People’s Daily, 2007-02-07)

In Beijing on February 6, the Ministry of Science and Technology, the United Nations Development Programme (UNDP) and the China International Center for Economic and Technical Exchange (CICETE) co-launched a development and cooperation project to establish a clean development mechanism (CDM), which will help China meet the Millennium Development Goals (MDGs). This project is aimed at encouraging more "green investment" in less developed areas of China, as well as more advanced technology.

This project aims to formulate a development strategy for the carbon market within two years and build CDM capability in 12 test regions including Qinghai, Shaanxi, Shanxi and Xinjiang. The project will improve the relationship between the public sector and private organizations as well as expand the carbon market to promote the CDM project.

At the project's launch, Liu Yanhua, the Vice Minister of Science and Technology said that as outlined in the 11th Five-Year Plan, China aims to reduce energy consumption. Energy consumption per unit GDP in 2010 is expected to fall 20 percent from what it was at the end of 2005. The proportion of renewable energy in the energy mix is expected to rise 10 percent. Liu hopes the establishment of a clean development mechanism will help ensure these policy aims are fulfilled.

ILC press conference held in China, \$7b proposed for particle study

(China Daily: 2007-02-09)

International scientists yesterday proposed a \$7-billion-plus plan to build an international linear collider (ILC) to find unknown particles and conduct studies.

The international scientific community has been working for two decades to build an ILC, but they agreed on a budget only yesterday at an International Committee for Future Accelerators (ICFA) meeting in Beijing. The meeting continues today.

Scientists hope the proposed ILC will be completed by 2016, but it is yet to be decided where it will be based or how the funds would be realized.

A linear collider is a gigantic device that makes electron beams hit each other, and scientists can find unknown particles by studying the collision results.

Scientists say the collisions can create an array of new particles that could answer some of the most fundamental questions about the nature of the universe, such as the origin of mass, dark matter and dark energy.

The collider will hurl about 10 billion electrons and other particles toward each other at almost the speed of light, making them collide 1,400 times every second and creating extremely high levels of

energy 500 billion electronvolts (GeV).

The energy level will increase to 1000 GeV, or 1 trillion electronvolts (TeV), in the second stage.

GeV and TeV are units of energy used in particle physics. One TeV is equal to the energy of a flying mosquito. But the proposed ILC will squeeze a TeV into a space about a million million times smaller than the size of a mosquito.

There are more than 70 colliders across the world, but most of them are not large and long enough to enable scientists to observe the basic nature of a material. Many of them, like the Beijing Electron Positron Collider (BEPC), have a ring-like structure akin to a giant tennis racket.

Difference in colliders

The proposed ILC will be different from the existing colliders, and will be built in a 31-kilometre-long tunnel that can be extended up to 50 kilometres in the second stage.

The costs, ICFA scientists said, will include \$1.8 billion for site-related construction, \$4.9 billion for high-tech equipment and for 2,000 scientists and engineers working on the construction.

Over 1,000 scientists and engineers from 100 universities and laboratories across two dozen countries are already working for an ILC.

Albrecht Wagner, a leading ICFA scientist, said the US National Academy of Sciences had suggested the US Government be the base for the project.

"Chinese scientists and industries have contributed a great deal to the development of an ILC by providing theoretical know-how and advanced equipment," Wagner said.

Chen Hesheng, director of the Chinese Academy of Sciences' Institute of High-energy Physics, said China's degree of involvement and whether it would be a candidate to host the huge project would be decided by the country's top policymakers, in accordance with its economic strength and industrial development level.

"But one thing is clear. The greater involvement of Chinese scientists in ILC will not only promote the international collider, but also boost the country's scientific capacity and train a new generation of physicists," Chen said.

6 Information for upcoming Workshops in October

The International Symposium on Combinatorics, Algorithms, Probabilistic and Experimental methodologies

Date: April 7 – April 9 **City:** Hangzhou, Zhejiang Province

<http://www.math.zju.edu.cn/zgc/escape/homepage.htm>

The 7th International Congress of Ophthalmology and Optometry, Shanghai (COOC2007)

Date: April 12 – April 15 **City:** Shanghai

http://www.cooc.cn/cooc_e/index.htm

The 7th WSEAS International Conference on INSTRUMENTATION, MEASUREMENT, CIRCUITS and SYSTEMS (IMCAS '07)

Date: April 15 – April 17 **City:** Hangzhou, Zhejiang Province

<http://www.wseas.org/conferences/2007/hangzhou/imcas/>

The 17th International Conference of Phosphorous Chemistry

Date: April 15 – April 21 **City:** Xia'men, Fujian Province

<http://icpc2007.xmu.edu.cn/index.php>

The 2nd International Symposium on Functional Materials

Date: April 16 – April 19 **City:** Hangzhou, Zhejiang Province

<http://serve.me.nus.edu.sg/isfm2007/>

The 3rd Global Botanic Gardens Congress

Date: April 16 – April 20 **City:** Wuhan, Hubei Province

<http://www.3gbgc.com/>

Eco Summit 2007

Date: April 22 – April 27 **City:** Beijing

<http://www.ecosummit2007.elsevier.com/index.htm>

The 18th Meeting of the International Collaboration on Advanced Neutron Sources (ICANS-XVIII)

Date: April 26 – April 29 **City:** Dongguan, Guangdong Province

<http://www.icans-xviii.ac.cn/>

Abbreviations

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