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

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1 Science News

1.1 Energy

China Ups Targeted Nuclear Power Share from 4 Pct to 5 Pct for 2020

(CRI, 2008-08-05)

China is likely to make nuclear power account for five percent of its total installed power-generating capacity by 2020, Tuesday's China Securities Journal quoted Zhang Guobao, head of National Energy Administration, as saying.

The newly revised share target was one percentage point higher than the four percent goal set in the 2007 edition of the nation's nuclear power development plan.

"The target adjustment will further improve the energy structure of the country and reduce significantly its reliance on coal," Gao Shixian, head of the research institute of energy under the National Development and Reform Commission, was quoted by the newspaper as saying on August 1.

It is believed that the move was a sign of China's determination to develop more recoverable energy to ease the energy shortage created by its fast expanding economy. It is also intended to improve environmental protection.

According to Xiao Zhengwen with the investment and development department of the China Guangdong Nuclear Power Group, one of the two Chinese nuclear power companies that command core technologies for nuclear power exploration, to hit the new target the nuclear power sector will have an installed capacity of more than 70 million kw in 2020.

Industry observers believed that the higher target meant nuclear power projects would expand from coastal areas to inland.

Last year China generated 62.6 billion kw/h of nuclear power, up 14.1 year on year, according to the China Electricity Council, an industry association.

China now has 11 operational nuclear generating units with a combined installed capacity of 9.08 million kw.

Nuclear plants provide 2.3 percent of China's power and the proportion is planned to rise to 16 percent by 2030.

China plans first 1 mln kw air-cooling systems at clean-coal plants

(Xinhua Net, 2008-08-14)

China will be the first country to install million-kilowatt (kw) air-cooling systems in ultra-supercritical coal-fired power plants, an official with the China Huadian Corp. said here on Thursday.

China Huadian is a state-owned power generation company.

The cooling facilities, which were entirely domestically designed and built, will be part of the Huadian Lingwu power plant project, located in the northwestern coal-rich and arid Ningxia Hui Autonomous Region.

The project will have two ultra super-critical generating units of 1 million kw each, which will start up around 2011, said the official who asked not to be identified. No cost estimates were given.

Ultra super-critical thermal generation is a clean coal technology that relies on very high pressures and

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temperatures to achieve greater efficiency of fuel use. Because it is more efficient, there is less waste heat (the amount not converted to electricity), but still, almost half of the heat generated isn't converted.

Air-cooling saves huge amounts of water, a key consideration in such arid areas as Ningxia.

Using this cooling technique will save an estimated 70 percent of the water that would have been used in conventional water-cooled power units. In this case, it means 24 million tones of water annually, enough for the consumption of nearly 800,000 people for a year.

All vanadium redox flow battery operates smoothly

(CAS, 2008-08-26)



A research team headed by Prof. ZHANG Huamin from the CAS Dalian Institute of Chemical Physics (DICP) has made important progress in the research and development of an all vanadium redox flow battery (AVRFB)-LCD screen demo system. The demo system has operated continuously for over one year without any malfunctioning, and the total running time accumulated to 8,800 hours.

The system is comprised of a kilowatt-scale battery, an energy controlling system and a screen load. Its key component is the AVRFB with a 2kw rated power output. No

deterioration in power output has been detected up to now.

The new system is a kind of electric energy storage device composed of battery modules, an electrolyte solution and its transferring system, as well as an energy controlling system. Comparing with similar systems, such as the Secondary Battery or the Electrochemical Capacitor, the AVRFB is superior in the capacity of energy storage. Other features of the system include high energy transformation efficiency, high storage capacity, independent of capacity from output power, high reliability, low performance and maintenance costs, safety in operation and environmental-friendliness. Consequently, the AVRFB is considered as the most promising candidate for large scale energy storage systems.

The 10kw AVRFB system developed by DICP has won the First Award for Scientific and Technological Progress of the Dalian Municipal Government in 2007.

1.2 Earth and Environment

China joins global seagrass monitoring network

(Xinhua Net, 2008-08-03)

China has set up a seagrass monitoring station, which will be part of a global network, in south China's Guangxi Zhuang Autonomous Region.

The station was co-sponsored by Guangxi Mangrove Research Center (GMRC) and the Seagrass Monitoring Network of the World Seagrass Association (WSA), which provided internationally standardized monitoring equipment.

The seagrass is valuable for its sensitivity to environmental changes. It requires a high light environment, meaning it can reflect harmful changes in the oceans.

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The Beibu Gulf of Beihai city boasts eight species of seagrass. The United Nations Environment programme (UNEP) built eight seagrass meadows covering about 540 hectares last year in the gulf in a scheme aimed at reversing environmental degradation in the South China Sea and the Gulf of Thailand. Findings from the station could help better protect seagrasses and their beds.

China to Monitor Particle Pollution, Ozone from Next Year (CRI, 2008-08-03)

China could start monitoring ozone and fine particle pollution next year and will take measures to curb levels of the two airborne pollutants, an environmental official said on Sunday.

Fan Yuansheng, of the Ministry of Environmental Protection (MEP), said the two pollutants had caused great concern and the MEP was making technical preparations to monitor them.

"We should be able to start regular monitoring of ozone and PM2.5 (particle matter) next year, which would lead to measures to deal with them," Fan told a press conference.

He was speaking in response to reports that China's environmental authorities had failed to include fine particles and ozone into their pollution measurements, causing ignorance of health damage caused by the pollutants.

Fine particles, known as PM2.5, are tiny solid particles of 2.5 micrometers in diameter and smaller. Health experts believe they are unhealthy to breathe and have been associated with fatal illnesses and other serious health problems.

Colorless ozone is also believed to cause respiratory problems and to affect lung functions.

Studies reveal intruding mechanism of exotic plants (CAS, 2008-08-18)



Oxalis corymbosa

Comparisons between invasive and native species may not necessarily characterize the traits of invasive species, as native species might be invasive elsewhere if they are introduced in to a new habitat.

By comparing two invasive species, *Oxalis corymbosa* and *Peperomia pellucida*, with their noninvasive alien congeners, Prof. FENG Yulong's research team from the CAS Xishuangbanna Tropical Botanical Garden hypothesized that invasive species have higher specific leaf (SLA) than their respective noninvasive alien congeners. They also made an analysis on the physiological and ecological consequences

of the higher SLA. The observation was published in a recent issue of *Planta*, under the title "Specific leaf area relates to the differences in leaf construction cost, photosynthesis, nitrogen allocation, and use efficiencies between invasive and noninvasive alien congeners."

Related research results by Prof. Feng's team were also published in other international peer-reviewed journals. The study "Nitrogen allocation, partitioning and use efficiency in three invasive plant species in comparison with their native congeners" was published in *Biological Invasions* in 2008. Another research observation entitled "Photosynthesis, nitrogen allocation and specific leaf area in invasive *Eupatorium adenophorum* and native *Eupatorium japonicum* grown at different irradiances" was published in *Physiologia Plantarum*.

Survey reveals the situation of Chinese caterpillar fungus resources (CAS, 2008-08-22)



Following its investigation of aweto (or Chinese caterpillar fungus) resources carried out from May to July 2007 on the Tibetan Plateau, the central producing area of this precious ingredient for traditional Chinese medicine (TCM), the Xishuangbanna Tropical Botanical Garden (XTBG) under CAS conducted a further survey from May to July 2008 in their marginal habitats.

Funded by CAS, this survey covers the populations on the south and the north verges of the geographical range they inhabit, including those on the southeastern skirts of the Tibetan Plateau in Yunnan Province and those scattering in the

The Chinese caterpillar fungus mountainous areas on the north edge of the Plateau in Gansu and Qinghai provinces, in a bid to reveal the impact of human herborizing on the local ecological environment.

The aweto is actually the combination of two species from two different biological kingdoms, consisting of the fruiting body of a fungus called *Cordyceps sinensis* and the corpse of a caterpillar named *Hepialus* spp.. This is just the peculiar outcome of a common phenomenon created by magical Nature, parasitism.

In the winter, the fungus invades in the body of the caterpillar, and relies on the nutrition from its host to grow and multiply itself. While it grows, the fungus extends its mycelium everywhere within the body of the poor caterpillar, until the former totally replaces the tissues of the latter. By late spring or early summer, the fruiting body of the fungus, or the stroma resulting from this robbery of nutrition sprouts from the head of the host caterpillar, in a cylindrical shape. Because of this special process of growth, the aweto is well known as "summer grass winter worm" in China. It has a long history as a healing fungus in TCM, being used as tonic for feeble people.

Strong demands for this precious medicinal material, however, have pulled lots of pickers to its habitats. Their herborization ruins the surface soil and vegetation on the frigid Plateau, posing great pressure on the local wildlife ecologies and pushing this fungus to the verge of extinction. In this context, the survey was launched to evaluate the status quo of the aweto resources and identify the impact of the human intervention on the fragile ecological balance in its producing areas. Combining the data from last year's investigation, so far the analysis of this survey has initially revealed some fundamental facts about the distribution of aweto resources, and meanwhile alerted some dangerous trends.

On the Tibetan Plateau, the aweto is revealed to have a distribution stretching northward from the Mt. Cangshan in Dali (Tali) Prefecture in Yunnan Province, or more exactly at E99°34'/N25°45', to the Qilian Mountains to the south of the Gansu Corridor (Kansu Corridor), exactly at E102°90'/N38°49'. Beyond this range, no aweto is found in the survey.

The distribution of aweto on the Plateau has a noticeable heartland, which covers the areas including parts of the Nakqu, Chamdo and Nyingchi prefectures in Tibet Autonomous Region, Yushu Prefecture in Qinghai Province, Tibetan Qiang Autonomous Prefecture of Aba (Ngawa) and Tibetan Autonomous Prefecture of Garze in Sichuan Province, Diqing Prefecture in Yunnan Province and, part of the Gannan Prefecture in Gansu Province. This central zone produces about 70% of the national aweto yield. On the other hand, aweto from the central zone has the best quality and the biggest sizes; the farther the producing area is from

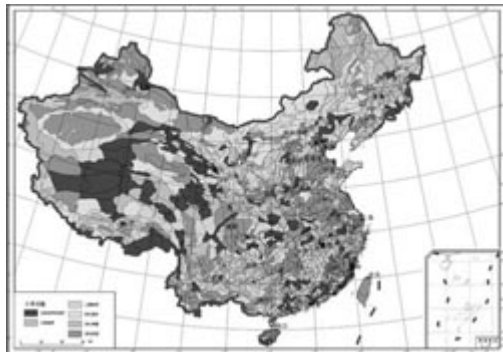
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the central zone, the poorer the quality of the aweto resource and the smaller the size.

A shocking trend revealed by the survey is, in the central zone, the prime altitude around which the aweto grows has risen by 200 to 500 meters compared to 20 years ago. At present the prime altitude ranges between 4400 to 4600 meters above sea level, while it used to be between 3900 to 4400 meters only two decades ago. What also deserves concern is, the prime altitude range has narrowed down significantly. In the marginal areas, things are also less than encouraging. Although the prime altitude sees little change there, the yield goes down and the quality worsens: The aweto differentiates a lot in size, shape and color from that in the central zone, showing evident signs of polarization between populations.

According to the scientists with XTBG, the worrying trends unveiled in the investigation might be related to global warming and predatory herborization, though the detailed results from further analyses are still under way.

China's first eco-function map released (CAS, 2008-08-27)



CAS and the Ministry of Environmental Protection (MEP) recently released 2008 China's first eco-function map. CAS Vice President DING Zhongli and MEP Vice Minister WU Xiaoqing were present at its press conference held in Beijing. Under the joint sponsorship of MEP and CAS, the map was accomplished by researchers from the CAS Research Center for Eco-environmental Sciences after six years of hard work. Experts say it will lay a scientific base for promoting sustainable regional development and national

eco-environmental conservation.

The zoning is made in three categories: first, Category I eco-function zones for ecological regulation, product provision, and human habitation, in line with the nature of ecosystems and the dominant service types; second, Category II eco-function zones in line with the importance of ecological functions, for water origin conservation, soil moisture conservation, wind breaks and sand fixation, biodiversity protection, and flood water storage, for agrifoods, animal products, aquatic products, and timber products, and for urban belts and urban function areas; and third, Category III eco-function zones enjoying the mixed ecological functions, based on the difference in space, terrains, and land use. The zoning efforts have carved the nation into 216 ecological function zones, of which 148 are for ecological regulation, covering 78% of the nation's territories, 46 for providing products, or 21% of the nation's territories, and 22 for human habitation, or 1% of the nation's territories.

Studies on lake eutrophication fruitful (CAS, 2008-08-27)

On last June 30, a group of aquatic botanists held a meeting in Beijing to review a research project on lake eutrophication and outbreak mechanism of blue-green algae, which has been completed recently. Coordinated by the CAS Institute for Hydrobiology (IHB) and the Chinese Academy of



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Environmental Sciences, the project has been supported by the "973" Program, a national key scheme for basic research..

At the meeting, Prof. Prof. LIU Yongding, first chief scientist of the project from IHB, and his co-worker reported the achievements of the five-year research.

First, targeted at shallow freshwater bodies in the Yangtze valley, the project made a systematic exploration into the formative reasons of lake eutrophication, its resultant ecosystem changes, and its countermeasures. The exploration was carried out from four aspects, namely, biogenic elements, aquatic vegetation, blue-green algae and management of the lacustrine ecosystem. Researchers have developed theoretical principles and related methodology for modeling the eco-management and health diagnosis. Via the approach of the ecosystem's stable conversion in a certain scope, they have found out new routes for preventing the curse and provided scientific grounds for protection of the freshwater lakes in China.

Second, the researchers made an analysis on geo-biological-chemical circulation of biogenic elements at the water-sediment interface, and revealed the correlation between its imbalance with the blue-green algae outbreak. Their research results include: the discovery of the four stages in the outbreaks, the dominant factors and threshold values in the process of the outbreak; the understanding of the generation and evolution of the algal toxicants as a result of the outbreak; the establishment of a parametric system at different stable stages in a shallow lake's ecosystem in the middle and lower reaches of the Yangtze; and the definition & explanation of the threshold values for the key nutritional loads & key driving mechanism at a stable stage of the ecological conversion.

Third, the project makes an interpretation of the aquatic vegetation's degeneration in a shallow freshwater lake located in the middle and lower reaches of the Yangtze, making clear the harm on submersed plants caused by the ammonia in a water body, establishing a formative model to depict the suppressive mechanism underlying the ammonia threat and determining some threshold values of the factors responsible for the degeneration.

China's first successful sampling of ice core in Mongolia (CAS, 2008-08-28)

In collaboration with their colleagues from the ROK and Mongolia, CAS scientists achieved their first success in obtaining a 40.18m. specimen of ice core in the drilling operation from 5 to 25 June in an expedition to the (Hovd) Tsambagarav glacier in Altay Mountains of Mongolia.

The glacier is a Quaternary glacial relic, with a total area of more than 15km² and a thickness of 90-100m. It is the headstream of the Hovd River, the largest river in the Central Asian endorheic basin. According to experts, the glacier and its vicinity are an ideal theatre for probing the interaction of the Arctic water vapor with westerly wind.

The joint expedition was first contrived in 2007 and related agreement was discussed and signed in Lanzhou, capital of northwest China's Gansu Province in April 2008.

The ice core-drilling project was first proposed by Prof. QIN Dahe, director of the State Key Laboratory for Cryosphere Science under the CAS Cold & Arid Regions Environmental and Engineering Research Institute. Its enforcement was under the leadership of its Prof. HOU Shugui from the Lab. This is the first successful attempt for Chinese scientists to obtain ice core samples from a foreign site except the polar areas.

China's Arctic Expedition Team Starts Research in 87 Degree N. Latitude (CRI, 2008-08-31)

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China's third Arctic expedition team started research operations in 87 degree north latitude, the northernmost part of the Arctic that the research team has ever arrived.

The scientific expedition team's helicopter landed on a large piece of a floating ice after an 87-minute flight.

The scientists took pictures and videos from the helicopter for further research.

Zhang Haisheng, chief scientist of China's third Arctic expedition team, said it was the first time that China has carried out research at such a high latitude, which showed China's improving ability in Arctic research.

The Arctic sea ice melting as a result of global warming helps the team successfully get deeper into this area and carry out a comprehensive study on the polar environment, he added.

Zhang also said the team has conducted a series of research activities in the Bering Sea and Arctic Ocean on oceanography, sea ice, and atmospheric subjects.

During the expedition from Shanghai on July 11, the team collected lots of data and samples, and achieved preliminary results, such as the discovery of salinity reduction in some Arctic sea areas, circulation anomalies and atmospheric circulation fluctuation, he said.

1.3 Health

China's first transgenic cow born to help fight cancer

(Xinhua Net, 2008-08-11)

Chinese scientists announced on Monday that they have bred a genetically altered cow capable of producing cancer fighting proteins for humans.

The cow, which can produce CD20 antibodies in its milk, was born in Beijing on Aug. 2 and a dozen more are due to be born next month.

Researchers said mass breeding of the animal would enable China to mass produce the therapeutic proteins cheaply.

The human monoclonal (produced from a single cell) antibodies could be purified from the milk of the transgenic cow, and used to treat B cell lymphomas and leukemias and some auto-immune diseases, said research team leader Li Ning, an academician with China Academy of Engineering.

"After 10 days of careful observation, we are happy to see the cow is very healthy," said Li, whose laboratory is based in the China Agriculture University.

The calf weighed 38 kg at birth. In seven to eight months, the research team would induce lactation to test its antibody expression.

The development is expected to significantly lower the costs of CD20 antibody production, which currently uses chimeric anti-CD20 CHO (Chinese hamster ovary) cells.

The low antibody expression level and high cost of cell culture has been a stumbling block in the industrial production of the antibody drug, which was approved by the U.S. Food and Drug Administration in 1997.

CD20 cell-surface proteins found in mature B cells become cancerous in patients who suffer from non-Hodgkins lymphoma, which accounts for about 40 percent of all new cases of lymphoma. It is identified as the target in the treatment of lymphomas.

"The objective of our research is to make the transgenic animal express the antibody at high levels," said Li, adding that transgenic mice had been able to express 10 mg/ml of CD20 antibody on average in tests.

Li said his group planned to complete the clinical study of the first functional food with the antibody in

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three years, and apply for production authorization from China's food and drug authorities, and the first functional drug could be expected in five years.

Studies shed new light on ginseng-drug interactions

(CAS, 2008-08-12)

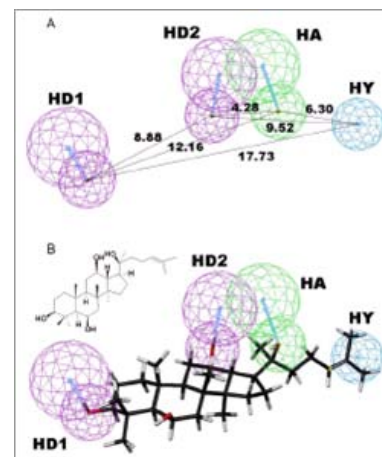
Supervised by Prof. WANG Hui with the CAS Institute of Nutritional Sciences, doctorate student HAO Miao and co-workers recently achieved new progress on influence of ginseng and its derivatives on human metabolism. The work was reported by a recent issue of PLoS ONE.

Ginseng, a traditional herbal medicine, may interact with several co-administered drugs in clinical settings, and ginsenosides, the major active components of ginseng, may be responsible for these ginseng-drug interactions (GDIs). However, results from previous studies on ginsenosides' effects on human drug-metabolizing P450 enzymes are inconsistent and confusing

To address the problem, the researchers first made a systematic evaluation of the inhibitory effects of 15 ginsenosides and sapogenins on five human enzymes (CYP1A2, CYP2C9, CYP2C19, CYP2D6 and CYP3A4) with the aid of commercially available fluorescent probes. Their work revealed that sapogenins in ginseng with identical parent ring structures present definitely different roles in inhibiting the P450's bio-activity.

In order to further explore the structure-activity relationship of their effects on the P450s, in cooperation with colleagues from the CAS Institute for Materia Medica in Shanghai, they established a 3D pharmacophore model for CYP3A4, the most important enzyme in the family of P450.

Based on this, the CAS scientists found that substrate-dependent phenomena existing in the effects of ginsenosides on CYP3A4 when another fluorescent probe was used and were further confirmed in tests with conventional drug probes and human liver microsomes. These substrate-dependent effects of the ginsenosides may provide an explanation for the inconsistent results obtained from previous lab reports on the ginseng-drug interactions. The research is of special significance in making clear the interactions between ginseng and other drug in the human metabolic processes and the optimization of the joint administration of several drugs.



Artemisinin studies helpful for drug development against ovarian cancer

(CAS, 2008-08-13)

Recent studies by CHEN Tao, a doctoral student under the guidance of Prof. WANG Hui with the CAS Institute of Nutritional Sciences, indicate that dihydroartemisinin, an Artemisinin's derivative, is a promising therapeutic agent against ovarian cancer, either used alone or in combination with the conventional chemotherapy. The work was published by a recent issue of the Journal of Cellular and Molecular Medicine.



Artemisiae Annuae

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The research was designed to determine the effects of Artemisinin and its derivatives on cancerous cells in the human ovary and investigate their underlying mechanisms governing the related bio-chemical processes by evaluating their therapeutic potentials.

In order to test their cytotoxicities, human ovarian cancerous cells (A2780 and OVCAR-3) and immortalized non-tumorigenic human ovarian surface epithelial cells (IOSE144) were exposed to four Artemisinin compounds. The lab assays showed that both in vitro and in vivo anti-tumor effects were found in the most effective compound with the most potent cytotoxicity: dihydroartemisinin (DHA), which inhibited the growth of the cancerous cells with the minimal side-effects on non-tumorigenic OSE cells.

In addition, the CAS scientists found DHA capable of inhibiting the ovarian cancerous cell's growth when administered alone or in combination with carboplatin, presumably through the death receptor- and mitochondrion-mediated caspase-dependent apoptotic pathway. These effects were also observed in in vivo ovarian A2780 and OVCAR-3 xenograft tumor models. The observation made the scientists believe that the DHA exhibits a significant therapeutic activity against ovarian cancer with the minimal toxicity to healthy human OSE cells. Their work provides solid experimental evidence for development of DHA as a new anti-cancer drug in clinical practice.

Artemisinin is an effective component with bio-activity extracted from some aromatic herbs and shrubs in the genus *Artemisia*, including wormwood, sagebrush and tarragon. Many Artemisian species are noted for their ornamental value because of their attractive silvery-grey foliage and therefore frequently used in horticultural plantings. The leaves of common wormwood (*A. absinthium*) have been used in medicines and beverages such as absinthe and vermouth. In today's world, Artemisinin, the extract from the Eurasian *A. annua* is the most popular and most efficacious drug against quinine-resistant malaria. In recent years, Artemisinin and its derivatives, such as DHA become the hottest research focus among the pharmaceutical labs and firms worldwide and the US National Cancer Institute has enlisted them into its projects for screening new anti-cancer drugs.

"Positive Results" on AIDS Therapy (CRI, 2008-08-13)

The early results of a clinical trial to test the efficacy of "second-line" treatments for people suffering from full-blown AIDS have been positive, a senior Chinese health official said at last week's 2008 International AIDS Conference.

More than 100 Chinese are currently taking part in the scheme, which was launched in December in Hubei and Anhui provinces, and the Guangxi Zhuang autonomous region, Ma Ye, a specialist with the Chinese Center of Disease Control and Prevention and head of the scheme, said.

Its aim is to determine the best course of treatment for about 8,000 Chinese people whose condition has reached the severe symptomatic or full-blown phase, she said.

"The scheme has already delivered some positive results, and we are now drawing up guidelines for medical workers with regard to drug selection and prescription," she said.

"We are also working on how to scale up the scheme to the national level."

Field studies have shown that up to 20 percent of people on first-line drug treatments have developed resistance to their medication and therefore require second-line therapy, Ma told China Daily.

In 2003, the government began providing anti-retroviral drugs free of charge to all people officially registered as having full-blown AIDS. More than 40,000 Chinese now benefit, she said.

However, some people with the full-blown condition are having to fund their own courses of second-line

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treatment.

Meng Lin, who heads a Beijing-based information support network for people with HIV/AIDS, is one of them.

"In the beginning, I took the drugs that were available in China, but they caused severe side effects. So in 2004, I switched to second-line treatment," Meng, who contracted HIV in 1995, said.

However, the drugs cost him more than \$1,500 a year, and he has to rely on friends overseas sending them to him, he said.

Although there are more than 20 kinds of AIDS drugs on the world market, only seven are available in China, he said.

Hao Yang, deputy director of the disease control and prevention department at the Ministry of Health, said the ministry will hold a meeting later this month to finalize the details of the nationwide second-line treatment scheme.

Cancer Drug Gets Green Light

(CRI, 2008-08-27)

The world's only oral medicine to treat gastric cancer was approved by China's State Food and Drug Administration, medical experts announced Tuesday.

Despite advances in drug therapy, experts said early diagnosis was the most effective way to combat gastric cancer and stressed the importance of general screening, regular checkups and a high awareness level among citizens.

Compared with traditional chemotherapy through intravenous injections, the oral medicine, Xeloda, produced by Roche Pharmaceuticals, is more convenient for patients as it has fewer side effects and diminishes the possibility of intravenous infection.

Gastric cancer is the most severe form of cancer of the digestive system. It is the third most fatal cancer killer and has an annual mortality of 300,000 in China. Each year, 400,000 people in China are diagnosed with gastric cancer, but fewer than 10 percent of these patients come in early enough for surgery.

Doctors said about 90 percent of patients who underwent surgery might survive for five years or more. But most patients came in when the disease was in its advanced stages.

"Chemotherapy is the main treatment for most patients and the only therapy for those with advanced gastric cancer," said Dr Ji Jiafu from Beijing Tumor Hospital.

Although medical researchers haven't found the genetic cause of gastric cancer, it is widely believed that gender, age and heredity play a role.

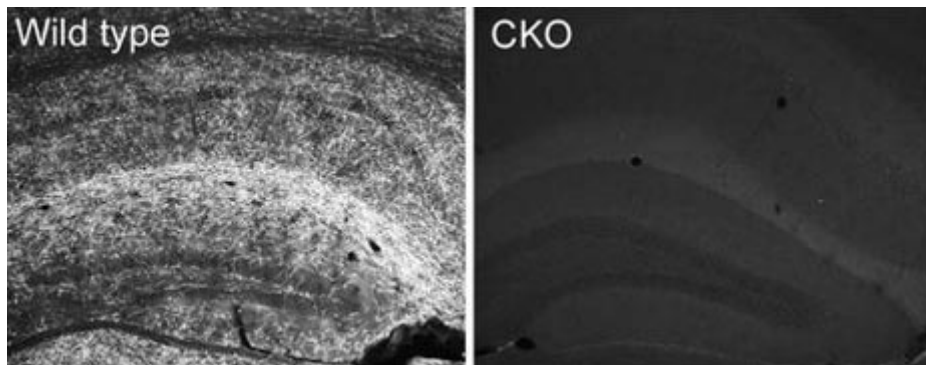
In China, men are more likely to be affected than women. Doctors said men over 40 should be screened for cancer at the slightest hint of trouble in the upper abdomen. If a person is a heavy smoker or drinker, he should start getting tests done from the age of 35.

Statistics show about 0.6 percent of people who receive general screening are diagnosed with gastric cancer.

Serotonin as a key regulator of fear memory

(CAS, 2008-08-29)

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Serotonin transporter staining in hippocampus

Serotonin (5-HT), an important neurotransmitter, has been implicated in a wide range of disorders such as depression, anxiety, post-traumatic stress disorder (PTSD), and learning and memory disorders.

Recent work of CAS researchers has shown that mice lacking serotonin are less anxious compared to control animals but retain fearful memories for much longer time.

The results, which were published online in Proceedings of the National Academy of Sciences, may contribute towards developing treatments for post-traumatic stress disorder (PTSD), where long lasting fearful memories bring constant pain and sufferings to individuals who cannot forget them.

In order to study the role of serotonin in the adult brain, the researchers developed a genetic method to specifically remove serotonin-producing neurons from the mouse brain, leaving intact all other types of neurons, many of which express receptors for serotonin. They then compared the behavior of these serotonin knockout mice with control mice in experiments which test their ability to respond to anxious or fearful situations.

The scientists found that the knockout mice were more carefree compared to controls in the open portion of an elevated plus maze, suggesting they were less anxious. However, in experiments in which these mice received electric foot shocks in a specific cage, serotonin knockout mice appeared to retain unpleasant memories of the cage for a very long time, whereas the controls were able to forget. This rather unusual behavior can be reversed by direct injection of serotonin into the brain of knockout mice, showing that it is really the specific loss of this transmitter in these knockout mice that is responsible for their long lasting fearful memories.

This work was a collaborative effort between the laboratory of Dr. XU Lin at the CAS Kunming Institute of Zoology, and the laboratories of Dr. XU Tianle and Dr. DING Yuqiang at the CAS Institute of Neuroscience, with most experimental work carried out by graduate students DAI Jinxia and HAN Huili.

1.4 Key Technologies

CAS researchers develop CPT clock with improved performance

(CAS, 2008-08-04)

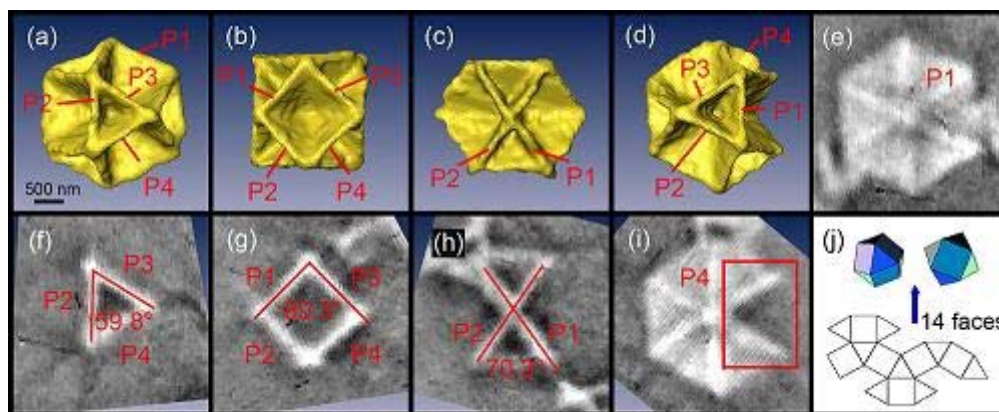
A research team led by Prof. GU Sihong with the CAS Wuhan Institute of Physics and Mathematics (WIPM) has made important progress in developing a CPT clock with better performance. The feat has made it comparable with the similar devices on the international market regarding major indicators such as stability and power consumption.

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CPT clock is a new kind of atomic clock using the coherent population trapping (CPT) principle. At present, it appears to be the method of choice for miniature atomic clocks in principle. Now the CPT clock could be as small as a watch powered by a bottom cell battery. This provides a bright prospect for the application of the device in a large telecommunication system and the synchronization of a large-scale telecommunication network. When being used in GPS receivers, for instance, the CPT frequency standard could remarkably upgrade the precision of its navigation and positioning.

WIPM researchers developed China's first prototype of CPT clock in 2006. Now they are striving to improve fabrication technology and design indexes so as to make it meet the needs of practical applications.

Nanotomography: Crystal clear (CAS, 2008-08-29)



X-rays from a synchrotron can produce incredible high-resolution three-dimensional images of nanoscale crystal structures

Researchers have combined medical imaging equipment with radiation from a particle accelerator to produce a powerful new method for three-dimensional (3D) imaging. The technique, developed by YU Shuhong, TIAN Yangchao and co-workers at the University of Science and Technology of China in Hefei, CAS, has already produced remarkable 3D renderings of a copper sulphide crystal, and could find many applications in materials development and the life sciences.

Electron microscopes can provide detailed two-dimensional information on functional nanostructures, but are limited in applications involving complex 3D shapes. On the other hand, X-rays can penetrate to great depths and are used in medical computed-tomography scans to take images in slices that are then compiled to render a 3D image.

Yu, Tian and co-workers used the beamline from the National Synchrotron Radiation Laboratory in Hefei to provide a very powerful X-ray flux. The beam was carefully manipulated to make 3D images of a recently discovered type of copper sulphide crystal.

The images show that the crystal is made up of four hexagonal plates about 200 nanometres thick (pictured). Together they form a cuboctahedron - a polyhedron with six square and eight triangular faces.

The image details indicate that the X-ray technique is useful to image nanomaterials with complex structures.

1.5 Structure of Matter

Cooler storage ring accomplished at heavy ion facility in Lanzhou (CAS, 2008-08-01)



The Heavy Ion Research Facility in Lanzhou- Cooler Storage Ring (HIRFL-CSR), a flagship facility of basic research in China, passed the acceptance check under auspices of the State Development and Reform Commission on 30 July in Lanzhou, capital of Gansu Province. The event was jointly presided over by the Commission's Vice Minister ZHANG Xiaoqian and CAS Executive Vice President BAI Chunli.

Started in 2000, the construction of the 290-million-yuan facility was implemented by researchers from the CAS Institute of Modern Physics. Experts say that it will serve as

a state-of-the-art experimental platform both for basic research in the fields of nuclear physics, hadrons physics, atomic physics, and high energy density physics and for applied research into heavy ion irradiation materials, heavy ion cancer treatment, and space radiation.

HIRFL-CSR consists of two rings: the main ring (CSRm) and the experimental ring (CSR_e). The former is used to accelerate, cool and accumulate heavy ion beam while the latter is used as an experimental terminal for applied research. It is on a par with world-class complex of cool storage such as the one at GSI in Germany.

According to experts, the HIRFL-CSR will be able to provide stable nuclear beams, radioactive nuclear beams, highly ionized heavy ion beams and polarized beams of high quality and strength with different specifications and wide energy scopes. It will make more advanced experimental conditions available for high quality and accurate scientific experiments that will lead to new breakthroughs in the areas of basic studies of nuclear physics and atomic physics, exploration of new energy and cancer treatment by heavy ion beams.

In the meanwhile, HIRFL-CSR project will promote associated developments such as those of electronic cooling, pile-up of heavy ion beams, super thin inner target, super vacuuming, synchronized ion beam source of stripped electron of high currents and strength, fast tracking control, fast changing magnetic field, beam diagnosis.

Scientists say that it is on a par with the similar facilities of world-class like the one at GSI in Germany.

Motion of exploding stars might throw light on dark energy (CAS, 2008-08-13)

A multi-telescope survey of millions of supernovae could give cosmologists a better understanding of dark energy and could help explain the origins of large-scale structure in the universe, according to CAS cosmologists ZHANG Pengjie and CHEN Xuele. The proposed survey would involve measuring the "peculiar motion" of each exploding star, which would reveal new information about how galaxies are distributed throughout the cosmos.

Galaxies are moving away from one another thanks to the ongoing expansion of the universe. However, this expansion is not the same everywhere and each galaxy has an additional "peculiar motion", which is caused

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by the gravitational pull of neighbouring galaxies.

Rather than isolate the peculiar motion of individual galaxies, astronomers try to determine the large-scale peculiar velocity (LSPV), which is the average peculiar velocity of galaxies relative to Earth in a certain region of the universe. They rely on knowing the distances between Earth and each galaxy -and that can be very difficult to measure precisely.

'Standard candles'

Something they can measure accurately, however, is the distance to a type-Ia supernovae - exploding white-dwarf stars that are known as "standard candles" because they always give off the same amount of light. All they have to do is measure the supernova brightness, and the dimmer it is, the farther away it is. But astronomers can also estimate the speed with which the star was moving away from Earth when it exploded by measuring the Doppler shift (or "red shift") in the wavelength of its light.

If the universe was expanding in a uniform manner, all type Ia supernovae of a specific brightness would have the same redshift. However, Zhang and Chen expect that the average brightness of supernovae with the same redshift in a small patch of the sky would be different to the average brightness (at that redshift) over the entire sky. "This difference is proportional to the LSPV," explains Chen (Phys Rev D 78 023006) .

Chen and Zhang believe that such a survey would be performed best using supernovae with an "intermediate" redshift of about 0.5, which dates their explosions to about five billion years ago. The survey would involve about 106 supernovae, and would require several decades of continuous observation using a number of different telescopes.

Christopher Gordon, a cosmologist at the University Oxford, UK, told physicsworld.com that the proposal "is an interesting idea". However, he believes that Chen and Zhang may be overly optimistic in saying that such a survey could be completed in several decades "C even when new telescopes designed specifically for finding supernovae such as the Large Synoptic Survey Telescope (LSST) come online in the next decade.

Smoothing dark energy

Still, if Chen and Zhang can persuade astronomers to do the survey, the results could shed light on the nature of dark energy - a mysterious substance that counteracts gravity and encourages galaxies to move apart. Dark energy tends to prevent galaxies from clumping and therefore should smooth out variations in the LSPV. However, some theories of dark energy predict less clumping than others.

A survey could also further our understanding of dark matter - a substance that interacts via gravity but not via electromagnetic radiation. Galaxies are made up mostly of dark matter, so Chen and Zhang believe that a LSPV survey could reveal much about the distribution of dark matter in the universe.

The survey would allow physicists to study the effects of gravity over very large length scales and could also help cosmologists understand how primordial quantum fluctuations that existed just after the Big Bang became the large-scale structure of galaxies that we observe today.

Recent progress of highly charged ion beam platform for multidisciplinary studies

(CAS, 2008-08-14)

A research project on the 320kV highly charged ion beam platform for multidisciplinary studies has made new progress after a voltage of 100kV was successfully applied to the facility at the CAS Institute of Modern Physics.



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The platform was biased with 150kV and 230kV respectively and the whole system ran smoothly and provided high quality beams for experimental studies for more than 20 days. The high voltage reached the designed value of 320 kV on 14 July. Since then its performance is in a good status, providing beams for atomic reaction studies. In the mean time, experiments, such as ion-atom collisions, ion-surface interaction, and ion-capillary interaction, were carried out.

The platform offers good opportunities for ion-atoms/molecules collision dynamics, ion-surface interactions, ion irradiation effects in solids, ion induced damages in bio-molecules and cells, and very low energy astrophysics, etc. The 320 kV platform and the five experimental terminals are open to outside users, proposals of performing experiments at the terminals are welcome.

Symposium on HIRFL-CSR physics convenes in Lanzhou (CAS, 2008-08-15)

The symposium on HIRFL-CSR physics was held at the CAS Institute of Modern Physics (IMP) recently in Lanzhou, capital of northwest China's Gansu Province.

The symposium was organized by IMP with the support of CAS. It was attended by more than 80 scholars from universities and institutions across the world.

The recent progresses and the future physics programs were reported and discussed on such fields as nuclear physics, hadron physics, atomic physics and tumor treatment.

Experts noted that S&T feats have been accomplished at IMP in various areas, including the commissioning of the heavy ion storage rings-Cooler Storage Ring, the test run of mass measurements, the construction of a new spectrometer for super-heavy element synthesis, the establishment of a parameter tunable laser system, a reaction microscope for atomic collisions, and the ultrahigh vacuum chamber for surface studies, and skin cancer treatment. They have formed a solid experimental basis and will provide the new opportunities for conducting experimental research at IMP.

New suggestions were presented at the symposium. Further cooperation between the IMP and institutions across the world is highly expected.

1.6 Transport and Space

All sub-mirrors in place for LAMOST (CAS, 2008-08-19)

The Large Sky Area Multi-Object Fiber Spectroscopic Telescope (LAMOST), a national big science project, has recently seen the complete installation of its 24 sub-mirrors for MA (correction mirror), and 37 sub-mirrors for MB (primary mirror) at the Xinglong Observing Station, the National Astronomical Observatories at CAS. Consisting of an MB (6.67m x 6.05m), and an MA (5.72m x 4.4m), the Schmidt telescope is able to observe the spectra of some 4000 celestial bodies over a 5-degree vision field, a system enjoying the largest vision field and highest spectrum acquisition rate in the world.



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The entire system has three major components, namely MA, MB, and a focal plane. The Schmidt MA is made up of 24 sub-mirrors in 1.1m. This is the first instance in the world applying active optical and sub-mirror assemble techniques. The 24 sub-mirrors would create a high precision non-spherical reflection, correcting the possible errors in the primary mirror. The MB, or the primary mirror, is built with 37 sub-mirrors in 1.1m, also using active optical and sub-mirror assemble techniques, to maintain a common focus in the course of celestial bodies observation.

Construction of China's largest observatory starts in Yunnan (CAS, 2008-08-19)

The construction of China's largest astronomical observatory station broke ground on 11 August in Yao'an County in the southwest China's Yunnan Province.

Following an assessment, CAS astronomers found Yao'an fulfilled all the requirements for an observatory to monitor days of clear skies and nights.

To be completed by 2010, the 340 million yuan (about \$49.5 million) facility will be jointly funded by the CAS headquarters and its Purple Mountain Observatory.

2 News from Universities

Overseas students feel more at home (People's Daily, 2008-08-16)

China has the fifth highest number of overseas students in the world, Ministry of Education officials said yesterday.

Only the US, UK, France and Germany play host to more international students.

China has drawn more than 1.23 million students from abroad since launching its reform and opening up in the late 1970s, Vice-Minister of Education Zhang Xincheng told a press conference.

"More overseas students are opting for long-term, formal education in China in a wide range of subjects, from language and culture to science, engineering and medicine," Zhang said. "They are from developing and developed countries both."

"With a good social environment, fast economic growth and upgraded quality of education, China has become more attractive for foreign students."

The number of overseas students studying in China reached a record 195,000 last year, up 20 percent from 2006, according to ministry figures.

China has signed mutual diploma recognition contracts with 33 countries, including the UK, France, Germany, Australia, New Zealand and Russia.

Last year, students from 188 countries and regions got admitted to China's institutions in 31 provinces, autonomous regions and municipalities.

Overseas education big lure (People's Daily, 2008-08-26)

Foreign educational institutions are holding seminars and exhibitions to lure more Chinese youngsters to study abroad.

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They are being helped by local educational consulting agencies as more parents are eager to send their children abroad.

"We have held six exhibitions this month and attracted about 100 foreign institutions and more than 1,000 students to the events," Jiao Yuying, press officer of the Zhejiang New Orient International Consulting Co, based in Hangzhou, Zhejiang province, said.

Zhejiang is one of the largest recruiting centers for overseas studies because of its booming economy.

"June and August is the peak period. We have received about 210 enquires from foreign universities so far this year. The figure was 180 last year," Jiao said.

He said as foreign universities look to increase their intake, more are looking to Chinese students, he said.

More than 1,000 students have gone abroad to study through New Orient so far this year, up 30 percent over the same period last year.

Hu Fei, who runs an architectural design institute in Hangzhou, plans to send her son to the United States for studies next summer.

"I have confidence in the Western system, which focuses on an all-round education. I believe my son will benefit," she said.

Like many, Hu is a thrifty parent, but when it comes her son's education, no expense is spared.

She has just paid more than 20,000 yuan (\$3,000) for a one-month English course at Hangzhou's New Oriental School, for her 18-year-old only son. She wants him to improve his English skills in order to take the TOFEL and SAT exams.

Hu has also set aside a good deal of her savings for her son's further education.

"It will cost at least 1.6 million yuan for his four-year college education overseas," Hu said. "It is worth it."

Hu is only one of such parents willing to spend large sums of money on their children's education.

Affluent people in Hangzhou are more inclined to invest in education when compared with such cities as Beijing, Shanghai, and Chengdu, Xiao Mingchao, deputy general manager of Sinomonitor International, a Beijing-based research company, said.

"The city's super rich are family-oriented and therefore more willing to invest in their children," Xiao said.

Shinyway International, the largest overseas study agency in Zhejiang, said more than 1,000 students used its services to study abroad. It too, registered 30 percent increase compared to the previous year.

Teng Wenzheng, Shinway's director of overseas planning center, said: "Owners of companies, most of whom are not well educated, are eager to send their children abroad.

"Many believe that well educated children with an international vision, will help globalize their businesses." Statistics show that the average cost for a four-year high school education in the US costs between 250,000 yuan and 300,000 yuan per year.

3 Innovation Management

Mega-science projects at CAS

(CAS, 2008-08-01)



The Shanghai Synchrotron Radiation Facility is under construction.

With the support of Chinese government, CAS has been undertaking national mega-science projects in line with both the requirements of the national socio-economic development and cutting-edge development of science and technology in the world.

At present, a total of seven such projects are under construction at CAS:

1. The Large Sky Area Multi-Object Fiber Spectroscopic Telescope (LAMOST). Under the charge of the National Astronomical Observatories at CAS, the construction of the 235-million-yuan project kicked off in 2000.
 2. The upgraded Beijing Electron-Positron Collider (BEPCII). Under the charge of the CAS Institute of High Energy Physics, the construction of 640-million-yuan project was started in 2004.
 3. The Shanghai Synchrotron Radiation Facility (SSRF). Under the charge of CAS Shanghai Institute of Technical Physics, the construction of the 1.2-billion-yuan project was started in December 2004.
 4. The Germplasm Bank for Wildlife in Southwest China Coordinated by the CAS Kunming Institute of Botany, the construction of the 148-million-yuan project was initiated in December 2004.
 5. The National Bio-safety Laboratory in Wuhan (a P4 lab). Its construction was started in May 2005 by the CAS Institute of Virology.
 6. The Meridian Chain of Comprehensive Ground-based Space Environment Monitors in the Eastern Hemisphere (dubbed as the Meridian Project). Under the charge of the CAS Center for Space Science and Applied Research, the construction of the 168-million-yuan network was started in January 2008.
 7. The Hefei High Magnetic Field Center. Coordinated by the CAS Hefei Institutes for Physical Sciences, the construction of the 390 million yuan project was started in May 2008.
- Five projects are to be started by CAS researchers in the near future:
1. An airborne remote sensing system. It is to be built under the charge of the CAS Institute of Electronics.
 2. A five hundred meter aperture spherical radio telescope (FAST). It is to be constructed by the National Astronomical Observatories at CAS.
 3. A maritime investigation vessel. It is to be built under the charge of the CAS Institute of Oceanology.
 4. A research facility for protein research. It is to be launched under the charge of the Shanghai Institutes for Biological Sciences
 5. The China Spallation Neutron Source (CSNS). The facility is to be built under the charge of the CAS Institute of High Energy Physics.

New head of the Guangzhou Institute of Biomedicine and Health

(CAS, 2008-08-21)

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Prof. PEI Duanqing, a cell biologist, has been named the new director-general of the CAS Guangzhou Institute of Biomedicine and Health (GIBH).

Pei received his Ph.D in biology from the University of Pennsylvania in 1991 and carried out postdoc research in University of Michigan from 1991 to 1995. Before joining GIBH, he was director of the Institute of Pharmacology at Tsinghua University.

Formally established in December 2003 by the joint efforts of CAS, Guangdong Provincial Government and Guangzhou Municipal Government, GIBH strives to develop itself into an internationally innovative and competitive R&D organization in the fields of biomedicine, vaccine and diagnosis, fulfilling the responsibilities of

tackling key problems at innovation and integration of world cutting-edge technologies in nosogenesis, and providing three platforms for biomedical science.

Its founding director-general, CHEN Ling, is an expert of gene therapy and HIV vaccines from the Merck Research Laboratories in U.S.

4 China's International Science Cooperation

National Center for International Research opens at LIAMA (CAS, 2008-08-15)



A National Center for International Research was inaugurated recently at LIAMA, a Sino-French Lab in Computer Science, Automation and Applied Mathematics at the CAS Institute of Automation. Chinese Vice-Minister of Science and Technology SHANG Yong, French Ambassador to China Herve Ladsous, CAS Vice Secretary-general TAN Tieniu and some 70 guests from China, France, and the EU were present at the event.

Since its establishment in January 1997, LIAMA has attracted the participation of some 1,000 researchers in more than 100 projects involving information, biology, and natural environment. It has also forged cooperative ties with numerous French enterprises and universities, including French Telecom, Alcatel Space Center, and polytechnique schools. LIAMA is entering a new phase for international cooperation, at which expanded research fields and disciplines, and increased involvement will be a new focus.

China to host int'l advanced materials summit (Xinhua Net, 2008-08-11)

Tianjin in north China will host the second international advanced materials summit from Oct. 30 to Nov. 1 to boost the domestic industry development, the conference organizing committee told Xinhua on Monday. The event aims at further enhancing mutual information exchanges between governments and enterprises

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and between companies both domestic and foreign. The first forum was in the southern island province of Hainan in last March.

Tianjin Municipal People's Government, ChemChina, the Society for Chemical Engineering and Biotechnology and Morgan Stanley are co-organizing the event.

Participants will discuss subjects including "enterprises and social responsibilities," "opportunities and investment strategies" and "technology and research directions" during the conference.

Huang Xingguo, the Tianjin mayor and president of the organizing committee, said the event would bring new development opportunities to the advanced materials industry in the port city.

Ren Jianxin, ChemChina general manager, expressed his hope to strengthen mutual communication with governments and learn from advanced domestic and foreign companies through the three-day summit.

Many big names will attend the forum, including Chinese government officials, academics, top U.S. scientists and industrial giants.

Advanced materials have been put into use in the country in super-alloy materials and high-end stainless steel employed in the Shenzhou VII space aircraft, plastic membrane in the Water Cube National Aquatic Center and recycled materials in the Olympic torch.

Experts said the country's advanced materials industry had experienced steady development, but was in urgent need of international cooperation and technological advancement. The industry still faced many problems, including high material and energy consumption, pollution, low levels of advanced materials application and inadequate core technology among others.

China to help Laos develop satellite-based communication system (People's Daily, 2008-08-25)

China will, under a recent agreement, help Laos develop a telecommunications satellite and a ground station, and train relevant staff, Lao newspaper Vientiane Times reported Monday.

Under the agreement signed by Bountiem Phissamay, head of Laos' National Authority for Science and Technology, last Friday in Laos, and inked earlier in China by Sun Laiyan, chief of China's National Space Administration, the Chinese side will exchange technical information with Laos in the fields of earth observation, remote sensing satellite technology and application of remote sensing data.

The two authorities will also cooperate to exchange information about satellite imaging and develop a program to read data from satellite images.

Developing Laos' expertise in space technology will be beneficial to the country's socioeconomic development, according to the National Authority for Science and Technology. It can be used to facilitate long-distance transmission of audio and visual materials, and national land surveys.

5 Miscellaneous

Magazine: China becomes physics powerhouse

(Xinhua Net, 2008-08-02)

There can be little doubt that China is finding its place as one of the world's physics power houses judged by the astonishing increase in papers written by scientists in China, said Physics World, an international monthly magazine, in a report published on Friday.

Nanoscience, quantum computing and high-temperature superconductivity are three of the cutting-edge areas of physics that have seen particularly large increases. Published journal articles in nanoscience, for example, with at least one co-author based in China, have seen a 10-fold increase since the beginning of the millennium, rising to more than 10,500 in 2007, according to the report.

China has already overtaken the United Kingdom and Germany in the number of physics papers published and is beginning to nip at the heels of the United States. If China's output continues to increase at its current pace, the country will be publishing more articles in physics - and indeed all of science - than the United States by 2012, said Physics World.

Quantity alone however is not enough. The number of times a journal paper is cited by other academics in their own journal papers is often used as a guide to journal papers' quality. Unfortunately for China, they are currently a long way from the national citation top spot, ranked in 65th for physics, just ahead of Kuwait, with an average of 4.12 citations for each of the papers published.

As China has only just started to publish large volumes of work, it is not a fair reflection. Werner Marx, an information scientist, who carried out a study for the Physics World article, said, "The figure is still quite impressive, and I estimate this will rise substantially in the next few years."

All indications suggest that China's propensity for world-leading research is growing. In March this year scientists in Japan first reported a new class of iron-based superconducting material that can conduct electricity without resistance when cooled to below 26 Kelvin (K). Researchers in China quickly picked up the baton and, within a month of the initial Japanese discovery, had boosted the transition temperature at which the material loses all its electrical resistance to 52 K.

"China has become a notable factor in the scientific landscape. Usually scientific development in nations does not show such a strong acceleration as we have seen in China, so it will be interesting to see how it responds and develops in the future," said Marx.

FACTBOX: Timeline of China's space industry

(Xinhua Net, 2008-08-11)

Starting from 1956, China's space industry has realized great achievements. Here is a timetable of the country's space industry.

October 8, 1956: The Fifth Academy of the National Defense Ministry -- the country's first rocket research institution -- was founded, symbolizing the birth of the Chinese space industry.

July 19, 1964: The first biological rocket was launched, carrying white mice into space.

April 1, 1968: Institute of Space Medico-Engineering was established, initiating the selection and training of astronauts and the manned space flight medical engineering research.

April 24, 1970: First artificial Earth satellite -- Dong Fang Hong-1 Satellite -- was launched at Jiuquan Satellite Launch Center as China joins the former Soviet Union, America, France and Japan as the fifth country to launch satellites.

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November 26, 1975: The launch and recovery of the first recoverable satellite makes China the third country to master this technology.

1979: Yuanwang-1 ocean-going tracking ship was commissioned, making China the fourth country to possess such a vessel.

1985: The Long March rocket series began to initiate commercial launch programs. In 1990, Long March 3 launched the first foreign satellite -- the U.S.-built AsiaSat 1.

1988: Ministry of Aerospace Industry was founded.

1992: The Chinese manned space program was officially adopted.

From 1990 to 2002, China launched four unmanned spaceships (Shenzhou 1 to Shenzhou 4), laying solid foundations for future manned spacecraft.

October 15, 2003: The launch of its first manned aircraft -- Shenzhou 5 -- sent one astronaut into space. The 21-hour flight allowed China to become the third country to independently conduct manned space flights, following the Soviet Union and the United States.

October 12, 2005: Shenzhou 6 manned aircraft was launched, sending two astronauts into space.

October 24, 2007: The first unmanned lunar orbiter -- Chang'e 1-- was launched, making China the fifth country to master this technology.

2009: The first Mars probe is scheduled to be launched in a joint mission with Russia in October 2009.

LIN Liwu elected fellow of Royal Society of Chemistry (CAS, 2008-08-20)



Prof. LIN Liwu, a physical chemist with the CAS Dalian Institute of Chemical Physics (DICP), has recently been elected a Fellow of the Royal Society of Chemistry (FRSC) in UK.

During the 1960s, Prof. Lin and his co-workers invented a new catalyst and process for the hydro-iso-cracking of heavy oil to produce the jet fuel from Daqing paraffin base crude oil which ceased the serious shortage of aviation kerosene at that time. In the 1970s, with the collaboration of the researchers of then Ministry of Petroleum, he explored the multi-metallic catalysts for the first reforming unit using the new generation of catalyst.

In the 1980s, he explored the new catalysts for the dehydrogenation of long chain paraffin to produce the detergent. All these catalysts have been put into commercial production. On the fundamental research, he has concentrated the studies of surface structure and reaction chemistry of metallic catalysts for a long time. Three other DICP researchers previously received this honor are SHA Guohe, LI Can, and ZHANG Cunhao.

China to Regulate Recycling of Electronic Waste (CRI, 2008-08-21)

China on Wednesday approved a draft law on the management of electronic waste, aiming to reduce the pollution it causes.

The proposed regulation on the recycling and treatment of used electronic products and home appliances received approval at an executive meeting of the State Council, China's cabinet.

The country will set up a mechanism to encourage recycling and centralized treatment of electronic waste.

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This will be supported by a special fund, according to the proposed law.

It also stipulated the respective responsibilities of manufacturers, retailers, repair and customer service providers and recycling companies in regards to the collection and treatment of electronic waste. These included used TV sets, refrigerators, washing machines, air conditioners and computers, among others.

The draft was approved following years of debate over the issue in China, whose 1.3 billion people and rapid improvement of living standards made it one of the world's major manufacturers and consumers of electronic products.

With the rapid economic and social development and improvement of people's living standards, electronic waste has increased largely. It was therefore necessary to make a special law to regulate the treatment of such waste to encourage a better use of resources, while preventing and reducing environmental pollution, according to the meeting.

The meeting also approved a draft on the import and export of "genetic resources" of livestock and poultry. It aimed to promote the "sustainable development of China's animal husbandry" sector.

The regulation stipulated certain conditions where the import and export of the resources could be allowed, and the cooperation between Chinese and foreign researchers could be approved.

Fudan Team Conquers Pool Sound Barrier

(CRI, 2008-08-24)

Shanghai's Fudan University announced Friday that a hydrophone developed by its professors with optical-fiber technology had been successfully applied in the National Aquatics Center for the Olympic Games water ballet.

Swimmers rely on underwater speakers when immersed in water to pick up the beat and dance gracefully. It causes big performance problems when speakers function abnormally or break down.

A hydrophone is a microphone designed to be used underwater and thus can monitor the sound of underwater speakers and provide vital information for referees and staff.

The hydrophone is the next step up in technology from underwater speakers and video cameras.

An optical fiber is a glass or plastic fiber, smaller than a human hair that permits transmission over longer distances and at higher data rates than other forms of communications

"We curled about 10 meters of optical fiber into a coil and put it on one wall of the swimming pool," said Tang Huang, a research team member.

The coil was linked to a machine weighing less than 4 kilograms at ground level to interpret information.

"The fiber-optic hydrophone has been used widely in military affairs," said Tang. "This is the first time that such technology has been used in an Olympic Games."

[END]