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# NEWSLETTER

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## SPECIAL ISSUES

### Emission Reductions Using S&T Means

China will establish a well functioned S&T system to support emission reduction efforts, especially in formulating standards and control policies for such efforts, said WU Xiaoqing, Chinese Vice-Minister of Environmental Protection at a national conference on environmental protection related S&T activities held on February 18, 2009.

WU added that 2009 marks a critical year for materializing the environmental protection objectives and tasks defined for the 11th Five-Year period (2006-2010). S&T activities shall be enhanced to support the implementation of the strategy of rejuvenating

environmental protection with science and technology, to facilitate innovation capacity building, and to create new avenues for environmental protection. Efforts shall be made to work on major S&T issues arising in environmental protection activities. One has to land technology breakthroughs in line with the master water pollution control plan approved by the State Council, aiming at raising the overall water pollution control level. Efforts shall also be made to update water and atmospheric environment quality standards, establish a new standard system for pollutants emission monitoring and control, formulate emission standards for the chemical industry in the Three-Gorge area, publicize technical standards for 12-15 major industries, launch pilot projects for market based pollution control, update green procurement lists, facilitate the construction of ecological industrial parks, and raise the level of industrial pollution prevention and control. China will also prepare a healthy environment development plan for the future decade, investigate environmental pollution and associated damages to human health in selected areas, update environmental pollution risk lists, establish a steering panel and an expert panel under the Ministry of Environmental Protection to deal with climate change issues, review CDM projects, and support climate change related basic researches.

## China's Top Ten Astronomic Events in 2008

China's top ten astronomic events in 2008 were recently unveiled at CAS National Astronomic Observatories. In the area of basic research, they are: the Purple Mountain Observatory has made breakthroughs in observing high-energy electrons and gamma rays; CAS National Astronomic Observatories discovered extrasolar planets, the distance between large mass stars, and structures of the Milky Way; and Chinese young scientists' new discovery of the mass of the Milky Way and trails of supernova. In the area of technical development, they are: the completion of the construction of LAMOST and associated approval; Chang'e I satellite obtained full moon images and completed its probe missions; new progresses for the construction of FAST and super large telescope; and successful observation made by the gamma ray spectrometer in the moon circling orbit.

CAS National Astronomic Observatories started to select China's annual top ten astronomic events in 2001. Thanks to the concerted efforts of both CAS National Astronomic Observatories and Chinese Astronomic Society, the selection process has expanded in 2007 from CAS National Astronomic Observatories itself to all the astronomic research institutes in the country.

## New Trends of Chinese Patents Granted in 2008

In 2008, China handled 828,328 applications for invention, utility, and design, with 411,982 grants. Patent applications in 2008 have shown the following four major trends:

- 1) A steady growth. In 2008, China has enjoyed a steady growth of its patent applications at 19.4%, with domestic invention patents being a major player at 27.1%.

- 2) Industry has produced more applications in terms of numbers of application, individual enterprise, and the one having 100 or more patent applications. In the same year, 40,005 enterprises have filed patent applications, with a 23.9% growth compared with the same period. Meanwhile, per enterprise patent application also went up to 7.29 in number. Additionally, more and more Chinese enterprises have joined the rank of large patent applicators. For example, in 2007, the domestic enterprises enjoying an annual patent application for one hundred or more have reached 420 in number.
- 3) More domestic invention patent applications, with an equal proportion for both domestic and international invention grants.
- 4) Most technical areas have enjoyed a 2-digit ascending trend for invention applications. A range of areas, including environment, telecommunication, chemistry, transport, and medicine, have produced more domestic applications than international applications, with a gap further narrowed down between domestic and international applications for audio-video and optical patents.

## INTERNATIONAL COOPERATION

### Ruler Telling the Fish Size for Capture

A research team, led by CHENG Heqin at East China Normal University, has recently developed a ruler that can be used to measure the minimum size of fish allowed for capture, under a special R&D project jointly initiated by the Chinese Ministry of Science and Technology and the EU. Made of soft plastics, and designed to measure the commonly seen fish in the oceans, the compact ruler can be coiled in a pocket. The fish ruler makes a simple but effective tool for fish resources management.

According to CHEN, the ruler is designed to tell the minimum maturity length of different fishes, based on the previous findings on fish growth. Fishes that fall under the minimum length range have mostly reached their maturity stage, desirable for capture as they have completed the mission of reproduction. Capturing a fish having the size under the required minimum length will lead to the decreased population of fish, and even to its extinction. The fish ruler makes an effective tool to address the problem.

### China-Vietnam S&T Cooperation Projects Evaluated

The representatives from the National Center for Science & Technology Evaluation, part of the Chinese Ministry of Science and Technology, and a similar organization under the Vietnamese Ministry of Science and Technology, jointly inked on February 19, 2009 an

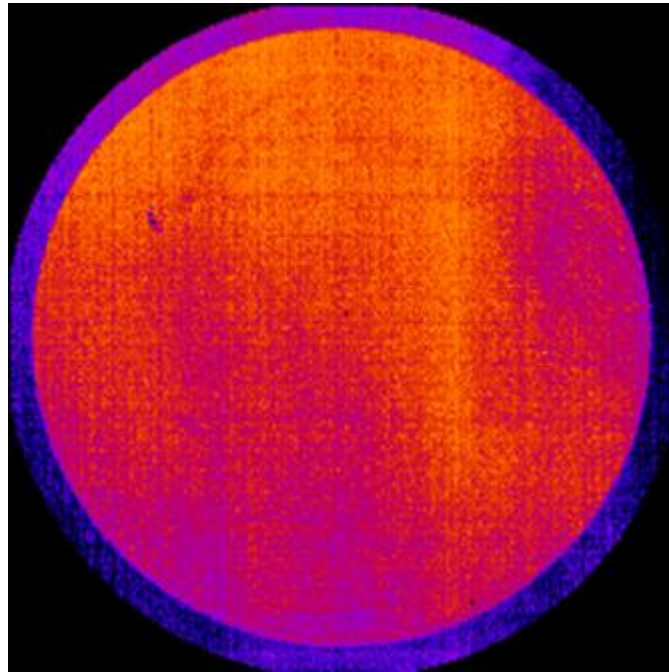
accord to evaluate the cooperation projects defined by the both sides. The capacity building project for science and technology evaluation was launched in January 2009, and will end on June 2010. Chinese side will provide guidance to and assist its Vietnamese counterpart to evaluate a national S&T program in Vietnam. Both sides will enhance the capacity building in the area through information sharing, training, and seminars. The new project creates a foundation for the long term collaboration between the two countries in the area of science and technology evaluation, allowing China to share its experience in the area with other developing countries. The project, a long term collaboration project proposed at the 7<sup>th</sup> joint committee meeting on cooperation between China and Vietnam in the area of science and technology, will be funded by the ministries of science and technology of both countries. It will facilitate exchanges and cooperation between the two countries in the area, allowing China sharing its proven experience in the area with developing countries in Asia.

## RESEARCH AND DEVELOPMENT

### China Builds Space Docking Module

According to a news briefing issued on February 27, 2009 by China Manned Space Program, China has been working on a module to dock with a spaceship to be launched in the future. The module, named Tiangong I (a palace in the heaven) and having a weight about 8.5 tons, is designed to dock with other spaceships, accommodating the working and living needs of astronauts for a short stay in the space, and facilitating space experiments. It will become a space platform that can host astronauts for their short stay, and run independently and reliably on a long term basis, accumulating needed experience for building a space station in the future. In 2009, researchers are supposed to work on a range of experiments and tests for the docking module, manned spaceship, CZ-2F launch vehicle, and prototypes of payloads, along with the development of other needed equipment and facilities. The prototype of Tiangong I has been basically completed. The finalized module expects to dock with a spaceship in 2011.

### Novel Infrared Horizon Sensor Gets Earth Image



An infrared horizon sensor, developed by CAS Shanghai Institute of Technical Physics, is a new technology to be tested aboard the experimental satellite III. Not long ago, the ground tests show that the infrared horizon sensor has produced an attitude measuring precision that is better than the scanning sensor. With a weight lighter than 2kg, and power consumption less than 5W, the new sensor is designed with no moving components, allowing a range of enhanced functions, including higher precision, smaller size, lighter weight, lower power consumption, and longer work life. The new sensor, the first of its kind in the country, has for the first time in the world proved its feasibility and utilities aboard a satellite. The sensor has successfully sent infrared earth images back to the ground station. The image shown above is the world's first infrared earth image at 13.5um-16.25um.

### China's Proprietary Gyro-Magnetic Compass

A proprietary gyro-magnetic compass, developed by CAS Changchun Institute of Optics, Fine Mechanics, and Physics to automatically find and track the local geodetic meridional plane, has passed the required technical check. This is a multi-position gyro-magnetic compass equipped with a range of advanced technologies for axial movement, high precision coding, readjusting, multi-position server control, temperature control, high speed data collection, and systematic bias measuring. It works independently, and does not need geographic positioning information from other sources. It enjoys numerous merits, including high measuring precision, short measuring time, fine environmental adaptability, all-weather capability, calibration free, and easy operation. The innovative compass has a proprietary data processing program that has applied for domestic patent.

## Carbon Dioxide Copolymerization

CAS Changchun Institute of Applied Chemistry has recently achieved new progresses in carbon dioxide copolymerization and associated commercial applications, rolled out internationally advanced high-barrier thin films. Researchers raised the high temperature intensity, low temperature tenacity, and stability of size temperature of polymers using novel rare earth catalysts and enhanced crosslinking techniques. Meanwhile, they have invented a technique that is able to produce large thin films in a consecutive manner through external crystallization control. The efforts have resulted in internationally advanced biologically degradable high-barrier thin films. The proprietary technology has enhanced the barrier and degradable performance of thin films, allowing environment friendly applications in the area of food packaging and medical dressing.

Jilin Jinyuan S&T Development Co. Ltd. has successfully rolled out medical dressings using carbon dioxide copolymerization technology. According to the manufacturer, the new product can be degraded in one or two months. The company has invested RMB 30 million to establish a novel medical dressing

driven permanent magnet technology. With the reduced numbers of gear box and other components, the turbine has registered a per-minute rev only at 16-17, allowing a noticeably enhanced reliability and efficiency. The turbine is supported by vanes that are 90m across. The new wind turbine will be put into trial operation next month.

## New Precision Rice Planter

Prof. LUO Xiwen and his coworkers at South China Agriculture University have recently developed a precision rice planter that is able to ditch, furrow, and sow in a combined manner. The new planter is designed with precision planting techniques, allowing rice seedlings to grow in neat rows, desirable for different species and regions. The new planter has been tested over an area of 3,000 mu (1 mu= 0.0667 hectare) on a combined basis in 10 provinces and autonomous regions, including Guangdong, Guangxi, and Heilongjiang. Test results show that the precision sowing technique is able to produce 10% more yields, compared with manual sowing, 8% more compared with manual seedling throwing, and 5% more compared with manual seedling planting.

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