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# NEWSLETTER

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SPECIAL ISSUES

National S&T Week for the Year



LIU Yandong, Chinese State Councilor, conferred the honor certificates to popular science role models.



LIU visited a popular science site.

The 10<sup>th</sup> national S&T week opened on May 15, 2010 in Beijing. LIU Yandong, Chinese State Councilor, and WAN Gang, Chinese Minister of Science and Technology, attended the opening ceremony. The yearly S&T week was held to show how the economic development, people's life, and ecological environment become the beneficiaries of S&T development, and how to enhance people's scientific literacy. During the week, a hundred or so large scale activities were staged, and some 1,500 local popular science sites set up to encourage people to be part of S&T activities. The scale of the Week has topped the series events held in the past. Local S&T authorities also planned a range of popular science activities that were tailored to their own situation and economic development levels, in an attempt to enhance people's awareness of the role played by science and technology in people's daily life as well as in the economic development.

## Enhanced Marine R&D System

China Marine Development Report 2010, published on May 11, 2010 by the Institute for Marine Development Strategy, part of the State Oceanography Bureau, indicates that China has achieved laudable accomplishments in marine studies, and established a well functioned marine R&D system, enjoying an enhanced marine survey capability.

Made up of five major components dealing with the macro environment for the marine development, marine legislations and interests, marine economy and S&T activities, marine ecological environment protection and resources development, and marine management, the Report summarizes and analyzes the macro environment, both domestic and international, for the marine development, the situation and status quo of marine undertakings, accomplishments and progresses achieved, problems, and perspectives.

The Report also points out that the development strategies approved by the central government for the coastal areas will spur up a new round of marine development, imposing new stress on offshore marine ecological environment. In addition, new legislations are needed to tap up and protect new marine life forms, including hydrothermal vent system, cold seeps, and cold-water coral reefs, that are mostly dwelled in the region outside a nation's jurisdictional boundaries.

INTERNATIONAL COOPERATION

SCO Science Ministers Met



An S&T cooperation ministerial meeting was held on May 14, 2010 under the banner of Shanghai Cooperation Organization in Beijing. Ministers attending the event agreed that efforts shall be made to strengthen the multilateral S&T cooperation under the framework of Shanghai Cooperation Organization, in the interests of members and their economic development. In recent years, the deepened bilateral cooperation between the members has made a multilateral S&T cooperation among the members possible. In this context, members have decided to establish a regular meeting mechanism among S&T ministers, and set up a permanent working group for the purpose.

Ministers agreed to co-sponsor a range of S&T activities, including joint scientific research, training, seminar, and exhibitions. They are also planning to establish joint innovation institutions, labs, and scientific centers, conducting multilateral S&T cooperation in different forms. Members will work together under the principle of supplementing each other with respective strength, rational division of work, results oriented, and due consideration paid to members' own interest. S&T ministers also agreed that at the initial stage, they will mainly collaborate in the areas of natural resources protection and associated rational utilization, energy efficiency and emission reduction, life system (including agricultural), nanotechnology, advanced materials, information, and communication.

### China-France Infectious Diseases Action

The 5<sup>th</sup> steering panel meeting of China-France infectious diseases prevention and control project was held on May 11, 2010 in Beijing. Some 60 representatives, including CHEN Zhu, Chinese co-chair and Chinese Health Minister, Alain Merieux, French co-chair and

Chairman of BioMérieux Foundation, and Roselyne Bachelot-Narquin, French Minister for Health and Sport, were presented and spoke at the event.

The meeting adopted the summary report of 4<sup>th</sup> meeting, and made an in-depth discussion of a range of collaborative issues, including biosecurity standards and legislations, high level biosecurity lab, training, joint research, mobile P3 lab, and Institute Pasteur of Shanghai. Both sides agreed to define the action plan and timetable for future cooperation, highlighting the importance of communication and exchange and close coordination. During the meeting, CHEN and Roselyne Bachelot-Narquin jointly inked a letter to WHO Director-General, highlighting the importance of the China-France project to safeguarding the global public health and security.

## RESEARCH AND DEVELOPMENT

### Origin of Bats Flying Unveiled

Scientists at the Kunming Institute of Zoology under the Chinese Academy of Sciences observed that an animal, when flying, may consume an energy 3-15 times the one needed for running. In this context, a flying animal needs a highly efficient energy supply system to cope with the suddenly raised energy needs, in addition to the physical system desirable for flying. It works like an aircraft that needs a powerful engine able to feed the machine with enough energy to fly. The respiratory chain of the mitochondrial produces 95% of the adenosine triphosphate needed for locomotion. Researchers deduced that changes in energy metabolism must be a primary factor in the origin of flight in bats. Both mitochondrial and nuclear-encoded genes display the evidences of adaptive evolution along the common ancestral branch of bats, supporting their hypothesis that genes involved in energy metabolism were targets of natural selection and allowed adaptation to the huge change in energy demand that were required during the origin of flight. The finding was published in April 26, 2010 online issue of *the Proceedings of the National Academy of Sciences*.

### Digital Artificial Cochlea

Not long ago, an R&D team, led by WANG Zhengmin, a CAS academician at Fudan University Otolaryngology Hospital, successfully developed a digital programmable artificial cochlea, the first of its kind in the country. The development makes China another country possessing the proprietary technology to work on a digital artificial cochlea, following Australia, Austria, and the United States, bringing up hopes for countless hearing disabled people. To make an artificial cochlea, one has to have two chips: one for digital signals processor, handling verbal information, and the other for a programmable central

processor. The tiny device has to be made and processed in a highly precise manner. After years of efforts, WANG and coworkers have eventually rolled out the prototype cochlea, with its major technologies and processing techniques reaching the level of its overseas counterparts.

## Mega KW Pressurized Water Reactor

China National Nuclear Corporation has recently built a proprietary pressurized water reactor at the mega kilowatt level, thanks to technical innovations. According to a briefing, as a follow-up to the localization of 2<sup>nd</sup> generation reactor that was built on an imported model, the new reactor has achieved 22 major improvements, including 177 core, single core deployment, and double safety domes, enjoying enhanced safety, stability, and economy. Meanwhile, the localization of major equipment in the reactor will not be lower than the improved 2<sup>nd</sup> generation reactor.

Thanks to more than 20 years' efforts, China has built up laudable strength in nuclear reactor R&D, design, manufacturing, construction, and operation management. China has so far built pressurized water reactors at 300,000 and 600,000 kilowatts level. It is expected that China will have an installed nuclear power capacity ranking 2<sup>nd</sup> place in the world.

## Large 3-D Image Display at Expo

A large 3-D image display, developed by a team led by Prof. LIU Jingao at East China Normal University, made its debut at the Shanghai Expo. Made up of a dozen of 32-bit CPUs, the display is of a computing capability that is much faster than a generic multi-core computer. It is able to display different sections and slices of an object in a three dimensional manner, and built a 3-D image through scanning the spatial elements of an object. The novel display, enjoying both horizontal and vertical views, meets with the viewing needs from different angles, allowing the viewer to gain a real-world like feeling.

Researchers have so far developed a large display system and a back-up. Its public debut marks the birth of a brand new approach to display, broke up the bottlenecks of conventional 3-D display techniques, including LCD and PDP that present a 3-D image through a 2-D platform. The new device shows a 3-D image in real term by scanning the object and building the image in a real 3-D environment.

## Refined Geodetic Coordinate System

Geocentric inertial coordinate system and its diffusion and application, a major mapping project initiated by the State Bureau of Surveying and Mapping, has recently passed an

approval check of its phase results. According to a briefing, the so-called geodetic coordinate system 2000 for China is a geocentric inertial coordinate system, with the original site of the coordinate being the earth mass center consisting of both atmosphere and oceans, and a coordinate axis being defined in line with international norms. The technique applied has greatly enhanced the precision of site expression, allowing people to obtain a 3-D geocentric coordinate with enhanced precision. The advanced coordinate system can find direct applications in a range of areas, including disaster prevention and preparedness, public emergency rescue and warning, space, marine, seismology, meteorology, water resources, construction, planning, geological survey, and land resources management. It can also be applied to facilitate the development of emerging industries, including vehicle based GPS navigation system, mobile targets positioning, and mobile communications.

## LCD Light Connects Network

According to the Institute of Semiconductors, part of the Chinese Academy of Sciences, its researchers have landed major breakthroughs in developing the semiconductor illumination based information network. The new technology allows LED lights to be the connection. For example, when placing a notebook computer under a LED light, it is able to broadcast online video in a smooth manner, without the physical connection of network cables or the wireless network card. It works with the assistance of the blue LED light installed on the ceiling. The LED light transmits network signals to the computer at a speed up to 2 megabytes per second. In addition to network connection applications, researchers also realized switch and tuning control of a number of electric appliances using the same techniques. The two applications have been displayed at the Aviation Pavilion and Shanghai Eco Pavilion of the Shanghai Expo.

NEWS BRIEFS

## Green Economy Conference

An international conference on green economy and adaptation to climate change impacts was held May 7-9, 2010 in Beijing. WAN Gang, Chinese Minister of Science and Technology, made his keynote speech "strengthening green support, facilitating green development, and adapting to climate change" at the meeting. WAN said in his speech that MOST attaches great importance to the S&T activities under global climate change, and will support the green development through S&T innovations, especially through R&D, demonstration, and international cooperation. China will invest more in R&D activities, organize/implement major S&T demonstration projects, initiate/implement earmark climate change projects, and enhance S&T cooperation in the area of adaptation to climate

change impacts. MOST is currently making a strategic plan for the purpose, in line with the strategic needs of changing development modes and economic restructuring. China will make adaptation to climate change part of China's S&T development plan for the 12th Five-year Plan period (2011-2015) and S&T development plan for adaptation to climate change impacts for the same period. During the 12th Five-year Plan period, MOST will, in the course of addressing climate change and green development issues, promote three major activities in the area: 1) enhance proprietary innovation capacity building, developing strategic emerging industries; 2) support energy efficiency and emission reduction, upgrading traditional industries using new proven technologies; and invest more in R&D activities, providing a powerful S&T support to the adaptation to climate change impacts.

## Chinese Map in MapGIS Version

A digital Chinese map in MapGIS version at a scale of 1: 1 million, built on the data employed by the National Geographic Information Center in compiling the international version of digital Chinese map at a scale of 1: 1 million, was recently completed. The product is made up of 77 frames of standard map, making it the finest map among the similar products so far produced in the country, presenting a detailed picture of China's natural geographic conditions, desirable for regional studies.

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