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CHINA SCIENCE AND TECHNOLOGY

# NEWSLETTER

The Ministry of Science and Technology
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IN THIS ISSUE



## SPECIAL ISSUES

### Regional Water Resources Pattern Defined

According to a briefing made by CHEN Lei, Chinese Minister of Water Resources, China will develop its water resources in a four-region pattern, in line with the nation s development and strategic needs, and in an attempt to optimize the distribution of water resources, and meet the call for the sustainable economic and social development.

For example, the east coastal areas have to pay more attention to supply, use, and drainage of water resources, enhancing the capacity building of disaster prevention and preparedness for flush floods, tides, and mountain floods, building a water efficiency and pollution free society, enhancing water supply to both urban and rural areas, improving sewage handling and treatment, protecting economic functions and ecological systems of rivers and lakes, raising the bearing capacity of water resources and water environment,

and taking a lead in the modernization of water resources.

In the middle section of the country, efforts shall be made to enhance the capacity building of flood disaster prevention and preparedness, accelerating the construction of irrigation and drainage systems, developing water resources in a rational manner, effectively protecting water sources, raising the efficiency of water resources, and ensuring water supply safety of both the urban and rural areas.

In the west part of the country, infrastructure construction, ecological environment protection, and water efficiency are the major focus. Efforts will be made to address both resources oriented water shortage and project based water shortage, with emphasis on drinking water safety, and ensuring biological water need. Efforts will also be made to develop water energy resources, strengthen soil moisture conservation oriented ecological reconstruction, restricting and removing backward industries with high water consumption and high pollution, and ensuring the water needs of west development. More efforts will be secured to support the development of water resources in veteran revolutionary areas, ethnic areas, border areas, and poverty-stricken areas.

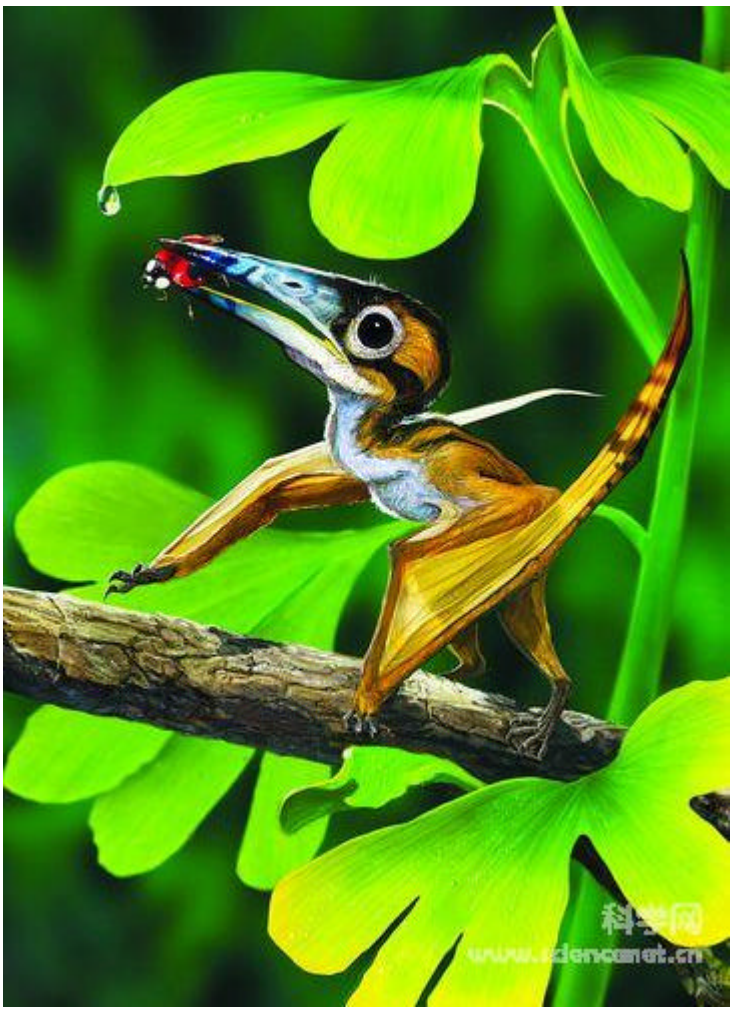
In the northeast part of the country, efforts will be made to accelerate the construction of an integrated flood control system, especially for urban flood control, aiming at an optimized distribution of water resources, water resources efficiency and protection, transformation of old irrigation area, water efficiency irrigation projects, soil moisture conservation and protection of black soil, food security, wetland protection, and ensuring the sustainable economic and social development of veteran industrial bases in the region.

### Progresses for Germplasm Resources Platform

Under the support and leadership of the Chinese Ministry of Finance and Ministry of Science and Technology, the Institute of Crop Science, part of the Chinese Academy of Agricultural Sciences, has worked on the standardization, consolidation, and sharing of a range of germplasm resources, including agricultural crops, perennial crops, tropical crops, trees, medicinal herbs, major wild plants, and grazing grass. The effort has accelerated the construction of plant germplasm resources platform with remarkable accomplishments. It has defined description, data processing, and data control standards for 1570 species, and completed the standardized and digitized catalog for 356,000 plants. It has submitted description data of 223,000 plants to the e-platform, realized information sharing of 305,000 plants via the platform, and established a sharing network for the purpose. It also regenerated and upgraded 132,000 plants, supplemented marker data for 103,000 plants, completed the rescue collection, consolidation, and protection of 72,000 endangered or rare species, and realized physical sharing of 305,000 plants.

## INTERNATIONAL COOPERATION

# Smallest pterosaurs in the world



A recent online issue of *the Proceedings of the National Academy of Sciences* published a story on the discovery of a new pterosaurs species in the western part of China's Liaoning province, a region that was forested when it lived there about 120 million years ago. WANG Xiaolin and ZHOU Zhonghe, the Institute of Vertebrate Paleontology and Paleoanthropology, part of the Chinese Academy of Sciences, and Alexander W. A. Kellner and his colleague at the National Museum of the Federal University of Rio de Janeiro, Brazil, are the co-authors of the paper.

With a wingspan of 25cm, or the size of a normal sparrow, the species unearthed is one of the smallest pterosaurs known to date in the world. The animal ṡ skull was not fully fused, indicating it was not yet an adult, but the ends of the bones were developed. It got a name of Nemicolopterus crypticus, implying it was a habitant of forests. Scientists said the tiny pterosaur carries a special value not only for its small size, but also for its special features and living habits, making it an important evidence for unveiling the mystery of the flying

reptile.

### Polar Light Observation

Northern Polar Light Observation and Study, an international cooperation project initiated by China, passed experts 'approval on January 21, 2008. China Polar Research Center, the implementer of the project, has forged close collaborations with space and physics research institutes in Norway, the UK, and Japan, by taking full advantage of the resources of China ś Yellow River Station and Norwegian stations in the North Pole. The collaboration has raised China research level in the area, through using large scientific observation facilities developed by European countries, such as incoherent scatter radar, and made China part of EISCAT. Scientists also developed a range of approaches for observing polar light, employing the combined efforts of a number of countries, and multiple means. The initiative has raised scientific values of polar light observation at the Yellow River Station. It also enhances China ś capacity being part of International Polar Year. The collaboration has broadened the international cooperation network of the Polar Research Center, allowed more Chinese scientists to work for international projects, raised China ś visibility, and spurred up a leaping development in the area.

## RESEARCH AND DEVELOPMENT

### Top Ten Events for China ś Basic Research

The top ten events for China ś basic research, jointly selected by the Basic Research Management Center under the Chinese Ministry of Science and Technology, and the Department of Basic Research affiliated to China Association for Science and Technology, were unveiled on January 31, 2008, as follows:

1) China successfully launched its first moon probe satellite Chang è I, and received data sent back from the satellite;
2) New progresses achieved in multiparticle entanglement and optic quantum computation;
3) Metal glass materials with super plasticity for indoor temperature;
4) Fossilized animal embryos and fossilized animals dated back to 630 million years ago discovered;
5) 24-facets platinum nanocrystal developed;
6) CASP8 is proved to have a 6-nucleotides insertion/deletion polymorphism that is associated with the vulnerability to cancers;
7) Dopamine-mushroom body circuit is proved to have a regulation role in determining Drosophila ś sense of value
8) Inhibiting factor ß-1 is a key factor for regulating the survival of CD4+T and associated autoimmunity;

9) Panda is proved to have kept a relatively high genetic diversity and evolution potentials;
10-A) Double negative refraction is realized in phononic crystals;
10-B) Dissolved inorganic carbon has been proved an important carbon pool in the global hydrologic cycle.

## Top Ten S&T Progresses for China's Universities

Top ten S&T progresses for China's universities were unveiled on December 19, 2007 as follows:

1) It has been proved that bird flu viruses may pass from mother to their babies, and cause infections in a number of organs (Peking University);
2) Key technology developed for high end color printer control (Peking University);
3) Large strain elastic deformation of covalent crystal and non-crystal structure/dimensional nanomaterials (Beijing University of Technology);
4) Theory, key technologies, and engineering applications of integrated digital telecommunication system for railway (Beijing Jiaotong University);
5) Full genome decoding for oil recovery microbes, and molecular mechanism of heavy crude decomposition (Nankai University);
6) New generation 3-D power grid management system (Tsinghua University);
7) 24-facet platinum nanocrystal catalyst (Xiamen University);
8) An epipodite-bearing crown-group crustacean from the Lower Cambrian (Yunnan University);
9) Physical realization and algorithm applications of photonic qubits (the University of Science and Technology of China); and
10) Formation mechanism of deep oil-gas reserves and associated distribution prediction (China University of Petroleum).

## 3GeV Beam Storage

Shanghai Illumination Sources, a key national project, announced on January 31, 2008 that it has stored electron beams in the 3GeV storage ring, and obtained the first beam of synchrotron radiation light. Further optimization of physical parameters has resulted in a 100mA stored beam.

According to the plan, the project will develop a range of devices, including a 150MeV linac, a 3.5GeV enhancer with a circumference of 180m, a 3.5GeV storage ring with a circumference of 432m, seven optic beam test stations, public facilities, a main building, and other support structures.

So far the main building has seen the completion of its civil engineering part and associated installations, with public facilities under test and trial operation. Linac, enhancer, and storage ring have their tunnel installed. The project, upon the completion, will make several dozens of optic beams and a hundred scientific experiment stations available for users, allowing several hundred scientists to work on basic research and technology

development on a daily basis. It will provide strong support to China's cutting edge research and high tech development.

Shanghai Illumination Sources is scheduled to complete the test of storage ring in 2008, allowing it to reach the design level of 3.5GeV for beam energy, and 300mA for current intensity. It will also complete the test of 7 scientific experiment stations which will be put into operation in the early 2009.

### No-Injury Nanoparticles Capture

A research team, headed by LI Yinmei at the University of Science and Technology of China, proposed to combine the microscope based light scatter technology with optical tweezers capture to address the technical requirements for precise overlapping of optical tweezers, microscope imaging, and laser imaging, by targeting a sample with a patch of laser beams generated from the traditional microscope based optical tweezers system, allowing scatter light of particles in the sample to image through microscope. The technology lets researchers observe nanoparticles in a microscope field, while capturing the polystyrene ball of 100 nanometers.

The technology has found the solution to the bottleneck that optical tweezers cannot make a direct observation, though it can capture liquid nanoparticles, which improves optical tweezers technology, allowing more applications in the area. It has also realized the Brown motion of individual particles in the controlled liquid phase, creating a new means for studying the properties of scatter light of each individual tiny particles.

## NEWS BRIEFS

### More Wetlands under International Protection

The Chinese State Forestry Bureau announced on February 2, 2008 that China has put another 6 major wetlands on the international protection list under the framework of "Convention on Wetlands". The effort adds China's major wetlands under international protection to 36 in number, with a total area of 3.8 million hectares. The newly added wetlands include Shanghai Yangtze River Mouth Chinese Sturgeon Wetlands Conservation Zone, Guangxi Beilun River Mouth National Nature Conservation Zone, Fujian Zhangjiangkou National Nature Conservation Zone for Mangrove, Hubei Honghu Provincial Nature Conservation Zone for Wetlands, Guangdong Haifenggongping Dahu Provincial Nature Conservation Zone, and Sichuan Ruoergai National Nature Conservation Zone.

JIA Zhibang, Administrator of State Forestry Bureau said that China has a wetland area of 38.48 million hectares, ranking first place in Asia, and fourth in the world. In recent years, China has made an investment worth RMB 26.5 billion for protecting wetlands. Some 17

million hectares of wetlands, or 47% of the total, has been placed under effective protection.

## First Aquatic Virology Textbook

*Aquatic Virology*, the first textbook in the area both at home and abroad jointly compiled by ZHANG Qiya, and GUI Jianfang, research fellows of CAS Institute of Aquatic Biology, was recently published by Chinese Higher Education Press.

The book introduces basic concepts, principles, and research methodologies concerning aquatic virology, from different angles, including molecules, cells, organisms, and species, in both pictures and words. Based on authors 'research and teaching experience, the book presents a vivid picture of aquatic virology before readers. It has 31 chapters in 8 parts, and a content of 530,000 words, depicting the basics about aquatic virology, and diseases/viruses in fish, amphibian animals, aquatic reptiles, aquatic invertebrates, planktons, and others. With some 210 color illustrations, and 12 case studies, the book can either be used as a textbook for both undergraduates and graduates, or as a reference for scientists and technical personnel in the related areas.

## Plastic Optic-Fiber Transmission System

Xi ân Feixun Photoelectric Co. Ltd. has recently rolled out a 650nm plastic optic-fiber transmission system. The system that has passed a validation check is a novel optic-fiber transmission system equipped with needed functions, enjoying numerous merits, including an increased transmission bandwidth, improved security, enhanced interference resistance, lightening proof, lighter weight, finer flexibility, and less copper use, compared with traditional copper wires. Even in the context of quartz optic-fiber, the plastic optic-fiber transmission system presents the strength of simple operation, easy interface, inexpensive light source, and a lower cost. The new system can find wide applications in public facilities, and local networks, especially in short distance high speed data transmission with high confidentiality requirements, including vehicle (car and boat) based internal telecommunication network, and industrial control network.

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Comments or inquiries on editorial matters or Newsletter content should be directed to:

Mr. XU Chaoqian, Department of International Cooperation, MOST 15B, Fuxing Road， Beijing 100862, PR China Tel: (8610)58881360 Fax: (8610) 58881364

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