

NO.610

CHINA SCIENCE AND TECHNOLOGY

# NEWSLETTER

The Ministry of Science and Technology  
People's Republic of China

NO.610

February 20, 2011

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## INTERNATIONAL COOPERATION

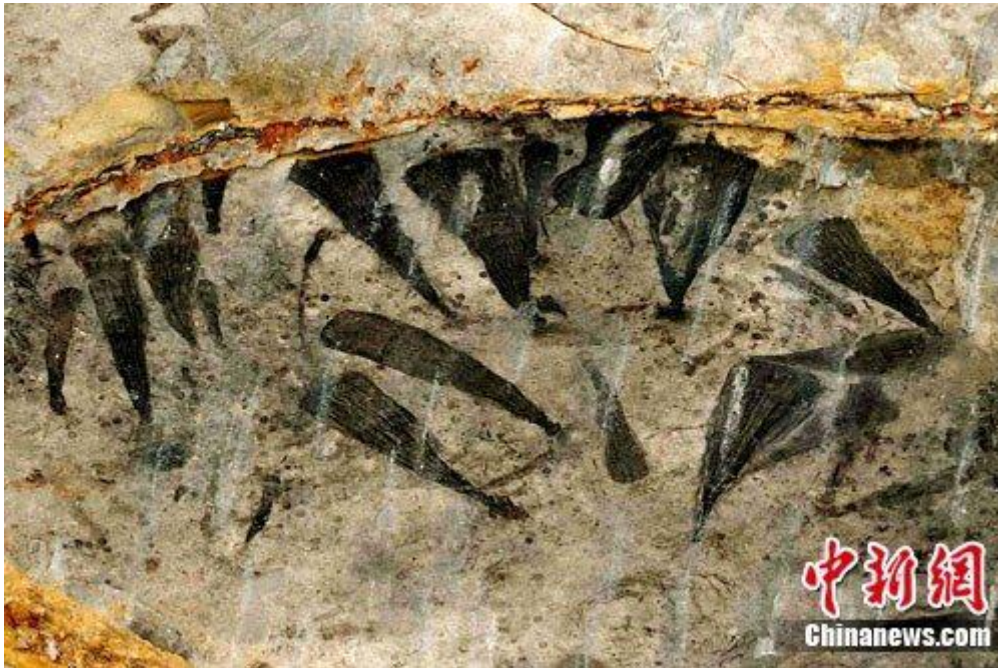
### WAN Met with Italian Guests

WAN Gang, Chinese Minister of Science and Technology Ministry, met on February 10, 2011 with new Italian ambassador Attilio Massimo IANNUCCI and the visiting Corrado Clini, Director General, Ministry of Environment, Land and Sea of Italy. Both sides thought highly of the important role played by S&T cooperation in the bilateral relations, and agreed that energy efficiency/emission reduction and sustainable development has become a highlight

in the bilateral relations. The two sides also exchanged the views on a range of issues, including implementing the electric vehicle memorandum signed during Chinese Premier Wen's visit to Italy in 2010, promoting electric vehicle demonstration and design cooperation, and promoting ecological housing and sustainable development and associated training. Both sides agreed to further strengthen cooperation, making a greater contribution to the deepening the bilateral relations.

## RESEARCH AND DEVELOPMENT

### Earliest Higher Life Found



YUAN Xunlai and coworkers at CAS Nanjing Institute of Geology and Palaeontology discovered the fossilized biota that used to live in a deep-water (50m-200m) environment some 600 million years ago in Lantian, Xiuning County of Anhui Province. The Lantian biota suggests that morphological diversification of macroscopic eukaryotes may have occurred in the early Ediacaran Period (600 million years ago), perhaps shortly after the Marinoan glaciation, and that the redox history of Ediacaran oceans was more complex than previously thought. The finding, published in the February 17, 2011 issue of journal *Nature*, advanced the origin of "higher life" by some 40 million years, and provided the earliest evidences for studying the evolution of higher life.



## Rice Height Regulating Mechanism

A study, led by HE Zuhua at CAS Shanghai Institute of Life Sciences, has landed new progresses in studying the mechanism regulating the height and development of rice plants. The finding was published in the February 9, 2001 online issue of *Plant Cell*.

HE and coworkers have studied rice plants' internode development for quite some time, which led to the successful cloning of BENT UPPERMOST INTERNODE1 (BUI1) gene, along with the systematic description of physiological and biochemical functions of BUI1. BUI1 encodes plant-specific Class-II formin proteins, regulating the assembly and dynamic changes of actin cytoskeleton. Actin cytoskeleton makes the basis for cell morphology and a range of physiological processes. BUI1 mutation may lead to the reduced concentration of F-actin in cells, with the reduced number of actin bundles and inhibited cell elongation and polarity expansion, which affects the internode development of the plants, causing a shortened uppermost node, and a bent growth. In collaboration with a team headed by HUANG Shanjin of CAS Institute of Plant Physiology and Ecology, HE and coworkers analyzed biochemical functions of BUI1 in a systematic manner, and proved that BUI1, a Class-II formin protein member, is a major player able to regulate actin cytoskeleton, playing an important role in assembling, growing, and developing higher plants' actin cytoskeleton. The finding found a new direction for studying the mechanism regulating the height of rice plants.

## New Therapeutic Targets for Liver Cancer

A team, headed by CAO Xuetao, a Chinese Academy of Engineering academician and Head of National Key Lab on Medical Immunology, published its innovative finding in the February 15, 2011 issue of journal *Cancer Cells*, reporting that an in-depth analysis of miRNomes in human normal liver, hepatitis liver, and hepatocellular carcinoma (HCC) shows that the expression of microRNA-199 is closely associated with liver cancer patients' prognosis. The finding, proving that microRNA-199 can inhibit the growth of hepatoma cells by inhibiting liver cancer kinase, and further inhibiting the downstream signaling pathway, sorts out a new potential target for liver cancer diagnosis and associated biotreatment.

Researchers, in collaboration with the scientists from other research institutes, have for the first time collected the microRNA data from normal human liver, hepatitis liver, and hepatocellular carcinoma through in-depth sequencing, which improved their knowledge of the differences between liver cancer and normal liver in the context of microRNA. 4 independent clinical cohort analysis of liver cancer patients shows that microRNA-199 that is richly expressed in the normal liver is significantly lower in liver cancer patients, showing a significant correlation between the reduced expression of microRNA-199 and patients' survival. Researchers also found that HCC histone methylation may result in the reduced expression of microRNA-199, and that microRNA-199 is able to inhibit PAK4, and then inhibit the downstream signaling pathway (ERK), which in turn suppresses HCC growth. Researchers also proved that MicroRNA-199 based therapy has significantly prolonged the survival rate of mice having liver cancer. The finding makes microRNA-199 a new potential target for liver cancer diagnosing and a new approach for biotreatment.

## Combined Land and Satellite Investigation of Polar Ice

It is reported from China's 27th Antarctic expedition team that Chinese scientists will improve their understanding of ice freezing and thawing activities in the South Pole, through combined land and satellite investigations. An observation platform, developed by Prof. CHENG Xiao and Dr. LI Xiuhong at Beijing Normal University School of Global Change and Earth System to investigate extreme polar environment using wireless sensors, has been operating smoothly, after a joint test. The platform has sent data back to the home data center in Beijing in a real-time manner, via the Iridium satellite communication system. The platform enhances human's real-time observation of polar surfaces. The system, working with satellite based observation, is able to provide a range of data needed for global change study, remote sensing data retrieval, and verifying polar ice parameters.

Two instruments, part of the platform, sit at the Zhongshan Station in the South Pole, 15km away from the continental ice sheet, a most desirable site for observing snow and ice

activities based on satellite remote sensing inversion. Researchers are able to tell the change of ice through the combined land and satellite based observation. A desk computer like cold resistant box stands in the center of the platform, allowing the sensors to automatically collect the needed parameters, including the vertical profile of snow temperatures in 9 layers, snow surface humidity, sunshine, atmospheric pressure, GPS, and snow depth, and to send data back to the home station on a daily basis. The smart cold resistant box, designed to survive the extreme coldness up to  $-80\text{ }^{\circ}\text{C}$ , can be charged either by wind or solar power. The system can also be updated remotely for new programs through a built-in module.

## Geological Disaster Watch Improved

During the 11th Five-year Plan period (2006-2010), China launched a project to develop the key technologies for geological disaster watch/early warning and emergency relief. The project has recently passed an acceptance check, with accomplishments in the following four areas:

- Key technologies have been developed for monitoring and early warning of rainfall triggered landslides. 2 demonstration sites have been established in Ailaoshan, Yunnan and the southeast part of Fujian to monitor massive landslides caused by heavy rain. Researchers also developed patented fiber optic based geological disaster monitoring techniques/equipment, and landslide monitoring and warning equipment desirable for universal application, with main technical parameters reaching the level of their overseas counterparts. The technology and equipment have found extensive applications in the Three Gorges reservoir area.

- Markers and methods have been developed to detect the possible occurrence of major geological disasters. Efforts have been made to understand the formation and the mechanisms that cause rock slide, earthquake landslide, high-speed distant landslide, multi-level rotational loess landslide, and reservoir landslide, along with a number of new theories and predicting techniques, including the earthquake projection theory, high-speed distant landslide theory, early detection indicators for heavy landslides, and spatial prediction technique. Researchers established large landslide warning demonstration sites in Danba of Sichuan, and in Wushan of the Three Gorges Reservoir Area.

- Researchers developed fast emergency response techniques to deal with major geological disasters, including the patented DTH Hammer drill system, and improved the pile anchor technique with a raised efficiency by 20%-50%. The said techniques have played an important role in dealing with the large earthquake occurred in Wenchuan in 2008 and in a major landslide occurred in 2009 in Wulong, Chongqing.

- Researchers have prepared a technical guidance for geological disaster risk assessment. Efforts have been made to address the technical difficulties in geological disaster assessment, along with the publication of China's first technical guidance for

geological disaster assessment. A geological disaster control demonstration center was established in the Baoji City, Shaanxi Province, which played a major role in combating the geological disasters occurred in the City during the 2010 flood season.

## NEWS BRIEFS

### International Chemistry Year in China

International Chemistry Year in China, a popular science event, was officially launched on February 19, 2011 at China Science and Technology Museum. China Association for Science and Technology and Chinese Academy of Sciences jointly staged a range of popular science activities for the purpose, including chemistry experiment design competition, popular chemical science show, Chemistry Day among others. XU Yanhao, head of China Science and Technology Museum said popular chemistry lectures would be held once every month at Science Forum, starting from this month, highlighting the importance of international chemistry year. The Museum will also host a series of popular chemistry events, including popular chemistry show.

China Digital Science and Technology Museum has opened an official website for International Chemical in China ([www.iyc2011.cn](http://www.iyc2011.cn)), promoting International Year of Chemistry in China events, making it visible to more people. One may get acquainted with the events through the website. Chemistry experiment design competition has also opened its registration and submission at the website.

### China's First Mars Probe in Early November

It was recently learned from Chinese Academy of Space Technology that China will launch its first Mars probe "Firefly-I" in early November this year. Both Chinese and Russian scientists agree that November 2011 makes a best time window for launching the Mars prob. Based on the agreement reached between the two countries, the launch will be made in early November 2011, if everything goes as expected.

According to a briefing, Firefly-I will be blasted off along with Russia's "Forbes-Soil" aboard the "Zenith" carrier rocket to be launched from the Baikonur Cosmodrome. While in orbit, Firefly-I will collect the data on Martian space environment, solar wind, and Martian magnetic field. The two countries will jointly probe Mars' atmosphere, and map the distribution of water vapor and temperature in the atmosphere.

## Clean Coal Study

Chinese Academy of Engineering kicked off on February 20, 2011 a strategic study of clean, efficient, and sustainable development and utilization of coal in China, a major consulting project participated by 227 researchers in Beijing. According to a briefing, the project will be made up of 10 task forces, studying coal and water resources, safe and efficient green coal mining technologies and strategies, quality raising technology and distribution solutions among others. Under the concept of low carbon utilization of high carbon energy, researchers will study the clean and efficient coal utilization in a comprehensive, systematic, and fundamental manner, focusing on developing clean coal technology, and borrowing the proven clean coal technology as an example. With advanced strategic study methods as the roadmap, and life cycle assessment as the means, the study will last from January 2011 to June 2012. China Academy of Engineering will make RMB 8 million available for the project, along with the contribution of RMB 8 million by the Shenhua Group.

## Near Ground Dust Watch

The area of 50 meters near the ground is an area seeing the most severe dust storm development. A forest break can reduce horizontal dust flux by 70%, and lower down wind speed by 30.5%-52.9%. In this context, forest breaks built to reduce wind, fix sand, and protect farmland imposes a blocking effect on dust storms, a conclusion drawn by the scientists in a 5-year observation and study of the grassland ecosystem in the Minqin area of Gansu Province. The finding makes a new method for dust storm prevention and control.

The working system is made up of 6 patented dust storm and sand observing instruments, including "sand flow monitoring device". Researchers made a comprehensive watch of weather, dust, environment, soil, and vegetation over three major landscapes, including desert, desert-oasis, and oasis in the Minqin area, along with a range of dust storm evolution studies in the context of structure/variation, dust flux, aerosol concentration, dust structure and spatial/temporal changes, and impacts of different protection systems on sand storm processes. The efforts allowed scientists to study the spatial structure of dust storms at a small and medium scale.

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