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IN THIS ISSUE

SPECIAL ISSUES

Science Enriches Farmers

A special project of enriching farmers and enabling counties with science and technology, initiated by the Ministry of Science and Technology, has enjoyed a smooth operation since its implementation. For example, an enriching farmer action with science and technology was launched in Sichuan Province, in a move to promote the economic development at the county level, accelerate commercial applications of S&T findings, foster special industries with regional strength, raise agricultural returns and farmers'

income, and provide a powerful S&T support for the local economic development.

1) The action has facilitated spin-offs and applications of S&T findings. In 2006, the action has produced a range of such results, including 493 novel technologies being diffused, 306 new businesses created, 913 growing centers established with an area of 645,000 mu(1 mu= 0.0667 hectare), and new species being diffused to 3.895 million mu. Lead businesses have recorded a sales revenue of RMB 14.828 billion, with a profit worth RMB 850 million. Farmers have enjoyed an increased income RMB 248 on average.

2) A long term mechanism has been created to implement the project of enriching farmers and enabling counties with science and technology. 10 agricultural engineering centers have been established at the provincial level, with industry as the key player, and research institutes collaborators. The project has produced 16 S&T envoy teams, from which 1845 S&T envoys were sent to work in the rural areas. Also derived from the action are 224 S&T experts' compounds, 1,033 special technical associations, and an 110 S&T information network for farmers.

3) Creating a new pattern combining S&T with economy. Thanks to S&T advancement, the action has spurred up industrial development, and helped farmers raise their income. Lead industries have enhanced their core competitiveness through a combined strength of industry, universities and research institutes. The action has also resulted in standardized breeding centers, innovative S&T service, innovative farmers, and raised quality and returns of special industries.

China's Space Information System

During the 11th Five-Year Plan period （2006-2010）, China will establish a space information system made up of 60-70 satellites, in a move to support the economic and social development in the country, said ZHANG Qingwei, General Manager of China Aerospace Science and Industry Corp., at the 11th ISCOPS held on May 16, 2007 in Beijing, under the co-sponsorship

of China Society of Astronautics, American Institute of Aeronautics and Astronautics, and Japanese Rocket Society.

ZHANG told audiences that the space information system will consist of an array of applications, including telecommunication, broadcasting, earth resources, meteorology, navigation, and scientific experiment. China will launch in 2008 a constellation made up of three microsatellites for environment and disasters watch and prediction. The number of the satellites in the constellation will be added to 7, in 2 to 3 years, allowing an all-weather, all-round, and full time watch, prediction, and assessment of ecological damages, environmental pollution, and disasters. China's satellite R&D effort has been transformed from experiment oriented to operation and service oriented. China will also blast off a probe satellite to circle the Moon in the year.

Largest Weather Modification Scale

Statistics published by the China Meteorological Administration show that 1,952 counties in China's 30 provinces, municipalities, and autonomous regions are able to provide rainfall enhancement and hail suppression operations, with 7,113 canons, 4,991 rocket launchers, and a contingent of 32,300 professionals. Some 24 provinces, municipalities, and autonomous regions are qualified to provide air born rainfall enhancement operations, with an annual lease of some 30 airplanes. Since 1999, air born rainfall enhancement operation has registered the following statistics on a combined basis: 3,430 airplane/time, for a duration of 8,745 hours, over a catchment area of 3 million square kilometers, enhanced rainfall of 250 billion cubic meters, and hail suppression area of 470,000 square kilometers.

According to a briefing, during the 10th five-year period, weather modification operations have enjoyed a steadily increased expenditure, mainly from local treasury, at RMB 2.2 billion on a combined basis. Local authorities have prepared rainfall (snow) enhancement

operation plans to accommodate different needs, including raising the water level of water reservoirs, ecological improvement, forest fire fighting, and pollution combating. Weather modification operation has also been used to serve large social events. In addition to rainfall enhancement and hail suppression, other weather modification activities, including fog dispersion, forest and grassland fire fighting, and ecological environment improvement, have also been conducted.

INTERNATIONAL COOPERATION

China-Europe Earthquake Collaboration

The Chinese Institute of Earthquake Science, part of the China Earthquake Administration, has established an internationally advanced earthquake model for protecting ancient temples, in collaboration with Italian and Greek universities. Based on the field investigations of the Xianshuihe Faults and the Xiaojiang Faults in southwest China, the new model is designed to analyze the brewing process of strong earthquakes, combing experimental data and stress estimations with actual fault activities, using the Coulomb stress theory.

Researchers have worked out new technical lines for integrating the predictions at different time scales, which effectively addresses the traditional methodological divorce between long and short term predictions. The new model works on both active faults indicating a long term risk, and slip rates describing the near term fault activities. It also predicts risks of future earthquakes in the faults, taking into account earthquake potentials at both time scales. It improves the accuracy of prediction using a combined quantitative and qualitative approach.

Thanks to its role in earthquake prediction, zoning, and

risk analysis, the model has been applied in the annual earthquake discussion, and medium/long term earthquake prediction.

China-Europe Information Project

A China-Europe information project was recently staged to improve the e-government of Beilin District in Xi'an. Officials from the Chinese Ministry of Science and Technology (MOST), the State Council Information Office, the EU Mission in Beijing, Shan'xi provincial government, and Xi'an municipal government, and experts and representatives from other communities were present at the launch event. The collaborating project, recommended by the Chinese Ministry of Science and Technology, and approved by the State Council Information Office and the EU Mission in Beijing as the 6th pilot project, marks the full-fledged implementation of China-Europe information initiative.

In an attempt to promote China's development in national economy and social information, China-Europe information initiative is an intergovernmental project between China and EU, under a China-Europe dialog framework of information and society, aiming at strengthening China-Europe exchanges and cooperation in the area of ICT, in line with China's information policies and strategies, and utilizing EU resources and proven experience. Both the State Council Information Office and EU Mission in Beijing, the project implementer, have worked effectively by staging e-government pilot projects in five cities, including Chengdu, Baotou, Yantai, Yangquan, and Handan.

During the 10th Five-Year period （2001-2005）, MOST has secured a strong support for improving the e-government of Beilin District in Xi'an, as an effort of narrowing down digital divide under the National 863 Program. The project has also won the support from the Ministry of Information Industry, Shan'xi provincial government, and Xi'an municipal government. The pilot project will raise the e-government of Beilin District to a new height, using advanced technologies

and proven experience of EU. Meanwhile, it will become a new role model for combining China-Europe information project with China's S&T programs.

China-Europe Volcano Study

In collaboration with Spain, the Chinese Institute of Earthquake Science, part of the China Earthquake Administration, has developed new techniques and approaches for monitoring dynamic geotectonic variations and volcanic eruption prediction, based on analysis, study, reduction, and interpretation of huge amount of data, and using both tidal and non-tidal theories, with Tianchi volcano in Changbaishan Mount. and Teide volcanoes in Tenerife, Spain as the targets. A monograph is derived from the project to discuss volcanoes and geotectonic movement in both Chinese and English languages. The findings have attracted the attention of island countries or regions in the Atlantic.

The collaboration has deepened Chinese scientists' understanding of the interactions between volcanic activities and dynamic geotectonic variations. The findings can be used to monitor major structures, such as high rise buildings and lifelines, on a long term basis, serving the urban development with real time assessment of structures' security.

China-Europe Work on Low Cost WiFi

Beijing University of Posts and Telecommunications is developing, in collaboration with Ericsson, a low cost relay system for the future low cost mobile telecommunication system. The new system will eventually become a feasible solution for a network at a higher speed, with a wider coverage, and of a larger volume.

The collaborating R&D efforts aim at the application of coordinated relay system in the wireless mobile network, with an enhanced strategy for both relay performance and system resource distribution. On the basis of single route relay, researchers have analyzed multiple relay and terminal interferences. They also

improved the quality of service and increased the system volume and coverage, through real-time control of relay resources. As a major breakthrough to the existing wireless resources management policies and network evolution, the new coordinated relay solution is of an important academic value as well as a promising application perspective.

EMS Technology for Auto Parts

Beijing Research Institute of Mechanical and Electrical Technology, part of China Academy of Machinery Science and Technology, has worked out EMS technology for auto pipes and sheets, in collaboration with an array of renowned auto makers, including Volvo, Fiat, Benz DaimlerChrysler, and Citroen, in a move to reduce the weight and CO^2 emissions of autos.

The collaborative effort has produced a model that allows materials to be reshaped under a high speed system. Researchers simulated and tested the formation process of aluminum alloy sheets at a high speed, using advanced technologies and equipment, including high speed photographing, and laser test. The experiment laid a ground for developing techniques needed for shaping the metal sheets at high speed and precision. The project has established basic EMF guidelines for further defining technical parameters, equipment indicators, and material selections needed in processing aluminum alloy pipes and sheets. It will become a basic EMF standard for Chinese industry.

Four major EU auto makers are part of the project. They provided real auto parts for experiments, which accelerates commercial applications of the technology. The four auto makers have their independent or joint ventures in China. Their involvement promotes the localization of EMF auto parts.

RESEARCH AND DEVELOPMENT

China will Launch Moon Rover

China's phase II moon probe project will launch a soft lander and a moon rover, said O'Yang Ziyuan, the lead scientist for China's moon probe project, and an academician of the Chinese Academy of Sciences, at the 11th ISCOPS held on May 16, 2007 in Beijing. The soft lander will investigate the area where it lands, and the moon rover will embark on a cruise probe.

According to O'Yang, the soft lander and moon rover are designed to accomplish four main objectives: collect the terrain, relief, and geotectonic data of the Moon; collect chemical and mineral samples from the lunar surface; collect the data of inner lunar structure; and explore Moon surface environment and conduct an ultraviolet observation of earth's troposphere, and moon based astronomical observation. They will also record moonquakes and collisions of small celestial bodies with the Moon, measuring the accurate distance between earth and moon, probing the lunar soil at a depth of 30m, and upper lunar structure at a depth of 3km, and investigating a lunar section of 3 km deep and 10 km long.

Key Technology for Digital Oral Restoration

Not long ago, a research project to develop the key technologies for digital oral restoration has called a success. The project, contracted to an array of universities, including Peking University School of Stomatology, the Second Artillery Engineering College, Nanjing University of Aeronautics and Astronautics, and Tsinghua University, has rolled out the key CAD/CAM technologies for oral restoration which is in line with Chinese population, based on the similar systems developed by foreign vendors.

The new system is made up of three components: a

3-D external model, a CAD platform, and a digital processor. The equipment can work on different materials, including metal, compound resin, and ceramics. The 3-D dental cast is equipped with a compact optic scanner, fully capable for accurate cast positioning. The CAD system is designed with a semi-automatic and self-adaptive solution, which makes it able to accommodate clinical needs in reality. The special processor is an open PC control system, with a number of improvements, including smaller size, simpler operation, and easier tool loading, desirable for sophisticated high speed and high accuracy processing. The project has completed the real processing test on the new system.

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