CHINA SCIENCE AND TECHNOLOGY

NEWSLETTER

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IN THIS ISSUE

SPECIAL ISSUES

Action Plan for Scientific Literacy

On March 20, 2006, an outline for scientific literacy action plan was published by the State Council, in a move to raise the nation's scientific literacy in a phased manner from 2006 to 2010, and further to 2020. The Outline is made up of six major parts, including foreword, policies and objectives, major actions, infrastructure projects, supporting conditions, and implementation.

The implementation of the action plan will make Chinese citizens' scientific literacy be greatly enhanced through S&T education, propagation, and diffusions. By 2010, Chinese citizens' scientific literacy will reach a level that major developed nations have achieved at the end of the 1980s. By 2020, China will enjoy a substantial boom in S&T related education, propagation, and diffusions. The efforts will produce a well-established system for implementation, infrastructures, supporting, and evaluation. China will also witness noticeably enhanced scientific literacy of its citizens, reaching a level of major developed nations in the early 21st century.

Aiming at the objectives set for the 11th Five-year period(2006-2010), the Outline proposes to raise the scientific literacy of the entire nation through working on selected populations, including teenagers, farmers, urban working people, and carders and public servants, in the course of implementing the concept of scientific development. Major efforts will be devoted to the construction of scientific education and training related infrastructures, developing and sharing of popular science resources, capacity building for S&T mass media, in an attempt to strengthen the activities in the areas. As a result, Chinese citizens will have more opportunities and means to raise their scientific literacy.

The Outline also points out that relevant policies and

laws shall be prepared for implementing the action plan, with enhanced governmental and public input in raising people's scientific literacy, including expertise training and establishing a volunteer contingent for the purpose.

CAS National Library

On March 18, 2006, the National Science Library, a part of the Chinese Academy of Sciences, was inaugurated for its birth. The new library is built upon a line of existing libraries, including CAS Library, Information Center for Resources and Environment, CAS Chengdu Library, and CAS Wuhan Library. The development heralds a most important system reform in CAS library system, one of major steps CAS announced for phase three of its knowledge innovation program. The new library breaks up the self-improvement and self-development pattern formed in the past by individual libraries, and strives for the motto of "service first", making satisfying the needs of researchers, graduate students, and the public as a criteria. It will operate in an innovative and improved manner.

The library introduces a new system allowing unified procurement of books, and unified utilization of resources, which makes it possible to raise its supporting role under limited resources, and enhance resources efficiency. It also plans to develop an integrated information system, providing enhanced technical support for users. The efforts will ensure unified planning, joint construction and results sharing, joint service, joint resources distribution, and integrated service. It will also become a part of the national S&T library platform.

INTERNATIONAL COOPERATION

China-Russia S&T Park in Zhejiang

Zhejiang Juhua China-Russia S&T Park, one of the three China-Russia S&T cooperation parks approved by

the Ministry of Science and Technology, is the only one created mainly by the industry. In the past 5 years since it's founding, the Juhua Group has harvested noticeable cooperation results with Russia. For example, a large joint venture producing large-caliber artificial crystals, in collaboration with the Russian State Optical Institute, has been put into operation. A FEP project using the technology transferred from the Russian side has witnessed a steadily enhanced product quality after coming into operation. An acetylene project using plasma technology, introduced from the Institute of Theoretical and Applied Mechanics, a part of Russian Academy of Sciences, has been put into trial operation. In addition, the China-Russia joint chemical lab has launched a number of cooperative projects.

In 1993, Juhua Group launched a full-fledged cooperation with Russia in fluorine. It created a joint holding company, with a registered capital worth USD 12 million, of which Juhua took 70%, and the Russian side 30%. Juhua made an investment using its land-use right, factory structures, equipment and some cashes, while the Russian side offered a complete set of technologies as its investment. Thanks to multiple-year efforts of both sides, Juhua rolled out qualified PTFE products in July 1999 with reliable quality. Its products took 40% of the domestic market, with a massive export destined to Europe, the United States, and Japan. The project has become a successful role model in Zhejiang Province for international S&T cooperation. While deepening cooperation with the Russian side, Juhua extended its businesses in the directions of artificial crystal, engineering plastics, and composite fertilizers.

Under the role mode of Juhua China-Russia S&T Park, and employing the strategies of "going out and inviting in", Zhejiang Province has extended collaborations with Russia from fluorine chemicals to high tech fields, including biopharmaceuticals, electronics and information, advanced materials, and optic-machinery-electronic integration. The collaborating areas are also extended to Hangzhou,

Ningbo, Wenzhou, Quzhou, Jinhua, and Zhoushan. Statistics show that the S&T Park has housed 11 enterprises and research institutes, with a sales revenue worth RMB 2.07billion and export volume of USD 18.71 million in 2005. It is expected that by 2010 the joint park will produce a sales revenue of RMB 5 million, and S&T cooperation between the two nations will step up to a brand new phase.

RESEARCH AND DEVELOPMENT

Superconductor Applications in Telecommunication

A high-temperature superconductor filter, developed by Tsinghua University for the application in CDMA, the first of its kind in the country, has proved a 24-hour no-failure operation for 18 consecutive months, since its installation at a mobile base station belonging to China Unicom on March 26, 2004. The development marks a success for the extended HTSC applications in telecommunication. China launched its HTSC study 18 years ago. The event makes China second nation in the world after the United States, realizing an extended HTSC application in mobile telecommunication using its proprietary technology.

The research team, headed by Prof. CAO Bisong, with Tsinghua University Department of Physics, has found solutions for a range of key technologies relating to HTSC filter's design, processing, low temperature modulating, and system integration. Also derived from the efforts are a dozen of invention patents. The HTSC filter system for GSM1800 mobile telecommunication, the first of its kind in the country developed in early 2002, has produced major indicators that reached an internationally advanced level of similar overseas products. After that, a new application system for GSM900 and CDMA was rolled out, with a line of key technical breakthroughs. The new filter system is proven with performance indicators that can satisfy practical application needs. On March 2004, Tsinghua

University Department of Physics, in collaboration with China Unicom (Tangshan), installed the new system at a CDMA base station belonging to the collaborator, and found immediate success.

The new HTSC filter reduces mobile phone's transmitting power by half, which means much less radiation for humans, in addition to noticeable improvements of numerous other technical indicators. The new HTSC filters were eventually installed at base stations for extended trial operation.

Technical Standards for Chinese Information

Major technical standards for Chinese information processing, one of special technical standard projects under the 10th Five-year period(2001-2005), has worked out a range of technical standards for Chinese word coding, Chinese information processing, Chinese office software, and Chinese Linux. It also developed criteria for Mandarin phonetics and associated recognition.

The project has produced an updated version for GB18030, and associated standards for Chinese word coding, and standards for Chinese words configuration in GB18030/GB13000. It also rolled out definitions for Chinese information processing terminologies, and made an analysis of terminologies used by two straits. It set up standards for Linux API, Linux test, interface of Chinese office software, Chinese files writing, Chinese phonetics synthesis, and associated recognition.

The project secures China's leading position in standardizing the core technologies involving Chinese information processing, and creates more space and a solid foundation for the further development of China's information industry. It also worked out a complete set of standards for Chinese word coding, in the course of meeting users' needs and standardizing Chinese applications. The efforts has not only laid a foundation for Chinese information processing and exchange, but also promoted a unified standardization for such

activities, which in turn facilitates economic and technical exchanges among Chinese all over the world. The standards set for Chinese Linux and associated office software facilitate the spread of Linux operating system and Chinese made office software in the country.

IP Standards for IC

IP core technology standards for integrated circuits, a major national project under the 10th Five-year period, represents an effort to establish China's own IP standard for integrated circuits, regulating IP design, facilitating the formation of China's IP market, and enhancing China's international competitiveness in the area.

Based on an in-depth study of internationally acknowledged IP standards, the project produced a report on international IP standards, and worked out an IP standard system list. It also completed 11 draft IP standards for reusability, using VSIA IP standard as a basis, including IP delivery standard and guidance documents for IP protection. These standards allows a good reusability of IP products, facilitates the development of IP trade, and provides a regulating support for the establishment of China's IP trade market. Researchers also studied a number of standards that have no internationally accepted standards, including IP interface standard, SoC test and storage standard, IP quality evaluation standard, and IP protection standard, which laid a fine ground for the further development of these standards. As agreed upon by CSIA and VSIA, a special interesting Chinese group was established for the purpose. The group is allowed to obtain all VSIA standards at a reduced annual fee. CSIA is authorized to publish Chinese version of reusable IP standards within China, and is allowed to create China's own industrial standards based on it.

The project provides Chinese SoC/IP design industry with reusable IP standards in line with internationally accepted standards. While collaborating with

international standard organizations, a close tie is forged between OCP-IP and Software and Integrated Circuit Promotion Center (CSIP), a part of Ministry of Information Industry and Shanghai SIP Exchange (SSIPEX), which becomes a prelude for establishing China's IP trade market.

First Coal Mine with Combined Operation Modes

On March 18, 2006, Anjialing Coal Mine, developed by China Coal using a combined operation mode for both open pits and wells, was officially put into operation. The optimized design has cut the dynamic investment of RMB 9.743 billion previously defined in the feasibility study by half, to a budget worth RMB 4.73144 billion. With S&T innovations, a combined mining mode for both open pits and wells is introduced, which provides good solutions for resources recovery and rational mining, in addition to achieving an open pit resources recovery as high as 95%. In the meantime, well based mining has successfully introduced a new mining technique that raises the stope recovery to 85%, and mining area recovery to 75% or more, under tough mining conditions. The project also established a dynamic coal separating plant, the largest of its kind in Asia designed by Chinese researchers, with a per-ton medium and water consumption reaching a domestically advanced level.

Chinese researchers have gathered rich experience in developing proprietary technologies for the new coal mine, especially the experience of open-pit and well joint operation, deep shallow mining, and efficient mining for high-yield coal layers. The successful application of a range of new technologies and techniques, and Chinese made mining facilities has facilitated the breakthroughs in mining mode, and raised resources recovery. The efforts also set up a good example for transforming local coal mines and for the construction of large coal mine base in the region.

Accuracy Navigation System for Neurosurgery

Not long ago, a high accuracy navigation system for

neurosurgery, developed by the Digital Medical Center affiliated to Fudan University, called a success in clinical trials at Huashan Hospital. The system, fed up with MRI and CT data, can display a 3-D virtual human brain on the computer screen. The computer can tell exactly the direction of the probe in surgeon's hand, whether the probe has reached the edge of a tumor, or if the matter ahead is an important tissue. As a result, a surgeon can safely reach the tumor under the guidance of the probe, without massing up the operation. Clinical trials show that the positioning accuracy for surgery can be raised from a cm level to an mm level, with an average accuracy less than 2mm.

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