

N0.447

CHINA SCIENCE AND TECHNOLOGY  
**NEWSLETTER**

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

N0.447

August 10,2006

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**SPECIAL ISSUES**

**More S&T Findings for 2005**

In 2005, China has registered 32,359 S&T findings, or a 2.01% growth compared with 2004, with 77.46% and 22.54% for the local and government agency sponsored registrations respectively. Of them, invention grants reached 4,319 in number, or 13.35% of the total registered, and new standards

1,477, or 4.56% of the total registered. Among the newly developed standards, 135 are international standards, 462 national standards, and 418 industrial standards.

- 1) Most findings are derived from the projects financed by the government at different levels

Of the S&T findings registered in 2005, 51.92% are derived from the S&T projects financed by government at different levels, and 29.54% from scientists' own selected topics. Of the S&T projects financed by government at different levels, national S&T projects takes 14.80%, local projects 24.09%, and government agency sponsored 13.03%.

- 2) Most findings are applied technologies

S&T findings are dominated by applied technologies, with a noticeable increase of soft science findings, but a sharply reduced share for basic and theoretical findings. In 2005, China has seen 28,559 applied technologies registered, or 4.37% up compared with 2004. Of them, soft science produces 1,671 findings, with a growth of 10.08% against 2004, while basic and theoretical findings are 2,129 in number, or 25.01% down, compared with the preceding year.

- 3) Industry becomes a major player

Of the 32,359 registered findings, 35.62% are derived from industry, or 3.19% up compared with 2004, with 23.08%, 18.97% and 11.98% from universities, independent research institutes, and medical institutions respectively.

S&T findings in the year reflects an increasing rationality, in terms of the nature of working place, age, education background, and academic titles of finding contributors. For example, industrial researchers have become the mainstream of the research contingent, and the young and middle-aged dominate in number. There is an increasing number of master's and doctoral students among the finding contributors registered in 2005. In addition, most finding contributors have an academic title at intermediate level or above.

- 4) Noticeable increase of S&T input, with sharp increase of proprietary investment

The S&T investment registered in 2005 reached RMB 1695.471 billion on a combined basis, with a 50.66% growth compared with 2004. The state treasury contributes RMB 221.02 billion, or 0.15% up compared with the preceding year, government agencies RMB 130.957 billion, or 1.03% less, and the localities RMB 195.8 billion, or 0.8% up. The proprietary money invested in S&T activities goes up by RMB 767.586 billion, or 18.03% more compared with 2004. S&T investment from diverse funds accounted for RMB 64.594 billion, or 2.34% up compared with the preceding year.

- 5) Industry paying more attention to IP protection

One has made a quantitative evaluation of applied technologies registered in 2005, in terms of intellectual property, including patents and software copyrights, with 78.69% for patents, or a slight increase compared with the preceding year, and 21.31% for software copyrights.

Of the proprietary applied technologies registered in 2005, industry has taken the lion's share by 31.35% and 25.21% for patents and software copyrights respectively, both enjoying a noticeable increase compared with 2004. In the meanwhile, all the finding contributors, regardless of their nature, have witnessed a large increase of software copyrights, compared with the preceding year.

### Private S&T Industry Develops Soundly

Statistics show that in 2005 Chinese private S&T industry has enjoyed a steady development, with the following credits:

- 1) A steady increase of private S&T enterprises in number.

As of December 31, 2005, there are 143,991 private S&T enterprises in the country, or 1.87% up compared with 2004. Of them, 56,855 are run by individuals, 50,278 in the form of corporation with limited liabilities, or shareholding limited, 9,959 invested by foreign businesses, or by the businesses from Hong Kong, Macao, and Taiwan, 8,676 in collective ownership, 8,506 shareholding cooperative, 4,131

state enterprises, 2,204 joint ventures, and 3,382 in other economic forms, with a respective proportion of 39.48%, 34.92%, 6.92%, 6.02%, 5.91%, 2.87%, 1.53% and 2.35%.

## 2) Enhanced assets of private S&T industry.

In 2005, the total assets of private S&T industry in the country amounted to RMB 6312 billion, or 19.09% up compared with 2004. The average debt/asset ratio of the industry is 53.04%. The total asset of the enterprises having the total revenue less than RMB 1 million accounts for RMB 263.2 billion, or 4.17% of the total assets belonging to the private S&T industry. Of the enterprises having the total revenue above RMB 1 million, the one whose total asset claims less than RMB 10 million accounts for 29,988 in number, or 20.83% of the total S&T industry. There are 25,182 businesses whose total asset ranges between RMB 10 million to 100 million, or 17.49% of the total. The businesses whose total asset reaches RMB 100 million and above are 8168 in number, or 5.67% of the total.

## 3) Noticeably raised economic returns

In 2005, the private S&T industry has registered the total revenue worth RMB 6121.8 billion, or 27.32% up compared with 2004. The enterprises having the total revenue less than RMB 1 million accounts for 80,653 in number, or 56.01% of the total; The number of the enterprises having the total revenue ranging between RMB 1 million to 10 million amounts to 30,988, or 21.52% of the total. The enterprises having the total revenue ranging between RMB 10 million to 100 million reaches 24,613 in number, or 17.09%; The one hitting the level of RMB 100 million or above is 7,737 in number, or 5.37% of the total, of whom the one exceeding RMB 1 billion comes to 874 in number, or 0.61% of the total.

In 2005, the private S&T industry realized an industrial added value worth RMB 1296.6 billion, with a growth of 30.34% compared with 2004. The industry produced a net profit of RMB 319.2 billion, or 12.99% more compared with the preceding year, taxes paid RMB 295.8 billion, or 26.30% up, and foreign exchanges earned from export USD 174.2

billion, or 44.09% compared with 2004.

#### 4)Ascending staff population for the industry

In 2005, the private S&T industry has a staff population of 12.12 million, or 7.26% more compared with 2004. The staff having a university degree accounts for 1.85 million in number, or 15.26% of the total. The personnel engaged in S&T activities are 1.69 million in number. The enterprises having the total revenue less than RMB 1 million are registered with a staff population of 1.42 million in number, or 18 persons per enterprise. Of the 63,338 businesses having the total revenue above RMB 1 million, the one having a permanent staff under 100 people is 44,256 in number, or 69.87% of the total. There are 19,082 businesses having a staff over 100 people, or 30.13% of the total.

#### 5)Further increased expenditures and technology revenues.

In 2005, the private S&T industry has registered an expenditure worth RMB 123 billion, with a technology derived revenue of RMB 275.7 billion, or 16.58% more compared with the preceding year. Of the 63,338 businesses having the total revenue above RMB 1 million, the one registering a technology derived revenue worth RMB 500,000 are 49,346 in number, or 77.91%. The one having a technology derived revenue between RMB 500,000 and RMB 5 million accounts for 8,977 in number, or 14.17% of the total. The one claiming a technology derived revenue above 5 million reaches 5,015 in number, or 7.92% of the total.

**INTERNATIONAL  
COOPERATION**

### Chinese S&T Events in US

A Chinese S&T delegation, headed by SHANG Yong, Vice Minister of Science and Technology, visited the US July 24-29, 2006. The delegation sponsored five S&T events in New York, Boston, Washington, and San Francisco, to introduce the Tianjin Binhai National Invention Park for Biopharmaceuticals, and the Shandong Jinan National Park for Information and Telecommunication, in collaboration with the Chinese Biopharmaceutical Association USA (CBA) and the Chinese

Information and Networking Association (CINA).

Some 400 representatives from US industrial and S&T communities, and from Chinese associations in the US attended the events. The two Chinese national parks encourage American businesses and Chinese Americans to invest in the parks, establish R&D centers there, or forge technical cooperation ties with Chinese parties. The Chinese delegation also discussed the development of the two national parks with the participants, soliciting their views and comments. The Tianjin Municipality, and Shandong Province, where the two parks are located, have established cooperative ties with a number of American businesses and Chinese associations in the US.

## RESEARCH AND DEVELOPMENT

### Magnetic Slot-In Drive

Not long ago, Shenzhen OVK Optics Technology Co., Ltd. rolled out a highly sophisticated magnetic slot-in drive. Built with a simple and thin structure, the new drive works on a magnetic force that clamps disc in a small area and makes inner movement for slotting in the disc. The new system allows operation on both large and small discs, with fine quality and less noise when reading. The innovative technology keeps a relatively stable position between the disc and optical lens, enjoying super shock resistance, fast tracking, and super focusing.

The technology has obtained a number of invention and utility grants in China, and PCT protections as well. The PCT searching organization thinks highly of the invention, believing the original creation will eventually simplify the configuration of PC drive, and bring down the costs. On November 2004, the Chinese Committee for Promoting Optic Disc Industry, a part of the Ministry of Science and Technology, reached the following conclusions at an annual meeting held in Jiangmen City, Guangdong Province: the new drive makes another major breakthrough in developing key optic disc technologies and localizing key components, after a range of similar breakthroughs in optic lens, LD, non-sphere objective, and AML3511 high definition server chip. The event puts an end to

the unfortunate fact that China had no proprietary drives on the past, allowing China to possess and use slot-in drives without restrictions.

The technology, named OVK, produces a low noise of 18 db at a speed of 4 X, in reading optical discs, much lower than the recorded 50 db. Thanks to a simplified structure, the technology allows a cost approaching to a traditional optical drive. The innovative technology will be used in high definition electric appliance and auto industries, where red and blue light technologies are used.

### Environment Controllable Farming Techniques

With the support of the National 863 Program, the implementation of environment controllable farming techniques has made major progresses in the following areas: high quality plant growing, greenhouse energy efficiency, coordinated biological-chemical pests and diseases control, and online nutrients testing and analyzing. The effort plays an important guiding and demonstrating role in raising the agricultural resource efficiency and the productivity of farming activities. It also spurs up the development of environment controllable agriculture in the country.

The project has resulted in 35 invention, 25 utility, and 2 design patent applications at the national level, from which 9 invention, 4 utility, and 2 design grants were issued. Also derived from the project are 40 software copyright registration applications, from which 30 have been granted. In addition, the project has made the following accomplishments: 23 technology standards and operating procedures, 19 S&T awards or approvals at the provincial level, 11 new fruit or vegetable species, 7 plant variety right (PVR) applications, 47 new products for environment controllable agriculture that have all entered pilot study or commercial applications. The project also produced 78 master's students, and 38 doctoral students, with 6 monographs, and 441 papers, of which 37 are collected by SCI and EI. The implementation of the project has also led to the establishment of 67 innovative technology and product demonstration and industrialization centers, with 50 enterprises involved in developing technologies and products needed for the environment controllable agriculture. 15 findings have changed hands under the project, with the payment to the finding transfer

and technical services amounting to RMB 10.45 million, and an output value from the findings reaching RMB 580 million

## NEWS BRIEFS

### Satellite Weather Data Shared

According to a briefing issued by the China Meteorological Administration, China will soon establish a FengYun satellite weather data broadcasting system to share with the Asia-Pacific countries the data and products derived from the FY weather satellites. The development is also meant to provide information and technical support for climate prediction, environment monitoring, and disasters evaluation activities in the region.

On March 24, 2006, the Chinese government donated the FY satellite weather data broadcasting and receiving system to the signatories of the Asia-Pacific Space Cooperation Convention, including Bangladesh, Indonesia, Iran, Mongolia, Pakistan, Peru, and Thailand. On July 24-26, a training course was also offered to train the technical personnel from the recipient countries, through which trainees got familiarized with the broadcasting system, and associated installation, maintenance, receiving, and application. The effort has laid a solid ground for the future installation and maintenance of the system.

According to the briefing, China offers free sharing of the data derived from the FY satellites with all the countries in the world. The data has found extensive applications in a range of areas, including weather forecast, climate prediction, natural disasters and environment monitoring, information transmission, and scientific researches. Its users come from different sectors, including meteorology, marine, agriculture, forestry, water resources, transport, aviation, and space. In this context, China has rendered an important contribution to the world.

With the support of the Chinese Ministry of Science and Technology, the China Meteorological Administration has completed the development of the FengYun satellite weather data broadcasting system. The system is a platform integrated with numerous functions, including data collection, dissemination, and application. Having been put into operation in 2005, the system not only receives the FY data, but is also able



to receive the data from US and European weather satellites. The system has become an important means for China to receive and use satellite data.

### Spallation Neutron Source

China will kick off the construction of spallation neutron source(CSNS), a mega scientific unit for multidisciplinary applications, in the next half of the year. The project will be completed at the end of 2011, said ZHANG Jie, Director of the Infrastructure Bureau, a part of the Chinese Academy of Sciences (CAS), at a seminar held not long ago to discuss multidisciplinary applications of spallation neutron source.

In 2002, CAS contracted the conceptual study of spallation neutron source to the Institute of Physics, and the Institute of High Energy Physics, both under its wing. CAS started a pre-phase study on July 19, 2005, upon the approval of the Chinese State Council for the construction of the mega scientific unit. According to the design plan, the construction of the spallation neutron source will not only allow the developing countries to possess their first spallation neutron source, but will also raise the valid neutron flux to a level that will overtake the currently brightest ISIS.

According to ZHANG, users have been invited to be part of the design of CSNS, as the unit will eventually be used by researchers and technicians from different disciplines and fields. A user alliance is also established for the purpose. For example, at the right beginning of the design phase, five spectrometers were proposed. However, extensive exchange of views and discussions at two rounds of users meeting led to the addition of two more spectrometers.

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