

# CHINA SCIENCE AND TECHNOLOGY NEWSLETTER

*Department of International Cooperation  
Ministry of Science and Technology(MOST), P.R.China*

*No.6  
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- **12<sup>th</sup> Five-Year Plan for Technology Market Issued by MOST**
- **China's New Energy Vehicles' Filed Patents Rank World's No.3**

## Headline news

### **Minister WAN Interprets “Innovation-Driven Development” at 12<sup>th</sup> NPC Press Release**

On March 7, a press release was held for the 1<sup>st</sup> Plenary Session of 12<sup>th</sup> National People’s Congress, and Minister Wan Gang and other representatives from the sci-tech community were invited to address “innovation-driven development” strategy.

**R&D input exceeds RMB 1 trillion, Hi-tech export ranks world No. 1**

In 2012, China’s total investment on research and

development stood at RMB1024 billion, or 1.97% of GDP.

Benefited from a series of policies supporting hi-tech industry, China’s hi-tech industry witnessed rapid growth in 2012 and the hi-tech exports ranked No. 1 in the world. The national innovation parks, including Zhongguancun, Zhangjiang and Donghu, have made remarkable achievements in sci-tech system reform, industrial development and technology innovation. The 105 hi-tech

Monthly-Editorial Board: Building A8 West, Liulinguan Nanli, Haidian District, Beijing 100036, China

Contact: Prof. Liu Zhaodong E-mail: [c\\_liuzdworld@sina.com](mailto:c_liuzdworld@sina.com) [hixiaosun@163.com](mailto:hixiaosun@163.com) <http://www.caistc.com>

parks generated a total revenue of RMB16 trillion in 2012, or 13.6% of national industrial added value.

### **Enterprises grow by undertaking national major projects**

Minister Wan said that the “top priority” of current sci-tech reform is to “make enterprises the major players in technology innovation”. In recent years, many companies have achieved tremendous progress by serving as contractors of major national projects, thus promote the development of related industry. Most of the companies working on major projects such as Change satellite, docking of Shenzhou-9 capsule with Tiangong-1 space station, lunar probe and deep sea exploration used to be research institutes. Other national projects, including high speed railway and West-East gas transmission, are carried out by groups consisting of both large domestic companies and SMEs. The government has also launched some special programs aiming at technology commercialization, such as high-end chips, high-end digital machine tools, oil and natural gas, which have obtained an added value of RMB1.1 trillion since 2008.

### **Individual efforts needed for air pollution prevention**

WAN said industrial restructuring such as the development of automobile technologies and use of electric vehicles, is only one of the measures to prevent fog and haze. “Each citizen should make their own efforts, for example, adding a filter to the range hood.” China also welcomes new technologies from the world to be applied for air pollution treatment.

### **No military expenditure included in R&D input**

As for “whether some military expenditure is included in R&D input”, WAN explained that there is no division between military and civil use for scientific research itself. In China, military expenditure and R&D input are administered by different departments, and it is clearly stated in national budget.

### **Scientific research is beyond boundary**

Every country is putting great emphasis on sci-tech collaborations. China has already set up sci-tech partnership with over 120 countries and regions. There are many collaborative activities among Chinese researchers and US, EU, Japanese and Korean scientists, and they have generated excellent results. The Chinese government recognizes and rewards the contribution of the foreign experts. A key principle we have been following is that sci-tech cooperation should be separated from diplomatic disputes.

### **EV reaches 39,000 by March 2013**

In the area of new energy vehicles, most of the electric cars serve for public transportation system and only a few are private cars.

When China started to promote electric vehicles in 2009, we focused on the public transportation system. By the end of last year, there were 27,800 electric cars running in China, 80% of which were public buses. In line with local development plans, this number will increase to 39,000 by the end of March. In the future, we will still put the focus on public transport system, but will also encourage private cars powered by new energies.

(Source: Science & Technology Daily, March 8, 2013)

# 2012 Top 10 Science Achievements in China

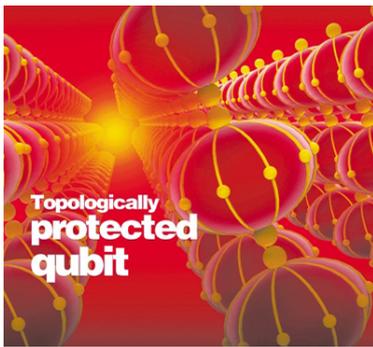
1. Manned Shenzhou-9 capsule docked with Tiangong-1 space station
2. Major progress in scalable quantum information processing extinction event
3. Explanation of the patterns of and reasons for Permian-Triassic
4. New kind of neutrino oscillation observed at Daya Bay
5. Discovery of how two natural specially targeted proteins treat leukemia
6. Androgenetic haploid embryonic stem cells proved capable of replacing sperms and delivering genetic modifications in a fast manner
7. Bt genetically modified cotton proved to facilitate biological control of pests
8. Structural basis of TAL effector protein for DNA recognition found

9. The molecular mechanism for autophagocytosis resulted from lack of nutrition revealed
10. The use of inverted-structure can improve energy conversion efficiency of polymer photovoltaic cells

(Source: Science & Technology Daily, March 9, 2013)



Manned Shenzhou-9 successfully docked with Tiangong-1



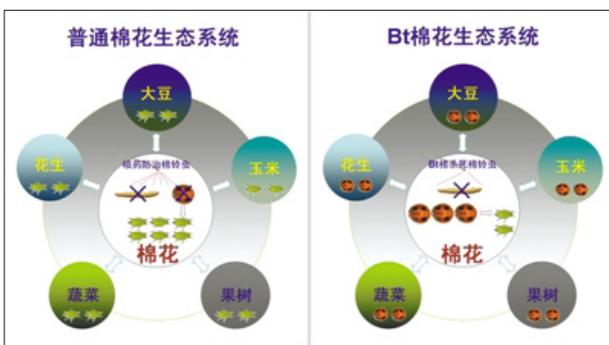
Topological quantum error correction principle



100 km free-space quantum entanglement distribution achieved



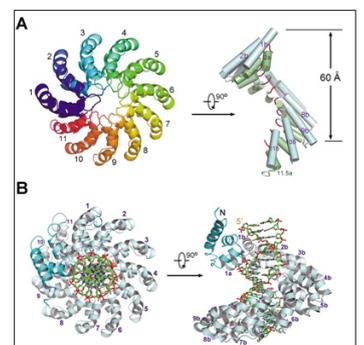
Daya Bay neutrino lab



Bt cotton can facilitate biological control of pests



Genetically modified mice bred with androgenetic haploid embryonic stem cells



High resolution crystal structure of TAL effector protein dHax3

### State Council Issues Opinions on Strengthening Enterprises as Major Players of Technology Innovation

The general content of the Opinions is advancing science and technology to drive socioeconomic progress, giving full play to the market in allocating resources with the government offering guidance and support, implementing the National Project on Technology Innovation as a means to improve the mechanism of industrial innovation with enterprises as major players, attracting elements of innovation to enterprises, enhancing their innovation capacity, and speeding up the translation and industrialization of research findings to pursue the innovation-driven development strategy and build an innovative country.

The target is to form a market-driven technology innovation system with enterprises as major players and combination of enterprises, universities and research institutes by 2015. Efforts will be made to foster a large number of innovative enterprises, with R&D input increasing. The average R&D input as percentage of revenues will reach 1.5%.

The major tasks identified in the Opinions include encouraging more inputs to technology innovation from enterprises, supporting establishment of business research centers, promoting commercialization of research findings, and supporting technology innovation and upgrading in SMEs through National SMEs

Development Fund and SMEs Technology Upgrading Fund, forming a Strategic Alliance of Industrial Technology Innovation with enterprises playing the dominant role, building research bases of generic technologies relying on transformed research institutes and leading enterprises, strengthening the supportive role of research institutes and universities to technology innovation in the business sector. Research institutes and universities will be encouraged to establish research centers, create new disciplines, and carry out joint projects with enterprises, back the business sector with both theories and frontier technologies. Efforts should also be made to improve service platforms that enable industrial technology innovation, and strengthen human resources development through HR projects and policies that attract high-calibre overseas talents and train innovation talents. Enterprises will be incentivized to attract overseas talents and returned Chinese students will be supported to start up businesses. Besides, science and technology resources will be open for sharing. Cooperation will be facilitated to promote technology innovation and policies on taxation and finance will be refined to underpin technology innovation in enterprises.

(Source: Ministry of Science and Technology, February 8, 2013)

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### China Issues the First Program on Innovation Capacity Building

According to news from National Development and Reform Commission (NDRC), The National Program on Innovation Capacity Building in the 12th Five-year

Plan Period, the first of its kind has been issued by the State Council. This document is of great significance to implement the National Innovation-driven Strategy of

Development.

Officials from NDRC outlined the objectives to be realized by the end of the 12th Five-year Plan Period.

I. The infrastructure for innovation will be better planned and built. Close to 50 infrastructure projects are in operation or under construction, forming a number of top-notch science centers. Efforts are also made to build or improve 100 national engineering centers, establish several state engineering (key) labs, certify a batch of national corporate technology centers, so as to improve the hardware for industrial technology innovation, research on major equipment and designing of major projects.

II. Innovation capacity will be enhanced to a large extent in agriculture, manufacturing, strategic emerging industries and social sectors like education and health.

III. Innovators will grow stronger. Enterprises will playing the dominant role in technology innovation, with

medium- and large-sized enterprises setting aside 1.5% of their revenues to research and development. A number of innovative enterprises will become Fortune 500s. Some first-class research institutes will lead the world for their innovation capacity and research findings. In a batch of high-level research-oriented universities, some disciplines will reach the top level in the world.

IV. Regional layout of innovation will be improved. A regional innovation system with coordination, sharing of tasks, complementary functions, and multi-level cooperation will take shape, with a better regional service platform for innovation.

V. Better ecosystem will be available for innovation. The human capital for innovation will be better structured, with a number of top-notch innovators, engineers and service providers. Every 10,000 Chinese people will hold 3.3 patents.

(Source: Science and Technology Daily, February 24, 2013)

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## 12<sup>th</sup> Five-Year Plan for Technology Market Issued by MOST

In order to further *the implementation of the National Outline for Medium- and Long-Term Development Science and Technology Program (2006-2020)* and *12<sup>th</sup> Five-Year Plan for Science and Technology Development*, MOST drew up and issued the 12<sup>th</sup> Five-Year Plan for Technology Market.

The general goal for technology market development during the 12<sup>th</sup> FYP period is to build a modern, sound, and open technology market that meets the requirements of socioeconomic advancement, complies with the rules of socialist market economy and sci-tech progress, and possesses sound regulation and policy support, market surveillance system and efficient service system. In addition, the technology market should be driven by the

combined efforts of supply and demand and integrate diversified players as well as domestic and international resources.

Based on the above strategy, efforts should be made to achieve the following objectives by the end of 2015:

1. Improve technology market ecosystem;
2. Put in place a united and multi-layer technology market service system at the national level;
3. Realise major innovations in technology trading mechanism and mode;
4. Upgrade the capability of technology market in supporting key national development strategies.

(Source: MOST, February 26, 2013)

## China Not Yet an Innovative Country

Funded by the Department of Policy, Regulations and Reform of MOST and the National Program on Soft Science, China Regional Innovation Capacity Report 2012 was issued at the end of last year.

Since the Chinese government affirmed the target of building an innovative country and the Innovation-driven Strategy of Development in the report of the 18th CPC National Congress, local governments have forged ahead toward that goal. The research team divides economic development into five stages: factors-driven development, transition from factors-driven to investment-driven development, investment-driven development, transition from investment-driven to innovation-driven development, and innovation-driven development. According to the study, Shanghai, Beijing, Tianjin, Jiangsu, Guangdong and Zhejiang have entered the stage of innovation-driven development. Shandong,

Hubei, Liaoning, Fujian and Sichuan bear witness to transition from investment-driven to innovation-driven development. 13 localities including Chongqing municipality are still relying on investment. Xinjiang Uygur Autonomous Region, Shanxi, Hainan, Shaanxi, Inner Mongolia and Heilongjiang are still making the transition from factors-driven to investment-driven development.

In conclusion, the Report says China hasn't become an innovative country yet, though a few provinces and municipalities have realized innovation-driven development. With 19 localities still relying on investment and production factors, China has a long way to go in pursuing the goal of an innovative country.

(Source: Science and Technology Daily, February 18, 2013)

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## Scientific Research Progress and Achievements

### China's New Energy Vehicles' Filed Patents Rank World's No.3

China has seen giant leaps in innovation in the field of new energy vehicles, according to State Intellectual Property Office. In the past seven years, its total number of filed patents in the field amounts to 2,011, tied with Germany and South Korea in the world's third place. The top two are Japan and the U.S., with patent applications standing at 9,000 and 4,000 respectively.

As of the end of 2012, a total of 27,400 energy-efficient and new-energy vehicles had been running. For new energy vehicles to develop, patent utilization and protection is the lifeline. Take the example of lithium

iron phosphate battery: if foreign companies are granted invention patents, domestic ones must obtain licenses for production, and pay a one-off fee of \$10 million or \$ 2,500 per ton of production. China has recently increased investment in new energy vehicles. A total of 5 billion yuan has been channelled towards 39 R&D projects under the 12<sup>th</sup> Five-Year Plan, 863 Program and Key Technologies R&D Program, to support self-developed prototype, power battery and other key technologies.

(Source: Guang Ming Daily, February 20, 2013)

## New Hemostatic Materials Developed by China

Ocean University of China and Boyite Biomaterial Co., Ltd in Qingdao have jointly developed functional chitosan-based haemostatic materials for tissues and organs. This new absorbable surgical material was developed by integrating molecular modification and special manufacturing of chitosan. It is biologically safe, and degradable and absorbable by the human body. It has already passed the inspection by National Medical Devices Quality Inspection Center, gone through clinical trial and got the go-ahead by State Food and Drug

Administration for production as a type-III medical device. Its effect is superior to the haemostatic material currently on sale, a world-famous brand. This material marks a landmark achievement in China's research of marine biomedical materials, and is significant for developing other high technologies in the field and high-end ocean industries.

(Source: Ministry of Science and Technology, January 4, 2013)

### Cooperation Projects and Channels

## International Science and Technology Cooperation Base (7): Peking University Stem Cell Research Center

Peking University Stem Cell Research Center is one of the earliest stem cell research centers in China. After years of ceaseless efforts, the center has formed a rather complete research system for stem cell and undertaken several 973 and 863 research projects, winning worldwide fame. Monash Immunology and Stem Cell Laboratories (MISCL) is an internationally renowned research institute, representing the highest level of research in stem cell. Major scientists of the two research institutes have been engaged in cooperation for years. With sufficient funding, human resources and technology backup on both sides, China-Australia Joint Research Center on Stem Cell was approved by Ministry of Science and Technology of both countries. The joint research center will provide a platform to extend

international cooperation. *Science* released news on the establishment of the joint research center, regarding it as a new model for international cooperation.

China-Australia Joint Research Center of Excellence on Stem Cell has promoted collaboration with stem cell and regenerative medicine in other countries, including California Institute for Regenerative Medicine, MRC Centre for Regenerative Medicine in University of Edinburgh, research institutes and industrial agencies in Thailand and Singapore.

- ◎ Contact: Li Lingsong
- ◎ Tel: 86-10-82802171
- ◎ Email: lingsongli@bjmu.edu.cn

## 2013 China (HangZhou) International Industry Exposition

⊙ Time: May.9,2013

⊙ Tel: 86-10-68594974

⊙ Venue: Hangzhou

⊙ Fax: 86-010-68513867

⊙ Sponsor: China Machinery Industry Federation

⊙ Email: Cmif-gi@mei.net.cn

⊙ Contact Person: Cao Renlan

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## 12th International Vacuum Exhibition

⊙ Time: May.15,2013

⊙ Contact Person: Wang Chenchen

⊙ Venue: Beijing

⊙ Tel: 86-10-68528491

⊙ Sponsor: Chinese Vacuum Society, China Association  
for Science and Technology(CAST)

⊙ Fax: 86-010-68571897

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(Editor's Note: All news in the issue are translated from Chinese texts for your reference. They are subject to checks and changes against official release of original Chinese or English texts.)