CHINA SCIENCE AND TECHNOLOGY NEWSLETTER

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- **President Hu Jintao presides over the conference:**

  Deepen reform of scientific and technological system and accelerate construction of national innovation system;

- **Promotion of economic modernization with science and technology;**
- **State key laboratories in China;**
- **Special planning of the "12th Five-Year Plan" for desalination technology of sea water;**

Headline news

Deepen the Reform of the Scientific and Technological System, Accelerate the Building of a National Innovation System

A conference of the Political Bureau of Chinese Communist Party Central Committee, chaired by General Secretary Hu Jintao, was held on May 28, 2012 to work on the reform of the scientific and technological system and accelerate the building of a national innovation system.

The conference pointed out that relying on the scientific power is the most fundamental and remarkably improving independent innovation capability is the most critical in the effort to build an innovative country, accelerate the transformation of economic development mode, and accomplish the strategic development objectives. China is now in a crucial stage towards an all-round well-off society, which is to deepen opening up and reform and speed up transformation of economic development mode. Scientific power plays an increasingly prominent role in economical development and the pace of new scientific revolution and global industrial transformation has quickened. Against this backdrop, the country faces influential strategic opportunities and serious challenges in scientific and technological development. It necessitates the progress in deepening the reform of the science and technology system and the introduction of a sound, scientific, dynamic, and efficient innovation system to stimulate social creativity and thereby achieve innovation-driven development.

The conference stresses that, to deepen the reform, we shall uphold the banner of the socialism with Chinese ch-

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aracteristics and under the guidance of the Deng Xiaoping Theory and the important thought of "Three Represents", put the Outlook of Scientific Development into thorough practice. It calls for the vigorous implementation of the strategies of rejuvenating the country through science and education and human resources development and adherence to the principle of making independent innovation and Leapfrog advances in key fields, supporting development and creating a better future. We shall fully carry out the outline for scientific and technological development plan and focus on prominent issues hindering scientific and technological innovation by improving independent innovation capability and integrating science and technology with economic and social development, so that the scientific power backs up and drives the transformation of economic development mode and economic restructuring. In this way, we shall expedite the introduction of a national innovation system, which lays a solid foundation for China to grow into an innovation-oriented country and an all-round well-off society in 2020 and a scientific power in its 100th anniversary.

The conference also calls for highlighted focus and effective results in deepening the reform. Centering on the tight integration of science and technology with economic development, we shall enhance the subject status of enterprises in technological innovation and accelerate the introduction of an enterprisesled industrial technological development and innovation system. Research institutions and colleges shall improve innovation service capabilities and strengthen collaborative innovation and coordination under optimal layout to push ahead the differentiated reform, and the openness and sharing of scientific resources. In this way, a mechanism for basic research, applied research, technological innovation and achievements commercialization shall take shape to improve the overall performance of the national innovation system. Government regulation and market forces should play a fundamental, yet coordinated role in the allocation of resources, and we shall perfect the systems for scientific projects, funds management, scientific evaluation, and rewards, giving rise to the correct stimulus to innovation. Apart from cultivating high-end leading talents and young scientific talents, we should also introduce outstanding overseas talents and encourage the entrepreneurship of returned overseas talents. In this regard, a sound and scientific talent evaluation system should be in place along with scientific integrity building to create a scientific, democratic, liberal and inclusive academic atmosphere and further boost the enthusiasm and creativity of the masses of scientific and technical personnel. In addition, relevant laws, regulations and policy measures should be implemented and improved, thus proving a strong support for the scientific and technological innovation. (Xinhua)

Remarks

After consulting some old readers and experts concerned both in the home and abroad, China Science and Technology Newsletter is now meeting you again with certain consolidation and improvements, which will cover the reported news in different frames such as Headline News, Progress of Major National Science and Technology Plans and Projects, Brief News and International Cooperation. China Association for International Science and Technology Cooperation(CAISTC) is mandated to join the editing of every issue.

Promotion of economic modernization with science and technology is one of the "12th Five-Year Plan" core objectives

The promotion of economic modernization with science and technology is one of the core objectives of the "12th Five-Year Plan" to the national economy and social development. Compared with the "11th Five-Year Plan", the "12th Five-Year Plan" has a more detailed blueprint and its core content is a reaffirmation of the resolution of adjusting economic structure by increasing domestic consumption especially the GDP proportion of household consumption to achieve a more inclusive growth.

The core goals of the "12th Five-Year Plan" include:

- ✧ Pay attention to service industry;
- ✧ Improve competitiveness power of manufacturing industry;
- ✧ Accelerate urbanization and realize balanced urban-rural development;
- ✧ Realize balanced development between regions;
- ✧ Improve the level of education and promote economic modernization with science and technology;
- ✧ Transform economic growth into improvement of material life and benefit level through promotion of equality in employment and income distribution of urban and rural residents and providing comprehensive social insurance and other means;
- ✧ More efficiently use resources and implement energy conservation measures to protect environment, reduce greenhouse gases emission and cope with climatic change;
- ✧ Coordinate between population growth and economic development.

Quantitative objectives of China's "12th Five-Year Plan"

Index	Unit	Nature of objectives	Plans		
			2010	2015	Growth rate(%)
Economic growth and structure					
Gross domestic product(GDP)	Million yuan	Predictability	3980	5580	7.0
Proportion of service sector in total value added	%	Predictability	43.0	47.0	[4.0]
Proportion of research and experiment expenditures in GDP	%	Predictability	1.75	2.20	[0.45]
Human and social development					
Total population	Million	Binding force	1,341	1,390	<7.2‰

Proportion of urban population in total population	%	Predictability	47.5	51.5	[4.0]
Quantity of newly increased employment	Million	Predictability	-	-	[45.0]
Registered urban unemployment rate	%	Predictability	4.1	<5.0	-
Per capita disposable income in urban areas	yuan	Predictability	19109	>26810	>7.0
Per capita disposable income in rural areas	yuan	Predictability	5919	>8310	>7.0
Number of urban residents covered by Basic pension insurance	Million	Predictability	2.57	3.57	[1.00]
Level of urban and rural residents to participate in basic medical insurance	Annual %	Binding force Binding force	9.0 -	[0.5] -	9.0 [3.0]
Life expectancy	Annual	Predictability	73.5	74.5	[1.0]
Science, technology and education					
Coverage rate of nine-year compulsory education	%	Binding force	89.7	93.0	[3.3]
Gross enrollment rate of higher education	%	Predictability	82.5	87.0	[4.5]
Proportion of S&T expenditures in GDP	%	Predictability	1.75	2.20	[0.45]
Patent applications per million people	Number	Predictability	1.7	3.3	[1.6]
Resources and environment					
Protected arable land	Million of hectares	Binding force	121.2	121.2	[0]
Percentage of forest cover Forest growing stock	% Million	Binding force Binding force	20.36 13700	21.66 14300	[1.3] [6.0]
Growth rate of water resource utilization in agricultural irrigation	%	Predictability	0.50	0.53	[0.03]
Decrement rate of water resource consumption of industrial added value	%	Binding force	-	-	[30.0]
Decrement rate of energy consumption per unit of GDP	%	Binding force	-	-	[16.0]
Proportion of non-fossil fuels in total energy consumption	%	Binding force	8.3	11.4	[3.1]
Decrement rate of carbon dioxide per unit of GDP	%	Binding force	-	-	[17.0]
Decrement rate of discharge of major pollutants: Chemical oxygen demand Sulfur dioxide Ammonia Nitrogen oxides	%	Binding force	- - - -	- - - -	 [8.0] [8.0] [10.0] [10.0]

[Source:China,EU and China's The 12th Five-Year-Plan,DOIC,MOST]

State key laboratories in China (SKLS)

By the end of 2010, there have been a total of 220 state key laboratories, including eight laboratories involved in preparation for construction of state laboratories, and six pilot state laboratories. In this section, the data is calculated according to 212 state key laboratories.

- **Distribution of fields**

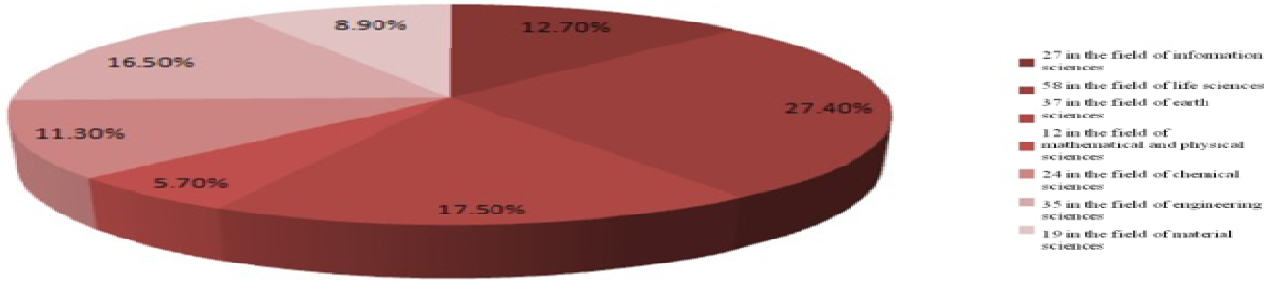
The 212 state key laboratories are mainly distributed in seven fields. Among them, 58 is in the field of life sciences, accounting for 27.4%, 37 in the field of earth sciences, accounting for 17.5%, 35 in the field of engineering sciences, accounting for 16.5%, 27 in the field of information sciences, accounting for about 12.7%, 24 in the field of chemical sciences, accounting for 11.3%, 19 in the field of material sciences, accounting for 8.9%, and 12 in the field of mathematical and physical sciences, accounting for 5.7%.

- **Distribution of regions**

The state key laboratories are distributed in 22 provinces, autonomous regions and municipalities. Among them, Beijing has 63, Shanghai has 29, Jiangsu has 16, Hubei has 14 and Shanxi has 11, which basically reflects the regional distribution of China's research in basic sciences.

Distribution of regions of state key laboratories

Regions	Number	Regions	Number	Regions	Number
Beijing	63	Tianjin	4	Shanghai	29
Chongqing	3	Hebei	1	Shanxi	2
Liaoning	8	Jilin	10	Heilongjiang	4
Jiangsu	16	Zhejiang	9	Anhui	1
Fujian	3	Shandong	3	Hubei	14
Hunan	4	Guangdong	8	Sichuan	9
Guizhou	2	Yunnan	2	Shanxi	11
Gansu	6				



In 2012, the state key laboratories and pilot national laboratories have held and undertaken a total of 24,749 research projects, an increase of 4.5% compared with that of 2009, and obtained 11.07 billion yuan of research grants, a growth of 30.4% compared with that of 2009. Among them, the research projects of national level account for 11,235, reaching

6.81 billion yuan, an increase of 6.5% and 46.8% compared with that of 2011 respectively.

(Source: Annual SKL Report,2011,DOBR,MOST)

Scientific Research Progress and Achievements

Special planning of the "12th Five-Year Plan" for desalination technology of sea water

In order to implement Outline of National Plan for Medium and Long-term Scientific and Technological Development (2006−2020), guide and promote the technological development and innovation on the desalination of sea water and support the development of sea water desalination industry, the Ministry of Science and Technology and the National Development and Reform Commission have formulated the Special Planning of the "12th Five-Year Plan" for Desalination Technology of Sea Water.

With the rapid development of economic society and acceleration of urbanization, the shortage of water resources has become an important factor restricting the sustainable development of China's society and economy. Especially in the coastal areas with great economic output and high population density, the shortage of water resources will turn into a severe problem affecting the economic and social development and even the living space of future generations. The desalination of sea water is an effective means to increase the quantity of water resources from the source and taking it as a strategic choice to solve the shortage of freshwater resources is not only a consideration of water price or technology, it is also an inevitable requirement of ensuring national security and sustainable development and an inevitable choice of the coastal areas for future survival and development. In order to accelerate the development of China's desalination technology of sea water, cultivate and expand the industry and improve supporting capacity of water resources, the Special Planning of the "12th Five-Year Plan" for Desalination Technology of Sea Water is set up based on the Outline of National Plan for Medium and Long-term Scientific and Technological Development (2006−2020), Planning on Scientific and Technological Development of the "12th Five-Year Plan" and other related planning.

(Source: www.most.gov.cn)

973 Program: 2,240 km of 168 × 103Gb/s optical fiber transmission has been first realized in China

The "Basic Research on Ultra-High-Speed, ltra-High-Capacity and Ultra-Long-Distance Optical Transmission" ,one of subprojects of 973 Program, has made significant progress in Wuhan Research Institute of Posts and Telecommunications, realizing 2,240 kilometers of 168 × 103Gb/s ultra-high-capacity super-dense wavelength division multiplexing transmission with an ordinary single mode fiber in China. The gross transmission capacity reaches 17.32Tb/s, equivalent to 210 million pairs of people simultaneously communicating on a single fiber.

The breakthrough of the technology is not only an effective solution to the key technical issues of the ultra-high-speed, ultra-high-capacity and ultra-long-dis-

tance transmission system, including the "realization of high spectral efficiency" and "restraint on nonlinear effects," it also lays the technological base for the practical use of the ultra-high-speed, super-dense wavelength division multiplexing and ultra-long-distance transmission, providing strong support for the implementation of national broadband strategies.

(Source: China Science and Technology Network on Aug. 19 and Science and Technology Daily on Aug. 24, 2012)

Hypersonic flight condition reappeared in JF12 shock tunnel

The JF12 wind tunnel project, kicked off in January 2008, is one of the eight major scientific research equipment projects under the joint support of Ministry of Finance and Chinese Academy of Sciences (CAS). It takes four years form concept development to design, manufacturing, installation, commissioning, performance test and field test. As a major initiative to implement the Outline of the Mid-and-Long-term Plan for National Scientific and Technological Development (2006-2020), this move aims to explore the approaches to develop advanced scientific instruments though independent innovation, so as to effectively change the over-reliance on import and imitation in this field. In response to the needs of major national scientific and technological programs and basic research in different disciplines, the task force successfully develops an advanced super-large supersonic shock tunnel which uses CAS reverse detonation driven methods and a series of innovative shock tunnel technologies. This wind tunnel is the world's first to reproduce the flight conditions of the 25-40 km high sky and allows for the testing of jets breathing clean air with a Mash number of 5-9 and a nozzle exit diameter of 2.5/1.5m for more than 100 milliseconds. This wind tunnel is able to achieve the hypersonic flight condition on the ground and it provides an irreplaceable test means for critical technological breakthroughs in major programs and the basic research about high-temperature gas dynamics.

(Source: www.stdaily.com , September 3, 2012)

International Scientific and Technological Cooperation

General Assembly of International Astronomical Union Was First Convened in China

On Aug. 21, 2012, the 28th General Assembly of International Astronomical Union was held in Beijing and Vice President Xi Jinping attended the opening ceremony and delivered a speech.

It is the first assembly held in China since it joined the international Astronomical Union in 1935.

Xi pointed out that with more than 30 years of reform and opening up, China not only opened its door to engage in construction but also carried out scientific and technological exchanges and cooperation with the world. Especially since the beginning of the 21st century, the natural and engineering sciences fields in the world have successively held a series of important international academic exchange meetings in China, such as the International Congress of Mathematicians and the World Engineers Convention, which greatly have broadened the international outlook of the Chinese scientific and technological field, deepened the International scientific and technological fields' understanding of China, promoted mutual exchanges, learning and cooperation between China and international scientific and technological fields and created beneficial condition for Chinese scientific and technological field to contribute to the development of the

world science and technology.

Chairman of the International Astronomical Union, Robert Williams made an opening speech. Williams said that China has made great progress in astronomy in recent years and increased the input in the field. The implementations of some large astronomy projects also have attracted a large number of students to enter the research field of astronomy. The International Astronomical Union is willing to carry out more extensive cooperation with China to explore the universe of mankind.

On the opening ceremony, U.S. astronomer, Charles Bennett and his research team were awarded the Gruber Cosmology Prize issued by the International Astronomical Union. In addition, British astrophysicist, Jocelyn Bell Burnell and Professor of Nanjing University and Academician of Chinese Academy of Sciences, Su Dingqiang respectively made a speech.

The assembly involved various branches of the astronomy and related interdisciplines. In addition to the general assembly, it also included eight large colloquiums, seven small joint seminars, eight special seminars and four large invited reports, creating a high record. About 3,000 astronomers around the world gathered in Beijing to exchange the latest research results, cutting-edge hot spots and development trend.

(Source: Science and Technology Daily on Aug 22, 2012)

Cooperation Projects and Channels

The 3rd CITTC be hold in Nanjing, Jiangsu, China

The 3rd China Jiangsu Conference for International Technology Transfer and Commercialization (CITTC) will be hold jointly by MOST and the Government of Jiangsu Province of China, in Nanjing, Nov. 9-11, 2012. It aims to enhance the cooperation and exchange mainly between enterprises of Jiangsu province and world-outstanding institutions, universities, enterprises and firms for technology transfer. The Forum and Conference will include lot of activities for cooperation and exchanges such as The plenary conference for main presentations on subject and key objectives , one to one joint talking among enterprises, Technical Information Press of countries and on-site visits and discussion, etc.

The priorities of technical areas for cooperation are: new energy, new materials, bio-technologies and new medicine, energy-saving, new generation of information technology, advanced manufacture and initiative designs.

You are welcomed to join the event, and contact the following if you are interested in it.

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