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China and Czech Promote S&T Cooperation

On March 7th 2016, Science and Technology Minister Wan Gang met with Bedřich Kopecký, the newly-appointed Czech Ambassador to China. The two sides exchanged views on furthering cooperation in science, technology and innovation.

Minister Wan noted that with guidance from the Intergovernmental Committee for Science and Technology, the two sides have laid a solid foundation for further cooperation based on previous achievements in many practical aspects. He noted that the Chinese side is willing to work with their Czech counterparts to follow up on the Memorandum of Understanding on Jointly Promoting the "Belt & Road" Initiative signed last November. Bilateral cooperation should receive renewed momentum in such fields as nano science, laser, pharmaceuticals, and biotechnology.

Minister Wan stressed that the Chinese government is committed to delivering a strategy of innovation-driven development. Innovation and entrepreneurship are booming nationwide. He proposed that the two countries mobilize young people to start their businesses and make innovation as it is important to engage the younger generations in further exchanges and cooperation.

Ambassador Kopecký echoed that the Czech government highly values its relations with China and regards bilateral cooperation in the science and technology a top priority. He expressed willingness to go further together in the scientific and technological areas, in particular the application and commercialization of research findings.

(Source: www.most.gov.cn, March 14, 2016)

China and Brazil Highlight STI Collaboration

On March 3rd 2016, Science and Technology Minister Wan Gang met a delegation led by Roberto Janguaribe, the Brazilian Ambassador to China. Minister Wan noted that there are strong complementarity and great potential for bilateral cooperation in science and technology. The two countries have built joint labs and made quite a number of accomplishments in the fields of agricultural food, new energy, new materials, aviation and aerospace. Both sides should continue to work together on projects of science parks, innovation and entrepreneurship of young researchers, and personnel exchanges. Further cooperation in science, technology and innovation (STI) is expected to stimulate socio-economic development in both countries.

Ambassador Roberto Janguaribe noted that the current Brazilian government stresses STI development and highlights cooperation with China. There is huge scope for further cooperation. He hoped that through high-level visits and exchanges of young scientists, both sides could tap potential in building production capacity and effectively tackling socio-economic challenges in the future.

(Source: www.most.gov.cn, March 10, 2016)

Partners Met for China-Australia Torch Park

To expedite the project on Torch Innovation Precinct in the Australia-based University of New South Wales (UNSW), a meeting of potential partners was organized by the Torch High Technology Industry Development Center under the Ministry of Science and Technology on March 1st 2016. Some 60 participants of 25 enterprises and organizations from Beijing, Shenzhen, Xi'an, Shijiazhuang and other cities attended the meeting. 13 enterprises and organizations introduced themselves to the Australian side and expressed interest in cooperation. The Australian side said they would keep in close touch with potential partners and invited all participating enterprises to visit the UNSW.

(Source: Ministry of Science and Technology, March 9, 2016)

Progress in Quantum Physics

In 2003, 31-year-old Pan Jianwei set up a laboratory of quantum physics and information at the University of Science and Technology of China. Since then, Pan and his team have obtained research findings that were termed as the "Highlights of the Year" by the Institute of Physics for 6 times; and as the "Top Physics Stories of the Year" by the American Physical Society for 5 times. At the end of 2015, among the annual top ten major breakthroughs in physics announced by the Physics World, the number one was "quantum teleportation with multiple degrees of freedom", an accomplishment by Pan Jianwei, Lu Chaoyang and other scientists.

Multi-photon entanglement and interferometry are core research topics of the "dream team" led by Pan Jianwei. Making several photons to entangle is a precondition essential for using photons to achieve quantum teleportation and quantum computing. In 2012, the team broke its own record and became the first to achieve an eight-photon entanglement in the world. Using features of quantum entanglement, it is possible to achieve long-distance transmission of particle properties. In 2015, the team achieved quantum teleportation with multiple degrees of freedom for the first time in the world. According to Pan, from a basic research perspective, they have proven that in principle, all properties of a particle can be transported. The work of Pan Jianwei and his team has laid the foundation for the further development of quantum communication.

(Source: Science and Technology Daily, March 5, 2016)

Progress in Fundamental Physics

Launched in 2006, the Daya Bay Neutrino Experiment is a large-scale international cooperation project. Major members of the Project come from the Institute of High Energy Physics of the Chinese Academy of Sciences. In August 2012, the Chinese side declared that by using numerous neutrinos generated by the Daya Bay nuclear reactor, researchers of the Project looked for and accurately measured a new kind of neutrino oscillation. The result was named by Science as one of the 10 Major Scientific Breakthroughs of 2012 and won in 2014 the Panofsky Prize, the highest award for particle physics of the American Physical Society. It also won the Nikkei Asia Achievement Award in 2015 and the Breakthrough Prize in Fundamental Physics in 2016.

Science Now, a columnof Science's online Edition, commented, "The result completed a conceptual picture of neutrinos and paved the way for experiments that would search for an asymmetry between the behavior of neutrinos and antineutrinos and could help explain why the universe contains so much matter and so little antimatter." Currently, official construction of the Jiangmen Neutrino Experimental Station has started, which was the second large-scale neutrino experimental station sponsored by the country. The new experimental station will be 100 times larger than the Daya Bay Project and be expected to be completed and become operational in 2020. The neutrino detector to be built will be the largest fluid flashing body detector with the highest precision in the world. The launch of the experiment marked the shift of neutrino experiment research from the starting stage to frog-leap progress.

(Source: Science and Technology Daily, March 5, 2016)

Superconductivity Research Progress in China

In 1987, researchers in China produced early results in the superconductivity research field. The Department of Physics of Peking University achieved zero resistance in superconducting materials at an absolute temperature of 91K, obtaining the same result as their Japanese peers did. On May 10, 2008, the Institute of Physics of the Chinese Academy of Sciences announced that it dominated in a new wave of high temperature superconductivity research in the international plasma physics circles. In superconductivity research before that time, copper-based materials were generally used, while ion was never included in superconducting materials because of its magnetism. After Japanese scientists discovered that lanthanum oxygen fluorine-doped iron-arsenic compounds possess superconductivity at 26 K(− 247.15°C), several research teams in China started research on iron-based superconducting materials and obtained the same result as their Japanese peers did. On January 10, 2014, the Iron-Based Superconducting Research Project won the First Prize of China's National Natural Science Award.

(Source: Science and Technology Daily, March 5, 2016)

Beijing Electron Positron Collider

In 1987, Beijing Electron Positron Collider entered a stage of installation and adjusting. Since then, this important facility has been playing an important role in the world's high energy physics field. From its completion to reconstruction, this big science facility has persistently been performing an outstanding role. In particular, improved performance after its reconstruction has enabled researchers to achieve several major results in physics, including light hadron spectroscopy and charmonium decay research. Meanwhile, many "byproducts" have also been obtained following the construction and operation of Beijing Electron Positron Collider. With 85% of its equipment being home-made, the collider has laid a technological and personnel foundation for the subsequent neutrino experiment at the Daya Bay Reactor, spallation neutron sources and accelerator driven sub-critical systems in China. Currently, Beijing Electron Positron Collider provides over 100 research institutes with services in more than 500 research projects each year.

(Source: Science and Technology Daily, January 1, 2016)

Supercomputers in China

Supercomputer is a symbol of the comprehensive strength and important guarantee of competitive advantages of a nation. As science and technology develops fast today, supercomputers have become a major infrastructure of big powers. In October 2009, National University of Defense Technology presented Tianhe-1, China's first petaflop supercomputing system, to the world, making China the second country after the United States to develop petaflop supercomputing systems in the world. On November18th, 2015, Tian-2 regained the first place on the 46th TOP500 List released by the TOP500 Organization. This was also the 6th consecutive time for Tianhe-2 to top the TOP500 List.

(Source: Science and Technology Daily, January 1, 2016)

Space Program in China

The Manned Space Program is China's strategic program for space science research. Since 2011, Chinese scientists and engineering teams have completed a series of rocket and spacecraft launch tasks, from Tiangong-1 to Shenzhou VIII, IX and X. In addition to these tasks, China has also achieved the expected progress in a number of projects, ranging from manned spacecraft cabin, Long March 2F rocket and escape tower, to radar docking and high-precision accelerometer. China's Lunar Exploration Program, a supporting program of the Manned Space Program, has also fulfilled all the launch tasks and realized the set goals, from Chang'e I, II and III to Lunar Exploration III's flight tester high-resolution ("Gaofen" in mandarin) satellites, including Gaofen-1, 2 and 4. In 2016, China's aerospace industry will continue to grow. In the whole year, more than 20 space launch missions will be carried out. These launch missions are represented by the maiden flights of new-generation carrier vehicles Long March V and VII rockets, Tiangong-2 Laboratory and Shenzhou XI Manned Spacecraft.

(Source: Science and Technology Daily, January 1, 2016)

High-Speed Railways in China

It only took China 6 years to lift the velocity of high-speed rail from 200 km/hour to 380 km/hour. On June 30, 2011, the Beijing-Shanghai High-Speed Railway, which captured worldwide attention at the time, was completed and put into operation. Running a total length of 1,318 km and having a designed speed of 380 km/hour, it is the world's first and longest high-speed line that was built at one stroke and has the highest continuous operation speed worldwide. The CRH380A, a new-generation high-speed train developed by China, was also put into service on the line for the first time. The Beijing-Shanghai High-Speed Railway Project won the Special Prize of China's National Science and Technology Progress Award in 2015. High-speed railways in China now have an operating mileage of 19,000 km, accounting for 60% of the world total. Backed by China's own standard, high-speed railways have come onto the world stage, as a name card of China's manufacturing industry.

(Source: Science and Technology Daily, January 1, 2016)

Qinshan Nuclear Power Plant: an Epitome of China's Nuclear Power Industry

In June 1983, the roaring sound of bulldozers broke out in Hangzhou Bay, Zhejiang province, starting to turn the blueprint of Qinshan Nuclear Power Plant into reality. As an important turning point in the 60-year history of China's nuclear power industry, Qinshan Plant has been an epitome of the industry. In December 1991, the Phase I Project of Qinshan nuclear power Plant was connected to the power grid, generating electricity. This 300 MW PWR nuclear power station became the only nuclear power generating unit in mainland China at the time. In Phase III, Qinshan developed heavy water reactors. On the morning of November 19, 2002, No.1 Generating Unit of the Qinshan Phase III Heavy Water Nuclear Power Plant was successfully connected to the power grid, generating electricity in Haiyan, Zhejiang. On January 12, 2015, No.2 Generating Unit at Fangjiashan Nuclear Power Plant, an expansion of Qinshan Nuclear Power Plant which adopted the second-generation PWR technology and consisted of two 1000MW generating units, was successfully connected to the power grid. With it, Qinshan Nuclear Power Base generates an annual power output of approximately 50 billion KWh and becomes a nuclear power base with the most generating units, the most types of reactors and the largest installed capacity in China.

(Source: Science and Technology Daily, January 1, 2016)

Achievements of Basic Research in China during 12th Five-Year Plan Period

1. Scientific papers

For several consecutive years, China has firmly taken up the 2nd position in the world for the total number of international scientific papers published and the 4th position for the number of citations and the number of cited papers. China has risen to the 2nd position in the world for the number of citations and the number of cited papers in seven subjects including chemistry, materials, agriculture, etc. In 2014, researchers in China published a total of 263,500 international scientific papers, approximately 3 times the number in 2006, bringing China's share of the total international scientific papers published worldwide from 5.62% in 2003 to 14.9% in 2014.

2. R&D personnel

The total number of FTE personnel engaged in basic research increased from 131,300 in 2006 to 223,200 person-years in 2013. Young and middle-aged scientists have become the main force of basic research in China.

3. Research bases

As of the end of 2015, 481 state key laboratories, 7 pilot national laboratories and 32 national major science and technology facilities had been built in China; with a cumulative investment of RMB16 billion of special funds for key laboratories and guiding funds for national laboratories.

(Source: Science and Technology Daily, January 1, 2016)