China's Sci-tech Circle of Friends Expanding

By LI Linxu

Faced with global challenges such as the pandemic, climate change and food security, international cooperation in science and technology is not only a need, but a must.

All countries in the world need to strengthen openness and cooperation in science and technology, explore ways and means of jointly solving important global issues through sci- tech innovation, address the challenges of the times together, and promote the noble cause of peace and development for all, said President Xi Jinping in his remarks at the 2021 Zhongguancun Forum.

To tackle the raging pandemic, China has shared information and experience and strengthened international cooperation in the joint research and development for vaccines, treatments, and testing.

The country attaches great importance to international cooperation in science and technology and is committed to further enhancing international cooperation on this front.

Up to now, China has established a science and technology cooperation relationship with more than 160 countries and joined more than 200 international and multilateral mechanisms.

Since the reform and opening up, the opening up in the field of science and technology has always been at the forefront, said Wang Zhigang, minister of science and technology during a recent interview, adding that the country will continue to elevate the opening up and cooperation in science and technology in an open, inclusive, and mutually beneficial manner.

A series of specific measures, such as pushing ahead with the quality upgrade of intergovernmental cooperation and actively participating in global innovation governance, were put forward to further expand China's circle of friends in the field of science and technology.

With the goal of building an innovative silk road, the *Belt and Road Science, Technology and Innovation Cooperation Action Plan* will be fully implemented, according to Wang, adding that more efforts will be invested in talented youth exchange programs.

Under the action plan, more than 8,300 young foreign scientists have been supported to work in China. The country has established 33 joint laboratories and five technology transfer platforms with developing countries, as well as science parks with eight of them, according to Qin Gang, the Chinese ambassador to the United States.

It's worth mentioning that international cooperation in science and technology is also highlighted in *China's Law on Progress of Science and Technology.*

China will further promote sci-tech innovation from a global perspective, and actively integrate into the global sci-tech innovation network, wrote Wang in an article, adding that the country will continue to advance the course of building a community of innovation and cooperation so as to benefit more countries and their people.

Chinese and Kenyan scientists exchange views in the Kenya-China Joint Laboratory for Crop Molecular Biology. The lab is the first Belt and Road Joint Laboratory approved by the Ministry of Science and Technology of China. (PHOTO: XINHUA)

A Year in Review

A number of sci-tech innovations in space and deep-sea exploration and other fields are achieved in the last couple of years. (PHOTO: VCG)

Commercialization of Technological Achievements Underway in Macao

By CHEN Chunyou

Macao's 2021 Science and Technology Week (STW) and Exhibition of Achievements in Science and Technology Innovation was held in the Venetian Macao from December 10 to 12.

Under the organization of China Science and Technology Exchange Center, 16 projects from the Chinese mainland were exhibited. A total of 20 exhibits designed to popularize science, such as China's space station experimental cabinet, VR medical training cabin and smart coffee robot, were some of the visitors' favorites.

In order to promote the commercialization of sci-tech achievements and enhance the cooperation between the Mainland and Macao, a roadshow pairing activity on industry- university- research cooperation was held during this event.

Seventy sci-tech enterprises and related institutions from Guangdong, Anhui, Hunan and Shandong provinces exchanged ideas with 29 research teams from the University of Macau and the Macau University of Science and Technology. More than 130 meetings were held, with 16 letters of intent on cooperation signed.

STW, which was initiated in Macao in 2005, is a large public science popularization event that takes place on a yearly basis. It is also an important science popularization project undertaken by the Mainland and the Macao Science and Technology Cooperation Committee. STW is being developed as a platform for commercialization of local sci-tech achievements and cooperation on industry-university-research.

The event was held concurrently with the Macao International Trade and Investment Fair for the first time, with the aim of creating more opportunities for exchange and cooperation, guiding private capital to participate in the technology transfer and commercialization of high- quality sci- tech achievements, and adding impetus to Macao's economic development.

New Opening-up Chapter of Xiamen SEZ

This year marks the 40th anniversary of the establishment of the Xiamen Special Economic Zone (SEZ). The Xiamen SEZ has made important contributions to the country's reform, opening up, and socialist modernization.

The view of Gulangyu Island in Xiamen, Fujian Province. (PHOTO: XINHUA)

Policies Formulated to Boost Innovation

By Staff Reporters

Scientific and technological innovation has always played an important role in human development, and its role has become increasingly more prominent in recent years.

China's *14th Five-Year Plan (2021-2025) for National Economic and Social Development and the Long-Range Objectives Through the Year 2035*, for the first time suggests prioritizing innovation in China's overall modernization drive, and regards self- reliance and self-strengthening of science and technology as the pillars of national development strategy.

The year 2021 has seen a host of measures launched or implemented to improve China's sci-tech innovation system.

New guideline issued for evaluating sci-tech achievements

The General Office of the State Council this August issued a guideline to improve the evaluation system for sci-tech achievements, and accelerate the transformation of achievements into real productive forces.

The introduction of the guideline focuses on solving the issue of achievement evaluation orientation, that is, how to realize the reform and not pay too much attention to quantitative indicators, such as the number of published papers and the research projects undertaken.

Revision of sci- tech progress law approved

After 14 years, *China's Law on Progress of Science and Technology* was revised again, aiming to further stimulate sci-tech innovation vitality. The revision has been approved by senior legislators and will enact from January 1, 2022.

Basic research has again become a separate chapter in the revision, sending a clear signal that basic research would be further enhanced. In addition, international cooperation is also highlighted and added as a separate chapter.

The revision inlcudes promoting international sci- tech cooperation and communication, supporting collaborative R&D among sci- tech experts at home and abroad, attracting foreign experts to carry out sci-tech R&D work in China, and improving relevant social services.

Researchers given more say in fund use

At a State Council executive meeting in July, a series of measures were decided to further reform and improve management of central fiscal research funding, so as to give researchers more rights in fund use.

The measures include streamlining budget-making, increasing incentives for researchers, and speeding up fund payments. It also includes innovating fiscal funding support for research, and employing professional financial assistants for research projects to ease the administrative burden on researchers.

Female scientists supported

To create a better environment for women to work in the field of science and technology, the Ministry of Science and Technology (MOST), the All China Women's Federation, as well as 11 other departments launched a series of measures to support female sci- tech talent in playing a greater role in sci-tech innovation.

These measures include supporting women in participating in the sci- tech decision- making process and international cooperation, developing their innovation and entrepreneurship capabilities, improving evaluation mechanisms for their jobs, and supporting their research during maternity.

Sci-tech support to address climate change strengthened

The white paper, titled *Responding to Climate Change: China's Policies and Actions*, was released by the State Council Information Office in October 2021.

It points out that scientific and technological innovation plays a fundamental role in identifying, analyzing, and responding to issues related to climate change, and is set to perform a crucial role in promoting the green and low-carbon transition.

The document, titled *Action Plan For Carbon Dioxide Peaking Before 2030*, details the country's main objectives and major actions towards carbon peaking.

It puts forward ten major actions, including the action for green and low-carbon energy transition, the action for energy saving, carbon emission mitigation and efficiency improvement, and the action for promoting green and low-carbon transportation.

Sci- tech role enhanced to protect cultural heritage

A plan to strengthen the protection of historical and cultural heritage through science and technology during the 14th Five-Year Plan period was released by the General Office of the State Council in November.

The study of cultural relics, including isotope analysis, trace element analysis, DNA research and organic residue analysis, will be enhanced. Measures are in place to also accelerate development of digital archaeology to serve the collection, management, analysis and application of archaeological information, according to the plan.

The Birth of China's First COVID-19 Antibody Drug

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In order to carry out more detailed research with high-precision equipment, the research team took a taxi overnight from Beijing to Shanghai.

In Shanghai, Wang and Zhang analyzed the high- resolution crystal structure of the novel coronavirus that entered the human body and found it uses the protein "key" on its surface to open the "lock" on the human cell. Once the door is opened, the virus invades.

Published in *Nature* on March 30, the team's article SARS-CoV-2 Spike Receptor- Binding Domain Bound to the ACE2 Receptor has become the most cited one in the relevant research.

First COVID- 19 antibody drug debuts

The research team announced the drug development of the country's first antibody cocktail therapy and promoted clinical trials in April 2021.

Zhang said the antibody cocktail treatment has competitive advantages and has shown an efficacy of 80 percent in cutting hospitalizations and deaths among high- risk groups in multicenter randomized clinical trials.

According to Zhang, the cocktail is very potent in inhibiting the virus from infecting cells. The antibody cocktail can target different sites of the virus, even it mutates. With one shot, the antibody cocktail can persist in the human body for about 9 to 12 months. Besides the therapeutic efficacy in current clinical trials, they can also be used for prevention measures.

In July, December of 2020 and April of 2021, the antibody cocktail treatment carried out phase I, phase II, and phase III clinical trials abroad in strict accordance with international standards. In August 2021,data demonstrated a statistically significant reduction of 78 percent in the hospitalisation and death in phase III clinical trials conducted in the US, Brazil, South Africa, Mexico, Argentina and the Philippines.

"This is a nano-level fight between humans and viruses, and the humans will eventually win," said Zhang.

World's First 35-kV Superconducting Cable Begins Operation

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It can replace four to six normal 220-kV cables and save 70 percent of underground space, said Xie Wei, chief engineer at the State Grid Shanghai Company.

"The distinctive advantage of superconducting cable makes it suitable for power supplies in downtown areas to facilitate bulk power transfer at high capacities," said Xie.

The State Grid Corporation Shanghai Electric Power Company took five years to complete the construction of the project and put it into operation.

In the future, Shanghai will make efforts to build a leading superconductor industry with global influence.