



# Science and Technology Daily

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WEEKLY EDITION

## China-ASEAN Partnership of Science, Technology and Innovation Strengthened

By Staff Reporters

A Special Session of the China-ASEAN Ministerial Meeting on Science, Technology and Innovation was held online on December 14. The ASEAN-China Plan of Action for a Closer Partnership of Science, Technology and Innovation for Future (2021-2025) was endorsed.

The plan of action is designed to focus on four main cooperation areas: 1) Science, Technology and Innovation Policy Cooperation, 2) Joint Research and Development for Shared Prosperity and Solution of Common Challenges, 3) Technology Transfer, and 4) Talent Exchange.

Wang Zhigang, China's Minister of Science and Technology, co-chair of the session, said that China has always treated ASEAN as a preferred partner in terms of international cooperation on science, technology and innovation.

In recent years, the Ministry of Science and Technology (MOST) and its counterparts in ASEAN countries have jointly promoted the China-ASEAN Science and Technology Partnership Project and shared the latest sci-tech achievements and experience in innovative de-

velopment, contributing to regional economic development and improvement of people's livelihood, said Wang.

Wang also said that MOST is willing to enhance China-ASEAN cooperation in science, technology and innovation of mutual benefits together with relevant departments in ASEAN countries.

The two parties agreed to hold forums on science, technology and innovation cooperation, to carry out joint research projects and training workshops, and to deepen collaboration on technology transfers and science parks. Under the Talented Young Scientist Exchange Program, China would increase the number of researchers from ASEAN member states and support ASEAN Youth Innovation and Entrepreneurship Tour to China.

Cooperation in health, digital and green industry will also be strengthened, as will cooperation in fighting against COVID-19, such as vaccines and medicine, according to Wang.

Deng Xijun, Chinese Ambassador to ASEAN, also attended the meeting, and said that the Mission of the People's Republic of China to ASEAN will fully support the bilateral cooperation in science, technology and innovation.



Chinese Shenzhou-13 taikonaut Wang Yaping working in the space station core module Tianhe. Her colleagues Ye Guangfu and Zhai Zhigang have been out of the core module to start extravehicular activities. (PHOTO: XINHUA)

## World's First 35-kV Superconducting Cable Begins Operation

By WANG Xiaoxia

The world's first 35-kV high-temperature superconducting (HTS) power cable, extending more than one kilometer, was put into operation in Shanghai on December 22, a major technological breakthrough in China's new power system construction.

Installed in the downtown Xuhui district of Shanghai, it was the first and longest 35-kV HTS power cable under fully commercial operation in the world, with the largest transmission capacity.

It effectively solves the problem of large capacity power transmission through a narrow channel, and ensures high capacity power supply in the city downtown.

The superconducting materials can almost eliminate the resistance of power transmission medium, and reduce power transmission loss to near zero. The transmission capacity of a 35-kV superconducting cable is equivalent to that of a 220-kV cable.

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## Green Olympics

### Low-carbon Sci-tech Integrated in Winter Olympic Venues

Edited by TANG Zhexiao

As an eco-friendly Games, Beijing 2022 has chosen to replace freon with carbon dioxide (CO<sub>2</sub>) as a cleaner and more efficient refrigerant, to reduce energy consumption, waste discharge and carbon emissions.

Environmentally friendly refrigerants are used for nine ice surfaces in seven competition venues, while carbon dioxide ice-making technology will be used in four venues.

It is the first time in the Winter Olympic history that the world's most advanced, environmentally friendly and energy-efficient ice-making technology will be used. A similar carbon reduction could be achieved by planting more than 1,200,000 trees.

The technology of using CO<sub>2</sub> at the skating rink of National Speed Skating Oval (also called the Ice Ribbon), which has a 12,000 square meter surface, is expected to save two million kWh of electricity annually, said the organizers.

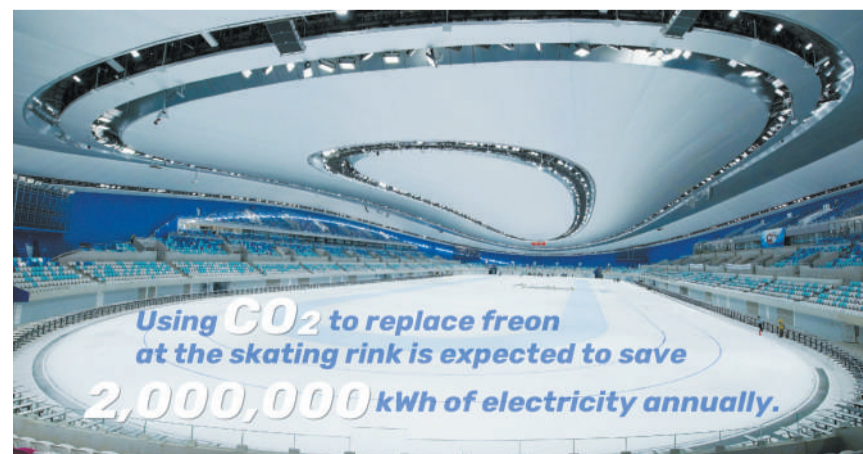
In addition, the construction of a

lightweight roof above the Ice Ribbon uses a saddle-shaped cable-net structure, only a quarter of the traditional steel structure roof, reducing the use of steel by about 3,000 metric tons.

The National Sliding Center is located on the southern slope of the mountain. Its construction is the result of a great deal of research and development into natural and artificial topography, climate protection systems like sun-blocking roofs, and optimal track shapes. These prevent the track surface from falling in victim of climate instability while reducing energy consumption.

In accordance with the concept of "sponge competition area," the surface water, rainwater and snowmelt water from artificial snowmaking in Yanqing and Zhangjiakou competition areas and venues have undergone an integrated design of "infiltration, retention, accumulation, purification, utilization and drainage."

After being treated as a huge water-absorbing sponge, the domestic water in the competition area and venues can be also used for toilet flushing and irrigation.



The National Speed Skating Oval, also called the Ice Ribbon, has a 12,000 square meter surface. (Graphic Design: TANG Zhexiao; PHOTO: XINHUA)

## Editor's Pick

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

Edited by TANG Zhexiao

The threat of the novel coronavirus has entered its third winter. In the face of the global pandemic and the virus variant, the world's demand for a COVID-19 antibody drug has become more and more urgent.

China's first home-developed COVID-19 antibody drug made of monoclonal antibodies BRII-196 and BRII-198 was approved for marketing on December 8. The treatment, co-developed by Tsinghua University, the Third People's Hospital of Shenzhen and Bii Biosciences, has a neutralizing activity against the Omicron variant.

The drug showed excellent safety and protection effects in international multi-center trials, according to Professor Zhang Linqi, who leads the research and development of the drug at Tsinghua University's School of Medicine.

Zhong Nanshan, China's renowned respiratory disease expert, said it might be the most effective antibody drug so

far and will be of great value to promote worldwide.

#### Fishing for antibodies

After 30 years of studying HIV-1 pathogenesis, vaccines and human viral pathogens such as MERS-CoV, SARS-CoV-1 and SARS-CoV-2, Prof. Zhang realized that the novel coronavirus study must start as soon as possible.

At the very beginning of 2020, in a Tsinghua University laboratory, he teamed up with his old partner Wang Xinquan, a biophysics professor at Tsinghua, and began studying the synthesis of the novel coronavirus surface protein gene sequence on January 15 that year.

However, finding the antibodies produced by B lymphocytes would be like finding a needle in a haystack. He realized it was necessary to create a "bait" of specific protein with extremely high similarity to the surface protein of the novel coronavirus, to "fish" out the monoclonal antibody.

Six days after testing during the Chinese lunar new year, protein reagents

had been developed and sent to the Third People's Hospital of Shenzhen, where blood samples from recovered patients of COVID-19 were kept. Researchers worked 24/7 until a total of 206 strains of monoclonal antibody with high efficiency and neutralization were successfully "fished" from the blood B cells.

#### Finding keys to unlock the antiviral mechanism

There are many antibodies that can resist the novel coronavirus, but finding the most effective is the tricky part. "It's like trying to pick out the most valiant 'warriors.' Finding the most effective antibody is the guarantee for the development of high-efficiency monoclonal antibody drugs for the treatment and prevention," said Zhang, while screening high-efficiency monoclonal antibodies.

On March 5, the team identified the highly effective neutralizing antibody P2C-1F11 (later named BRII-196) for the first time. Deciphering the antiviral mechanism of antibodies became the next focus of research. See page 2

### China's First Greenhouse Gas Observation Network Built

By Staff Reporters

The China Meteorological Administration (CMA) released the country's first greenhouse gas observation network directory on December 18, after nearly 40 years of construction.

The directory includes 60 observation stations that cover key areas of China's major climate and focus on high-precision observation. Seven greenhouse gases specified in the Kyoto Protocol, such as carbon dioxide, methane and nitric oxide, are observed.

China is one of the earliest countries to start monitoring atmospheric greenhouse gases. The country's first regional atmosphere watch station was

put into operation in Miyun District, Beijing in 1982. Mount Waliguan station in Qinghai, the only global atmosphere watch station on the hinterland of Eurasia at an altitude of 3,816 meters, was built in 1994. The data gained from the Mount Waliguan station were well acknowledged all over the world.

More work concerning greenhouse gas observation has been done, contributing to China's progress toward achieving carbon peak and carbon neutrality.

Since 2021, the CMA has established a national monitoring and evaluation center for greenhouse gases and carbon neutrality, and sub centers in many provinces, building an evaluation system for the effectiveness of China's carbon

neutrality actions.

The system can precisely distinguish natural and anthropogenic carbon fluxes in a city, a region and around the globe.

The CMA also built China's first laboratory capable of calibrating seven specified greenhouse gases. The calibration results from the laboratory have become the gauge for the origin tracing of greenhouse gas observation within the country. Therefore, the research findings based on the results provide an important basis for the release of reports by the Intergovernmental Panel on Climate Change and the United Nations Framework Convention on Climate Change.

## WEEKLY REVIEW

### Revised Law to Boost Sci-tech Innovation

Chinese lawmakers approved on December 24 the revision to the Law on Progress of Science and Technology at a session of the Standing Committee of the National People's Congress. The newly revised law will take effect from January 1, 2022.

### High-orbit Rocket Sends Two Satellites to Space

A Long March-7A rocket sent Shiyang-12 01 and Shiyang-12 02 satellites into preset orbit on December 23 from Wenchang, Hainan. With a total length of 60.7 meters, the tallest rocket in service in China can send a payload of 7 tonnes to geosynchronous transfer orbit.

### Shenzhou-13 Taikonauts Complete Second Extravehicular Mission

Taikonauts Zhai Zhigang and Ye Guangfu have completed their extravehicular activities and returned to the space station core module Tianhe, the China Manned Space Agency said on December 27. Dinosaur Embryo Study Supports Ancestral Link to Birds

The posture of the embryo within a fossilized dinosaur egg is similar to that of modern bird embryos, which provided further evidence supporting the notion that modern birds evolved from dinosaurs, according to the study published in the journal *iScience* by scientists from China, Britain and Canada.

WECHAT ACCOUNT

E-PAPER

