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WEEKLY EDITION

## Asia-Pacific: Towards Community with a Shared Future

By Staff Reporters

President Xi Jinping on November 11 urged the Asia-Pacific region to face up to the responsibility of the times, be in the driver's seat, and strive hard to meet the goal of building an Asia-Pacific community with a shared future, via video at the Asia-Pacific Economic Cooperation (APEC) CEO Summit.

Xi first called for making all-out efforts to fight COVID-19. The region should translate the consensus that vaccines are a global public good into concrete actions, ensure their fair and equitable distribution as well as their accessibility and affordability in developing countries, and thus work together to close the immunization gap, said Xi.

He then urged openness and cooperation, and said, "We should advance trade and investment liberalization and facilitation, keep industrial and supply chains stable and functioning, and promote the orderly flow of resources and inputs to boost economic recovery and achieve interconnected development."

When talking about promoting green transition, Xi said that the Asia-Pacific should follow the principle of common but differentiated responsibilities and deliver on what was agreed upon in the Paris Agreement on climate change and at the 15th Meeting of the Conference of the Parties to the Convention on Biological Diversity.

Xi also called on the region to actively promote innovation. "We need to scale up cooperation between member economies of the Asia-Pacific on scientific and technological innovation, and foster an open, fair, equitable and non-discriminatory environment for the development of science and technology," he said.

In terms of digital economy, Xi said

that the region needs to commit to innovation-driven development, harness the power of the digital economy as a new growth engine, and spread the fruits of digital technologies to more people in the region while addressing the 28th APEC Economic Leaders' Meeting via video link.

In his speech at the APEC CEO Summit, Xi pledged that China will remain firm in advancing reform and opening-up so as to add impetus to economic development in the Asia-Pacific. China has ratified the Regional Comprehensive Economic Partnership (RCEP), and it has applied for joining the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP).

China will also advance green transition on all fronts and make its due contribution to boosting ecological conservation in the Asia-Pacific and beyond. The country will strike a balance between low-carbon transition and ensuring the living needs of its people, and between development and carbon reduction, and will achieve carbon peak and carbon neutrality within the time frame set previously.

China's carbon reduction action will also require massive investment, thus creating huge market opportunities and room for cooperation, said Xi, noting that the business communities across the Asia-Pacific are warmly welcome to join in this endeavor.

Xi added that China will stay committed to promoting win-win cooperation and contribute to the economic development of the Asia-Pacific.

China will also inject impetus into economic recovery and sustainable development in the Asia-Pacific, and strive to build a global community of development with a shared future, he noted.



Fuel loading has started at China's second nuclear power unit using Hualong One technology, after the first one entered commercial operations earlier this year. (PHOTO: XINHUA)

## Editor's Pick

# Hualong One Drives China's Nuclear Energy Surge

By Staff Reporters

A small atomic nucleus holds incredible energy. Nuclear technology uses the energy released by splitting the atoms of certain elements to produce electricity. So, this technology can have a bearing on the power supply security and international status of a country.

Starting from scratch, China's nuclear power industry has seen steady growth over the past 30 years, from relying on imported technology to achieving self-reliance in design, construction and project management.

The commercial operation of Hualong One, China's indigenous third-generation nuclear technology, marks a new milestone for the development of the country's nuclear industry.

**Early nuclear beginnings**  
Nuclear technology has been of strategic importance for major countries. During the Second World War, the research initially focused on producing bombs, and attention turned to the peaceful use of nuclear fission from the start of the postwar years. From then almost all parts of the world are involved in nuclear power development.

China's nuclear industry commenced from the early 1950s. On October 16, 1964, when its first atomic bomb was successfully tested, China became one of the five nuclear weapons states under the Treaty on the Non-Proliferation of Nuclear Weapons.

China's civil nuclear effort began in the 1970s. After years of effort, the construction of Qinshan 1, China's first nuclear power plant, with a capacity of 300 MWe, officially began in 1986, with first grid connection coming in December 1991.

China's concerted nuclear expansion began from the 21st century, with electricity consumption increasing sharply in coastal areas due to rapid economic growth.

Through its construction experience and technology transfer from companies such as CANDU Energy Inc., Westinghouse and AREVA, China's nuclear industry gained increased self-reliance.

For example, the CPR1000 developed by the China Guangdong Nuclear Power Corporation (CGNPC) is a significantly upgraded version of the 900 MWe French M310 three-loop technology.

Even though CGNPC has a nearly complete domestic supply chain for the

CPR1000, the intellectual property rights are retained by the French company AREVA, which restricts its use to domestic market.

Xing Ji, the chief designer of Hualong One, said that without the exclusive intellectual property rights, China cannot export its technology to the overseas market.

**Indigenous design of nuclear reactor**

China was determined to build a megawatt nuclear power plant with exclusive technology, all the way through from designing and construction to operation.

In 2011, the Fukushima Daiichi nuclear accident in Japan caused great concern over nuclear safety worldwide. Subsequently, China required better safety attributes for its independently developed nuclear technologies.

In 2013, the China National Nuclear Corporation (CNNC) announced that its independently developed ACPR1000 (or CP1000), and CGNPC launched the advanced CPR, ACPR1000+, with full Chinese intellectual property rights. Featuring a double containment, their safety attributes comply with international requirements. *See page 2*

## China-U.S. Declaration on Climate Action

By TANG Zhexiao

China and the United States released the *China-U.S. Joint Glasgow Declaration on Enhancing Climate Action in the 2020s* on November 10, at the 26th session of the Conference of the Parties (COP26) to the United Nations Framework Convention on Climate Change.

The two sides are committed to tackling the climate crisis through accelerated actions this decade, reiterating they will observe the Paris climate agreement to hold the increase in the global average temperature to well below 2°C and pursue efforts to limit it to 1.5°C.

To try to keep those temperature limits "within reach," China and the United States agreed to strengthen climate action and cooperation aimed at accelerating the green and low-carbon transition and climate technology innovation, seizing this critical moment to engage in the transition to a global net zero emission. *See page 2*

## WEEKLY REVIEW

**Northeast Asia Biodiversity Research Center Established**

A research center dedicated to Northeast Asia biodiversity conservation was established on November 13 in Northeast Forestry University, China's Heilongjiang province, to boost cooperation of research institutes in China, Russia, Japan and the Republic of Korea.

**World's First Inhaled COVID-19 Vaccine Exhibited**

The world's first inhaled form of COVID-19 vaccine was unveiled at the 5th Hainan International Health Industry Expo 2021 in south China's Haikou city on November 12. The vaccine is inhaled through the mouth into the respiratory tract and lungs to stimulate mucosal immunity.

**Second Reactor of China's HTR-PM Reaches criticality**

The No.2 reactor of the Shidaoan nuclear power plant in China's Shandong province, which is the world's first High Temperature Gas Cooled Reactor-Pebblebed Module (HTR-PM), has reached the critical stage of success on November 11.

**World's Largest Metabolism Research Platform Starts Operation**

On November 11, the world's biggest digital metabolism monitoring platform was set up in Shanghai's Ruijin Hospital. With 10 rooms simulating different conditions, the platform will help in the study of human metabolism and other key life data for medical research.

S&T DAILY WECHAT ACCOUNT (EN)



## COP26 Reaches New Global Deal on Climate

By Staff Reporters

Nearly 200 participating countries adopted the Glasgow Climate Pact at the end of 26th session of the Conference of the Parties (COP26) to the United Nations Framework Convention on Climate Change.

The deal makes unprecedented mention of fossil fuels in the climate crisis. It calls for the phasing down of coal, the dominant source of carbon dioxide emissions in the process of electricity generation.

The Article 6 of the pact asks to establish a robust framework for countries to exchange carbon credits, which is expected to facilitate emissions reduction.

During COP26, more than 100 countries have promised to end deforestation

by 2030. More money for developing countries to help them adapt to climate impacts are promised in the deal. COP26 President Alok Sharma expressed his "deep regret" over climate finance failures, for rich countries still had not kept their word to raise 100 billion USD in annual climate finance.

The Glasgow Climate Pact "will help kick-start a new journey of global efforts to tackle climate change," said Zhao Yingmin, head of the Chinese delegation to COP26 and China's vice minister of ecology and environment.

COP26 is the first climate change conference after the five-year review cycle under the Paris Agreement inked in 2015. COP27 will be held next year in Egypt with updated plans on how to slash greenhouse gas emission by 2030.



The closing plenary of COP26 to the United Nations Framework Convention on Climate Change in Glasgow, Nov. 13, 2021. (PHOTO: XINHUA)

## BSE: Bigger Chance for Innovative SMEs

By Staff Reporters

Aiming to serve innovative small and medium-sized enterprises (SMEs), Beijing Stock Exchange (BSE) started trading on November 15, only two months after China announced to set up a new stock exchange.

On the bourse, 81 companies comprised the first batch, ten out of which were newly listed.

By the close on the first day, the turnover of the companies hit 9.57 billion RMB, and the share price of the ten debuted firms rocketed by nearly 200 percent on average.

BSE is established based on the se-

lected tier of China's National Equities Exchange and Quotations, also known as the "new third board." The listed companies in BSE can choose to transfer to Shanghai or Shenzhen market.

Why is BSE necessary when there are already stock markets in Shanghai and Shenzhen? Zhao Xijun, joint dean of China Capital Market Research Institute at Renmin University of China, said that the new third board is not able to fully transfer the sci-tech innovation resources of Beijing to economic values due to its limited capability of allocation.

According to Zhao, Beijing has gained abundant sci-tech innovation

achievements thanks to the research institutes, universities and sci-tech enterprises located in the city. The platform offered by BSE and the market mechanism can make such sci-tech research and achievements develop sustainably.

There are a great many SMEs that wish to be listed every year. However, the STAR Market in Shanghai and the ChiNext board in Shenzhen can only provide a limited amount of opportunities, leaving a large gap to be filled. "I think this is also an important aspect to think over when BSE is established, that is, to solve the problem of the imbalance and insufficiency in allocating financial resources," said Zhao.

# FOCUS

## Sci-tech Role in Protection of Cultural Heritage Strengthened

By CHEN Chunyou

China released its plan to strengthen the protection of historical and cultural heritage during the 14th Five-Year Plan period on November 8.

According to the plan, the protection system will cover ancient buildings, historical sites, natural landscapes,

cultural settings and intangible cultural heritage.

In order to enhance the role of sci-tech innovation in cultural heritage protection, some important measures will be taken, which include attaching importance to cultivating talent in heritage institutions.

The application of modern science

and technology in archaeology will be strengthened, says the plan. The study of cultural relics, including isotope analysis, trace element analysis, DNA research and organic residue analysis, will also be enhanced.

Digital archaeology will be accelerated to serve the collection, management, analysis and application of archaeological information. Warehouses for archaeological specimens in key national areas will be built, according to the plan.

In addition, digital and information-based technology will be employed to promote high-precision restoration of the scattered overseas cultural relics, such as the Dunhuang posthumous writings.

Wu Yuanbin, director general of the department of science and technology for social development of the Ministry of Science and Technology, said that China will continue to strengthen basic research and interdisciplinary studies in the next five years.

The research of the technological application in cultural heritage protection will be arranged in key national labs. Comprehensive experimental plat-

forms for scientific research will be built by relying on the National Scientific and Technological Innovation Center of Cultural Heritage and the Nanhai base of National Center for Archaeology, National Cultural Heritage Administration, said Wu.

Nowadays, China is home to 36 national archaeological parks, among which 11 are UNESCO World Heritage sites. The country aims to build no less than 15 such parks during the 14th Five-Year Plan period, said Lu Qiong, the director general of department of policies and regulations of National Cultural Heritage Administration.

According to the plan, a structure-optimized system of cultural heritage protection with distinctive features and multiple functions will be preliminarily established in China by 2025.

By 2035, China will put in place a cultural relics protection and management system commensurate with the goal of developing the country into a cultural power, and the development of sci-tech innovation personnel will provide strong support for the protection, research and utilization of cultural relics.



A cotton picker works in fields in Yuli County, Xinjiang. (PHOTO: XINHUA)

## Xinjiang: Building Innovation Engine at the Heart of Silk Road

By LI Linxu

Xinjiang, located in the core area of the Silk Road Economic Belt, is striving to be an engine of innovation in science and technology.

By 2025, it will make significant achievements in the building of a regional sci-tech innovation highland, according to a plan recently released by the government of Xinjiang Uygur Autonomous Region.

The document, titled the 14th Five-year Plan for Xinjiang Uygur Autonomous Region's Science and Technology Innovation, lays out a detailed roadmap for its next phase of work.

In the next five years, the region's sci-tech strength will get a big boost, and its innovation capabilities will get a great lift, according to the plan.

To achieve these goals, the government budget for research and development (R&D) activities will be increased, and enterprise's investment on R&D are encouraged.

During 2021-2025, the R&D expenditure of the whole society will grow by more than seven percent annually, among which the proportion of basic research expenditure will account for no less than 10 percent of the total.

According to the plan, the full time equivalent of R&D personnel per 10,000 employees will increase to 11.73.

To create a favorable ecological en-

vironment for innovation and entrepreneurship, Xinjiang is doing its utmost to improve its sci-tech infrastructure and service system.

It will focus on ten special advantage industries, such as power industry, textile and clothing industry, and strategic emerging industries, such as the digital economy, new energy and new materials.

Aiming to build a regional innovation engine, the plan highlights the leading role of the Urumqi-Changji-Shihezi national innovation demonstration zone and the Silk Road Economic Belt innovation-driven development pilot zone.

The plan also proposes to form a regional innovation pattern featuring opening-up and cooperation.

Xinjiang neighbors with Gansu, Qinghai and Xizang, and borders eight countries including Russia, Kazakhstan, Kyrgyzstan, Tajikistan, Pakistan, Mongolia, India and Afghanistan.

To make the most of its unique location advantages, it will expand the space for opening-up and cooperation under the Belt and Road Initiative, and actively integrate into domestic and international innovation networks.

Sci-tech innovation will inject strong impetus into the region's high-quality development, and lay a solid foundation for a beautiful, healthy and safe Xinjiang, says the plan.



An exhibition of ancient books restoration achievements. (PHOTO: VOG)

## Modern Technology Makes Excavated Artifacts Preserved

Edited by BI Weizi

The archaeological excavations at Sanxingdui in Sichuan province have unearthed a huge number of "national treasure" relics, including the most complete gold mask and a massive bronze statue.

These artifacts, which have been "sleeping" underground for thousands of years, are located in a closed underground space where oxygen is consumed in the long-term metabolic activities of oxygen-consuming bacteria. They are often covered with moist soil under low temperature in order to be preserved for a long time.

However, changes in temperature, humidity, carbon dioxide, and other environmental factors after excavation put these artifacts at risk of being ru-

ined. Therefore, the control of environment during excavation and the protection of artifacts afterwards become especially crucial.

**Integrated air-conditioning system to give heritage "sense of security"**

At the entrance of the third and fourth pits at the excavation site, an intelligent air-conditioning system provides a suitable environment for the excavation of cultural relics.

The system, which connects the original soil, air and light parameters in the excavation compartment through sensors to the intelligent air cloud platform, helps archaeologists master the air changes at all times, truly making the air "visible".

Moreover, through AI algorithms, instructions can be automatically given to the excavation site air conditioner to

achieve automatic adjustment of the site environment, ensuring that the environmental parameters are within the safe range at all times and protecting the excavation quality of cultural relics.

More than thirty kinds of functional segments are freely combined with multi-stage filtration to meet the requirements of air purification and sterilization of the excavation compartment.

**Heritage display cabinet with hi-tech for the protection of cultural relics**

Due to air, light and microbial changes, newly-excavated ivory and other organic materials in this archaeological excavation site have to deal with the challenge of discoloration, mouldering and powdering.

In order to solve this problem in the archaeological community, a made-

in-China heritage display cabinet was introduced.

Through a combination use of new technologies, such as intelligent storage and management system, the cabinet is able to fulfill dual responsibilities of displaying and storing cultural relics simultaneously.

In terms of the storage environment of cultural relics, through the "constant temperature and humidity" technology, more than 90 percent humidity on average can be maintained, thus eliminating the cracking caused by temperature changes.

A new generation of archaeologists is starting again with a new generation of excavation techniques, and these modern technologies are also escorting the products of ancient civilization.

## China Supports Female Scientists to Make a Difference

By ZHONG Jianli

Wang Yaping, China's first female astronaut to conduct a spacewalk, has become a global headline grabber and she is part of the drive seeing more women entering the world of sci-tech.

"The world needs science, and science needs women. We see that female scientists have achieved outstanding results in many fields such as physics, medicine, and mathematics. They are using science to change the world," said Wang Hongyang, director of the National Center for Liver Cancer and president of the China Women's Association for Science and Technology, during the 3rd World Science and Technology Development Forum held on November 7 in Beijing.

Female sci-tech talent are an impor-

tant part of the whole sci-tech community and play an essential role in China's scientific and technological development. In recent years, the number of female sci-tech experts has expanded rapidly. They have made great contributions in basic research, applied technology, and engineering practice, which fully demonstrated their ability.

According to statistics from the China Association for Science and Technology, women currently account for 40 percent of China's human resources in science and technology, and the figure is even more than 50 percent in the Internet and biomedicine fields.

To create a better environment for women to work in the field of science and technology, the country has made great efforts.

This April, seven departments in-

cluding the Ministry of Science and Technology (MOST) and the All-China Women's Federation (ACWF), initiated an action to encourage women to contribute more to sci-tech innovation.

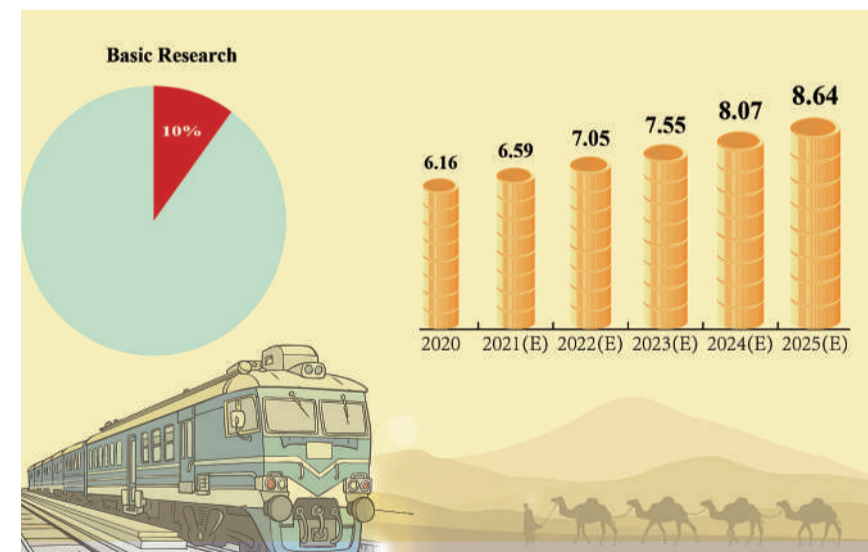
In July, MOST, ACWF as well as 11 other departments, jointly launched a series of measures to support female sci-tech talent in playing a greater role in sci-tech innovation.

These measures include supporting female sci-tech talent 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.

In 2020, four women won the Nobel Prize for their pioneering contribu-

tions in the fields of chemistry, physics and literature. Though women around the world have demonstrated their creativity and influence in sci-tech development, "We still have to call on the whole society to give more attention, support and respect to female experts, create more platforms and opportunities, and give them more resources and trust," said Wang Zhizhen, academician of the Chinese Academy of Sciences, adding that female scientists should also be confident and self-reliant.

As a female researcher in the field of life sciences, Wang also encouraged female scientists, with their unique generosity and empathy, to overcome the barriers of language, tradition, nationality, and politics, and to promote international scientific and technological exchanges and cooperation.



In 2020, Xinjiang's R&D expenditure reached 6.16 billion RMB and is expected to grow by more than seven percent annually. (Graphic Design: Li Linxu)

## China-U.S. Declaration on Climate Action

From page 1

The two sides intend to cooperate on:

- regulatory frameworks and environmental standards
- maximizing the societal benefits of the clean energy transition
- policies to encourage decarbonization and electrification
- key areas related to the circular economy
- deployment and application of technology

Recognizing the significant role that emissions of methane (a potent greenhouse gas) play in increasing temperatures, both countries intend to de-

velop additional measures to enhance methane emission control before COP27 in 2022.

To help reduce CO<sub>2</sub> emissions, China will cut down coal consumption during the 15th Five Year Plan (2026-2030). The two countries agreed to cooperate on distributed generation policies that boost integration of solar energy, storage, and other clean power solutions to electricity users.

"The Working Group on Enhancing Climate Action in the 2020s," which will meet regularly to address the climate crisis and advance the multilateral process in this decade, will also be established.

From page 1

The Hualong One is the result of CNNC and CGNPC merging their design, as suggested by the Chinese National Energy Administration. The design incorporates the latest safety systems following internationally accepted standards, including backup passive safety systems, SA mitigation systems and enhanced seismic protection.

With all core components manufactured in China, the country is now the

fourth to develop indigenous third-generation nuclear power technology after the U.S., France and Russia.

**Green future**

On January 30 this year, CNNC announced the start of commercial operations for Unit 5 of Fuqing Nuclear Power Plant, the first project to use Hualong One.

China's second nuclear power unit with a Hualong One reactor began to fill with fuel on November 6, a major

step to putting the reactor into operation. Currently, a total of eight Hualong One units are under construction or have been delivered around the world.

Once operational, the power generated by a Hualong One unit will reduce consumption of nearly 3.12 million tons of standard coal and offset 8.16 million tons of carbon dioxide emissions per year.

Each unit with a Hualong One reac-

tor has the capacity to produce approximately 10 billion kWh of power per year. This is equivalent to the annual electricity demand of one million people in a moderately developed country, according to CNNC.

CNNC chairman Yu Jianfeng said that the corporation will accelerate the construction of Hualong One reactors to help achieve carbon neutrality, and promote the new technology to overseas market.

## Hualong One Drives China's Nuclear Energy Surge

# Reliable, Open to Sharing: China Space Exploration

## Voice of the world

Edited by QI Liming

2021 is widely regarded as the best year for space launches in China. There had been forty launches by the end of October, which is already one more than last year.

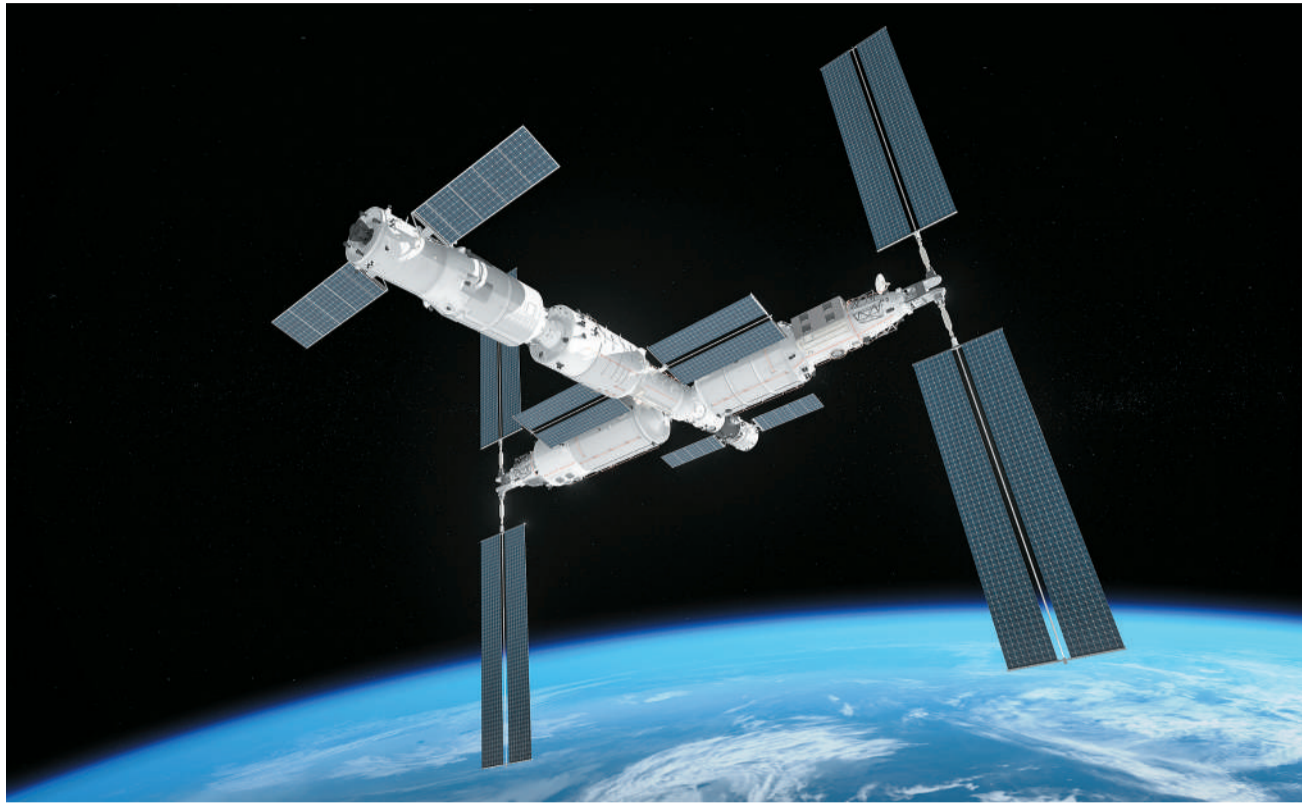
According to *South China Morning Post*, China has invested heavily in space programs in recent years and made significant progress.

Before 2007, the country had never carried out more than 10 launches in a year. But since then it has gathered momentum, firing off 152 launches in the past five years, more than any other country.

**Major achievements since this October**

The Shenzhou-13 astronauts aboard the China Space Station (CSS) took the first spacewalk of their mission on November 7, marking the country's first spacewalk by a female astronaut.

Meanwhile, China launched a sustainable development satellite SDGSAT-1



China Space Station. (PHOTO: VCG)

to study Earth from space on November 5. The satellite will observe interactions

between human activities and nature. Being developed by the Chinese Academy

of Sciences (CAS), it is the world's first scientific satellite dedicated to the

UN 2030 Agenda for Sustainable Development.

A Shijian-21 satellite was also launched on October 24. The satellite will be mainly used to test and verify space debris mitigation technologies.

**Long-term impact of Shenzhou-13 mission**

The Shenzhou-13 astronauts arrived safely and have settled into the Tianhe, including opening the hatch of the Tianzhou-3 cargo spacecraft for their supplies.

Dr. Namrata Goswami, an independent scholar on space policy, great power politics and ethnic conflicts, told *The Diplomat* China's aim is to build space logistics and capacity for a permanent presence, first in Low Earth Orbit, and then in space between the Earth and the Moon.

In addition, Shenzhou-13 displayed a logistic chain of space infrastructure that includes the core module, Tianhe, and the cargo spacecraft Tianzhou-2 and Tianzhou-3. Shenzhou-13 is a step forward toward building capacity for larger space stations, said Goswami.

**Platform for further international cooperation**

Cooperation has already begun between China and some other countries for selection and training of astronauts. The China Manned Space Agency is working with the UN Office for Outer Space Affairs to invite certain UN members for scientific experiments at the Tianhe space station module.

China also sells launch services abroad, said Richard Bitzinger, a U.S.-based visiting senior fellow at the S. Rajaratnam School of International Studies in Singapore. "China is reliable, and open to sharing technology," he said. Bitzinger also said partner nations might see joint space exploitation as a "logical next step."

The CSS is likely to do "thousands

of experiments" in micro-gravity and could accept countries unable to reach the International Space Station, said Marco Cáceres, director of space studies at the Teal Group market analysis firm.

**More Sino-foreign space cooperation**

According to the comments released on online portals, China is extending its space program step by step.

"My sense is that this is a good opportunity for China to seek international cooperation," said Cáceres.

China is putting in much effort to assist the countries in need.

The Voice of America, said that China builds high-end satellites for developing countries and shares satellite data to help with relief work after natural disasters.

China offered Japan remote sensing data after its 2011 tsunami and had given images to Australia for wildfire damage surveys, said Yun Sun, co-director of the East Asia program at the Stimson Center in Washington DC. Chinese satellites have provided free earth imagery to developing countries, she added.

"It sounds like the data collected by these satellites are quite a popular or needed data for many countries," said Sun. "So, for developing countries who don't have access to commercial satellites, or to information shared by Western countries, then China provides a useful alternative."

As of 2008, China has signed space-related cooperation agreements with Argentina, Brazil, Canada, France, Malaysia, Pakistan, Russia, Ukraine and the European Commission. Last year, Pakistan became a partner eligible to use the BeiDou navigation satellite.

China is endeavoring to be the pioneer in space collaboration, space power projection, space technology demonstration, and deep space exploration and utilization, striving to make outer space exploration a reality.

## Hi! Tech

# All-Climate Battery Adopted by Beijing Winter Olympics

Edited by QI Liming

An all-climate battery has been adopted by the 2022 Beijing Olympic Winter Games as one of the core technologies to power its Olympic electric vehicles.

The all-climate battery is also the thermally modulated battery designed for electric vehicles without range anxiety and has unsurpassed safety, low cost, and contains no cobalt.

Chao-Yang Wang, leader of the research team at Pennsylvania State University, was looking for a battery with a controllable interphase and finally invented the all-climate battery.

According to Wang, without increasing the flammability of the electrolyte or changing the thermal stability of the electrode material, a piece of nickel foil with a thickness of 10 microns is implanted inside the battery to act as a heating element. Then the one end is attached to the negative terminal and the other is extended outside the cell to create a third terminal.

When electrons flow, it rapidly heats up the nickel foil through resistance heating and warms the inside of the battery. Once the battery's internal temperature gets to 60°C, the switch opens and the battery is ready for rapid

charge or discharge.

Using a switch, the activity of the battery can be adjusted at will. For a battery completely frozen in an environment of minus 30°C, it only takes 30 seconds to self-heat to above zero degrees and function normally.

Wang's team modeled this battery using existing technologies and innovative approaches. They proposed that using this self-heating method, they could use low-cost materials for the battery's cathode and anode and a safe, low-voltage electrolyte.

The cathode is thermally stable, lithium iron phosphate, which does

not contain any of the expensive and critical materials like cobalt. The anode is made of very large particle graphite, a safe, light and inexpensive material.

The batteries have a range of 250 miles, with the ability to charge in 10 minutes. The key to long-life and rapid recharging is the battery's ability to quickly heat up to 60°C, for charge and discharge, and then cool down when the battery is not working.

The 10-minute fast charging battery will become an important milestone in the development of electric vehicles, said Wang.

# Online Dual-carbon Brain to Reduce Carbon Emissions

By Staff Reporters

An innovative "dual-carbon brain" that is a data system for monitoring and analyzing carbon emissions, was recently put online by the Shenzhen Power Supply Bureau (SPSB) of China Southern Power Grid. The system collects consumed power resource statistics, such as electricity, coal, gas and oil.

According to Lyu Zhining who is in charge of innovation and digital research at SPSB, a "dual-carbon brain" can give users information about energy consumption for targeted energy conservation.

Electricity consumption data of more than three million people can be

collected by the "dual-carbon brain". The data could be actively put into the government digital exchange platform after classification and summarization, and help officials monitor carbon emissions from individuals and enterprises in real-time.

The production team has designed a carbon emission measurement model for the "dual-carbon brain" based on the government's carbon emission standards and calculation regulations. "Based on electricity consumption, the system can calculate the indirect carbon emissions of electricity. Using the number, combined with the fossil energy consumption value announced by the government in the previous year, the 'dual-carbon brain,' can evaluate

fossil energy's total direct carbon emissions and carbon emissions," said Lyu.

Wang Zhengsi, deputy director of application support department of SPSB's information Center, said that the system will provide multiple services such as energy consumption detection, index display, and problem location. Meanwhile, it may become a significant system to provide energy consumption monitoring and



Dual carbon brain. (PHOTO: SPSB)

consulting services for public service institutions and other industrial parks. It helps enterprises and institutions reduce operating costs.

# Top 10 Scientific Issues of Human Society Development Unveiled

By TANG Zhexiao

A list of the top 10 scientific issues related to shared global challenges and deeply affecting social development was released during the Third World Science and Technology Development Forum in Beijing recently.

Focusing on the UN 2030 Agenda for Sustainable Development, the top 10 scientific issues are related to three fields, namely ecology, medical treatment and information.

"Selecting and publishing the top 10 scientific issues will help strengthen the global sci-tech exchanges and pool the wisdom and strength of global sci-

entists, in order to promote the realization of the UN Sustainable Development Goals," said Guo Huadong, academician of the Chinese Academy of Sciences.

The ecological issues included:

- establishing a nature-based circular economy
- relationship and feedback mechanisms between climate change and biodiversity loss
- achieving carbon neutrality while maintaining the ecosystem and protecting biodiversity

The medical issues included:

- pathological mechanisms of major diseases and the early diagnosis strat-

egies

- using data and information technologies to control pandemics
- remote AI diagnosis expert transforming the traditional medical system

The information issues included:

- the information processing mechanism of the human brain
- digital revolutions changing the sustainable development model of human society
- the impact of information dissemination and trust machine (a holistic approach to microfinance) on human society structure
- ensuring personal privacy and security

Julian Young, president of the Institution of Engineering and Technology, said global warming and other ecological problems require urgent and effective responses, which no countries or societies can tackle alone. He wishes that scientists worldwide can cooperate with each other and find the best solution for shared goals.

Based on the search results of the database Scopus and INSPEC, the top 10 issues were selected and voted worldwide. Scientists from more than 10 countries and regions including China, the United States, the United Kingdom and Canada have participated in the selection.

# China and U.S. Declaration on Climate Action Welcomed

## Opinion

Edited by YU Haoyuan

On November 10, China and the U.S., the world's two biggest economies, announced that they will increase efforts on climate-related actions to meet the goals of the 2015 *Paris Agreement* goals in this decade, just days before the end of the COP26.

The declaration announced is an upgrade action for China and the U.S., recalling their *Joint Statement Addressing the Climate Crisis* of April 17, 2021. The move came as a major surprise to the world as the two countries are locked in several disputes in a range of other areas.

Both the China special envoy for climate change Xie Zhenhua, and U.S. special climate envoy John F. Kerry expressed that in the face of climate change, China and the U.S. can find common ground to cooperate.

"There is more agreement between the China and U.S. than divergence, making it an area of huge potential for cooperation," Xie said at a news conference. Speaking at a separate press conference, Kerry said, "Cooperation is the only way to get this job done."

Many observers considered the climate agreement to be a remarkable turnaround.

"While this is not a game changer the way the 2014 U.S.-China climate deal was, in many ways it's just as much of a step forward given the geopolitical state of the relationship. It means the intense level of U.S.-China dialogue on climate can now begin to translate into co-

operation," said Thom Woodroffe, a former climate diplomat now serving as a fellow at the Asia Society Policy Institute working on China-U.S. climate cooperation.

Frans Timmermans, the EU climate policy chief, noted that the U.S. and China know that climate issues are much more important than most other issues. It could finally lead to a great result of helping boost negotiations at COP26.

In addition, the declaration will benefit not just COP26 negotiations, but also help promote global solutions on environmental protection.

Laurence Wainwright, departmental lecturer at the University of Oxford's Smith School of Enterprise and the Environment, told *Forbes* that when these two largest economies, whose relationship has been rocky over the last decade, are ready to cooperate, it sends a powerful message to the rest of the world.

Critics say that several declaration details about the latest agreement are still unknown, but many world leaders and climate experts also "broadly welcomed the agreement," according to *The Guardian*.

Genevieve Maricle, director of U.S. climate policy action at World Wildlife Fund, said that the two nations, "Have the power to unlock vast financial flows from the public and private sectors that can speed the transition to a low carbon economy."

"Tackling the climate crisis requires international collaboration and solidarity, and this is an important step in the right direction," said UN Secretary-General António Guterres, who welcomed the effort and hoped the two countries would take action this decade.

# LIFE IN CHINA

## Language as the Vehicle of Cultrual Exchange

By BI Weizi

Martin Woesler, a German sinologist, cultural expert and translator of Chinese literature, received the Chinese Government Friendship Award in 2021.

Professor Woesler translated works from the Chinese authors, such as Lu Xun, Yu Dafu, Zhu Ziqing, Bing Xin and Ba Jin into English and German, as well as



Martin Woesler, a German sinologist, cultural expert and translator of Chinese literature. (COURTESY PHOTO)

of Cao Xueqin into German. He published the first complete translation of the Chinese classic novel *Dream of the Red Chamber* into German. Thanks to Woesler, many Chinese literary works are available to a Western audience for the first time.

### Languages as carriers of culture

As a high school graduate with top grades and scholarships, Woesler decided to major in Chinese Studies because it was considered the hardest subject and he wanted a challenge with a difficult language and a distant culture.

Speaking several languages and having travelled extensively provide Woesler a creative perspective of looking at the relationship between languages and cultures.

He believes that Chinese carries one of the richest cultures in the world and has lived in the country on and off for almost eight years, considering himself to be partly Chinese. To Woesler, languages open new worlds, especially the literary tradition of Qu Yuan, Li Bai, Du Fu and Bai Juyi.

### Dream of the Red Chamber

When he started to study Chinese at Bochum, Germany and Peking University, he was intrigued by *Dream of the Red Chamber*, whose German translation and revisions would become his most significant tasks for decades.

*Dream of the Red Chamber* opens up a Chinese world about 250 years ago to Western readers. The novel is a classic, not only for its huge cast of characters and psychological scope, but also for its precise and detailed observation of the life and social structures typical of 18th-century Chinese society.

According to Woesler, one of the major obstacles

he encountered while translating the epic work was the cultural elements, which cannot be understood if one is not familiar with China's history and traditions. He tried to solve this problem by giving further explanations in the text or in footnotes. In terms of the meanings of names and places, sometimes double meanings, he explained when he could not recreate the complexity in the target text. He hopes that his translation could take the readers back in time and identify themselves as one of the protagonists, therefore evoking similar, if not the same response from target readers.

Woesler developed the appropriateness theory as a new translation strategy - striving not just for the best equivalence, but for the one which is the most appropriate.

### Chinese Government Friendship Award

Woesler regards the friendship award as a great honor and incentive, deepening his feelings with Chinese people and love of Chinese culture. The award has inspired him to continue his dedicated work to advocate communication and exchanges between Chinese and Western cultures.

He plans to spend more time in China and help guide the promising young academic community to reach international standards. There are many talented young scholars in China and he is striving to make as many as he can prepare for the very competitive future globalized job market. Chinese and international scholars should cooperate more in research and teaching, said Woesler.

He believes that the more international cooperation and exchanges there are, the better China can learn useful things from the world and the better the rest of the world can benefit from China.

## Letter to the Editor

### China's Success in the Fight against Poverty

By Mark H. Levine

While the list of China's accomplishments since the founding of the Communist Party of China 100 years ago is long, what impresses me the most is the elevation of approximately 100 million people out of poverty and the eradication of extreme poverty. To understand why this ranks number one on my list of gains, I think it is necessary to understand a little about my life.

I am a sociologist who studied social change, social movements and social stratification (inequality within society). After a few years of university teaching, I left the academic work and became what some of my colleagues later called a "public sociologist." To clarify, I became a full-time volunteer working in organizations of poor workers and their families. So for nearly 30 years before coming to China in 2005, I was both working and living in some of the poor communities across the U.S. struggling against poverty in the richest country in the world.

Whether working or unemployed; whether receiving some minimal governmental assistance or not; whether living in rural or urban areas, day-to-day life was a constant struggle for food, housing, clothing, medical care, legal representation, and everything. Our work was to try to fill these needs through co-operating with everyone we could EXCEPT the government since we had learned through generations of struggle in the U.S. that government aid most often got in the way of finding solutions. We also understood that our efforts, as helpful as they might be, were insufficient and what was truly needed was a serious governmental and social commitment to permanently change these conditions.

Instead, what we saw was that despite "The War on Poverty," "The Poor People's Campaign," and other slogans that were supposed to bring an end to poverty, over the past 40-45 years, poverty has actually increased.

During that same period of time in China, however, the exact opposite has happened. During my 16 years in China, I have been in 29 provinces, municipalities and autonomous regions. I have been in big cities, small cities, towns and villages. Driving along country roads, I have seen old, dilapidated farm housing that is no longer occupied as the families are living in new houses or apartment buildings close to the fields where they work.

Ten years ago when I was supervising students who were writing their Bachelor's thesis, when I would tell them that they would have to work over the Spring Festival Holiday, some students would tell me that they have no Internet in their town or village or that they have no computer. No one tells me these things anymore because they are no longer true.

I have read of the work of party cadre across the country who left their homes to work and live in the poorest communities, making the commitment that not only were they there but that they would stay there until the campaign to end poverty succeeded.

As I look at the progress that has been made, it is clear that with the examples of success and the continuing commitment of the Communist Party of China, the future is very bright ahead.

(Dr. Mark Levine is an American sociologist who came to China in 2005. Now, he teaches sociology in Minzu University of China.)

## Educational Experts Gather to Redefine Learning

By Staff Reporters

The online version of the Sixth Annual Conference of Global K-12 Education Research Association, sponsored by the Department of Science and Technology of Hebei Province (Hebei Administration of Foreign Experts Affairs) and undertaken by Shijiazhuang Foreign Language Education Group, came to a successful close on November 3.

About 604,600 people attended the conference (on line), including educational experts and scholars from 14 countries such as the U.S., Canada and Russia. Themed "Redefining Learning," the conference provided a platform for wide exchanges, unity and cooperation, and mutual inspiration in the field of basic education in Hebei Province. At the conference, representatives from 14 countries and 128 schools actively

shared their experiences, exchanged ideas, and achieved fruitful results. The conference contributed valuable insights to help boost the growth of students worldwide. Guo Yuming, deputy director-general of the Department of Science and Technology of Hebei Province, noted that Hebei Province has been committed to grounding its work in promoting high-quality development in recent years. Moreover, the province has played an ac-

tive role in spreading Chinese culture and language learning, while making concerted efforts to attract foreign experts.

At the same time, Hebei is constantly improving its entry mechanisms to improve the services offered to foreign experts in a bid to facilitate communication and cooperation between Hebei and various countries and regions, said Guo.

Source: the Department of Science and Technology of Hebei Province

## Service Info

### Hainan Tropical Rainforest National Park

Aerial photo taken on Sept. 30, 2021 shows the view of the Hainan Tropical Rainforest National Park in south China's Hainan Province. The Hainan Tropical Rainforest National Park boasts one of the most concentrated, best preserved and largest contiguous tropical rainforests in China. The park covers nine cities and counties, with a total area of 4,400 km<sup>2</sup>, or about one-seventh of Hainan Island's land area. It is an important part of the world's tropical rainforest and a key area for biodiversity conservation in China. (PHOTO: XINHUA)



## Traditional Eastern Wisdom

### Youchao: the Father of Building

By BI Weizi

According to Han Feizi, people could avoid harm from animals with the help of buildings made from wood, which was originally taught by Youchao.

In ancient times, there were many wild animals and few human beings, and people nomads were often attacked by animals and lived in constant fear of death. The ancients noticed that some animals lived in caves, so they followed suit as the caves provided protection from the wind, rain and wild animals. However, caves were damp and cold, and humans were still attacked by wild animals from time to time.

Chinese mythology says that Youchao was born in Cangwu, south of Jiuyi Mountain, and had traveled to the immortal mountains where he became enlightened by the immortals, and gained unparalleled wisdom. He noticed that the nests of birds were built in trees, so that they could be sheltered from the wind, rain and the threat of wild animals. Inspired by this, he built a house in the tree using branches and cane. Other people came to realize the advantages of the tree house and followed suit.

From then on, people collected plant seeds and wild fruits during the day, lived in the trees at night, and no longer had to worry about sudden at-

tacks from wild animals. In order to express their gratitude to the inventor of the house, people elected him as the leader of the tribe.

The development from cave dwelling to nesting was a big step forward in the development of human civilization. The change lifestyle led to a change in human relationships. People no longer lived in groups in caves, therefore inter-marriage within the same clan was gradually abolished. Both men and women sought to find life partners from other clans without any close blood ties.

In the history of Chinese civilization, Youchao took this vital step to help distinguish humans from animals.



A tree house. (PHOTO: VCG)



Doctor Mark H. Levine at the Great Wall. (COURTESY PHOTO)

## Zero-Tolerance Policy on COVID-19 Not Expensive

By Staff Reporters

Zhong Nanshan, a leading Chinese respiratory disease expert, told China Global Television Network (CGTN) that the current two percent death rate of the disease globally is not tolerated in China in spite of vaccination against COVID-19.

### A relatively low-cost measure

Zhong said China had to adopt a zero-tolerance and zero-transmission policy, as the current Delta variant of COVID-19 spreads fast and replicates very quickly. While the policy is expensive, Zhong said the cost could be higher if ignored and the virus was allowed to spread. He also said that some countries had lifted restrictions while still reporting some small gatherings, leading to a new series of infections that come at a greater cost. Zhong said that the imported cases of COVID-19, or sporadic outbreaks will certainly be reported if China gradually opens to the world. Therefore, he thought the zero-tolerance policy would be taken for a long time. However, he further explained this is not a rigid zero-transmission policy. The policy duration depends on the basis of anti-virus performance worldwide. "No matter how well

China does in containing the pandemic, the imported cases will not be avoidable when the country opens its doors. In my opinion, China's zero-tolerance strategy doesn't cost too much, [as it is a] relatively low-cost approach," he said.

### Valuable experiences against COVID-19

As to his latest comments on recent sporadic outbreaks in some regions, he is confident on government help and experience gained before. A local outbreak of the COVID-19 in Guangzhou in May and June was controlled in about a month, while another outbreak reported in Nanjing, Jiangsu province, was tamped down within 26 days, said Zhong.

He highlighted four points on China's success in containing the recent sporadic outbreaks. "The first is to find the first patient and trace where he or she came from. The second is to figure out the infection chain," said Zhong, adding that the third is to find close contacts in the infection chain, so that they can be screened in a timely manner. The last point is that all the close contacts are isolated and tested in time to prevent the virus from spreading in local communities.