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### Editor's Pick

## Breakthrough in fNIRS Imaging Technology Benefits All

By Staff Reporters

For a long time, the evaluation and diagnosis of mental and psychosomatic diseases have been lacking objective biological indicators. Now, the application of functional near-infrared spectroscopy (fNIRS) imaging technology may help solve this problem.

A research team from Beihang University (BUAA) has developed fNIRS brain imaging equipment with over 100-channels, and received the medical device registration certificate for it. Based on fNIRS imaging technology, an intelligent disease diagnosis and treatment model has also been established.

#### Fit for purpose

High resolution imaging of brain activity in its natural state has been a challenge worldwide until the advent of fNIRS imaging equipment, which is now considered to be a solution to this problem. The device can record brain activity as people walk, drive, talk, play a musical instrument or games, and also be used on restless children, claustrophobic patients and people who are unable to undergo MRI scans.

However, the current fNIRS equipment, with a unit price of millions of RMB, cannot effectively image the areas covered by people's dark hair, such as the parietal lobe and occipital lobe. This is because many Westerners have light colored hair, while Asians have dark hair, and dark colors absorb 1,000 times more infrared light, said Wang Daifa, who leads the research team at BUAA.

After hundreds of experiments, setbacks and verifications, Wang's team finally made a breakthrough in the physical limit of near-infrared ultra-light detection technology and original signal extraction technology, to overcome the challenge imposed by dark hair with their whole brain imaging technology.

#### Higher resolution

In 2016, Wang's team founded Danyang Huichuang Medical Equipment Co. Ltd (Huichuang) to manufacture new equipment of high resolution imaging. "After three years of efforts, we began using fNIRS imaging equipment in the clinic, initiating the development of homegrown high-end equipment in this field," said Fu Qijun, R&D director of Huichuang.

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### New Graphic

#### Rise in Chinese-brand Passenger Car Sales (2022-2023)

14.6 million units

11.8 million units

increased by 6.1 percentage point

The market share of Chinese-brand passenger cars

Source: China Association of Automobile Manufacturers  
Designed by YAO Yulu / Science and Technology Daily

The Jingu Haihe Tunnel is the high-speed shield tunnel with the largest diameter and longest driving distance in the Beijing-Tianjin-Hebei region. (PHOTO: XINHUA)

### Two Sessions

## Upcoming 'Two Sessions' Highly Anticipated

By Staff Reporters

The 14th National People's Congress (NPC) and the 14th National Committee of the Chinese People's Political Consultative Conference (CPPCC) will open their second session on March 5 and 4 respectively. Because the NPC and CPPCC are traditionally held in March around the same dates, people have taken to calling them the "Two Sessions" or "Lianghui".

The NPC is the highest organ of state power and the top legislature. Its deputies are elected from all levels of society for a five-year term. They have the right not only to appoint and supervise the chief justice and chief prosecutor of China, but also to formulate and amend the laws.

The CPPCC, also known as China's top political advisory body, was established in 1949, five years before the NPC.

Every year, the CPPCC facilitates China's multiparty cooperation and political consultation mechanism, led by the Communist Party of China. CPC representatives, members of other political parties, and people from all ethnic groups and other parts of society, can offer proposals to participate in the deliberation and administration of state affairs.

The Two Sessions offer the public a practice of "whole-process people's democracy" every year.

The term of "whole-process people's democracy" was first mentioned by President Xi Jinping, and was written into Chinese law in 2021. It is a process which allows "people to pursue, develop and realize democracy" and fully represents the idea of "people are the masters of the country." Specifically, people can engage in democratic elections, consultations, decision-making, management, and oversight.

Every year, a government work report on behalf of the State Council is delivered at the opening meeting of the NPC. It summarizes the past year's achievements, while also proposing China's major development targets and the key tasks of government for the next year.

During the Two Sessions, all NPC deputies will gather together to review the past year's work of the central government and reach consensus on policies for the next 12 months.

The proposals of the Two Sessions are related to many areas. Throughout history, many far-reaching decisions have been made during this period, such as establishing new administrative regions, constructing the Yangtze River Three Gorges Dam Project, joining the World Trade Organization, and eradicating absolute poverty.

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## Political Advisor Advocates Unified Carbon Market for Green Growth

By WANG Xiaoxia

To promote carbon peaking and carbon neutrality prudently, China needs a larger carbon trading market with unified rules.

Jiang Pengyu, a member of CPPCC, the top political advisory body, shared his proposal for the upcoming CPPCC session during a recent interview with *Science and Technology Daily*.

Jiang, who is also deputy mayor of Changzhou, Jiangsu province in east China, and chairman of the Changzhou Committee of the China Zhi Gong Party, will propose expanding the carbon trading market at the annual CPPCC session, which kicks off on March 4.

China's national carbon emissions trading market commenced operation

in July 2021, a milestone in achieving China's emission reduction targets. In the past two years, it has made remarkable progress.

Apart from the national carbon market, there are eight local carbon markets in major cities like Beijing, Shanghai and Guangdong. However, they have different trading rules and regulations and the allocation of responsibilities in financial regulations is ambiguous, Jiang said.

Therefore he proposes establishing a unified carbon emissions trading market nationwide, and coordinating the trading systems of the national and local markets, as well as improving the regulatory mechanism of carbon finance.

As the carbon market expands, the

market transaction mechanism will guide the green transition of carbon-intensive sectors and energy consumption structure, encourage innovation in green and low-carbon technologies, and boost green and low-carbon economy, Jiang pointed out.

With China being one of the largest carbon emitters, its carbon trading market will play an important role in global climate governance, he added.

Its successful operation will help reduce global carbon emissions and promote global green and low-carbon development. At the same time, it will demonstrate the effectiveness of the market mechanism in climate governance, and the experience can be shared by other countries and regions, especially other developing countries, Jiang explained.

## Solar Power Project Contributes to Bangladesh Green Development

### International Cooperation

By Staff Reporters

China's shift towards clean energy development under the Belt and Road Initiative is poised to reshape Bangladesh's energy landscape, as evidenced by recent initiatives aimed at transitioning from coal to renewable energy.

Approximately 120 kilometers from the capital city Dhaka, stands Bangladesh's second-largest solar power station. Around 170,000 solar panels imported from China convert sunlight into electricity, illuminating local homes. This solar power project was initiated in 2019 with the aim of meeting Bangladesh's electricity demands and improving the local energy structure. This ambitious endeavor was undertaken by HDFC SinPower Ltd., and constructed by Fujian Yongfu Power Engineering Co., Ltd. At the end of 2020, the project was operational.

"Despite challenges such as the COVID-19 pandemic, the project was completed in just about a year," said Faisal, a local engineer involved in the project. He also noted that this project was Bangladesh's first solar project built according to Chinese standards, providing impetus to Bangladesh's advancement in renewable energy and earning recognition from various departments, including the Bangladesh Power Development Board.

Over the past three years of operation, the power station has generated approximately 300 million kilowatt-hours of electricity, becoming a crucial power source in central Bangladesh. Local resident Nasiruddin is grateful, saying the solar power station has greatly benefited the community, with many of his relatives and friends now employed there.

The station has also obtained an international Verified Carbon Standard certification in 2023 and is reducing carbon emissions in Bangladesh.

"We hope to actively practice a green development business model in Bangladesh, promoting local economic development and improving livelihoods, while also using investment to propel Chinese technology, standards, and equipment onto the global stage," said Zhou Jinshun, chairman of HDFC.

## WEEKLY REVIEW

#### 2024 Mission: 100 Space Launches

China is projected to make about 100 space launches this year. They include the maiden flight from the country's first commercial spacecraft launch site in Wenchang, Hainan province. This is stated in the 2023 blue book of China aerospace science and technology released by the China Aerospace Science and Technology Corporation on February 26.

#### Manned Lunar Exploration Vehicles Named

The China Manned Space Agency announced the names of the new vehicles for future manned lunar exploration missions on February 24. The new manned spacecraft has been named Mengzhou and the lunar lander Lanyue. They will take astronauts to the moon before 2030.

#### Chinese Scientist Receives International Award

Huang Xiaojun won the annual Distinguished Service Award of the Center for International Blood and Marrow Transplant Research in San Antonio, the U.S., for his groundbreaking work known as the Beijing protocol in transplantation and cellular therapy on February 23.

WECHAT ACCOUNT



E-PAPER





# C919 Flies High on Global Stage

## Voice of the World

Edited by GONG Qian

China came out in force at the Singapore Airshow this year, bringing its largest-ever contingent, and showing off the new C919 — the country's first domestically developed large, narrow-body passenger aircraft, *Japan Times* reported.

For the first time, the Singapore Airshow, held from February 20 to 25, had exhibitors from China. The C919 and the other showcased Chinese aircraft attracted wide attention.

The C919 would be the most scrutinized aircraft at the airshow, Shukur Yusof, founder of Endau Analytics, a firm that tracks the aviation industry, had told CNN earlier. "There is a lot of interest to see the actual aircraft, how it performs and how it is in flight," he said.

Manufactured by the Commercial Aircraft Corporation of China (Comac), the C919 made its international debut at Asia's largest airshow. According to *The Hindu Daily*, on the first day of the event, liveried in white, green and navy blue, the C919 wowed trade exhibitors, aviation executives and officials with sleek aerial manoeuvres.

The international debut of the



A Chinese passenger jet C919 makes a rehearsal flight to prepare for the Singapore Airshow in Singapore, February 18, 2024. (PHOTO: XINHUA)

C919 and the cost of going green by 2050 dominated the opening day of the airshow, Bloomberg reported.

Many overseas media called it a prominent symbol of "Made in China" strategy. The C919 is a legitimate effort by China to build its own technological and industrial capabilities, Airbus commercial aircraft chief executive Christian Scherer was quoted as saying by *The Straits Times*.

"The Singapore Airshow is a fantastic opportunity for Comac particularly given the current situation with Boeing," Brendan Sobie of Sobie Aviation told CNBC. Boeing has now reduced production due to quality control issues and Airbus's backlog is very long, which presents Comac with "a strong opportunity to gain market share," particularly in its domestic market, Mike Yeomans of aviation consultancy IBA

told Reuters.

Previously, Comac had revealed that it had received orders for about 1,000 C919 jets. It is an impressive figure for a brand-new aircraft, said *Japan Times*. During the airshow, Comac signed a deal for 40 C919s and 10 ARJ21s with an airline company in China.

Meanwhile, overseas customers have shown their interest in the C919. "We have also seen a growing trend where clients are including the C919 option in their fleet evaluation," Adam Cowburn from Alton Aviation Consultancy told Reuters.

Comac won an endorsement from Saudi Arabia's Riyadh Air as an emerging rival to Boeing and Airbus, Bloomberg reported. "I'm sure they will build a world-beating aircraft in the next 10 years," Riyadh Air's Chief Operating Officer Peter Bellew said at the airshow. "I wouldn't underestimate Comac for one minute. They will be a real force to be reckoned with."

Currently, the Chinese aviation authority is negotiating with the European authority for type certification.

"It will take time for the C919 to land an order from a major carrier," aviation analyst Shukur Yusof at Singapore-based Endau Analytics told AFP. But it's "a matter of when, not if, a top-tier airline buys a Chinese-made commercial jet."

## Opinion

# Challenges and Opportunities Brought by Sora

By YIN Ximing

AI, as a new frontier of disruptive technology and international competition, is the new opportunity of the industrial revolution and a driver for cultivating New Productive Forces. On February 16, OpenAI released its first large-scale text-to-video model, Sora, which ignited global attention. Sora's debut has become a milestone event after ChatGPT.

Sora is positioned as a "video generation model as a world simulator," and its core feature is that it can directly transform text description into corresponding dynamic video content. Sora's innovation lies not only in its technological breakthrough, but also in its change of application contexts of AI.

A traditional AI large model is mostly trained and applied in a closed environment, but the emergence of Sora means that AI technology can directly interact with the real world, which will greatly promote the application of AI technology in all walks of life.

However, it is also necessary to realize that Sora also brings new challenges to employment, privacy protection and ethical governance. In particular, Sora may be abused to create false information, online fraud, maliciously impact the history and culture of other countries and cyberspace sovereignty.

For China, the release of Sora has brought new ideas and opportunities for its innovation, but it also reveals that there is a gap between AI enterprises and industries in cutting-edge theoretical breakthroughs, infrastructure construction, technological disruptive breakthroughs, rapid application transformation, and industrial ecological cultivation. Therefore, it has become an urgent issue to explore the new ecosystem and new mode of cultivating and expanding AI firms, accelerating AI technology breakthroughs and rapid application in various contexts.

Chinese AI enterprises, such as Huawei, Baidu, ByteDance, Beijing Academy of Artificial Intelligence and Baichuan, have actively explored the AI inno-



Yin Ximing delivers a speech at China Association for Science and Technology Youth Scientist Innovation Salon. (COURTESY PHOTO)

vention and industrial application of context+ technology two-wheel drive. In the future, China needs to seize the paradigm change opportunity of context-driven innovation in the digital age, accelerate the construction of context-driven AI innovation ecosystem, aim at the global innovation frontier and new opportunities emerging in new contexts, support firms to lead the deep integration of university-industry collaboration, and accelerate the cultivation of domestic AI innovation ecosystem.

In particular, more attention should be paid to breakthroughs of core technologies such as national AI computing power, and data infrastructure construction and advanced GPU, in order to accelerate the cultivation of AI talents through the university-industry collaboration, build open application context, cultivate and expand AI enterprises, promote a virtuous circle of "context-technology-finance-industry", and form an "AI innovation flywheel." In this way, China may open up new advantages for AI development, and empower New Productive Forces towards high-quality and sustainable development.

YIN Ximing is an associate researcher in the School of Management, Beijing Institute of Technology, and Tsinghua University Research Center for Technological Innovation.

## Hi! Tech

# First Human with Brain Chip Implant Moves Computer Cursor with Thought

By GONG Qian

Elon Musk said in a recent post on social media platform X that the patient who had received a brain implant from his Neuralink company, the first human to do so, is doing well. The patient can control and move a computer mouse on the screen by "thinking."

The news comes after Neuralink last year began recruiting people for a clinical trial of the brain chip.

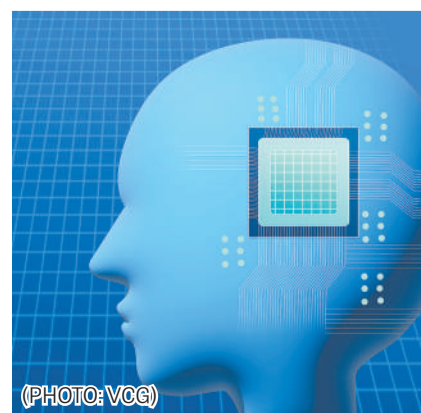
The technological focal points of the trial are the implant and the surgical robot that inserts the device. According to the Neuralink website, the chip, called N1, is hermetically sealed in a bio-compatible enclosure that can withstand physiological conditions several times harsher than those in the human body.

The N1 is powered by a small battery charged wirelessly from outside via a compact, inductive charger that enables easy use from anywhere. It has over 1,000 electrodes distributed across 64 highly flexible, ultra-thin threads to record neural activity. The threads are so fine that they can't be inserted by the human hand. So the surgical robot has

been designed to do the job.

The robot has three main components: the head, body and base. The head is like a helmet with embedded cameras and sensors to map the patient's brain, and the surgical needle. This is where the patient's head is placed. The body of the robot holds the parts that give it mobility. The base balances the robot and contains the technology for operating the entire system.

In the coming days, as Neuralink and Musk provide more details of the trial, it will be seen how significant the implant is as a scientific advancement.



(PHOTO: VCG)

# Discarding Zero-sum Thinking in Worldwide Connectivity

## Comment

Edited by QI Liming

In late January, the *Foreign Policy* and *The Diplomat* websites released two similar articles on the same day. The articles examined the Belt and Road Initiative (BRI) in a rational and panoramic way. Very different from the clichéd press reports by some Western media outlets that constantly smear the BRI, the *Foreign Policy* article *The Red Sea Crisis Proves China Was Ahead of the Curve* explains how the BRI is not a sinister plot. Rather, it is a blueprint for what every nation needs in an age of un-

certainty and disruption, said the article.

Parag Khanna, founder and managing partner of global strategic advisory firm FutureMap, and the article's author, said, "The Red Sea crisis shows that the BRI is vital to all countries." There is precisely one pathway for a world plagued by dire mistrust and unpredictable crises to take meaningful collective action in the global public interest, and that is to build more pathways for supply to meet demand, said Khanna. The solution to supply interruptions is more supply chains. More belts, more roads. China is the country that has known this, and acted on it for years, he said.

In his article Khanna also mentioned that, from a functional perspec-

tive, the BRI represents what all countries should do in their own national interest: build as many pathways as possible for supply to meet demand, both as a hedge against unforeseen disruptions, but also to boost one's connectivity and influence.

For overpopulated developing countries, solid infrastructure is essential to cope with domestic demands, as it generates economic multiplier effects, and builds connectivity to the world economy.

Many Western governments and the mainstream media hold long-standing distrust and criticism of the BRI. Rational and objective opinions should, therefore, be valued.

According to *The St Andrews Economist* website, on November 28, 2023, a symposium was held in Brussels to celebrate the 10th anniversary of the BRI. At the symposium, Bart Dessein, a professor at the University of Gent, said that the BRI's 3,000 projects had resulted in the creation of 420,000 jobs globally. Meanwhile, Bernard Dewit, Chairman of the Belgian-Chinese Chamber of Commerce, praised the BRI for aiding countries in developing more rapidly. "It has been a success, and that is the reality," he said.

As Khanna said, the BRI has also significantly promoted economic cooperation and cultural exchange between China and other countries. The initiative has fostered partnerships in sectors such as trade, investment, technology

and education. For example, the BRI-supported China-Pakistan Economic Corridor has facilitated joint ventures in energy, infrastructure, and agriculture between the two countries.

"Even though Chinese-led versus Western-led initiatives are portrayed as zero-sum, in most cases infrastructure such as ports and electricity grids are nonexcludable and nonrival and open to any commercial user and providing equal service to those users," said Khanna. In fact, each infrastructure project, whether a pipeline, electrical grid or Internet cable, inadvertently advances the far grander project of transforming the world into an interconnected supply chain system. The answer to the question as to the fate of infrastructure is the same as for the globalization it underpins, he concluded.

A volatile international situation and recurring regional crises are the current status quo. The BRI has demonstrated the power of connectivity, created greater development space for many countries, and objectively played a role in hedging risks. This has led to the value and the global significance of the BRI being realized by more countries.

There is a growing realization that only when countries work together to achieve common development through connectivity, can they meet global challenges and safeguard world peace and prosperity.

# Breakthrough in fNIRS Imaging Technology Benefits All

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The R&D team did not stop there. Their next goal was to improve the accuracy of fNIRS imaging. Fu said that the advantages of fNIRS imaging technology are many, but the disadvantages are also obvious. "It is accurate to only about 3 cm, while the accuracy of functional MRI (fMRI) is 3 mm," Fu said.

Scientists have long been trying to improve the accuracy of fNIRS imaging to the level of fMRI, and in recent years, the development of artificial in-

telligence and deep learning have assisted to solve this problem.

After numerous attempts, Wang's team found a way, which combines neural network-based image reconstruction frameworks and models with traditional physical models, to improve the spatial resolution of fNIRS imaging to about 5 mm.

## Intelligent interpreting system

As fNIRS imaging is a new technology and outputs new type of images, several questions emerged that need answers. How to interpret the im-

age? What are indicators of insomnia, depression or autism? What about medication?

"We want to build a model that can help doctors analyze the image information and support disease diagnosis, classification and evaluation of therapeutic effect throughout the clinical process," said Deng Hao, software development director of Huichuang.

The team has established cooperation with dozens of clinical institutions, and has collected tens of thousands of dynamic brain function data.

The software developers designed a model to collect disease-related data and establish the link between data and disease to support diagnosis.

To date, fNIRS imaging technology and related models have been demonstrated in more than 800 institutions including Peking Union Medical College Hospital, Shanghai Huashan Hospital and Tsinghua University. For Wang and his team, after nearly 20 years of effort, they are on the threshold of taking a giant leap for science and humankind.



# China's Food Safety System Worth Learning from

## Dialogue

By FU Han and BI Weizi

Professor Francis Gregory Snyder is an internationally recognized expert on food safety law, WTO law and EU law. He served as dean of the Law Department of the European University Institute and Honorary Professor of the London School of Economics and Political Science, and is now chair professor at School of Transnational Law, Peking University.

For more than 20 years, American/British Snyder has provided expertise to China's reform and modernization development. As a food safety expert of the Foreign Experts Advisory Committee of the State Administration of Foreign Experts Affairs, he has made suggestions on the revision of China's Food Safety Law in 2009, and reform of the food safety supervision system. In 2018, he received the Chinese Government Friendship Award for his dedicated service to food safety.

Looking back on his professional experience in China, Snyder recently shared his insights on China's food safety practices during a recent interview with Chinese media.

**How did you learn about China's food safety laws?**

**Snyder:** When I was a law student at Harvard, my tutor asked me to translate Chinese law into English and French. In 1992, when I was a visiting scholar at The University of Hong Kong, I took the opportunity to travel around China, giving lectures on food safety laws. In 1997, I went to Dongguan for an inspection, which gave me a deeper un-



Professor Francis Gregory Snyder and his wife. (PHOTO by International Talent Magazine)

derstanding of international trade. I think that food safety, WTO law, international trade law, etc. are like different streams coming together to form a river.

China is a model for other countries to follow in terms of food quality. China has green, organic, non-polluting food. In Europe and America, organic food is very expensive. I think China's system is something other countries should learn from, but not many people seem to realize this.

**Have you noticed any changes in China over the past few decades?**

Of course! It's incredible! The first time I came to Shenzhen was in 1997. It was no longer a small fishing village, but it was still not a metropolis. We had to go to the mayor's office to get a pass to visit a factory. The entrance to the mayor's office building was still muddy. Now, Shenzhen is a big city with a large popula-

tion. It is very beautiful, with excellent buildings and roads. It is a really humane city.

China's approach to urban and rural problems is worth learning by other countries. China has always been very modest. Chinese people are excellent and hardworking, which is very important for China's future.

I think China is a country with a vast territory, a large population, an ancient culture, and world-famous food. *The Book of Songs* also dates back to the Western Zhou Dynasty. I often watch Chinese TV shows and movies in France, and I know that China has beautiful scenery and melodious music. I think this should be promoted. A lot of Europeans do not understand China. If they cannot come to China in person, it is especially important to understand China through other channels.

**What can the world learn from China?**

Many years ago, I did a project in Europe — What Can the World Learn from China? At that time, many students were confused. They didn't understand why they should learn from China. But reality tells us a different story. China has an ancient wisdom that is different from other countries. Europe is made up of many small countries, while China has been a unified country for a long time in history. Especially now that China is using its own ancient civilization to handle international relations, I think it is worthy of learning by many countries. China is a country with a large population, and China's online medical system is also worth learning. Many patients can consult doctors online, which saves patients a lot of time.

*This article includes contributions from International Talent Magazine.*

## Traditional Eastern Wisdom

# Hand Warmer: A Convenient Hot Item

By BI Weizi

The hand warmer, a small, often square or round mini portable furnace filled with burning charcoal, with a hollow lid on top, is one of the innovative winter heating devices used in ancient China. Usually made of copper or enamel, the hand warmer could fit in the hand or be placed in the sleeve for heating, similar to the heating pads used today.

Hand warmers have long been used by Chinese. A copper hand warmer from the Warring States Period is on display at the Hunan Provincial Museum. Dur-

ing the Ming and Qing Dynasties, hand warmers were widely used in the palace, made with exquisite craftsmanship and beautiful shapes.

Ancient hand warmers had a variety of designs. Round, square and octagonal shapes are typical, with some shaped like pumpkins, flowers and turtle shells. The charcoal used for heating was also often pressed into flower shapes together with fragments of incense that emitted a pleasant fragrance when burned.

Structurally, the hand warmer consists of four parts: outer layer, inner

compartment, top lid and handle. The outer layer is made of colorful wood. The inner copper compartment stores the burning charcoal. The top lid is a hollow net woven with copper wire, which not only provides ventilation allowing the charcoal to burn, but also prevents sparks from flying out. The heat generated by the hot charcoal is transferred to the copper inner compartment, and then to the wooden outer layer, providing warmth for the user.

The hand warmer's artistic shape and practical functions reflect the aesthetic taste and innovation of an-

cient Chinese, and also embodies the excellent manufacturing skills of the craftsmen.



An ancient hand warmer is displayed at the Palace Museum, November 24, 2023. (PHOTO: VCG)

# Ancient Trees Present a Trip Back in Time

## Science Outreach

By Staff Reporters

Ancient trees are silent witnesses to the changes that have occurred in the world around them. Having survived for millennia, they are rare, and in China, these ancient giants are primarily found in the harsh environment of the Qinghai-Xizang Plateau.

**Surviving in extreme weather**

The question of why the Qinghai-Xizang Plateau, with its extreme conditions, is home to many ancient trees has intrigued scientists and the public for a long time. Professor Zhang Qibing from the Institute of Botany, Chinese Academy of Sciences, has shed light on this phenomenon. According to mainstream beliefs, trees living under

certain adverse conditions tend to have longer lifespans. This concept suggests that the extreme conditions of the Qinghai-Xizang Plateau might contribute to the longevity of its trees, says Zhang.

**The role of ecological resilience**

One key factor in the longevity of these trees is ecological resilience, which is the capacity of trees to actively respond to environmental stresses and disturbances. As trees age, their demand for photosynthetic products, water, and nutrients increases. If the supply of these resources cannot meet the demand, the tree's ecological resilience declines, making it more difficult for the tree to survive natural disasters such as extreme climate events and pests, ultimately affecting its ability to reach old age.

However, the ancient trees of the Qinghai-Xizang Plateau, like the cypress, have adapted to their harsh environment through a strategy of slow

growth, reducing their demand for resources and maintaining their ecological resilience over long periods. This adaptation can be seen in the exceptionally narrow tree rings of millennia-old cypress trees on the plateau, usually less than 1 millimeter wide, indicating their remarkable ability to endure and thrive in adversity.

**Ancient trees tell stories of past climates**

The tree rings of these ancient giants hold vast amounts of information about past climate conditions. For instance, research on seven millennia-old cypress trees in Qinghai province revealed wider tree rings between 929 and 1031 AD, correlating with increased rainfall from May to June over that period. This suggests favorable moisture conditions during the Medieval Warm Period, highlighting how ancient trees can provide insights into historical climate patterns.

Moreover, the resilience and

"memory" of trees, as observed by Zhang and his team, show that trees can accumulate experiences from past disturbances, enhancing their resilience against future challenges. This ability was evident in ancient cypress trees in Xizang, where narrower growth rings indicated a two-hundred-year period of hardship, followed by a return to normal growth.

**Cultural and archaeological significance**

According to Zhang, the ancient trees in the Qinghai-Xizang Plateau are not only valuable for their climatic and ecological records, but also because they hold cultural and archaeological significance. In some areas, these trees are revered as sacred, which has helped protect them from human destruction. Additionally, tree ring data from ancient trees has played a crucial role in archaeological studies, such as dating the construction period of ancient tombs in Qinghai province.

## My China Story

# An American Girl's Chinese Dream

By YIN Wei

"Studying in China has been my dream since I was 16 years old, and after three years of hard work, I finally made it to Tianjin in 2023," said Raina Chareese Luke, who hails from Georgia, U.S., and is currently enrolled in the Chinese Language Program at Tianjin University (TJU).

Luke knew little about China or Chinese until her second year of middle school. She is very grateful to her Chinese teacher and still keeps in touch with her to this day. "She opened up a new world for me," Luke said.

It is often said that interest is the best teacher. "The more I learn about China, the more fascinated I become with Chinese culture. The way people behave and their mindsets are very different from our own, but that's what the world should be like—colorful and inclusive," she said.

Luke's study of Chinese broke off for a while in high school, when it was closed due to the pandemic. "In 2021, soon after school resumed, I picked up [my] Chinese studies again and realized how happy I was to do it," she said. It was at that time that she made up her mind to study in China.

Eventually, Luke applied to TJU and was accepted. "For me, TJU has two very appealing aspects. One is its old-fashioned campus, which fulfills my expectations of the university in China, and the other is the professionalism shown by TJU admission counselors during my application process. They responded [to] my queries very quickly."

A new world that she has long dreamed about unfolded before Luke's eyes the moment she set foot in China in September 2023.

She had a hard time adjusting to an international student's life on campus at first. However, she gradually became accustomed to China's well-established electronic payment system and began to appreciate the convenience it provided. "See my boots? I bought them on Taobao. They are warm and stylish. What a deal!" Luke exclaimed joyfully.

Her life at TJU is busy and fulfilling. "Studying is my first priority. The Chinese language program I'm taking is for only one semester, so every day counts," she said. She also feels inspired by her Chinese friends, from whom she gained a firsthand appreciation for the diligence of Chinese people.

In addition to her studies, Luke actively seeks opportunities for immersive cultural experiences in China. She is particularly fond of traditional Chinese clothing, especially the qipao, also known as cheongsam, and Han-style clothing.

Luke also has a keen interest in Chinese history. "When you think about the 5,000 years of history and all



Raina Chareese Luke. (COURTESY PHOTO)

those dynasties, each distinct from the other, it's very fascinating." She has watched videos and documentaries about Chinese history and has discovered that her favorite Chinese dynasties are the Zhou dynasty and the Song dynasty.

The diverse range of university events adds another layer of colour to Luke's life. "Our university provides us with plenty of opportunities to establish connections with people through various student communities and activities.

As the semester draws to a close, Luke's language study program is also wrapping up. She plans to return to her hometown. "But I will come back to China for my undergraduate studies," said Luke, adding that, "I hope to somehow work in China someday after graduation."

Her faith in her future in China was greatly boosted after she learned about the Chinese government's plan to invite 50,000 American teenagers to come to China for exchange and study in the next five years. "Now the opportunity to build relationships with China is growing for American students. I am so glad to witness this. Education is a very important value that can deepen the relationship between the U.S. and China. I believe that ordinary people on both sides want to see an improved relationship between the two countries."

As the time for leaving China approaches, Luke cherishes her remaining days at TJU even more. She is eager to share her experience as an international student studying in China. Luke is determined to share what she has learned about China with her friends and community back home. "My goal is to promote a better understanding of Chinese education and its unique features," said Luke.

*This article is contributed by TJU.*

# Upcoming 'Two Sessions' Highly Anticipated

From page 1

To date, all the provincial-level regions have unveiled their 2024 growth targets. Important hubs like Beijing and Shanghai have already set a growth target of around five percent, consistent with last year's goals. National specific economic stimulus policies will also be discussed during the Two Sessions, and the announcements are sure to attract much attention from the world's media.

In addition, regulations and bills in respect of people's livelihood and policies that aim to promote science

and technology development are also on the agenda.

As for now, the NPC deputies and CPPCC members are preparing for the proposals. How to implement the large-scale equipment upgrading and trade-ins of consumer goods, which was proposed during the just-concluded Central Commission for Financial and Economic Affairs, may be a hot topic during the Two Sessions. It is expected that proposals to increase R&D and to improve the technical level of related industry equipment will be put forward.



# 2024 Two Sessions INNOVATIVE CHINA



## Policy Express

### Spurring Sci-tech Innovation

In 2023, China for the first time overtook the U.S. as the economy with the highest number of science and technology clusters that rank among the top 100 worldwide, according to the *Global Innovation Index 2023* released by the World Intellectual Property Organization.

China has also been topping in international patent applications through the *Patent Cooperation Treaty* for four consecutive years, establishing itself as one of the world's leading countries in the area of intellectual property and innovation.

All this progress would not have been possible without the government's support.

The government has continued to increase investment in R&D. In 2023, China's R&D input crossed 3.3 trillion RMB (458 billion USD), with the R&D input intensity reaching more than 2.64 percent.

Since enterprises are the main inno-

vation makers, specific policies have been made to offer preferential taxation and financial support for high-tech enterprises to encourage innovation.

The government has also introduced a set of new measures to cultivate more young experts, including prioritizing their role in major R&D projects and tasks.

What's more, foreign investors are encouraged to set up R&D centers in China, while foreign experts are welcome to innovate in the country.

In its efforts to set ethical guardrails for developing science and technology, China introduced a range of trial measures for the ethical reviews of R&D activities.

Overall, these policies are designed to create a sound environment for sci-tech innovation and drive economic growth.

#### Editor's Note:

China's much-awaited Two Sessions start with the CPPCC, the top political advisory body, opening on March 4, and the NPC, the top legislature, on March 5. This is the annual period when NPC deputies and CPPCC members discuss new plans and policies for China's development in the following year.

On the eve of the Two Sessions, we look back on the impressive sci-tech achievements China has made over the past year, the policies introduced by the government to boost sci-tech innovation and facilitate international exchanges, as well as the changes and benefits from the proposals submitted during the previous editions of the Two Sessions.

## 2023 Milestones

### Self-reliance and Strength at Higher Level

For China, 2023 is a year of major achievements in science and technology. As the Two Sessions discuss new plans for China's development, let's take a look at some of those exciting and impressive events:

#### Manned submersible Fendouzhe

Manned submersible Fendouzhe, which means "Striver", was carried by the scientific research ship Tansuo-1 to complete its first international manned deep-diving scientific research mission in Oceania in March last year. The domestically developed Fendouzhe has greatly improved the independent innovation level of China's deep-sea equipment technology.

#### C919 passenger aircraft

The C919, China's self-developed large passenger aircraft, completed its first commercial flight from Shanghai to Beijing on May 28, 2023, marking its official entry into the civil aviation market. This February, the C919 made its international debut at the Singapore Airshow. It attracted considerable global attention with visitors flocking to see the aircraft and how it performed.

Many aviation experts have commented that the C919 could break the duopoly of Boeing and Airbus in China's domestic market. The size of China's aviation market and strong industrial policy give the C919 an edge to advance the "Made in China" strategy in aviation.

#### Adora Magic City

China's first domestically-built large cruise ship, the Adora Magic City, was delivered in November 2023. It took eight years of research and five years of designing and construction. In January 2024, the massive Adora Magic City, resembling a modern city on the sea, completed its maiden voyage. The international media hailed it as a milestone for China's shipbuilding industry.

#### Nanohertz gravitational waves

Chinese researchers have found key evidence of the existence of nanohertz gravitational waves by using the Five-hundred-meter Aperture Spherical Radio Telescope, or FAST. Overseas media outlets called the discovery pivotal in understanding the structure of the universe and the behavior of supermassive black holes, paving the way for future exploration of gravitational waves.

#### Shenzhou aircrafts

China's space exploration efforts made significant strides in 2023. The crew of the Shenzhou-15 and 16 aircraft successfully met each other in China's Tiangong space station. The Shenzhou-16 mission also stood out for taking the first Chinese civilian astronaut to space. After a five-month stay in space, it returned to earth, passing the baton of space exploration to the Shenzhou-17.

Looking forward, we will see China making further strides to take its sci-tech self-reliance and strength to a higher level to support national development.

## Proposals Review

### STB Promotes Poverty Reduction in Rural Areas

With the 2024 Two Sessions about to commence, deputies to the NPC have gathered in Beijing to submit their proposals. What the delegates proposed in the previous Two Sessions and the changes they have brought will also be in the spotlight.

In 2023, NPC deputy Zhang Fusuo, a professor at China Agricultural University (CAU), put forward a proposal that remains highly relevant. Zhang called for prioritizing prevention and control of nonpoint source pollution in river basins and high-quality agricultural development. His proposal stemmed from his in-depth, hands-on work in Gusheng, a village in Yunnan province, where he set up a science and technology backyard (STB) with his colleagues.

In 2009, the CAU established the country's first STB in Baizhai in Hebei province. Under this model, agriculture postgraduates reside in rural areas for some time. They experiment with new rice or other planting technologies on farmland, teach farmers to use new technology, and help them resolve the problems encountered in farming.

STBs play a huge role in rural revitalization. Over the past two years, central departments have issued documents to support the construction of STBs in rural areas.

To date, more than 30 agriculture-related universities have established about 300 STBs, covering nearly 20 provinces and provincial-level regions. The Food and Agriculture Organization of the United Nations recognized it as one of the best poverty reduction practices.

This February, the STB was written into the No. 1 Central Document, encouraging more research institutions and experts to engage in this initiative.

Today, STB work not only includes agricultural advice for farmers, but also extends to more fields, like contributing solutions to pollution control, and conducting e-commerce training for beginners to grow their business.

With the STB entering a new stage, there is confidence that the efforts of the STB faculty and students nationwide will bring more changes, taking rural areas further ahead on the road to common prosperity.

### Dedication to Green Development

Green development has become a defining feature of Chinese modernization in the new era.

At the end of December 2023, China issued a guideline to promote a "Beautiful China." The goal is to improve the ecological environment fundamentally by 2035. This will be done by broadly adopting green ways of production and life.

To respond to climate change, a guideline was issued in April 2023 to establish a system of standards for achieving carbon peaking and carbon neutrality. Then in November 2023, before the United Nations Climate Change Conference in Dubai, it was followed by a plan to select 100 pilot cities and industrial parks to explore the path for carbon peaking, once again demonstrating the determination to handle this global issue.

Besides, China issued a roadmap

for biodiversity conservation (2023-30) to implement the Kunming-Montreal Global Biodiversity Framework, which urges all countries to halt and reverse biodiversity loss by 2030.

To improve the air quality, China issued an action plan emphasizing the development of a green and low-carbon circular economy system, and accelerating the green and low-carbon transformation of industries, energy and transportation.

To better leverage the role of technological innovation in green and low-carbon development, the country released an implementation plan to improve the market-oriented green tech-innovation system.

Thanks to these efforts, not only have the Chinese benefited from a bluer sky and cleaner water, but the rest of the whole world has benefited too from China's expanding green landscape.

## Service Guides

### Enhance Appeal to Foreign Professionals

China aims to promote people-to-people exchanges as well as cross-cultural exchanges. For that, several measures were implemented last year to make it easier for foreigners to work or reside in China. With the annual two sessions coming up, let's look at some of these efforts.

A recent measure is the National Immigration Administration announcing in January, 2024, five visa measures to facilitate the entry of foreign nationals for business, education and tourism. They include a provision that says eligible foreigners needing to visit China urgently can apply for a port visa on arrival.

From October 9, 2023, the service platform of the National Immigration Administration added more functions. Now foreign visitors can make their appointments and inquiries online. They can also carry out other functions re-

lated to visas and other documents online.

According to the National Immigration Authority, a new version of the foreign permanent resident ID is being used from December 1, 2023. It will make it easier for the cardholders to conduct their personal affairs online.

Also, China now has a mutual visa exemption agreement with Singapore. Singaporean citizens holding an ordinary passport can enter and stay in China visa-free for up to 30 days, and vice versa. This arrangement took effect on February 9 and a similar arrangement with Thailand starts from March 1, expanding the "visa-free era."

These initiatives underscore China's dedication to fostering a more inclusive and accessible environment for foreigners, promoting mutual understanding and facilitating international cooperation and development.

### Regulating BCI for Common Good

In 2022, NPC deputy Yao Dezhong, a professor at the University of Electronic Science and Technology of China proposed enriching brain-computer interaction to delay the process of Alzheimer's disease.

In recent years, brain and computer interface (BCI) technology, which creates information channels between the brain and external devices, enabling direct information interaction, has become a hot technology.

R&D in BCI technology gets strong support from the central department, which we can see from the series of guidelines issued to support future industries.

Its application mainly includes medical health, communication and entertainment, particularly improving motor and perceptual functions for patients with neurological disabilities.

The latest breakthrough in China was made in February by a joint research team led by Jia Wang, a professor at the Beijing Tiantan Hospital affiliated with China's Capital Medical University, and Tsinghua University Professor Hong Bo. They managed to use a minimally in-

vasive BCI to help a patient with high paraplegia move a computer cursor with thoughts.

This technology brings hope for people with disability and neurological diseases. However, it also raises ethical questions about the risks and caution should be exercised for its commercial use.

The Ministry of Science and Technology released a document in February 2024, which emphasizes that the research should primarily focus on restorative BCI technology and meet people's health needs. For non-medical purposes such as attention, sleep or memory regulation and other augmentative BCI, exploration and development should be conducted under strict standards and clear benefits.

The development of any new technology has its risks and hidden dangers. But to promote the progress of science and technology and make it benefit the people, the good side of science and technology and research ethics should always be emphasized, no matter where science and technology develops.

## 2024 Missions

### Space Industry Set for New Milestone

Looking ahead, China has several ambitious missions planned for the next decade. Starting with 2024, let's look at some major and challenging space exploration programs.

A major highlight is the Chang'e-6 mission, scheduled later this year. The goal is to bring back samples from the far side of the moon, a never-before accomplished feat.

The Chang'e-6 will also see notable international collaboration, as it will carry scientific instruments from foreign countries like France on its lander. The news outlet *Space Daily* said this level of international participation highlights the global interest in lunar exploration and the growing recog-

nition of China's capabilities in space missions.

The China Manned Space Agency has already announced that there will be four manned space missions this year: the cargo crafts Tianzhou-7 and Tianzhou-8 will be launched, as well as the manned spaceships Shenzhou-18 and Shenzhou-19. The upgraded Tianzhou-7, sent to Tiangong in January, marked China's first space station mission in 2024.

As more missions follow, they will not only enhance our understanding of space but also foster international collaboration, representing a significant step forward in the collective pursuit of exploring the final frontier.

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