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Xi, Putin Hail 'New Stage' of Ties in Beijing Meeting

Chinese President Xi Jinping and Russian President Vladimir Putin on Wednesday hailed a "new stage" in bilateral ties as they agreed to further extend a China-Russia friendship treaty and pledged to work together for a more just and equitable world order.

Putin's two-day state visit marked his 25th trip to China. Xi and Putin held talks, chatted over tea, visited a photo exhibition, and witnessed the signing of a slew of cooperation documents in Beijing.

Amid a fluid and turbulent international landscape, the two countries have developed a comprehensive strategic partnership of coordination for a new era based on equality, mutual respect, good faith and win-win cooperation, Xi noted during their talks.

Political mutual trust has further deepened, cooperation in trade, investment, energy, science and technology, and people-to-people and sub-national exchanges has steadily advanced, while the bonds between the two peoples have grown stronger, he added.

"The China-Russia relationship has entered a new stage of greater achievements and faster development," he said.

This year marks the 30th anniversary of the establishment of the China-Russia strategic partnership of coordination and the 25th anniversary of the signing of the China-Russia Treaty of Good-Neighborliness and Friendly Cooperation.

The treaty established by law the institutional foundation for long-term good-neighborliness, friendship and comprehensive strategic coordination between the two countries, according to the Chinese president.

Since it was signed, bilateral relations have achieved leapfrog development, Xi said.

As the two presidents agreed on the treaty's further extension, Putin said it has become increasingly relevant under current circumstances.

Putin said Russia-China relations have reached an "unprecedented level" through the joint efforts of both sides, characterized by close high-level exchanges and strong political mutual trust.

Russia-China relations have withstood tests and grown stronger over time, becoming a paradigm of comprehensive strategic coordination, he said. *See page 3*



Farmers harvest wheat with heavy machinery in Yichang, central China's Hubei province, on May 21, 2026. This day is also one of China's 24 solar terms, Grain Buds or "Xiaoman," a time traditionally dedicated to intensive farm work, cultural rituals, and seasonal wellness. (PHOTO: VCG)

STI Frontier

Xilingol Station: A Grassland Sentinel

By LU Zijian & WU Yefan

It is China's first long-term fixed-site research station for grassland ecosystems established in the temperate grassland region, situated in the Xilingol grassland in north China's Inner Mongolia autonomous region.

The cutting-edge Xilingol station is tasked with four major objectives, namely, observation, research, demonstration and service. Observation refers to the long term monitoring and data accumulation of water, soil, meteorological and biological elements of the grassland ecosystem, in order to reveal the long-term change pattern of typical grassland ecosystem in Xilingol.

Storing long-term observation data

The earliest soil sample in the Xilingol station's specimens bank dates back

to 2000, while plant specimens such as single-flowered tulips collected in this area in 1979 are also stored for research.

Bai Yongfei, a researcher at the Institute of Botany, Chinese Academy of Sciences (IBCAS) and director of the Xilingol station, said a long-term historical record is indispensable for analyzing the change of the entire grassland ecosystem.

Taking grassland degradation as an example, it is globally acknowledged that the ecosystem structure and function of a grassland will only deteriorate when humankind overuses the grassland for 20 to 30 years, or even longer. Therefore, it will be difficult to know what changes have taken place in the past decades without long-term and regular monitoring data.

Long-term and scientific observation data is the basis for conducting

ecological protection and restoration, Bai said, adding that their aim is for 100 years of data. In total, the Xilingol station has a soil and plant specimens bank covering 450 square meters, preserving 130,000 pieces of specimens from across the country.

Revitalizing grassland ecology

Another vital task of the station is research on ecological restoration technologies for degraded grasslands and demonstration areas for new technologies.

Wang Yang, an engineer of IBCAS and executive director of the station, said the station has established several experimental demonstration zones for comprehensive desertification control, restoration of degraded grasslands, rational utilization of natural pastures, and establishment of artificial grasslands.

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Biological Conservation a Mission Shared by All

By WANG Xiaoxia

May 22 is celebrated as the International Day for Biological Diversity (IDB). The 2026 theme, "Acting locally for global impact," underscores the importance of applying the whole-of-society approach. China's biodiversity conservation has become a nationwide endeavor where local actors such as communities, enterprises, public organizations and research institutions contribute innovative solutions under government guidance.

Digital empowerment

Xishuangbanna in southwest China's Yunnan province boasts one of the country's most well-preserved tropical

ecosystems.

On last year's IDB, the Xishuangbanna Biodiversity Platform was launched as the first digital platform in China with tropical biodiversity as its theme. It integrates the species record data contributed by researchers and nature enthusiasts in Xishuangbanna over the years. Currently, it displays 90,000 records of more than 15,000 species to the public, including more than 400 national protected species.

Digital technology is injecting strong impetus into biodiversity conservation.

For example, 4G and 5G infrared cameras installed in the Shennongjia Forestry District in central China's Hubei

province send images of the golden monkeys, an endangered species, and other wildlife activities in seconds; Wuhan is using underwater sonar and AI voiceprint technology to establish a "digital identity file" for endangered finless porpoises in the Yangtze River; and the Yellow River Delta Wetland Ecological Data Platform integrates over one billion pieces of data and can automatically generate assessment reports, realizing the whole process of monitoring, analysis and decision-making. These technologies have improved the ecological monitoring quality and enabled the public to participate in ecological protection.

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International Cooperation

Chinese Machinery Empowers Family Farming in Brazil

By GONG Qian

In northeastern Brazil, the China-Brazil Science and Technology Backyards (referred to as Residences in local Brazilian usage) on Family Agricultural Mechanization are transforming the landscape of local family farming.

The China-Brazil Science and Technology Backyards (STBs) established in capital city Brasília and Apodi municipality are not only emerging as a vital platform for agricultural cooperation, but also a testament to the deepening bond between the two peoples.

The Apodi STB was launched on November 13, 2024, as China's first STB in Brazil and even across Latin America, Professor Yang Minli from China Agricultural University (CAU), one of the initiators of the China-Brazil STB program, told *Science and Technology Daily (S&T Daily)*. Less than a month later, another STB was launched in Brasília.

This cooperation began in September 2021, when Brazilian representatives approached Yang to seek Chinese assistance in solving mechanization issues.

Yang was told that many Brazilian smallholder family farms still rely on very traditional methods. They cannot afford the imported large farm equipment, which is expensive, and Brazil lacks domestic manufacturers producing suitable small and medium-sized agricultural machinery. Yet, they produce about 70 percent of the food on Brazilian dining tables.

In 2024, CAU and some Chinese agricultural machinery enterprises, cooperated with the Brazilian government, universities, research institutions and farmer organizations to set up the two STBs in Brazil.

The primary mission of the CAU team is to address the needs of Brazilian smallholder family farming through actions like field surveys, technology promotion, and talent cultivation. Moreover, leveraging big data management systems jointly developed by CAU and Sinomach Digital Technology Co., Ltd., the STBs provide services like operation monitoring and production statistics, significantly enhancing precision management in local crop production. *See page 2*

WEEKLY REVIEW

China's 42nd Antarctic Expedition Concludes Successfully

China's polar icebreaker Xuelong 2 returned to Shanghai on May 18, marking the successful completion of China's 42nd Antarctic expedition. The 199-day mission navigated harsh ice conditions, extreme weather and frigid temperatures, collecting over 20,000 samples and 3,400 GB of data.

Significant Progress Made in 'Sun Chasing' Project

Chinese scientists are developing a space solar power station that could one day transmit energy to Earth or spacecraft. A major breakthrough has been achieved in the "Sun Chasing" (Zhuri) project, which has developed a wireless power transfer system for multiple moving targets. Tests showed 20.8 percent transmission efficiency over 100 meters, and the system successfully powered a drone flying at 30 km/h from a distance of 30 meters.

Joint Mission SMILE Satellite Launched

The Solar wind Magnetosphere Ionosphere Link Explorer (SMILE), a joint mission between the Chinese Academy of Sciences and the European Space Agency (ESA), was successfully launched on May 19 aboard a Vega-C rocket from Europe's Spaceport in French Guiana. The satellite was confirmed to have entered its planned orbit, with its solar arrays successfully deployed and systems functioning normally.

Humanoid Robots Conduct Live-streamed Package Sorting Operations

AI robotics company Figure AI has been livestreaming three humanoid robots sorting packages 24/7 in a U.S. logistics warehouse since May 14, operating nonstop without any shutdowns. The demo has run for five days, sparking online debate about automation in the workplace.

New Graphic

IN 2025

The total output value of
**China's BeiDou
Spatiotemporal Industry**
1.33 trillion RMB

Satellite navigation industry
629 billion RMB

9.24 Y-O-Y

Source: GNSS and LBS Association of China
Designed by SONG Ziyao / Science and Technology Daily

WECHAT ACCOUNT



E-PAPER



New AI Model-data Resonance Initiative Launched

Policy Express

Edited by TANG Zhexiao

To promote coordinated interaction and deep synergy between AI models and data resources, the Ministry of Industry and Information Technology (MIIT) and the National Data Administration (NDA) jointly issued a notice on launching the initiative of model-data resonance — the point where a theoretical model aligns perfectly with observed physical data.

The notice sets the target of forming a virtuous interactive cycle of model-data-scenario application by the end of 2026, and advancing high-level AI empowerment for new industrialization.

The initiative focuses on 20 key industry sectors, including steel, petrochemicals, non-ferrous metals, automobiles and aerospace. Through this initiative, the authorities aim to deliver a batch of AI application scenarios with high promotional value and strong technical feasibility, tackle key challenges in developing industry models, and construct a batch of high-quality datasets covering both general and specialized



Information collectors train embodied robots in the Fuzhou Software Park. (PHOTO: VCG)

industry knowledge.

Specific measures include cataloging industrial data resources by sector to develop high-quality datasets of general industry knowledge, and identifying and cultivating segmented AI appli-

cation scenarios with great application potential.

Other concrete measures include establishing an evaluation system for model capabilities tailored to industrial and specialized scenarios, building

model-data resonance zones, and selecting cities with solid AI industrial foundations and abundant data resources as key implementation hubs.

The notice encourages model-data resonance zones to achieve interconnection and interoperability with the national data infrastructure, facilitating efficient and credible data circulation among multiple participants. This will empower model training, intelligent agent R&D and industrial applications, and gradually transform the zones into intelligent agent factories.

The MIIT and NDA stated that they will strengthen overall planning and guidance. Preferential policies and project support will also be granted to regions and enterprises that deliver good results in implementing the initiative.

Meanwhile, local industry and information technology authorities, communications administrations and data management departments will enhance organizational support. They are expected to fully mobilize the support of various stakeholders, such as AI application enterprises, data service providers, model technology firms, and AI service vendors, by providing the necessary policy and financial backing for the initiative.

Case Study

Key Industries Get Tech Boost in Aksu

By TANG Zhexiao & LIANG Le

Qamgur (Brassica rapa L.), a unique medicinal and edible plant native to northwest China's Xinjiang Uygur autonomous region, has now been transformed into freeze-dried powder and compound beverages through sophisticated processing.

To protect the precious plants and keep them pest free, the services of a multi-rotor drone are used for crop spraying, with its output and efficiency far exceeding that of manual labor.

These technology-driven initiatives have become part of a vivid microcosm of industrial revitalization across the Aksu prefecture in Xinjiang.

In recent years, leveraging its distinctive competitive industries, Aksu has cultivated new quality productive forces in accordance with local conditions, promoted quality upgrading in traditional sectors and the rise of emerging industries, aiming to boost the regional economy.

Located on the northern edge of the Taklamakan Desert, Aksu's unique climate nurtures specialty agricultural products including qamgur and camel milk. Yet for years, inadequate deep-processing capabilities kept product added value low.

To overcome this challenge, local authorities have targeted enterprises as the primary drivers of innovation, essential to the upgrading of their agricultural processing industry.

A dairy company that settled in Kalpin county in 2021 has resolved longstanding difficulties of camel milk preservation and product quality through technological innovation. The company conducts strict testing on 115 indicators for fresh camel milk, and has independently developed a low-temperature spray drying system. This system retains 90 percent of active nutrients while extending shelf life.

Qamgur, the signature crop of Kalpin, has also been revitalized with innovation support.

Over six years, an agricultural technology company bred and purified two

premium varieties: pure purple-skin and white-skin qamgur. By supplying high-quality seeds and standardized breeding techniques, they established a planting base of 35,000 to 40,000 mu. The result was raising the incomes of nearly 12,000 farming households under an order-based model.

Meanwhile, using vacuum freeze-drying technology at minus 45° C, the company processes fresh qamgur into freeze-dried powder, developing a series of products that include sauces and drinks, adding substantial value to the product.

While advancing the upgrading of traditional industries, Aksu has actively embraced the low-altitude economy, allowing technology to empower a diverse range of sectors.

Based in the Agricultural Industrial Park of Kalpin, Xinjiang Sanhe UAV Research Institute Co., Ltd. has established localized drone production, filling a gap in the drone industry in southern Xinjiang and emerging as a flagship project for the local low-altitude economy.

Drone-based plant protection can reduce pesticide costs by 30 percent and increase crop yields by 10 percent to 15 percent. In addition, they are more efficient than manual labor.

Taking agricultural and forestry plant protection as its focus, the company has launched plant protection stations for cooperatives and provided professional training to address the lack of agricultural expertise among drone operators.

In the fire protection field, the company has developed a 120-meter high-altitude heavy-duty fire-fighting and extinguishing drone, with a maximum payload of 120 kilograms. By connecting with fire trucks, the drone enables uninterrupted delivery of foam fire extinguishing agent.

Looking ahead, Aksu will continue to strengthen its competitive industries, foster and expand new quality productive forces, and strive for more solid progress in high-quality regional economic development.

Official Evaluation Measures Unveiled for Carbon Goals

By YAO Yian & LIU Yuanyuan

China has recently issued comprehensive evaluation and assessment measures for its carbon peaking and carbon neutrality goals. Jointly issued by the General Office of the Communist Party of China Central Committee and the General Office of the State Council, the new measures aim to advance the country's dual control system for carbon emissions volume and intensity.

The measures will apply to the per-

formance reviews of all provincial-level local authorities starting this year. They will cover local governments' progress in meeting carbon peaking and neutrality targets, driving the comprehensive green transition of economic and social development.

According to the measures, during the 15th Five-Year Plan period (2026-2030), the National Development and Reform Commission, together with relevant departments, will formulate a carbon peaking action plan. Key targets include reducing carbon

emission intensity by more than 65 percent from 2005 levels, increasing the share of non-fossil energy consumption to 25 percent, and ensuring to peak both coal and oil consumption by 2030.

An indicator system consisting of five control indicators and nine supporting indicators has been established. The control indicators include total carbon emissions, carbon intensity reduction, total coal consumption, total oil consumption, and the share of non-fossil energy consumption.

The supporting indicators cover representative indicators from sectors including energy efficiency, industry, urban-rural development, transport, public institutions, and carbon emission trading, all of which play a supporting role in advancing carbon peaking and carbon neutrality.

"This indicator system not only highlights key priorities but also delivers comprehensive coverage, and it is both grounded in immediate realities and focused on long-term development," an official said, adding that the new measures set out systematic arrangements covering target decomposition, result evaluation, implementation procedures, monitoring and early warning.

In terms of target decomposition, the traditional top-down approach used

in the dual control of energy consumption has been replaced by a "combined top-level guidance and bottom-up initiative" approach. In accordance with unified national work requirements, all regions are required to study and propose targets and formulate action plans based on local conditions and actual circumstances.

In terms of result evaluation, the traditional "weighted value scoring" performance assessment model has been discarded. Instead, for each indicator, the performance shall be rated as "target met" or "target not met" and the final evaluation and assessment result shall be determined according to the compliance status of all indicators.

Regarding monitoring and early warning, the new measures mandate continuously improving the carbon emission statistical accounting system and establishing a dynamic monitoring and early warning system for key data.

Various carbon-related data types will be collected and processed and efforts will be focused on addressing data timeliness. Any problems or deviations in regional work should be promptly identified and proactively alerted to, ensuring the evaluation system's supervisory and guiding role is effectively exercised.



A wind farm in the Inner Mongolia autonomous region. (PHOTO: XINHUA)

MINEFILL 2026: Driving Sustainable Mining Through Green Backfill

By LI Linxu, ZHAO Yue & WEI Liyun

Themed "Minefill for Sustainable Mining Tomorrow," the 15th International Symposium on Mining with Backfill (MINEFILL 2026) was held in Beijing from May 17 to 20.

Focusing on cutting-edge industry trends and key technical needs, more than 300 representatives from 16 major mining countries gathered to exchange research findings and explore future directions for backfill mining technology.

Since its inauguration in 1973, the symposium has evolved into a premier global academic event in the field of mining with backfill, serving as an important platform for pooling industry expertise, guiding technological innovation, and promoting international exchange and cooperation.

In his opening address, Jia Mingxing,

chairman of the Nonferrous Metals Society of China (NFSoc), said backfill mining technology has become a key pillar for ensuring safe, green, and efficient mining operations. In recent years, China has achieved remarkable breakthroughs in backfill mining processes, equipment, and applications. The symposium provides a high-level platform for academic exchange and industrial cooperation, aiming to promote the deep integration of new technologies such as AI and digital twins with backfill mining.

Han Long, chairman of the BGRIMM Technology Group, hoped the participants would use the symposium to deepen exchanges, build consensus, and work together to advance global backfill mining toward greener, smarter, and more efficient development. BGRIMM, serving as a technology development base for China's mineral resource development and utilization,

has established a number of international cooperation platforms and taken the lead in formulating multiple international standards, national standards, and industry standards in backfill mining.

Maureen McGuinness, chair of the Minefill Symposium Committee, said the symposium held in China once again after 22 years was profoundly significant. She urged the attending experts and scholars to fully leverage the high-level platform to share cutting-edge research findings, deepen the exchange of technical expertise, and jointly drive innovation in backfill mining technologies to advance the sustainable development of the global mining industry.

Guo Lijie, chair of MINEFILL 2026 and professor of BGRIMM, viewed the symposium as a vital global platform for technical exchange and innovation cooperation in the field of backfill mining.

The successful hosting of MINEFILL 2026 highlighted the international influence and competitiveness of China's mining industry in the global backfill mining sector.

Besides keynote speeches, the symposium featured 10 technical sessions on frontier research and critical engineering challenges in backfill mining. The topics included new technologies and equipment, geomechanics and geotechnical aspects, rheological characteristics and testing methods, integrated planning and management, and case studies.

The symposium, jointly organized by the NFSoc and the BGRIMM Technology Group, also hosted short courses, technical exhibitions, and industry-university-research matchmaking activities, providing a comprehensive international platform for academic exchange and industrial collaboration.

Chinese Machinery Empowers Family Farming in Brazil

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"Local farmers speak highly of it: it is high-efficient, labor-saving and highly practical," Yang said.

The benefits were particularly evident during harvesting and land preparation, according to Muhammad Mateen, a PhD student at CAU and a member of the program. Mateen recalled visiting Alcione, a farmer who grows vegetables and beans with her husband. Getting their plot ready, especially during planting, used to be a very time-consuming job for the couple.

After being shown a walking tractor, a versatile machine especially suitable for small farms, Alcione was eager to learn how to use it. The Chinese machine changed her routine, reducing labor cost, saving time, and directly increasing crop yields.

"What touched me most was her sense of empowerment. She even planned to take out a loan to purchase Chinese agricultural machinery," Mateen

said. "This is the impact we want to achieve through the China-Brazil STB program, enabling small farmers, especially women, to access affordable technology."

Chinese machinery has brought tangible benefits. Farmers growing cilantro and lettuce have seen their household incomes rise by 80 percent to 90 percent. The seed usage for corn dropped by roughly 50 percent, while expected yields increased by 40 percent.

So far, 15 Chinese enterprises have provided 62 small and medium-sized agricultural machines and more than 60 sets of big data equipment across Brazil, serving over 1,000 family farming households.

"Cooperating with Brazilian farmers feels like being with family," Yang added. "Their passion and eagerness make us determined to keep moving forward."

The Rural Social Technology Service Center of China Association for Science and Technology (CAST) contributed to this article.



Employees harvest at a digital agriculture plant factory in Aksu prefecture, northwest China's Xinjiang Uygur autonomous region. (PHOTO: XINHUA)

Blocking Chinese EVs Hurts the U.S.



By LIANG Yilian & ZHANG Mengran

Recently, the U.S. has taken new action targeting China's automotive industry. More than 70 Democratic members of the House of Representatives cosigned a letter to President Donald Trump on April 28, citing the need to protect national security, data and American jobs, and urging the administration to block Chinese automakers from building factories or selling vehicles in the U.S.

This move is not an isolated political gesture, but rather part of a recurring pattern in U.S. trade and industrial policy in recent years: continuously expanding the definition of national security to build trade barriers, and using non-market means to suppress industries in which China holds a clear competitive advantage.

Washington's campaign to contain China's new energy vehicle (NEV) industry has gradually intensified, becoming a highly discriminatory policy framework. In 2024, through its review of Section 301 tariffs on China, the U.S. raised tariffs on Chinese electric vehicles (EVs) to 100 percent, while also imposing additional duties on key components such as lithium batteries and critical minerals. This move effectively shut the door on direct Chinese EV exports to the U.S.

In January 2025, the U.S. Department of Commerce introduced new regulations that packaged technological restrictions as compliance reviews. Citing "supply chain security," the rules imposed bans on Chinese-linked in-vehicle hardware, autonomous driving technologies, and connected software entering U.S. supply chains. Essentially, this serves as a textbook example of protectionism and economic coercion.



Visitors view the Geely Starray EM-i electric vehicle, April 28, Paris, France. (PHOTO: XINHUA)

The latest congressional letter is clearly intended to further institutionalize this pressure campaign. By targeting issues such as corporate ownership, technology origins and third-country market access in advance, lawmakers are seeking to systematically block any possibility of Chinese automakers entering the U.S. market through localization strategies or indirect channels.

The logic behind this expanding net of restrictions — from trade barriers and technology blockades to domestic market exclusion — is clear: the real objective is not addressing evidence-based security risks, but preserving the U.S. industrial dominance.

Washington has repeatedly claimed that connected vehicles could become "mobile data collection devices" that threaten national security, yet it has consistently failed to present convincing evidence to support such allegations. For

their part, Chinese automakers have repeatedly expressed their willingness to comply with local data-security and regulatory requirements and to cooperate on cybersecurity matters. However, the U.S. response has largely remained confined to broad political suspicion, with little constructive engagement.

Claims about "protecting jobs" or "preventing tariff circumvention" are familiar protectionist rhetoric. What truly unsettles Washington is the Chinese NEV companies' comprehensive advantage in areas such as battery technology, intelligent connectivity, and supply-chain integration. Rather than competing fairly, shutting the door whenever competition becomes difficult exposes the hypocrisy behind the U.S.' long-proffered commitment to free markets and fair competition.

The consequences of Washington's escalating blockade strategy are likely to

be far-reaching. Such barriers deprive Chinese companies of the opportunity to compete fairly in the U.S. market. Yet in the longer term, Chinese automakers have already diversified their global market presence. Despite being blocked from the U.S. market, China's technological and cost advantages will continue to gain traction in Europe, Southeast Asia and Latin America. The broader trajectory of the industry is unlikely to be reversed.

For the U.S., however, short-term protectionism may come at a long-term cost. Shielding domestic industries from competition risks weakening market dynamism, slowing innovation, delaying product upgrades and ultimately increasing costs for American consumers. More broadly, continually raising supply-chain barriers will further fragment global industrial networks, undermining the widespread adoption of new energy vehicles and slowing the pace of the global green transition.

History has repeatedly shown that weaponizing national security and politicizing industrial competition opens a Pandora's box that eventually backfires. NEVs are crucial to the global green transition, and their success depends on openness, cooperation and fair competition. Turning away from market principles in favor of protectionism will neither halt the rise of Chinese automakers nor strengthen America's long-term competitiveness. Instead, it risks eroding the U.S. industrial credibility and leaving the country increasingly passive in the next wave of global industrial transformation.

Isolation and exclusion offer no sustainable path forward. Only through healthy competition that drives technological progress and open cooperation that integrates global resources can the world achieve sustainable industrial development and meet the demands of the green transition.

Voice of the World

China's IP Protection Defines Innovation Landscape

Edited by QI Liming

In 2025, an impressive 972,000 new invention patents were granted in China, making the country the first in the world to have over five million valid invention patents.

Currently, China holds approximately 60 percent of global AI patents and about two-thirds of robot-related patents. From the leading performance of general models such as DeepSeek to autonomous navigation robots surpassing the world record for men's half-marathon, the vigorous development of AI is underpinned by strong intellectual property (IP) protection.

Travel And Tour World website called China surpassing five million valid invention patents a historic milestone demonstrating its leadership in technological innovation and IP protection. As China continues to bolster its global IP dominance, it will play an even more crucial role in shaping the future of global technology and intellectual property standards. The world is watching closely as China's patent ecosystem redefines what it means to be an innovation powerhouse in the 21st century.

Wang Binying, deputy director general of World Intellectual Property Organization (WIPO), said that in recent

years, China has closely integrated IP rights with high-quality development and new quality productive forces, providing valuable experience for global IP governance. WIPO is ready to deepen cooperation with the Chinese government and various partners in areas such as IP capacity building, coordination of rules in frontier fields, and empowerment of small and medium-sized enterprises to improve the global IP ecosystem and enable more countries and people to benefit from innovation achievements.

Salvatore Majorana, president of the International Association of Science Parks and Areas of Innovation, said IP protection remains a key issue in international sci-tech cooperation. China has made significant progress in this area and there is great potential for IP cooperation between China and Italy, as well as between China and Europe.

Peter David Lund, a foreign academician of the Chinese Academy of Engineering, said that China has continuously increased its investment in science and technology, and has achieved remarkable progress. With its solid talent reserve and efficient technology transfer capabilities, China is in the forefront of global sci-tech innovation, and China's sci-tech development is of great significance for all countries.



At the headquarters of the WIPO in Geneva, Switzerland, people visit the "China (Guangxi) Geographical Indication Products Exhibition," November 2025. (PHOTO: XINHUA)

Opinion

Chinese Large Models Lead Global Innovation

By QI Liming

Recently, "agents" and "tokens" have gained popularity, especially in open-source AI projects, where they are giving rise to new business models and market opportunities. As this technological trend continues, China's large model technology has made exponential progress and its applications are rapidly expanding. This is refreshing the intelligent economy and gradually becoming the cornerstone of global innovation.

As a driving force behind the current technological revolution and industrial transformation, AI stands at a crucial development juncture. For example, in terms of programming capabilities, AI demonstrates significant potential for application in code design, writing, testing, and deployment. In some knowledge-based tasks, it can even reach the level of human experts, prompting industry predictions that AI will further boost societal productivity in the foreseeable future and become a reliable assistant in people's work and life.

Yang Zhilin, founder and CEO of Moonshot AI, said that China's Internet and digital economy have a huge number of users and diverse application scenarios. These advantages have continued into the AI era. In March this year, the average daily token calls in China exceeded 140 trillion, growing

more than 1,000-fold in two years, while the number of generative AI users exceeded 600 million, with a penetration rate of 42.8 percent.

More importantly, China has already produced a number of self-developed large models that can rival the world's best, becoming an indispensable variable in AI innovation. The rise of Chinese large models is reflected not only in quantity, but also in multiple aspects such as quality, application depth and global influence.

In 2025, China's open-source models topped the global download charts. The new technology not only enables a wider range of domestic chips to be effectively used for large model inference, but also reduces the overall operating cost of large models.

A large number of Chinese open-source models are becoming the "benchmark" in global model evaluation and an important sample for overseas research institutions.

The homegrown large model Kimi, for example, has gained a foothold in the global market due to its high cost-effectiveness. It has become a "productivity tool" for many overseas developers and users, with a significant increase in paid usage volume and other metrics. Chinese open-source models can be widely applied and subsequently form an ecosystem.

AI LOOK Robot Helps Visually Impaired 'See'

Hi-Tech

By Staff Reporters

A robot that assists the visually impaired with daily movement in a range of environments, using fully autonomous guiding technology, has been developed by the Shandong Zhuge Robot Co., Ltd.

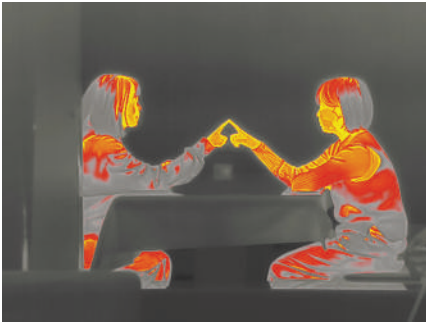
The company spent six years on intensive R&D to perfect the robot, named AI LOOK.

Powered by advanced multi-sensor fusion technology, AI LOOK is capable of autonomous navigation and intelligent obstacle avoidance without requiring map scanning or remote control. Designed for both indoor and outdoor environments, it effectively addresses two of the most pressing challenges faced by visually impaired individuals: mobility and object recognition.

"The core competitiveness of the AI LOOK robot lies in our pioneering multi-sensor fusion 'neural perception network,'" Zhao Chong, chief technology officer of Shandong Zhuge Robot

Co., Ltd., said. "The system integrates data from seven types of high-precision sensors, including LiDAR and depth cameras, enabling real-time 360-degree environmental modeling with no blind spots. Combined with our self-developed pedestrian-path visual large model, the robot achieves a 99.7 percent accuracy rate in recognizing traffic

signs, precisely measures obstacle distances, and independently plans the safest and most efficient travel routes for users," Zhao said.



In a completely dark environment, diners try to make contact by touching fingertips. (PHOTO: XINHUA)

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Practical cooperation

Reaffirming the enduring ties, Xi said unswervingly promoting the long-term, sound, steady and high-quality development of the China-Russia relationship is a strategic choice by the two sides based on the fundamental interests of the two countries and the global trends.

He said both countries should upgrade practical cooperation in trade, investment, energy, transportation and scientific and technological innovation, expand cooperation in frontier fields, and foster new growth drivers.

According to China's Ministry of Commerce, trade between the two countries exceeded 200 billion USD for the third consecutive year in 2025. China has remained Russia's largest trading partner for 16 years in a row.

Xi also called on both sides to carry forward the traditional friendship between the two peoples, expand exchanges

in education, culture, film, tourism and sports, and strengthen public support for friendship.

This year marks the launch of the China-Russia Years of Education, which is the 10th national theme year of the two countries. The two presidents attended the opening ceremony on Wednesday.

Xi and Putin also signed and issued a joint statement on further strengthening comprehensive strategic coordination and deepening good-neighborliness and friendly cooperation.

On the same day, Chinese foreign ministry spokesperson Guo Jiakun announced that China has decided to extend the visa-free policy for Russian citizens to December 31, 2027, in a move to continuously facilitate personnel exchanges between the two countries.

More just, equitable global governance system

As permanent members of the UN

Security Council and major countries of the world, China and Russia should adopt a strategic and long-term perspective and work to make the global governance system more just and equitable, Xi told Putin.

Xi called on both sides to deepen multilateral coordination, strengthen cooperation on multilateral platforms, firmly uphold the post-war international order and the authority of international law, unite the Global South, and steer reform of the global governance system in the right direction.

The two leaders also exchanged views on major international and regional issues.

On the situation in the Gulf region in the Middle East, Xi said all hostilities must cease immediately, adding that an early end to the conflict would help ease disruptions to energy supplies, industrial and supply chains, and the international trade order.

In a volatile international landscape, Russia-China cooperation serves as an important stabilizing factor, Putin said.

He added that Russia is ready to continue strengthening multilateral coordination with China, support China in hosting the APEC Economic Leaders' Meeting, jointly enhance the status and influence of the Shanghai Cooperation Organization, and strengthen unity and coordination within the BRICS mechanism.

Putin also vowed to work with China to safeguard the authority of the UN, champion the diversity of civilizations, and promote a more just and equitable international order.

During Putin's visit, China and Russia also issued a joint statement on advocating a multipolar world and new type of international relations.

Source: Xinhua

4

LIFE IN CHINA

Henry Curran: Making Science Accessible to All

Dialogue

By LONG Yun & BI Weizi

"Always ask why," advises Irish scientist Henry Curran. It's the advice he gives to young people who want to become scientists. And it's the same curiosity that has guided his own career, from developing the chemical mechanisms that help measure fuel performance, to working with Chinese researchers on low-carbon solutions for the future.

Curran directs the Combustion Chemistry Center at the University of Galway in Ireland and is an honorary professor at Northwestern Polytechnical University in China. Recently, he gave *Science and Technology Daily* insights into his research and cooperation with Chinese colleagues.

Promoting energy efficiency
Curran became increasingly interested in chemistry as he progressed along his academic journey. One of his most significant contributions to the field is the development of mechanisms for the primary reference fuels, heptane and isooctane. These fuels are essential to the gasoline and diesel industries, as they serve as benchmarks for determining their octane ratings. The octane rating indicates how well a fuel can resist engine knocking or detonation, a process that can damage the engine.

His work on these mechanisms has helped the combustion academic community simulate primary reference fuels, understand the chemistry of gasoline and diesel fuel oxidation, and predict emissions. This contributes to reducing particulate emissions and eventually improving air quality. According to a 2025 research summary from the University



of Galway, Curran's team has developed a new set of compact chemical reaction models that can accurately simulate the combustion behavior of low-carbon fuels such as hydrogen and ammonia, an area he is interested in developing.

Additionally, research is being done on capturing carbon dioxide emissions and using them in combination with hydrogen to produce fuels, creating a sustainable cycle of energy generation.

Curran sees combustion research as having an important role in the field of advancing space exploration. Detonation engines are being developed, which rely on a better understanding of combustion chemistry to improve their performance. By better controlling combustion, more powerful and efficient engines can be generated that can be used in space exploration.

Unlocking the secrets of science
Despite the importance of his research, Curran recognizes the significance of making science more accessible to the general public. He believes

science outreach programs are crucial, especially for young people. He attaches great importance to the power of "peer influence," adding that younger students should be engaged with and taught by both undergraduate and graduate students, who can act as role models and inspire them to pursue careers in science. Furthermore, Curran emphasizes the importance of female professors and role models for young girls, encouraging them to see that science is a field for everyone.

Curran notes that there are effective ways to engage and inspire the public's interest in science. He cites the example of Space Day of China, an activity to popularize science, where children's paintings of space and astronauts are displayed outside lecture halls. According to him, the paintings inspired and engaged the public, particularly young people, showing that science can be vivid and inspiring.

Curran encourages scientists to continue to engage with the public in

similar ways, highlighting the importance of making science accessible and relatable to everyone. For young people who aspire to become scientists, he said a thirst for knowledge is a key attribute for scientists and noted that young people could unlock the secrets of the universe and make a positive impact on society by constantly asking questions and seeking answers.

An 'energetic' and 'forward-looking' country

In terms of international collaboration, Curran recalled some wonderful times working with scientists and students from China in his Irish lab. He emphasized the importance of collaboration among scientists worldwide to advance knowledge and improve the world.

This Irish scholar is intrigued by China's advancements in science and technology, mentioning that this country left an impression of being "energetic" and "forward-looking." He applauded China's impressive progress in combustion and flame research, noting an increase in the quality of research papers from Chinese scientists.

In early 2026, Curran received the Chinese Government Friendship Award, an honor that followed his earlier International Cooperation Award from the Chinese Society of Engineering Thermophysics.

When talking about how to promote effective and efficient international cooperation, Curran called for more exchange programs and resources to support joint study. While some challenges still exist, increasing support is being given to foster international cooperation, and cross-border collaboration in terms of sharing knowledge is critical to finding solutions to these complex challenges, he said.

served to enhance the efficient use of land. During the Ming and Qing dynasties, farming practices became more refined and a rich variety of millet emerged, adapted to suit different regional environments and climatic conditions. Meanwhile, the accumulated technical expertise was systematically codified.

Millet cultivation has also profoundly influenced global food systems. Over 3,000 years ago, dryland farming systems centered primarily on millet spread from China's Yellow River Basin to the Korean Peninsula, various parts of Southeast Asia, the Indian subcontinent and the Eurasian steppe, reaching as far as Eastern Europe.



A display of carbonized foxtail millet seeds (6,800- 4,800 years old) at the Shaanxi Archaeology Museum in Xi'an. (PHOTO: VCG)

Offering a Chinese solution

Since its establishment in 1979, the Xilingol station has made several breakthroughs, which have been applied in many other grasslands.

For example, the technique of suspending grazing during the spring regrowth period is a conservation measure implemented during the critical growth phase of spring pastures. Its purpose is to allow the grassland to rest and recover, thereby promoting healthy regrowth of forage and the restoration of the grassland ecosystem.

This measure was first promoted by the Xilingol station, and has since been used in Inner Mongolia autonomous region, Qinghai province, and Xizang autonomous region.

In addition, achievements like the technical system for rational grassland utilization, combining enclosure and

grazing moratorium with delayed grazing and zoned rotational grazing, have also effectively promoted the synergistic enhancement of grassland productivity and ecological functions. This has provided crucial scientific and technological support for the construction of China's northern ecological security barrier.

In recent years, several new modes of optimizing grazing ecosystem management, proposed by the Xilingol station, have been recognized internationally. In 2022, three degraded grassland restoration models from the Xilingol station — including the management of desertified grasslands, the establishment of perennial artificial grasslands and rotational mowing of hayfields — were selected as three of the 10 restoration good case studies from key vulnerable ecosystems in China, published by the United Nations Environment Programme.

Tech+Culture

Zhongcun Site Unlocks Xia Dynasty Secrets

By HAN Rong & BI Weizi

Lying dormant beneath the ground in Xiyang county for over 3,800 years, the Zhongcun site has now been selected as one of China's "Top 10 New Archaeological Discoveries of 2025." Located in Jinzhong city, Shanxi province, it features the largest known single-chambered aristocratic tomb from the Xia Dynasty. Excavations have yielded rare artifacts from distant regions, including scallops from the Yellow and Bohai Seas, cinnabar from the Hunan-Guizhou area, and turquoise from the eastern Qinling Mountains. These discoveries fill a gap in Xia and Shang Dynasty archaeology on the western foothills of the Taihang Mountains and have revolutionized academic understanding of the hierarchical structure of Xia Dynasty tombs and the broader civilizational landscape.

According to Fan Wenqian, director of the Shanxi Provincial Institute of Archaeology, a total of 18 tombs were excavated at the Zhongcun site, including six high-status noble tombs from the late Xia Dynasty and 12 small tombs from the Warring States period. The most striking discovery is the large Tomb M10, covered an area of 46.2 square meters.

The primary occupant was a man over 56 years of age, whose body was entirely coated in cinnabar, with a scallop shell placed atop his head and a turquoise plaque buried on his left side — a level of ritual grandeur unprecedented in the region. In contrast, female burials featured only partial cinnabar application and no other valuable artifacts, reflecting the mature ritual system of a patrilineal aristocratic society.

A systematic survey of the Songxi

River basin and neighboring areas by the archaeological team confirmed that the Zhongcun site served as a regional political center independent of the Xia Dynasty's core ruling area, situated within the core zone of the Dongtaobao culture. The noble tombs discovered here represent the highest-ranking remains within this culture.

Multidisciplinary scientific archaeology played a crucial role in decoding the mysteries behind the Zhongcun site excavation. DNA research reveals that the Zhongcun population primarily belonged to the ancient Central Plains people, with a small proportion exhibiting characteristics of the ancient Mongolian Plateau people. The site has been confirmed as a patrilineal family cemetery, and the occupants of the high-status tombs M9 and M10 share a father-son kinship.

Isotopic dietary analysis indicates that the primary subsistence pattern was millet-based agriculture. Sulfur isotope analysis traces the origin of cinnabar to the Wanshan region of Hunan and Guizhou, while turquoise comes from Luonan in the eastern Qinling Mountains of Shaanxi, and scallop shells originate from the Yellow and Bohai Seas. Cinnabar from the south, turquoise from the west, and shell ornaments from the east converged here across thousands of kilometers, clearly outlining the Xia Dynasty's resource circulation network that spanned north to south and connected east to west. Research suggests that these luxury goods were first concentrated in the core area of the Erlitou Xia Dynasty, then distributed to local regions through allocation and exchange, reflecting the Xia Dynasty's firm control over key resources.

Millet: Original Chinese Staple

Traditional Eastern Wisdom

By BI Weizi

Contrary to what many may think, millet — commonly known as guzi — is China's oldest and most important staple crop, predating rice. Millet-based agriculture played a seminal role in the genesis of Chinese civilization.

Around 10,000 years ago, evidence of early domesticated millet grains first appeared at the Donghulin site in Beijing. By 7,000 to 5,000 years ago, millet had become the primary staple food in regions associated with the Yangshao culture in the middle reaches of the Yellow River. This marked a transition where formal agriculture replaced hunting and gathering as the dominant mode of subsistence.

During the Xia, Shang, and Zhou dynasties, millet held the highest status

among the "Five Grains," which included soybeans, foxtail millet, broomcorn millet, wheat, and rice. It formed the bedrock of the national food supply and was central to ritualistic practices. Advancements in cultivation techniques emerged, such as deep ploughing, thorough harrowing to pulverize the soil and conserve moisture, timely sowing, and rational close planting. Furthermore, the practice of selecting superior seeds based on grain quality began during this era.

During the Qin and Han dynasties, sophisticated farming practices were fully established, and comprehensive systems for drought resistance and moisture conservation were developed. Autumn ploughing became standard agricultural practice. *The Quzhong Method*, also known as the *Pit-Field Method*, was invented, a high-yield, intensive farming technique focusing on maximizing land use in small, localized pits. It utilizes concentrated, heavy fertilization and close planting to significantly increase

yields per unit area, even on poor land. The agricultural treatise *Fan Shengzhi Shu* systematically summarized millet cultivation techniques, and a dedicated official, the commissioner for grain procurement, was appointed to oversee grain production.

During the Wei, Jin, and Northern and Southern Dynasties period, the monumental agricultural compendium *Qimin Yaoshu* devoted its most extensive section to documenting 86 distinct millet varieties. Crop rotation featured as the core technical principle in this work, which explicitly stated that "millet fields must be rotated annually" and identified mung beans and adzuki beans as optimal preceding crops. This established a complete and systematic rotation model.

The cultivation of wheat expanded during the Song and Yuan dynasties, leading to a decline in the importance of millet. However, intercropping and relay cropping, which involved combining millet with wheat, legumes or vegetables,

Xilingol Station: A Grassland Sentinel

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It has conducted R&D on technologies such as wind erosion prevention and control in desertified grasslands, rotational mowing and fallowing of hayfields, rotational mowing and grazing of pastures, and comprehensive management of saline-alkali grasslands.

An experimental demonstration zone for restoring shrub-dominated grasslands was established 70 kilometers north of Xilinhot city. Over the past seven years, researchers at the Xilingol station have sought answers to three questions: what caused the shrub domination, whether the process can be reversed, and how to restore it.

Through continuous attempts, the

researchers found effective ways to reverse the shrub domination. Shrubs are insensitive to water and fertilizer, whereas grasses absorb and utilize water and fertilizer quickly, Bai said, adding that the scientific increase of water irrigation and fertilizing can effectively promote the growth of grass and restrain the expansion of shrubs.

With ongoing intervention, the demonstration zone has grown abundant grass again. "We are currently compiling our findings on water and soil restoration techniques and conducting small-scale demonstrations. At the same time, we have proposed a 'high-intensity, short-cycle' grazing method to curb shrub growth," Bai said.

Biological Conservation a Mission Shared by All

From page 1

Community model

The Leyi Habitat Garden, Shanghai's largest community habitat garden, used to be an abandoned public space, but has been transformed into an ecological haven. It hosts 129 plant species, 36 bird species, over 30 insect species, and four mammal species, including nationally protected animals and birds such as the raccoon dog, crested goshawk, and kestrel.

It has a special governance model — government funding, expert design, and resident autonomy. A volunteer team nicknamed the "F4" (four retired residents) leads the daily maintenance work, while the adjacent 600-square-meter Habitat Museum serves as an educational and cultural hub.

The garden gained international acclaim when it was selected as one of the "100+ Typical Global Cases of Biodiversity" at the 15th meeting of the Conference of the Parties to the Convention on Biological Diversity (COP15) in Kunming in 2021.

Shanghai's 15th Five-Year Plan (2026- 2030) includes recommendations for construction of habitat gardens to provide habitat corridors for urban wildlife, integrating ecological functions and community recreation.

Enterprises' role

Chinese enterprises are creating a series of innovative and effective solutions to address ecological issues with cutting-edge technologies.

The Sinopec Zhenhai Refining & Chemical Company (ZRCC) demonstrates how heavy industry can coexist with nature, and was featured as a case

study at COP15. To protect local egrets, the company nurtures a 2,200-square-meter native wetland within the industrial zone. The pipelines are adjusted, and high-noise construction is halted during the egrets' breeding season.

Over the past two decades, the ZRCC has expanded its annual crude oil processing capacity fourfold into a world-class coastal refining and chemical base. Meanwhile, the number of egrets has increased from a few hundred to over 5,000.

Since 2012, the Egret Garden of ZRCC has been open to the public, and in 2022, the world's first egret live-stream platform "I- EGRET" was launched.

Additionally, the China National Petroleum Corporation has established 12 self-contributing biodiversity conservation areas over approximately 49 square kilometers, where the enterprise voluntarily utilizes its own land or sites to carry out biodiversity protection and management.

Some leading enterprises like new energy vehicle manufacturer BYD are leveraging their technology and platforms in global ecological governance.

In January, BYD partnered with UNESCO to launch the third season of the "Light Chaser Program." This program organizes in-depth scientific investigations in key ecological areas such as the Northeast Tiger and Leopard National Park and the Dongting Lake Wetland in central China to grow replicable protection plans. All collected data is uploaded to UNESCO's open database, making it freely accessible to global researchers.