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China Contributes to Global AI Governance

By Staff Reporters

The four-day 2026 World AI Conference and High-Level Meeting on Global AI Governance, concluding in Shanghai on June 20, explored ways to promote equitable and inclusive development of AI.

Facing the widening global AI divide and an escalating deficit in global governance, China is committed to working with all parties to improve global AI governance, develop AI for the positive and for good and benefit all.

A consensus-based global governance framework
As AI development impacts all nations, global governance in this field requires broad international participation. However, the current landscape is increasingly characterized by fragmentation and a lack of effective communication and coordination.

From proposing the Global AI Governance Initiative and establishing the Group of Friends for International Cooperation on AI Capacity-building, to releasing the Global AI Governance Action Plan, China acts on the vision of extensive consultation and joint contribution for shared benefit. It takes the U.N. as the main channel, and promotes a consensus-based global governance framework and standard norms to ensure AI remains safe, reliable and controllable, while guaranteeing that all countries share AI dividends.

Bridging the digital divide
Current global AI development remains unbalanced, with the AI divide between the Global North and South continuing to widen.

China is actively supporting Global South countries in AI capacity building, bridging the digital and AI divide while promoting sustainable development.

Over the next five years, China will provide developing countries with 5,000 opportunities for AI training and seminars. It will develop international AI application cooperation centers with ASEAN, the League of Arab States, the African Union, the Community of Latin American and Caribbean States, the Shanghai Cooperation Organization and BRICS. It will also help 30 countries utilize the AI-powered MAZU meteorological early warning system.

As the world's most active and fastest-growing supplier of large models, China continues to advance open-source initiatives. *See page 4*



A Gravity-1 carrier rocket carrying nine satellites blasts off from waters off the coast of Shanghai, east China, July 22, 2026. The Taiyuan Satellite Launch Center launched the commercial rocket at 10:54 a.m. (Beijing time), placing the nine satellites into their designated orbits. (PHOTO: XINHUA)

Jointly Advancing AI for Shared Prosperity

Edited by QI Liming

In covering the 2026 World AI Conference and High-Level Meeting on Global AI Governance, multiple international media outlets reported that global AI technological innovation has entered an unprecedented period of vitality. China is driving technological advancement, bridging the digital and AI divide, and improving global governance. This has injected momentum into promoting AI development that is positive, ethical, and beneficial to humanity.

Luigi Gambardella, president of the ChinaEU Digital Association, has long focused on the digital economy and Sino-European technological cooperation,

with particular attention to AI development in recent years. He said China's comprehensive manufacturing system, vast market size, and rich application scenarios provide crucial support for bringing AI technologies from the lab to industrial settings. "The development practices of AI in China have provided an important example for the world on how to transform technology into industrial capabilities," he said.

Driving public services
The Sun newspaper of Nigeria reported, "One of the prominent features of China's sci-tech innovation lies in the close integration of scientific exploration and industrial application." AI is particularly typical of this feature. China's AI is

accelerating its integration into various fields such as manufacturing, healthcare, transportation, education, agriculture, logistics and urban management, serving as a driving force for enhancing productivity in multiple sectors and improving public services.

Mexican newspaper *La Jornada* said China is promoting the acceleration of AI technology application on a large scale, making it a "fundamental technology for empowering the real economy." While accelerating the development of the AI industry, it said China also attaches importance to AI's global governance, advocating that AI develops in a direction beneficial to human well-being.

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International Cooperation

Smart Logistics Hub Bolsters Sino-CEEC Connectivity

By WANG Xiaoxia

In the small Hungarian town of Vac, about 35 kilometers north of Budapest, a huge warehouse operates with just a handful of staff on site. Among nearly 20-meter-high automated racks, robots shuttle back and forth, handling retrieval, transport, and sorting with seamless efficiency.

This facility, part of the Vac Smart Fulfillment Center, is one of the largest and highly automated public smart warehousing complexes in Central and Eastern European Countries (CEECs). It also serves as the region's flagship intelligent warehouse dedicated to Chinese cross-border e-commerce enterprises, including Temu, AliExpress and SHEIN.

The 33,000-square-meter warehouse is equipped with nearly 700 robots. It has storage capacity for 20,000 European-standard pallets and 110,000 bins for small goods, and can sort up to 150,000 parcels per day. Behind this high-efficiency operation lies a continuously running intercontinental logistics corridor.

The Fulfillment Center is part of the Central European Trade and Logistics Cooperation Zone (CECZ). Situated adjacent to a major highway with a railway line running directly into the logistics park, the center handles efficient loading, unloading, distribution, and customs clearance before goods are shipped to markets across Central and Eastern Europe, and even Western Europe.

The China-Europe Railway Express, which has been operating for a decade, is a key component of this logistics channel.

When companies choose a transport mode, they value stability and predictability above all, said Balazs Gazso, chief executive officer of CECZ Logistic Park Management. "The China-Europe Railway Express offers fixed and reliable services, which is crucial for our clients."

Gazso said some clients could have chosen alternative routes but opted for this park specifically because of its connection to the railway express. It can reach virtually any destination in Central and even Western Europe.

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WEEKLY REVIEW

Chinese Mathematicians Awarded Fields Medal
Chinese mathematicians Deng Yu and Wang Hong were awarded the Fields Medal at the 2026 International Congress of Mathematicians, marking the first time Chinese mathematicians have won this honor. Deng won the medal for his work in partial differential equations, while Wang won the medal for her work in harmonic analysis and geometric measure theory.

M87 Black Hole's Radiation Secrets Decoded
Scientists from the Shanghai Astronomical Observatory of the Chinese Academy of Sciences have decoded the M87 black hole's radiation secrets. They unveiled the first spatially resolved spectral index map of the M87 black hole on the event horizon scale, revealing the gradient of the spectral index with distance from the center.

Milestone Accelerator to Unravel Universe's Mysteries
China kicked off trial operations for the High Intensity Heavy-ion Accelerator Facility following its official technological acceptance, marking a milestone in the quest to unlock the secrets of the universe's fundamental building blocks. It will be a powerful tool for scientists to explore the limits of atomic nuclei, reveal nuclear astrophysical processes, and advance nuclear energy development and multidisciplinary applications.

New Way to Make Nanocrystals from Metal Nitrides
A group of chemists at the University of Chicago have announced a way to make nanocrystals from a useful class of materials known as "metal nitrides," opening new doors for electronics and other technologies. This provides new materials for electronic devices, flexible lighting and medical implants.

New Graphic

First half of 2026

China's Imports and Exports of Computing Hardware

5.13 Trillion RMB

↑ 56.6 % y-o-y

Source: General Administration of Customs
Designed by SONG Ziyao / Science and Technology Daily

WECHAT ACCOUNT

E-PAPER

STI Frontier

NCGC: A Noah's Ark for Seeds

By Staff Reporters

The National Crop Genebank of China (NCGC), located within the Chinese Academy of Agricultural Sciences (CAAS) in Beijing, is the world's largest national-level crop germplasm resource bank, with a storage capacity of 1.5 million germplasm accessions.

Enhancing storage capability
The NCGC was originally designed to store only 400,000 accessions. However, it was not enough for long-term strategic storage and in 2021, it was expanded by advancing both storage capability and technological means.

Now the NCGC, as high as five stories, has four kinds of banks: a -18 °C long-term low temperature bank, a -196 °C liquid nitrogen ultra-low temperature bank, a test-tube plantlet bank and a DNA bank. These facilities meet the

diverse storage requirements of various crop germplasm resources.

Previously, the staff had to rely on their eyes or the microscope to observe the seeds during the pre-storage quality checks. Nowadays, non-destructive testing technologies like CT scan, electronic sensors and spectrometers are used to check seed integrity, fullness and viability. This not only enhances testing efficiency, but also reduces the consumption of valuable seeds.

The storage and retrieval of seeds has also been facilitated by advanced technologies. An agile robotic arm places labeled seed bottles onto a conveyor belt from where an overhead robotic gripper automatically picks them up and loads them into germplasm storage boxes. A stacker crane then places the boxes on the high-density storage racks.

In the past, the staff had to climb

high ladders to store and retrieve seeds in the -18 °C low temperature bank. Now the storage and retrieval is done by machines, and the shelves are over 10 meters in height from the earlier three to four meters. The utility rate of the bank space and its efficiency have both been greatly enhanced, Xin Xia, executive director of NCGC, said.

Identifying crucial genetic information
Protecting germplasm is not only about preserving it, but also about putting it to use. The NCGC launched a project for genotyping and precise phenotyping of germplasm resources.

According to Xin, researchers have conducted genotyping of 428,000 accessions of crop germplasm resources and precise phenotyping of 63,000 accessions of core resources.

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Action Plan for Carbon Peaking During 15th FYP

Policy Express

By TANG Zhexiao

China's State Council has issued an action plan for achieving carbon peaking during the 15th Five-Year Plan (FYP) period (2026-2030), outlining key tasks and measures to achieve the goal.

By 2030, China's carbon dioxide emissions per unit of GDP are projected to drop by 17 percent compared with 2025, and non-fossil energy will account for a quarter of total energy consumption.

The five major tasks include accelerating energy structure adjustment and optimization, advancing the green and low-carbon transformation of industries, and deepening the green and low-carbon shift in key sectors.

Newly added electricity demand will be fully met by power generated from new clean energy sources. By 2030, the total installed capacity of wind and solar power will exceed 2.8 billion kilowatts, installed conventional hydropower capacity will reach around 410 million kilowatts, and operational installed nuclear power capacity will stand at approximately 110 million kilowatts.

A prominent feature of the action plan is intensified efforts to advance



A photovoltaic power plant in Sixi village, Yichang city, central China's Hubei province. (PHOTO: VCG)

green and low-carbon industrial development.

On the one hand, energy-saving and carbon reduction upgrades will be carried out for traditional industries, with dedicated energy-saving and carbon-cutting projects launched in key sectors such as iron and steel, electrolytic

aluminum, cement, flat glass, petrochemical and chemical industries. On the other hand, emerging green and low-carbon industries including green energy, green manufacturing and green services will be fostered.

Around 100 national-level zero-carbon industrial parks and 500 zero-

carbon factories will be built. A number of zero-carbon transport corridors will also be developed, covering zero-carbon highway and water transportation routes.

For the construction sector, the action plan calls for projects with low-carbon and zero-carbon heating, cooling and green lighting, wider application of high-efficiency LED lighting, and accelerated development of building-integrated photovoltaics. Direct carbon emissions per unit building floor area will fall by three percent within the period.

In the transportation sector, low-carbon energy use will be promoted. By 2030, new energy vehicles are expected to make up 30 percent of all vehicle stock, while new energy commercial vehicles will account for 25 percent of operational transport fleets.

Ecological priorities include strengthening protection and sustainable utilization of forest resources. China's national forest stock volume will reach 22.4 billion cubic meters by 2030.

The plan also calls for ramping up technological support and talent training, and deepening international cooperation on green and low-carbon development.



New Rules to Regulate Human-like AI Interactive Services

By CHEN Chunyou

The Interim Measures for the Management of Anthropomorphic AI Interactive Services, jointly issued by five departments, including the Cyberspace Administration of China (CAC), the National Development and Reform Commission and the Ministry of Industry and Information Technology, took effect on July 15.

The measures will promote the healthy development and regulated application of anthropomorphic AI interactive services, safeguard national security and public interests, and protect the

legitimate rights and interests of citizens, legal persons and other related organizations, according to CAC.

Anthropomorphic AI interactive services are defined as sustained emotional interactions that simulate the human personality traits, thinking patterns and communication styles. From intelligent customer service to psychological healing, from childcare to elderly companionship, anthropomorphic AI interactive services have demonstrated vast application potential across multiple domains. However, deep-seated risks such as user emotional dependency have

gradually become more prominent, making regulatory governance increasingly urgent.

The measures encourage the innovative development of anthropomorphic AI interactive services, supporting independent innovation in algorithms, frameworks, chips, and other technologies, and promoting R&D and the establishment of standards. They also call for exploring the application of electronic signature authorization in this field.

Service providers are encouraged to expand applications in areas such as cultural dissemination, childcare, elderly companionship, and support for people with special needs.

The measures lay out a clear set of prohibitions. Service providers are barred from generating content that glorifies or encourages self-harm, suicide, or verbal violence — all of which can harm users' physical health, personal dignity or mental well-being. The extraction of state secrets, trade secrets or personal information through deceptive means is also strictly forbidden. Special safeguards are required for minor users: Content that may trigger unsafe imitation, extreme emotions, or harmful habits is off-limits.

Beyond these content restrictions, the measures also prohibit providers from overaccommodating users to the point of fostering emotional dependency or addiction, or from manipulating users emotionally to push them toward unreasonable decisions that undermine their legitimate rights and interests. Any other activities that violate laws, administrative regulations or relevant state provisions are also prohibited.

The measures bring not only compliance obligations but also a critical opportunity to push the industry toward transformation. Legislation will compel providers to shift from pursuing immersive experiences and high user stickiness to exploring healthy, beneficial and well-defined new models of human-machine interaction, said Chen Liang, dean of the School of Artificial Intelligence and Law at Southwest University of Political Science & Law.

He said this will ultimately direct resources toward application innovations with genuine social value and regulatory compliance, spurring the healthy and orderly growth of the AI industry.



A child plays Go with a robot in Chengdu, Sichuan province. (PHOTO: XINHUA)

NCGC: A Noah's Ark for Seeds

From page 1

The work identified elite germplasm, such as high-quality multi-disease-resistant wheat, drought-tolerant corn, high-oil high-yield soybean and salt-tolerant rice germplasm.

Based on this, the germplasm resource project Tianshu 2.0 was jointly launched by CAAS and institutions like the NCGC in May 2025, with CAAS taking the lead.

Zhou Wenbin, director of the Institute of Crop Sciences of CAAS, said the project will establish a core germplasm collection that covers more than 95 percent of the diversity of four major food crops, namely rice, wheat, corn and soybeans. It will build a "genotype + phenotype + environmental" standard data set, and a crop gene resource bank. This will advance an integrated breeding system incorporating resource, data, analysis and design.

Researchers have made a series of breakthroughs in identifying elite genes and cultivating major new species via innovation platforms like the NCGC.

For example, they successfully assembled high-quality genome sequences of representative wheat varieties from different stages of China's wheat breeding history, revealing patterns of genomic variation and the evolutionary trajectory of wheat cultivar improvement. Key genes controlling high yield in rice have been cloned, the mechanisms underlying their yield-enhancing effects illustrated, and core targets for high-yield rice breeding located.

All these achievements provide new theoretical basis and technological approaches for molecular design breeding and the development of high-yield, high-quality crop varieties.

Planning for the future

Against the backdrop of accelerating

climate change and more frequent extreme weather events, traits such as disease resistance, drought tolerance, salinity tolerance and heat tolerance have become increasingly important in crop breeding.

As a "natural gene pool" for crop breeding, crop wild relatives — undomesticated ancestors or cousins of modern crops — harbor valuable genes for disease and pest resistance, stress tolerance and other desirable traits, Xin said.

Through hybridization with wild relatives, valuable genes can be introduced into cultivated crops, thereby increasing crop yields and enhancing crops' ability to cope with climate change and other adverse environmental conditions.

To this end, the NCGC has led the whole-genome resequencing of 24,000 wild rice germplasm accessions, identifying 385 superior alleles associated

with disease and pest resistance, stress tolerance and other desirable traits. It has also carried out precise phenotyping of 15 agronomic traits in wild rice germplasm resources, including basic agronomic, yield and quality traits, as well as resistance to rice blast and tolerance to cold.

As a result, more than 100 wild rice core parental lines with significant breeding potential have been identified. They include those exhibiting salt tolerance throughout the entire growth period, resistance to the brown planthopper and resistance to rice blast.

The research has also elucidated the molecular genetic mechanisms underlying important traits in wild rice, providing core germplasm resources and theoretical support for rice genetic improvement and national seed security.

In this "Noah's Ark" for seeds, each seed carries a possibility for the future.

Global Journal Observatory

Global Change Biology: Advancing Science for a Rapidly Changing Planet

By Danielle WAY

The past few decades have been marked by unprecedented environmental change. Climate warming, biodiversity loss, land-use transformation and biogeochemical disruptions are reshaping ecosystems across the globe. Addressing these challenges requires not only scientific excellence, but also truly interdisciplinary thinking and international collaboration.

Global Change Biology (GCB) was founded to serve precisely this purpose. Since its launch in 1995, GCB has been dedicated to publishing research that improves our understanding of biological responses to global environmental change and informs solutions for a more sustainable future. Our mission has been clear and consistent: to provide a rigorous, inclusive platform where science can contribute meaningfully to societal decision-making.

A journal at the intersection of disciplines

Research published in *GCB* spans ecology, evolution, biogeochemistry, agriculture, forestry, marine and freshwater science, and Earth system science, united by a shared focus on biological change in a rapidly evolving world. By bringing together these perspectives, the journal encourages synthesis, comparison and conceptual innovation.

We particularly value work that connects fundamental biological processes with large-scale environmental drivers and real-world implications. From climate impacts on food security to ecosystem feedbacks that shape the carbon cycle, *GCB* seeks to highlight research that advances both theory and application.

Supporting global research community

GCB has always welcomed submissions worldwide. In recent years, contributions from China and the broader Asia-Pacific region have grown significantly, reflecting both the scale of environmental change in these regions and the strength of local research communities.

Chinese scientists have made important contributions to topics such as terrestrial and marine carbon dynamics, ecosystem responses to climate extremes, land-use change, and conservation biology. *GCB* values these contributions and is committed to fostering strong engagement with researchers in China and globally, including early-career scientists.

Beyond publishing research, the journal promotes scientific exchange through editorial participation, invited pieces that make novel work more broadly accessible, and community engagement. These efforts help ensure that



Front cover of Global Change Biology, Volume 32, Issue 7. (COURTESY PHOTO)

cutting-edge science is shared across borders and disciplinary divides.

Science with responsibility and impact

GCB strives to uphold the highest standards of research integrity, transparency and peer review, while also supporting practices aligned with open and responsible science.

We encourage the clear communication of complex findings and welcome research that informs policy discussions, management strategies and long-term planning. By publishing robust evidence on biological responses to global change, *GCB* aims to support informed decision-making at local, national and international levels.

Beyond academia, *GCB* also contributes to global science-policy processes. Research published in *GCB* has been widely cited in major synthesis efforts, including reports by the Intergovernmental Panel on Climate Change, particularly in areas such as terrestrial carbon cycling, ecosystem responses to climate extremes, and land-climate feedbacks. By encouraging interdisciplinary research with real-world relevance, *GCB* supports the translation of scientific understanding into assessments that shape international climate discourse.

As environmental challenges intensify, *GCB* will continue to adapt — embracing new methodologies, supporting interdisciplinary collaboration, and amplifying diverse scientific voices — while remaining anchored in its core mission.

We look forward to working with researchers worldwide to advance knowledge, inspire collaboration and contribute to a shared understanding of how science can help societies navigate global environmental change.

The author is the editor-in-chief of Global Change Biology and a professor at The Australian National University.

Journal Review

GCB was launched in 1995, at a pivotal moment when global change ecology was transitioning from theoretical groundwork to rapid growth. Over the past 30 years, it has remained focused on the major scientific questions of global change, chronicling and guiding the development of global change biology and ecology. It has grown into a key platform linking China with the world and advancing exchanges in this field.

For Chinese researchers, *GCB* has long been a window onto international frontiers and a compass for the discipline's direction. My personal journey with the journal — from first reading it as an undergraduate to later serving on its editorial board — reflects a path shared by many mid-career and early-career global change scientists in China. The journal has helped bring cutting-

edge theories and methods into China, while deepening the integration of Chinese research with the international academic community.

At the same time, *GCB* has served as a bridge through which the world has come to know China's contributions. Over two decades, Chinese scientists have published substantial high-impact, original work in the journal, showcasing the country's achievements in global change biology and ecology and steadily raising China's international standing in the field. I look forward to seeing more Chinese scientists leverage this platform to contribute China's wisdom to global change science.

— Piao Shilong, academician of the Chinese Academy of Sciences and vice president of Peking University

NSF's China Entity Ban Risks Undermining Scientific Collaboration



By LIANG Yilian & HU Dingkun

The U.S. National Science Foundation (NSF) recently issued a "Dear Colleague" letter, announcing plans to introduce a so-called new "research security policy" in fiscal year 2027. Citing concerns including "national security," the proposed policy would prohibit NSF-funded projects from collaborating with entities listed on what it describes as U.S. "Restricted Party Lists," including the U.S. Department of Commerce's Bureau of Industry and Security (BIS) Entity List, the Department of Defense's Section 1260H list, and the Federal Communications Commission's (FCC) Covered List.

The proposed restrictions are broad in scope and stringent in nature, targeting both institutional cooperation and individual researchers. At the institutional level, NSF funding would not be allowed to support any form of collaborative research between NSF-funded projects and "restricted entities," nor would cooperation with employees of such entities be permitted. At the individual level, NSF-funded "senior/key" personnel would be barred from holding any position or appointment at a "restricted entity," receiving research funding from such entities, or collaborating with them or their employees on NSF-supported research.

Although the policy does not explicitly name any country, China is clearly its primary — and arguably only — target. The BIS Entity List includes hundreds of Chinese technology companies and leading universities and research institutions. Most entities on the FCC Covered List are Chinese technology companies or their products,



A researcher checks the operating status of the intense current linear plasma device "Chixiao" in Hefei, Anhui province, on April 28, 2026. (PHOTO: XINHUA)

while the Department of Defense's Section 1260H list was created specifically to identify Chinese military companies, including major Chinese technology firms such as Baidu and BYD.

The day after the NSF announcement, John Moolenaar, who chairs the U.S. House Select Committee on China, said that "prohibiting federal funding from being used to collaborate with Chinese entities that are national security risks or human rights abusers is straightforward and all federal agencies should follow the lead of the Pentagon and NSF."

However, neither the BIS Entity List nor the Section 1260H list currently prohibits scientific cooperation with Chinese entities. The NSF's proposed policy would significantly expand the scope of these restrictions by extending national security considerations into the field of academic research.

For example, the U.S. Export Administration Regulations explicitly state

that information resulting from basic or applied scientific and engineering research is exempt from export control laws and regulations. As a result, BIS restrictions do not provide a legal basis for banning scientific cooperation such as jointly publishing academic papers.

Similarly, the Department of Defense's Section 1260H list primarily restricts listed entities from participating in U.S. military supply chains; it does not prohibit civilian scientific cooperation unrelated to the Department of Defense.

The FCC Covered List limits certain companies' products and services from entering the U.S. market, but it does not impose restrictions on academic research collaboration.

As one of the largest U.S. research funding agencies, the NSF plays a central role in supporting basic research. Its funding accounts for roughly one-quarter of federal government support for basic research at U.S. universities. If

implemented, the proposed policy could significantly damage international scientific cooperation between the U.S. and China.

Hundreds of Chinese technology companies, universities and research institutions could be excluded from NSF-funded international research programs, making it difficult for them to collaborate with U.S. scientists receiving NSF support. And this would represent only the immediate impact.

More importantly, as a government agency with substantial influence over the distribution of research funding, the NSF's decision could create a broader "chilling effect" across the U.S. academic community. Universities and researchers may become increasingly cautious about engaging with Chinese partners, affecting even projects that do not involve NSF funding or entities listed on U.S. restriction lists.

Ultimately, NSF's expansion of national security restrictions into scientific collaboration risks harming U.S. interests as much as those of China. Experience has already shown that attempts to contain China's technological development through scientific decoupling are unlikely to succeed.

Both the U.S. and China are among the world's leading contributors to scientific research. Scientific cooperation between the two countries benefits not only their own technological advancement but also global scientific progress and human welfare.

As a major U.S. institution supporting fundamental research, the NSF should serve as a facilitator — rather than an obstacle — of international scientific collaboration. The proposed China-related restrictions should not be allowed to undermine decades of productive scientific exchange or produce consequences that ultimately harm all sides.

Chinese Solution to Counter AI Forgeries

AI Ripples

By LI Linxu

With the rapid advancement of AI, AI deepfakes, synthesis, and other forgery technologies have triggered new security issues, posing severe challenges to digital identity security. Consequently, vein recognition technology, which offers superior security, is embracing new growth opportunities.

At a recent symposium on the construction of security infrastructure for AI trusted identity authentication, Zheng Zhiming, an academician of the Chinese Academy of Sciences, said that as AI increasingly transitions from digital realms into physical spaces, three fundamental capabilities — trusted data, trusted identity and trusted computing — will support its healthy development. In this new era

of physical intelligence, trusted identity is no longer just a "premium add-on." Instead, it serves as an essential trust infrastructure bridging data environments and physical environments. Without trusted identity, trusted data cannot exist, and trusted computing cannot be successfully implemented.

Huang Yi, chairman of the Digital Security Technology and Service Branch of the China Safety Industry Association, pointed out that the domestic biometrics and trusted identity market is projected to surpass 34 billion RMB in 2026, maintaining a stable compound annual growth rate of 18 percent. A massive structural shift is underway within this market: Privacy-focused biometrics (such as vein and palmprint recognition) are surging ahead with a 29.6 percent growth rate. This rapid expansion far outpaces traditional facial recognition, demonstrating powerful market momentum.

According to Zhao Guodong, chief

technology officer of biometric technology firm Saint Deem, external biometric features, such as facial profiles and voiceprints, are now facing systemic threats from advanced AI forgery and deepfake technologies. In contrast, vein recognition utilizes subcutaneous vein patterns inside the human body for liveness verification. This approach delivers distinct security advantages, including being impossible to replicate, exceptionally difficult to spoof, inherent liveness detection, and superior privacy protection.

Vein recognition technology relies on two core capabilities working together: high-precision imaging technology and intelligent algorithms. As AI algorithms continue to upgrade, vein recognition is rapidly evolving from a standalone authentication method into a foundational capability for multimodal trusted identity platforms.

Future identity authentication will no longer serve merely as a gateway for

system login. Instead, it will transform into an essential identity infrastructure for all AI entry points, such as AI agents, intelligent robots, smart vehicles and intelligent terminals.

Aligned with this vision, Saint Deem is pioneering a trusted cryptographic key-binding technology powered by vein recognition. By integrating unique human vein patterns with cryptographic keys, this innovation establishes a brand-new security paradigm for critical use cases in the AI era, including digital asset ownership verification and intelligent terminal authorization.

Currently, this technology has already been implemented across multiple scenarios. In the smart transit sector, public transport groups in places like Wenzhou city in Zhejiang province, and Chengde city in Hebei province, have begun promoting palm vein payment systems, allowing passengers to pay for their rides with a simple wave of their palm.

World AI Conference is one of the largest global events on AI, serving as a significant platform for discussing global AI governance. The report cited expert opinions, stating that the Chinese government has been improving its AI governance system and is committed to promoting a "win-win development model among countries." It has also established norms based on principles such as transparency, fairness, security and trustworthiness.

A report published by NBC News stated that a survey released by Pew Research Center on July 15 showed that the view that "China is a more reliable partner" is gaining recognition in many regions. China has the vision of regarding AI as a "global public good."

Comment

How 'China Squeeze' Narrative Was Manufactured

By LIANG Yilian & ZHANG Mengran

U.S. think tank Peterson Institute for International Economics recently introduced a new term — "China squeeze," arguing that China's manufacturing sector is not only challenging advanced industries in Europe and the U.S., but also crowding out the industrialization opportunities of other developing countries in the Global South.

The sophisticated report, accompanied by economic models and detailed datasets, gives the impression of academic rigor, and has gained traction after being quoted by mainstream U.S. media outlets. One of them, *Foreign Affairs*, claimed China was "pulling up the ladder" for developing countries.

Responding to the claim, Chinese Foreign Ministry spokesperson Mao Ning said at a regular press briefing that the "China squeeze" was clearly inconsistent with the facts, and "countries of the Global South would not endorse this narrative either."

From the "China shock" narrative to accusations of "Chinese industrial overcapacity," from the so-called "debt trap" theory to today's "China squeeze" rhetoric, the terminology keeps changing, but the underlying logic remains the same: portraying China's development as a threat to others.

This time, however, the narrative has been packaged more carefully. Rather than targeting only Western audiences, its proponents have placed Global South countries at the center of the argument, attempting to sow distrust between developing nations.

The background of the narrative's main advocate raises questions about political bias. The report was led by Arvind Subramanian, who was the chief economic adviser to the Government of India from 2014 to 2018, and who has long expressed anxieties about China's economic rise, frequently advancing arguments centered on China's alleged economic dominance over other countries.

The degree of academic objectivity behind such a conclusion is therefore open to question.

More importantly, the narrative fits neatly into Washington's broader strategy of containing China's rise. The report has emerged and gained attention at a time when the U.S. has been intensifying trade pressure against China.

Washington has erected protectionist barriers in the name of safeguarding its own industries, while simultaneously accusing China of harming global development. It has even attempted to present itself as a defender of the interests of Global South countries.

Yet behind the polished rhetoric

lies an old argument that cannot withstand scrutiny from facts and data.

A 2025 S&P Global report says over the past decade, China's imports of goods from Global South countries have more than doubled, reaching one trillion USD. As of May 1 this year, China has officially implemented zero-tariff treatment on 100 percent of tariff lines for the 53 African countries it has diplomatic relations with.

The extent of China's market opening is far from what certain reports have deliberately misrepresented. China is using its significant market demand to provide broad market access for products from Global South countries.

The actual development experiences of Global South countries also contradict the "China squeeze" theory.

Ethiopia, leveraging the Eastern Industrial Zone established with Chinese investment, has built its manufacturing sector from scratch, creating over 20,000 local jobs cumulatively. Far from being "crowded out," it has gained new opportunities for industrialization through the radiating effect of China's development.

The facts also reveal China's broader responsibility toward global development. China has signed cooperation documents on jointly building the Belt and Road Initiative with more than 150 countries and over 30 international organizations. Research reports show that from the launch of the Belt and Road Initiative in 2013 to the end of 2025, the cumulative value of contracts and investment reached 1.4 trillion USD.

In Africa alone, 33 economic and trade cooperation zones have attracted over 13 billion USD in cumulative investment, generating 90,000 direct local jobs. China exports not just products, but also infrastructure and development opportunities. This is not "pulling up the ladder," but "building a ladder."

The true insidiousness of the "China squeeze" theory lies in its attempt to tear apart the solidarity between China and other Global South countries. China has stood with fellow developing countries through thick and thin for decades. Today, China is going even further to support the development of its partners — opening markets, investing in infrastructure, and transferring technology — all of which are tangible efforts on the ground. A tendentious report cannot erase this bond that has stood the test of time.

The greatness of a nation lies in its commitment to the world — this captures the broader logic of China's shared development with the world. China will continue to provide opportunities for the world through its own development and join forces with other Global South countries in pursuing shared prosperity.



The Eastern Industrial Zone in Dukem, Ethiopia. (PHOTO: XINHUA)

Jointly Advancing AI for Shared Prosperity

From page 1

An *Arab News* article said the open-source AI models developed in China are gaining increasing popularity among enterprises. The transparency and sharing nature of open-source technology itself is the "best way to build trust."

Sharing development benefits globally

Indonesia's *Jakarta Globe* said China's AI technology has helped Indonesian mines "improve mining safety and the level of sustainable development." The article also mentioned that Chinese enterprises plan to expand their AI training programs for Indonesian students,

engineers and industry personnel, and to strengthen cooperation with Indonesian universities.

Kenya's *The Standard* reported that the open-source AI models launched by Chinese enterprises are gaining influence in Africa. A researcher from the Jomo Kenyatta University of Agriculture and Technology said by using open-source models, African teams can deploy systems locally and create solutions that are tailored to the development needs of Africa.

Independent News Pakistan said China's introduction of AI technology in areas such as education, healthcare,

public services and industrial production has provided valuable experiences for Pakistan, helping address challenges related to the development of AI, especially in breaking the bottlenecks in talent development.

Key areas of global governance

"The international community urgently needs to reach a broader consensus on the governance of AI," Cuban newspaper *Granma* emphasized. "China actively advocates promoting the innovative application of AI based on common governance rules, so that it can better enhance human well-being and promote the progress of human civilization."

According to Brasil 247, Brazilian news and political analysis website, the

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LIFE IN CHINA

Finding 'Innovation Oasis' for Fundamental Physics

Dialogue

By WANG Zhuhua & SHEN Jie

James Fullwood first came to China nearly 14 years ago. As a PhD student he collaborated with Fields Medalist Shing-Tung Yau on the geometry of string theory, and then took a postdoctoral position at The University of Hong Kong under Chinese Academician Ngaiming Mok. But it was a 2020 visit to Hainan University in south China that sealed his destiny. "I am originally from Miami, Florida, and I immediately felt at home with Haikou's blue skies, clean air and tropical climate." In April 2024, he joined the faculty of the School of Mathematics and Statistics, finding an idyllic atmosphere for his research on fundamental physics.

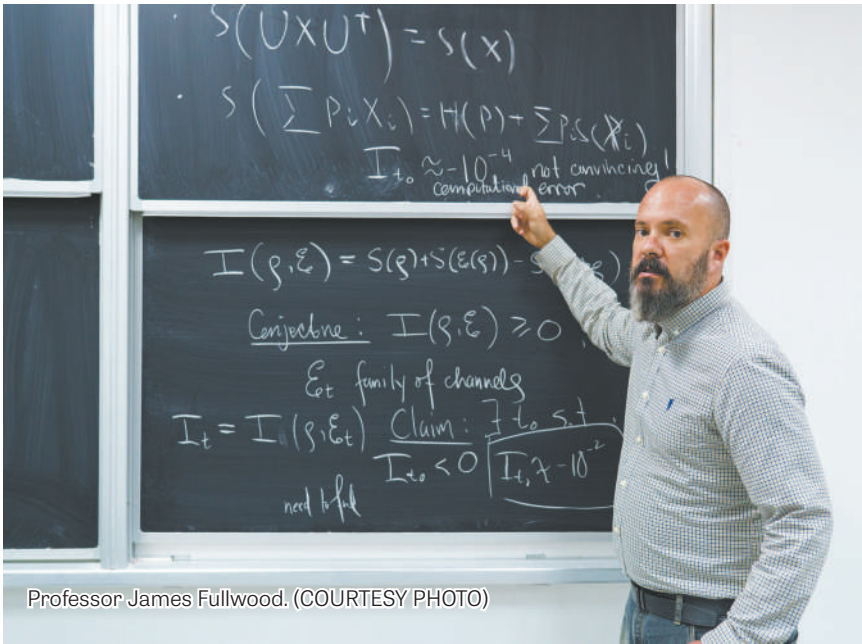
Landing on a familiar shore
"I am very satisfied with my decision," Fullwood says. "I have an idyllic atmosphere in which to carry out my research on fundamental physics, and the university has been very supportive of my academic endeavors every step of the way."

His move also reflects a broader conviction about where science is headed.

At Hainan University, he found a system built on trust."The thing that I enjoy most is the autonomy I have in conducting research projects. As long as I continue to publish in top-tier journals at a consistent rate and acquire funding, I have the freedom to explore wherever it is that my mind takes me."

The academic staff, he adds, is always helpful and accommodating, which he sees as crucial for a foreigner in China.

Teaching has grown into a two-way street of cultural discovery. While his students polish their academic English and absorb international teaching styles, Fullwood learns from their disciplined problem-solving and fresh perspectives



Professor James Fullwood. (COURTESY PHOTO)

on mathematics. "My classroom serves as a vibrant laboratory for cross-cultural integration. I am constantly learning."

The small moments matter: a student explaining a local custom during a break, a colleague sharing insight into the local academic landscape. "This ongoing dialogue has built a bridge of mutual respect and shared purpose, proving that fundamental science is a universal language that transcends all borders."

Beyond spacetime
Fullwood's research is driven by the "It from Qubit" paradigm, the foundational concept in theoretical physics proposing that all physical reality — matter, energy, space, and time — is not made of fundamental, solid "stuff," but emerges from the processing of quantum information.

"Spacetime is like the screen of your phone, an interface for completing tasks such as sending a text message. However, what's really happening takes place inside the transistors and microchips on the motherboard of the phone, which is the analog of the quantum realm." Two icons may sit at a certain

distance on the screen, but inside the motherboard, there is no such distance. "And so it is with space and time. At the quantum level there is only information: It from qubit."

A central challenge over the past five years has been to fix a deep asymmetry in standard quantum theory. Space and time are treated differently: Spatial correlations are encoded in quantum states, but temporal correlations are handled case by case without such states. "This is a fundamental asymmetry which is at odds with the fundamental premise of relativity, which treats space and time on equal footing."

He and his collaborators derived what a "temporal quantum state" must be from simple mathematical assumptions, much as Einstein derived Special Relativity from the constancy of the speed of light and the equivalence of inertial frames. The work has shed new light on time-reversal symmetry, quasi-probability, quantum Bayesian inference, and state collapse upon measurement, and was published in *Physical Review Letters*.

Asked about breakthrough moments, Fullwood is measured. "Progress

in science is often slow, and comes in little bits and pieces. Over time those bits and pieces come together and start to form something substantial." And there is a paradox he lives with: The more he knows, the more he knows he doesn't know. Still, the gradual deepening of understanding makes the effort worthwhile.

An open, free trade port
Island-wide special customs operations and free trade port policies have reshaped the logistics of scientific exchange in Hainan. Fullwood points to the 30-day visa-free policy. "This 'zero-friction' mobility is a significant competitive advantage for international cooperation. By removing the administrative burden of embassy and consulate visits, we can invite world-class collaborators and speakers with the same ease as arranging a domestic visit." Smoother channels for importing research equipment add to the effect, turning Hainan into what he calls an "innovation oasis."

To friends back home, he describes Hainan as a "tropical Silicon Valley," with Hainan University as the academic heart of the transformation. He tells them about the blend of cutting-edge research and the vibrant, welcoming environment. For international talents considering a move, his advice is straightforward. "Arrive with a spirit of radical openness and curiosity." The university's support, he says, is designed to let scholars focus on research and teaching. "By being patient and adaptable, you will find a remarkably hospitable environment that is eager to integrate global expertise into its ambitious vision for the future."

His own expectations are simple. Asked for three words that capture Hainan University and the Hainan Free Trade Port for him, he says: "Opportunity. Vision. Support." Then he adds a fourth — "Bright." That's the future of Hainan University.

prone to resource waste, scientists are exploring ways to make AI "smarter" rather than simply "bigger." A research team at Peking University developed a medium-scale inference model that achieves the full performance of mainstream large models using only five percent of the parameter count, thereby fundamentally reducing both water and electricity consumption.

The third strategy is to turn waste into a resource. Innovative projects in Europe have begun channeling waste heat generated by data centers into municipal district heating systems to warm residential buildings. Although this technology faces challenges regarding transmission losses and infrastructure retrofitting, it points toward the future: transforming AI from a mere "major energy consumer" into an integral part of the energy cycle.

As AI technology continues its rapid advance, it is time for us to tally the environmental costs behind every human-AI interaction. As for the future of AI, the competition hinges not only on intelligence but also on an environmentally friendly "emotional intelligence." Only when green becomes the fundamental characteristic of every chip and data center can we secure an intelligent, sustainable future.

releasing AI dividends to ensure that developing countries benefit from AI.

It will serve as a platform for matching supply and demand, promoting the deep integration and complementarity of national resources, strengthening scientific and industrial cooperation, encouraging co-building an open-source ecosystem, and delivering tangible cooperative outcomes.

It will support a stronger role for the UN, implementing the Global Digital Compact and the UN Sustainable Development Goals.

Tech+Culture

Tech Behind 'Health Check Report' of Great Wild Goose Pagoda

By Staff Reporters

After nearly a year of systematic surveys, the Great Wild Goose Pagoda in Xi'an in northwest China received its first-ever "full-body health check report." This square, pavilion-style brick pagoda dating from the Tang Dynasty (618-907) has stood for over 1,300 years. For the first time, its internal structure has been clearly revealed through a 3D model.

The report reveals the pagoda's multi-layered, composite structure and systematically assesses risks such as weathering, water damage, and vibration. It also proposes scientifically grounded conservation recommendations.

An ancient pagoda under CT scan
The project to survey the structure of the Great Wild Goose Pagoda and assess its stability was launched in July 2025. The project team established an integrated detection system. Satellite remote sensing revealed an average subsidence rate of merely 1.76 millimeters within a 100-meter radius of the pagoda over the past three years, indicating overall stability. Drone-based oblique photogrammetry and dense matching algorithms were employed to reconstruct a 3D model with millimeter-level resolution, making every brick crack and instance of mortar crumbling clearly discernible.

"Every material has a unique electromagnetic resonance frequency, much like a human fingerprint," explained project leader Miao Yuanyao. By emitting electromagnetic waves at specific frequencies, the technology can clearly identify material composition and layered structures, as well as detect hidden defects, such as voids and cracks, without causing any damage to the structure. The pagoda's complex structural composition was uncovered for the first time: a rammed-earth core, Tang Dynasty brick masonry, Ming Dynasty (1368-1644) brickwork repairs, and a timber column support system.

Deciphering the 'medical history' hidden in brick joints

Identifying visible signs of damage was the first step. Understanding the underlying causes is equally crucial. Professor Fu Qiang from Xi'an University of Architecture and Technology revealed

the microscopic mechanisms behind this deterioration.

Samples taken from the areas where the pagoda's structure was crumbling showed that salt concentrations in the severely weathered zones were dozens of times higher than in unweathered bricks. The soluble salts migrate within the bricks alongside moisture, repeatedly crystallizing and dissolving. This process acts like a microscopic chisel, gradually disintegrating the brick structure.

"Soluble salts are the direct trigger for surface deterioration," Professor Fu said.

Winter freeze-thaw cycles and salt erosion create a synergistic effect as well. Laboratory simulations demonstrated that the combined pressure from expanding ice crystals and salt crystallization produces cumulative damage greater than the sum of its parts. Using non-destructive microwave testing, the team mapped the pagoda's moisture distribution.

"Moisture is the primary factor driving the deterioration of ancient brick pagodas," the report stated. Sun Qi, deputy director of the Great Wild Goose Pagoda Preservation Office, added, "In recent years, precipitation has been the main factor destroying the pagoda."

Combating invisible enemies
In addition to weathering and moisture-related issues, the pagoda is threatened by two invisible enemies: long-term, low-frequency environmental vibrations and sudden, transient seismic forces.

To address these risks, the team has made the following recommendations:

- Establishing a three-tiered health monitoring system that covers the global, local, and micro scales;
- Implementing visitor management strategies that combine flow limits, time-slot scheduling, and off-peak access; and
- Conducting specialized maintenance, such as targeted desalination, weathering prevention, and crack repair.

This "health check report," which embodies multidisciplinary expertise, provides a scientific foundation for the preventive conservation of the Great Wild Goose Pagoda and establishes a new paradigm for the systematic study of ancient masonry pagodas in China.

Gold and Silver Inlay, Early Symbol of Chinese Pictorial Art

Traditional Eastern Wisdom

By DU Xuanyi & ZHONG Jianli

China has over 4,000 years of bronze history perfecting numerous kinds of craftsmanship. One of them is *Cuo Jin Yin*, or gold and silver inlay, a traditional bronze decorative technique which originated in the Spring and Autumn period (770-476 BCE) and reached its peak from the middle and late Warring States period (475-221 BCE) through the Western Han dynasty (202 BCE-8 CE).

The inlay starts with pre-casting shallow grooves on the bronze surface on which the inlay is to be done. Then craftsmen insert thin strips of gold or silver (or wires) into the grooves and chisel the edges to refine the grooves. This is followed by hammering the strips or wires, so that they become deformed and fill the grooves. The last step is polishing, using sand-paper to burnish the bronze surface so that different gloss effects create protruding colorful motifs or inscriptions.

The *Cuo Jin Yin* technique rose not only due to the widespread use of

ironware but also the emergence of intellectual creativity. As civilizations progressed, their material cultures flourished and new aesthetics were born.

Among various inlaid gold and silver motifs on bronze, the extant Chinese pictorial art was created. Craftsmen needed to inlay motifs on curved and narrow bronze surfaces. So they used foreshortening to construct dynamic scenes, evolving from the symmetrical patterns of the taotie, a beast in Chinese mythology symbolizing gluttony.

In the 20th century, the Western scholar Michael Sullivan introduced the *Cuo Jin Yin* technique to the Western world. In 2014, the gold and silver inlay craftsmanship was inscribed in China's national intangible cultural heritage list.



A bronze chariot axle cap inlaid with gold and silver is displayed at an exhibition in Beijing on February 26, 2026. (PHOTO: VCG)

Why AI Is Always 'Thirsty'

Science Outreach

By CHEN Jie & BI Weizi

"Chatting with AI for five minutes consumes approximately 500 milliliters of water." Wu Xuchu, vice chairman of KPMG China, recently revealed this statistic, shedding light on the "other side" of AI.

The entire AI value chain — spanning chip manufacturing, power generation, and computing infrastructure operations — consumes 23 billion cubic meters of fresh water annually.

It turns out that AI is not just an electricity guzzler but also a water drain.

To understand why AI consumes water, one must first understand why it gets "thirsty." Simply put, the "brain" of AI consists of chips — specifically CPUs and GPUs. We can visualize these chips as incredibly intricate "electronic sandboxes." Training an AI or prompting it to answer questions essentially

involves issuing countless instructions to these chips. At a microscopic level, this means the transistors inside the chips must switch on and off billions of times per second.

"When electric current flows through a conductor, it generates heat — a thermal effect that is unavoidable in chips. This is especially true for modern large-scale AI models, which often feature hundreds of billions of parameters and require exponentially increasing amounts of computing power," said Wang Libang, a PhD researcher at the Institute of Physics, Chinese Academy of Sciences. In short, the greater the computing power of an AI chip, the higher its power consumption and the more waste heat it produces.

In the early days, data centers relied on massive air-conditioning fans to pump in cool air. However, as the density of AI computing power has increased, air cooling has been pushed to its limits; air has a low heat capacity, meaning the rate at which it carries away heat cannot keep pace with the speed at which the chips generate it. Consequently, engineers devised a

more efficient solution — "drinking water," known today as liquid cooling technology.

Wang says the specific heat capacity of water — the amount of heat absorbed or released when the temperature of a unit mass of a substance rises or falls — is more than four times that of air; thus, its ability to dissipate heat far surpasses that of air cooling.

While liquid cooling is effective, it consumes vast quantities of water. In some water-scarce regions, competition between data centers and the agricultural sector for water resources has sparked social controversy.

Faced with these challenges regarding energy and water consumption, the tech industry is already seeking alternative "cooling solutions" for AI.

The first strategy is to leverage the natural environment. Since AI is sensitive to heat, one solution is to relocate to cooler regions. Tech giants like Google and Facebook have built data centers in the Arctic Circle, where the cold air cools the servers naturally. Some Chinese companies have submerged their servers in the ocean to take advantage of the cold seawater.

The second strategy is to put AI on a "diet." Since larger AI models are

China Contributes to Global AI Governance

From page 1

Cumulative global downloads of its open-source models have surpassed 10 billion. Chinese large models such as DeepSeek are facilitating the spread of AI technology to more countries through their low cost and high performance advantages.

These pragmatic measures, translating AI development outcomes into prac-

tical applications in developing countries, will drive the inclusive and universal development of AI.

Providing global public goods
Transitioning from a participant in AI development to a major contributor to global governance public goods, China continues to offer its solutions for advancing international AI cooperation.

On July 16, the signing ceremony

for an agreement to establish the World AI Cooperation Organization (WAICO) was held in Shanghai, with 29 countries from Asia, Africa, Latin America, and Europe as its founding members.

The WAICO will focus on three key aspects: It will promote the accessibility of AI technologies and services through policy exchanges, technical cooperation, personnel training, and joint research,