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Observer

Production Lines Implement Lab Breakthroughs

By Staff Reporters

The deep integration of industry, academia, research and application, led by enterprises, should be promoted to smooth the innovation chain spanning basic research, application development and commercialization, according to a symposium on strengthening basic research in April.

This vision is becoming a reality, with measures carried out nationwide to integrate technology and industry, providing the "maximum driver" for modernization.

A more resilient industrial chain

Located 150 km southeast of Sanya, Hainan province, "Deep Sea No. 1" — the world's first 100,000-tonne-class deep-water semi-submersible production and storage platform — produces up to 15 million cubic meters of natural gas and over 1,600 tonnes of condensate oil daily.

"Key core technologies cannot be bought but need independent innovation," said Wang Huifeng, vice president and chief engineer of Offshore Oil Engineering Co., Ltd. From "Deep Sea No. 1" to "HaiKui No. 1," Asia's first independently designed and built cylindrical floating production, storage, and offloading facility, these breakthroughs have made China the third country globally capable of independently developing ultra-deepwater oil and gas resources.

Lei Zhensheng, chief expert of the Ministry of Agriculture and Rural Affairs' high-yield and quality wheat breeding innovation team, has developed 55 high-quality wheat varieties with his team. "These varieties are deeply integrated with processors through order-based production, generating 4.85 billion RMB in premium value and 6.99 billion RMB in processing efficiency gains," Lei said.

The resilience of industrial chains, consolidated in the deep sea and the fields, is branching out into more sectors. 5G and gigabit optical networks have been integrated into 91 major economic categories, with over 25,000 "5G+industrial Internet" projects nationwide. Key components of green energy including large-capacity wind turbines, ultra-long blades, floating platforms, and flexible DC converter valves have all been localized.

Industrialization of frontier technologies

The Nanjing Steel Group has partnered with Huawei to develop an AI large model that has transformed its ironmaking process. *See page 2*

New Graphic

IN 2025

China's Digital Industry
Revenue Reached

39.6 Billion RMB
8.8% Y-O-Y

Source: Cyberspace Administration of China
Designed by SONG Ziyan / Science and Technology Daily

WECHAT ACCOUNT



E-PAPER



The photo shows the Ming'antu observation station of the National Space Science Center, the Chinese Academy of Sciences, in Zhengxiangbai banner, Xilin Gol league, north China's Inner Mongolia autonomous region, August 1, 2026. (PHOTO: XINHUA)

STI Frontier

Traditional Turbine Factory Turns Intelligent

By Staff Reporters

In a production workshop of Harbin Turbine Company Ltd. in Heilongjiang province, northeast China, huge digital screens display real-time data on production progress, the operating status of equipment and quality inspection, updated in milliseconds.

Established in 1956, the company has been developing and manufacturing turbines for seven decades. Now with new technologies like 5G, digital twin and AI intelligent testing, operations have been digitalized, greatly enhancing production capacity.

Total process upgrade

Production workshops are the main battlefield for the transition to intelligent manufacturing.

In a workshop for turbine blade production, precise and agile robotic arms

sequentially grip, position and process the blades, while automated guided vehicles shuttle materials between production lines and component warehouses without human intervention, creating a fully automated closed-loop workflow.

Fan Yu, deputy director of the company's digital information department, said this is the turbine industry's first automated production line cluster covering every manufacturing operation across the entire production workflow for small and medium-sized turbine blades.

Built on a 5G-enabled flexible manufacturing management and control system, the production line is equipped with a "superbrain" and a central nervous system, enabling a seamless end-to-end workflow from receiving incoming material and code marking them to intelligent machining, sawing, milling, grinding and automated polishing.

After upgrading, the comprehensive utility rate of machine tools has increased by eight percent and comprehensive production capacity by 20 percent.

Welding, critical for core turbine assemblies, is one of the most demanding jobs in traditional heavy manufacturing. When key turbine components are welded, the temperatures must be above 350°C, which, in the past, exposed the workers to intense heat and pervasive welding fumes.

That situation has changed in the cold working factory of the company. At the new intelligent welding production line welding robots work with precision. A digital control system manages the welding parameters, temperature and trajectory during the entire process, resulting in flexible automated welding of key components. *See page 4*

Industrial, Information Sectors Maintain Strong Growth

By LIANG Yilian & CUI Shuang

China's industrial and information sectors continued to advance toward higher quality and greater technological sophistication in the first half of the year, according to a press conference held by the State Council Information Office (SCIO) last month to brief the media on the development of China's industrial and information sectors.

Wang Weiming, chief engineer of the Ministry of Industry and Information Technology (MIIT), said the value-added industrial output of major industrial enterprises grew 5.4 percent year on year, while industry contributed more than 35 percent to economic growth. Corporate profitability also improved significantly,

with total profits of major industrial enterprises rising 18.8 percent year on year in the first five months.

The latest data released at the press conference showed that more than 30 percent of China's major manufacturing enterprises have adopted AI technologies. China's open-source AI foundation models recorded more than 10 billion cumulative downloads worldwide.

Wang said high-quality development will be the MIIT's top priority. It will issue and implement sectoral and specialized plans for the 15th Five-Year Plan period (2026-2030), accelerate the development of a modern industrial system centered on advanced manufacturing, and improve the quality and efficiency of industrial economic performance.

Next-generation networks taking shape

By the end of June, China had over five million 5G base stations. It is advancing the construction of commercial 5G-Advanced networks, while 10-gigabit optical networks are being piloted in residential communities, factories and industrial parks. The second phase of 6G technology trials is also being accelerated.

Xie Cun, spokesperson for the MIIT, said the next generation of communications networks will be "new" in four major respects.

The objects being connected will expand from traditional individual users to a diverse range of entities, including people, machines, physical objects and embodied AI. *See page 3*

International Cooperation

Sci-tech Backyard Makes Brazilian Agriculture Smarter

Edited by WANG Xiaoxia

On a typical morning at the Fazenda Água Limpa (FAL) on the outskirts of Brasília, Brazil, the crops are thirsty. FAL is a 500-hectare experimental and educational farm that is a university-run research project. In a nearby workshop, agricultural expert Sergio Sauers monitors real-time data of the fields on his screen. He swiftly draws an irrigation zone, sets a 25-minute timer, and clicks "start" to activate the irrigation equipment in the fields.

This is a snapshot of daily operations at the "Sci-tech Backyard (STB)" for smart agriculture jointly built by China and Brazil. To date, over 400 hectares at FAL, about 200 hectares in Apodi municipality in northeast Brazil, and nearly 133 hectares in the city of Londrina in southern Brazil have been transformed into smart demonstration zones. Chinese-backed solutions have nearly doubled the efficiency of large-scale corn farming.

The backstory was one of real struggle. Nearly five million family farms across Brazil, mostly in the north, were long trapped in low-efficiency cycles — plowing with oxen, hauling with donkeys, and relying entirely on muscle power. Mechanization was a distant dream, and digital farming almost unheard of.

Around 2020, some farmers started looking eastward for solutions. In early 2024, China's Sinomach Digital Technology dispatched a dedicated team deep into Brazil's agricultural heartlands to assess local practices and infrastructure, map out the core needs of family agriculture, and build a bridge among governments, universities and enterprises.

By November of that year, with backing from China's Ministry of Education and Brazil's Ministry of Rural Development, the China-Brazil Joint R&D and Technology Transfer Center for Family Agriculture Mechanization — better known as STB — was launched in Brasília and Apodi.

Then the magic began. Chinese and Brazilian researchers rolled out the "Smart Farm Management Platform" on pilot farms. IoT sensors began monitoring the temperature, humidity, and pest activities, while BeiDou base stations relayed soil data from the intelligent machinery working the fields.

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WEEKLY REVIEW

World's 1st Boring & Blasting Machine Rolls Off Production Line

On August 1, the world's first boring and blasting machine developed by Chinese researchers officially rolled off the production line in Wuhan. This innovative piece of equipment combines the advantages of the two mainstream construction methods — tunnel boring machines and the drill-and-blast method — to provide a brand-new technical solution for the construction of long tunnels in complex geological conditions.

Catalyst for Acidic Water Electrolysis Developed

Chinese researchers proposed a novel design strategy that differs from the traditional spinel structure, leading to the development of a new cobalt-based oxygen evolution catalyst that significantly enhances the activity and stability of anode catalysts for acidic water electrolysis.

Cross-species Chromatin Atlas Reveals Gene Switching Rules

A Spanish research team constructed the first cross-species chromatin atlas spanning diverse eukaryotic lineages. The study found that the signals that switch genes on in cells have remained virtually unchanged over two billion years of evolution, while the mechanisms that switch genes off have evolved into radically different schemes across different lineages of life.

Magnetic Nanoparticles Clean Water of Forever Chemicals

German scientists have developed a new method that uses functionalized magnetic nanoparticles to efficiently remove a variety of PFAS, also known as forever chemicals, from water. Its most notable advantage lies in the tailored surface chemistry of the nanoparticles.

Key Tasks Set in New IP Blueprint

Policy Express

By TANG Zhexiao

China's State Council has issued a plan for the protection and utilization of intellectual property rights (IPRs), specifying development targets, key tasks and special projects for IPR development during the 15th Five-Year Plan period (2026-2030).

The plan states that by 2030, China's overall strength and international competitiveness in intellectual property will be enhanced, with stronger IPR protection and more in- depth international IPR cooperation, ensuring decisive progress in building an intellectual property powerhouse.

By 2035, China's comprehensive IPR competitiveness will rank among the world's top tier, and a world-class IP powerhouse with Chinese characteristics will be basically established.

The plan lays out key tasks in four areas:

- Optimizing and improving the IPR legal system and strengthening foreign- related intellectual property



An employee uses an air-cooled handheld laser welder to weld a steel plate at a laser technology firm in Suzhou, Jiangsu province. (PHOTO: XINHUA)

protection.

- Bolstering the commercialization and application capacity of intellectual property, scaling up IPR supply to develop new quality productive forces, and promoting high-quality growth of the intellectual property service industry.

- Upgrading public IPR services and advancing social co- governance of intellectual property.

- Deepening participation in global IP governance and expanding international IP exchanges and cooperation.

Sci-tech Finance System Gets Boost

By TANG Zhexiao

China will boost opening, sharing, integration and application of data in the sci- tech finance sector to underpin high-level technological self-reliance, according to a notice issued by nine government departments including the People's Bank of China (PBOC), the National Development and Reform Commission and the Ministry of Science and Technology.

The notice unveiled the first version of a national catalogue for development and utilization of data in sci- tech finance. It covers eight categories with 26 data indicators. The categories are enterprise rosters and sci- tech innovation attributes; import and export records; in-

vestment and financing information; business operations; R&D input; intellectual property rights; innovation capacity evaluation; and enterprise demands.

Local governments are encouraged to build supporting provincial information infrastructure and advance collection and sharing of data.

To scale up the opening, sharing, integration and application of sci- tech financial data, authorized institutions will be supported to properly use public sci- tech data. Local authorities will establish licensed data access channels for tech- based enterprises and promote models such as information inquiry and joint modeling.

Pilot programs for the innovative development of trusted data spaces for

sci- tech finance will be launched. Eligible regions should open and leverage corporate revenue and expenditure transaction data, build platforms for industrial research and information exchange, and realize cross- domain sharing and matching of sci- tech financial data resources.

Market-oriented credit reference institutions will receive support to build databases for tech- based enterprises and expand the supply of credit reference products and services.

Balancing development and security, China will standardize the development and exploitation of public sci- tech data, enforce whole- process security management, and guard against all types of data- related risks.

Twelve special projects will be launched, covering IPR protection for strategic emerging industries, integrated empowerment of intellectual property and AI, IP- driven regional development, and high- quality IP cooperation under the Belt and Road Initiative.

Amid a new round of technological revolution and industrial transformation, China will improve IPR protection rules for AI, big data, algorithms and other emerging fields, and adopt more robust measures to strengthen intellectual property protection and utilization, Rui Wenbiao, deputy head of the China National Intellectual Property Administration, stated.

By the end of June, China had 2.36 million high- value invention patents, equivalent to 16.8 high- value invention patents per 10,000 people.

The high- value invention patents fall into four categories: patents for strategic emerging industries, invention patents with overseas patent families, patents maintained for more than 10 years, and patents winning the National Science and Technology Award or the China Patent Award.



Centering on financing matching, intelligent risk control, product innovation and other links, the notice guides financial institutions to leverage sci- tech financial databases to build digital credit profiles for tech- based enterprises, develop distinctive risk control, investment and research models for such firms, and roll out sci- tech financial products tailored to the financing needs of enterprises in segmented industries.

The PBOC will boost public sci- tech information sharing, improve the allocation of sci- tech financial resources, and deliver data and financial backing to achieve high- level technological self-reliance.



China-Indonesia Digital Cooperation Strengthened

By LU Zijian

An Indonesian tourist can pay in a restaurant in China simply by scanning the QR code with an Indonesian payment system. This shows how well China and Indonesia cooperate in the digital field.

This payment system is called QRIS, short for Quick Response Code Indonesian Standard.

It is a standardized QR payment system in Indonesia that can be used as cross- border payment in China and takes only a few seconds, Yulian Wihantoro, chief representative of Bank Indonesia Beijing Representative Office, said during the China-Indonesia Friendship Stories Exchange Event in Beijing on July 31.

However, behind those few seconds are years of conversation, negotiations, technical work and most importantly, trust between Indonesia and

China, Yulian said. "We (both) are part of ASEAN+3, we are part of the Regional Comprehensive Economic Partnership, and we are part of the Global South cooperation."

Marsudi Wahyu Kisworo, member of the Board of Governors, National Research and Innovation Agency of Indonesia, said innovation must also serve local communities. "In digital technology and AI, we are delighted to have cooperation with China."

Indonesia is located along the Pacific Ring of Fire, where minor earthquakes occur almost every day. Marsudi said Indonesia has adopted integrated satellite and AI system for early warning. Sharing data across borders, especially with China, can save lives globally.

Cooperation in remote sensing technologies also facilitates disaster response. In October 2014, the China National Space Administration and the Indonesian Maritime Security Coordinating

Board (IMSCB) signed an agreement, giving Indonesia access to Chinese remote-sensing data.

Wang Zhongmin, director of International Cooperation Center of Deep Space Exploration Lab, was involved in the program. He participated in the coordination with IMSCB many times, discussing topics such as how Chinese remote- sensing data can be used in the governance of Indonesian waters.

China's high- definition satellite data provided strong support for disaster rescue and reconstruction during disasters in Indonesia, such as the 2018 Lombok earthquake, the 2021 East Nusa Tenggara floods, and the 2025 Central Java landslides.

In addition, the APSTAR- 6E satellite developed by China and delivered while in orbit in November 2024 covers the whole of Indonesia and provides high- throughput broadband communication services. This has helped advance the country's digital transformation.

Bilateral cooperation in the digital sector also facilitates the development of industrial parks in Indonesia, which faces great challenges such as low efficiency and environmental pollution.

Located in Central Sulawesi, the Indonesia Morowali Industrial Park (IMIP) is a joint industrial development by Chinese and Indonesian companies. IMIP used to rely on manual form filling to collect data, but digital technologies changed the situation.

Liu Zhigao, associate researcher

and deputy director of the Department of Regional Sustainable Development Modeling, Institute of Geographic Sciences and Natural Resources Research (IGSNRR), Chinese Academy of Sciences, saw the changes when he visited IMIP this year.

In cooperation with the University of Science and Technology Beijing, IMIP has developed a digital twin system for massive information collection. The system can gather data from every tunnel of the factories in the park, thus minimizing the pollution and waste. This is just one of many such stories, Liu said.

The Indonesian Industrial Estates Association opened a representative office in Shenzhen in south China in April. During the APEC SME Business Forum 2026, it signed a memorandum of understanding with the China International Cooperation Association of Small and Medium Enterprises and IGSNRR on strengthening regular cooperation in the industrial park sector between China and Indonesia.

Bilateral cooperation in the digital sector continues, so does friendship. Yulian ended his speech singing a couple lines from the Chinese song *Friends*. He said they define the Indonesia- China partnership: "Friendship that endures, trust that strengthens, and prosperity that we build together."

Themed "Digital Bridge in the Age of Innovation," the event was hosted by the China International Publishing Center.

Case Study

Greater Bay Area NCTI: From Innovation Cluster to Initiating Hub

By YE Qing & QI Liming

Since its establishment in 2021, the Greater Bay Area National Center of Technology Innovation (GBA NCTI) has continuously demonstrated innovative momentum, rooted in the institutional synergy of Guangdong, Hong Kong and Macao. These three regions are comprehensively deepening cooperation and jointly building a world-class bay area.

From R&D cooperation to industrial collaboration, an international sci- tech innovation center with global influence is emerging. The "Shenzhen- Hong Kong- Guangzhou" innovation cluster topped the global top 100 innovation clusters in the World Intellectual Property Organization's Global Innovation Index 2025. The "Macao- Zhuhai" cluster has been included in the global top 100 innovation clusters for two consecutive years.

The Guangdong- Hong Kong- Macao GBA is a vivid example of connecting the "lab" and the "production line." Through complementary advantages among regions, it is promoting breakthroughs in core technologies and efficient transformation of sci- tech achievements.

Since 2025, the Qianhai Shenzhen- Hong Kong Modern Service Industry Cooperation Zone has cumulatively implemented 123 research projects from Hong Kong universities.

Guangdong has 74,000 high- tech enterprises. Jiang Yuhao, a professor at the Public Policy Institute of South China University of Technology, said the integration of the "two chains" to promote a modern industrial system in the GBA is one of the characteristics of the GBA NCTI.

The GBA is supported by four major cooperation platforms — Hengqin, Qianhai, Nansha and the Lok Ma Chau Loop.

These platforms form a cross- regional collaborative innovation carrier network, driving the rapid clustering and development of industries such as traditional Chinese medicine and integrated circuits.

In March, the Marine Hydrodynamics Research Facility, a central research facility located at the Hong Kong University of Science and Technology (Guangzhou), was launched. This is the first large- scale marine engineering laboratory in the GBA. Its main experimental facilities include the world's first combined deep and shallow water ocean engineering basin.

A series of innovation breakthroughs have been achieved and consolidated by the research efforts of the three regions. The Guangdong provincial science and technology projects are now open to Hong Kong and Macao as well.

Another vivid example is innovative technology from Macau Terahertz Technology Co., Ltd. A device the size of a computer mainframe helps enterprises save approximately 15 percent of energy in their power distribution systems.

Traditional technological breakthroughs usually take 180 days. However, with the help of the Hengqin Digital Zero- Carbon Island Shared Laboratory, the process can be completed in just 60 days.

Since moving into the laboratory in 2022, Terahertz's researchers working in Macao have jointly developed the "Terahertz Smart Energy- Efficient Internet of Things Equipment" with experts from China Southern Power Grid, and the product has been iterated to version 4.0.

Currently, this technology is being deployed in Southeast Asian and Portuguese- speaking markets.



Researchers work at a laboratory of the Research Institute of Tsinghua University in Shenzhen, Guangdong province, July 4, 2026. (PHOTO: XINHUA)

Production Lines Implement Lab Breakthroughs

From page 1

The model reduces coal blending adjustment times to mere minutes from the earlier three to six days and can predict furnace conditions an hour in advance. The cumulative revenue of the entire scenario is over 100 million RMB, said Li Jinyan, director of the group's AI research institute.

From January to May this year, China's high- tech manufacturing contributed nearly 40 percent of industrial growth. During the same period, the number of authorized invention patents increased by 12 percent year on year, and a batch of them were promoted in diverse scenarios.

A team led by Professor Zhu Jiaqi from Harbin Institute of Technology has developed diamond composite heat sinks for electronics enterprises. The thermal conductivity of the sinks is twice that of copper, significantly improving high- performance equipment's heat dissipation.

Rising industrial clusters

Agricultural machinery equipped with the BeiDou navigation satellite system can undertake complete rotary tillage, sowing and harvesting along a preset route. Such equipment is being used in more than 20 provinces and autonomous regions.

A guest speaks at the China- Indonesia Friendship Stories Exchange Event, Beijing, July 31, 2026. (COURTESY PHOTO)



Robot Import Ban May Backfire on U.S.

Clear Voice

By LIANG Yilian & ZHANG Jiaxin

The U.S. has once again invoked "national security" to target Chinese robotics. On July 28, the U.S. Federal Communications Commission (FCC) announced that it would add foreign-produced "advanced robotic devices" and connected power inverters to its Covered List. This move blocks new foreign-made humanoid and quadruped robot models, as well as connected power inverters, from gaining authorization to enter the U.S. market. The FCC stated this was necessary because such equipment poses "unacceptable risks to the national security of the U.S. or the safety and security of U.S. persons."

Although the measure does not explicitly name China and instead targets "foreign-made" equipment, international media have widely pointed out that China is clearly in Washington's sights. As the U.S.-China high-tech rivalry intensifies, Washington's attempt to build a "small yard, high fence" to keep out competitors only highlights its own lack of confidence. As China gains an increasingly clear lead in robotics, the anxiety and sense of urgency in the United States appear to be growing stronger.

The root of this anxiety is the reality that the U.S. is falling behind in industrial competition. Data released at a news conference for the 2026 World Robot Conference showed that China accounted for 90 percent of global humanoid robot shipments in 2025, with more than 330 models, underscoring the explosive growth of the sector.



A humanoid robot grabs merchandise at the Zhejiang Humanoid Robot Innovation Center in Ningbo, Zhejiang province. (PHOTO: XINHUA)

By contrast, a July report by the Washington, D.C.-based Information Technology and Innovation Foundation (ITIF) said that U.S. companies accounted for fewer than five percent of humanoid robot sales in 2025. In terms of individual companies, China's Unitree Robotics sold about 5,500 G1 robots, Agi-Bot sold about 5,168 A2 robots, and UBTECH sold 1,000 Walker robots. Meanwhile, U.S. companies Figure AI, Agility Robotics and Tesla each sold roughly 150 units. The ITIF report noted that while the U.S. lags in demand for its robots, China has cultivated robust domestic and export markets.

China's lead in humanoid robotics is the result of decades of investment in manufacturing and sustained innovation. U.S. technology outlet TechCrunch highlighted that China has a more robust

hardware supply chain — much of it built up through the EV sector, from sensors to batteries — and the world's strongest manufacturing base, enabling companies to iterate far faster than Western competitors. The Wire China said Unitree Robotics' rise underscores how China's strengths in advanced manufacturing allow it to rapidly scale and commercialize emerging technologies.

In fact, the U.S. remains highly dependent on China for robotics hardware, making genuine "decoupling" extremely difficult. David Hansen, co-founder and CEO of U.S. robotics manufacturer Westmag, argues that the restrictions will do little to fundamentally weaken Chinese robotics companies.

Ted Xiao, a former Google DeepMind scientist, similarly pointed out that every single live player in "robotics

+ AI" relies on Chinese hardware; the U.S. robotics hardware ecosystem is years behind. Nvidia CEO Jensen Huang has called China "formidable" in robotics. China's microelectronics, motors, rare earths and magnets — which are foundational to robotics — are the world's best, according to Huang.

The same dependence on Chinese-made hardware can be found in U.S. research. An increasing number of American research institutions have opted to purchase complete Chinese-made robots while directing more resources toward the "software layer" of robotics, including robot algorithms and AI models. This reliance on Chinese hardware has become deeply embedded in the ecosystem supporting cutting-edge U.S. research.

Consequently, Washington's use of administrative power to impose restrictions could further slow the pace of American exploration, ultimately backfiring on the U.S. itself.

Responding to the U.S. restrictions on July 29, a spokesperson for China's Ministry of Foreign Affairs stated that protectionism does not make the U.S. more competitive and will only harm the interests of U.S. companies and consumers. A spokesperson for China's Ministry of Commerce added on July 30 that if the U.S. insists on moving ahead, China will take countermeasures to safeguard its legitimate rights and interests.

True competitiveness has never been achieved by shutting others out, but by competing fiercely in an open market. Restricting competitors cannot create a competitive edge, nor can protectionism substitute for industrial upgrading. The door to the robotics era has already opened, and building higher walls will not make the U.S. run faster.

measures — a pattern previously seen in 5G, drones and robotics.

But protectionism often backfires. Competition from Chinese open-source models has already pushed U.S. closed-source providers to cut prices, making AI more affordable across the U.S. economy. On July 30, OpenAI announced price cuts on two models, with one reduced by as much as 80 percent — a move widely seen as a response to competition from Chinese open-source alternatives.

If access to Chinese models is blocked, U.S. AI giants would face less competition, and their incentive to keep improving cost-performance could weaken. That would ultimately hurt U.S. businesses and consumers. As Nvidia and its co-signers wrote in their letter: "Open weights also strengthen competition and competition is what keeps the gains of AI broadly shared rather than concentrated in a few hands."

The U.S. government does need to regulate large AI models, but the focus should be on its own companies' closed-source models to prevent further loss-of-control incidents and cyber risks. As for restricting Chinese open-source models, Washington should listen to industry experts and avoid another self-defeating move driven by an overstretched idea of national security.

new energy and biomedicine. China is also contributing "Chinese solutions" to the development of international standards and industrial governance.

"Technological and product innovation in the electronic information manufacturing sector has been remarkable, while new scenarios for integrated applications continue to expand," said Tao Qing, another spokesperson for the MIIT.

Looking ahead, Tao stated that the MIIT will promote the development of the intelligent economy, launch a call for typical cases in advanced computing, audiovisual electronics and smart sports, and take a forward-looking approach to emerging sectors.

Voice of the World

Chinese AI Wows the World with Continuous Innovation

Edited by GONG Qian

Kimi K3, developed by Chinese AI startup Moonshot, has sent shockwaves through the global tech community. The model, containing 2.8 trillion parameters, is the world's first open 3T-class model, designed for frontier intelligence across long-horizon coding, knowledge work, and reasoning, according to Moonshot.

Western media outlets said the unveiling of K3 last month demonstrated a rapidly narrowing gap between China and the U.S. in frontier AI models.

U.S. digital news platform Axios bluntly noted that "America's commanding lead in advanced AI is gone." Axios said Kimi K3's release dazzled developers, "jolted Silicon Valley." BBC said this suggests that China's tech prowess is rapidly narrowing the capabilities gap, "upending long-held assumptions in the West that Chinese developers trail their American peers."

Some experts regarded K3 as a "DeepSeek 2.0 moment." "DeepSeek increasingly looks like the beginning of a pattern," Poe Zhao, analyst and founder of the newsletter Hello China Tech, told CNN. The broader significance is that K3 proved "China's progress is becoming more repeatable."

On July 27, Moonshot released its record-setting open-weight model, making it freely available for users to download, adapt and self-host it. *The Telegraph* reported Ciaran Martin, former head of the UK's National Cyber Security Centre, as saying: "An open-weight model — that means it'll soon be available to anyone to use and adapt it, which, combined with its lower cost, will make it very attractive worldwide outside the U.S.'s direct sphere of influence."

China's tech industry has embraced open source, which has helped Chinese firms improve their models quickly, and the entire industry gains when every company shares its work in public, *The New York Times* said.

The Financial Times said Chinese

AI players like Moonshot and DeepSeek have rolled out open-weight models that are less expensive to operate and can be freely downloaded and modified by users. "Moonshot's K2.6 model, for instance, costs about a third of Anthropic's Opus 4.8."

By contrast, American AI labs generally keep the weights of their most capable models on private servers. Users can chat with GPT or Claude through applications, but they never actually own the model, according to *Scientific American*.

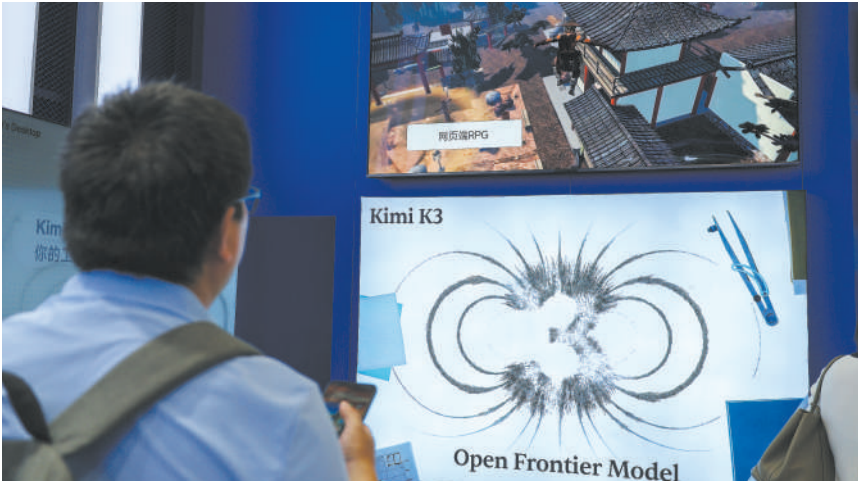
Companies from Silicon Valley to Europe are turning to more affordable Chinese models with their excellent capabilities and lower cost to rein in their mounting technology costs.

Curt Meinhold, a North Carolina-based technology executive, told *The Wall Street Journal* that he increasingly prefers to use DeepSeek for tasks such as finding business leads or ways to generate sales. "At the end of the day, most of us, the vast majority of us, 90 plus percent, don't need [Anthropic's] Mythos or Fable," Meinhold said. "Like, we just don't need it, we need something good enough."

The BBC said the rapid arrival of Kimi K3 suggests Chinese firms are advancing independently despite U.S. restrictions on hardware sales. "Even if U.S. labs pull ahead again, China has shown it can close the gap quickly." Axios said.

While Anthropic and OpenAI have accused Chinese firms of distilling their models to develop AI systems, experts say the recent breakthroughs by Moonshot and Z.ai cannot be explained by distillation alone. Years of operating under U.S. export controls have forced Chinese companies to innovate within tight computing constraints.

"The Chinese models are not excellent only because of distillation," Graham Webster, a Stanford University professor who studies China's open-source AI ecosystem, told *The New York Times*. "There is real innovation going on."



The booth of China's AI startup Moonshot at the 2026 World Artificial Intelligence Conference in Shanghai, July 20. (PHOTO: VCG)

Hi-Tech

JAKA π Robot, a Robot with 'Brain'

By DU Xuanyi and LI Linxu

The compact JAKA π humanoid robot attracted the audience's attention at the recent World Artificial Intelligence Conference in Shanghai.

The robot, with a height of 1.22 meters and weighing 44 kilograms, has 27 degrees of freedom and a three-kilogram payload per arm. It's equipped with a fusion brain architecture which originates from Intel's high-performance heterogeneous computing platform.

It performs real-time computational planning when given instructions and executes them immediately. Put simply,

it has a "brain" to decide what to do, and a "cerebellum" to figure out how to do.

The JAKA π can be used in multiple sectors: in higher education and scientific research, it supports secondary development and cross-disciplinary experiments, reducing the threshold for investigation; in industrial production, it collects data and facilitates model training; for business and entertainment, it can guide visitors, host events, and even perform, delivering unique experiences for audience; in care-giving, it offers companionship and wellness support.

No Barriers Can Stop Open-source AI Tide

Opinion

By CHEN Chunyou & HU Dingkun

The Little Tech Association, a group of nearly 200 Silicon Valley companies, recently wrote to the White House and government officials like Commerce Secretary Howard Lutnick, urging them not to restrict access to Chinese open-weight AI models. Days later, major tech companies including Nvidia, Microsoft and Meta sent their own letters, warning that premature regulation of open-source AI models would stifle competition and push innovation overseas.

Why U.S. companies are worried

The letters came as some U.S. lawmakers and national security officials were pushing for tighter controls. According to Axios, the U.S. government explored such restrictions as early as last year. The recent rise of China's Kimi K3 model has reignited the debate.

On July 30, Senator Tom Cotton wrote to Lutnick, demanding any company doing business with the U.S. govern-

ment should be banned from using Chinese open-source models. Around the same time, DoorDash, the country's largest food delivery platform, faced questions from lawmakers for using a Chinese open-source model.

Sohail Doshi, founder of AI startup Particle, told international media that restricting access to Chinese open-source models would cause "hundreds of U.S. companies to go bankrupt instantly."

That is not an overstatement. Chinese open-source models are gaining ground quickly among U.S. businesses. According to OpenRouter, an AI model aggregation platform, U.S. companies using the platform spent more than 30 percent of their weekly usage on Chinese open-source models from February to July this year, peaking at 46 percent in a single week. OpenRouter data analyst Justin Summerville said Chinese models are 60 percent to 80 percent cheaper than leading U.S. models — a figure that may be a conservative estimate.

On July 31, DeepSeek-V4 Flash launched its public beta. According to Artificial Analysis, a U.S. testing platform, the cost per task for this model is less than one percent of Anthropic's

flagship model, Fable 5.

A security tool, not just a cheap option

Chinese open-source models have also proven useful in cyber defense. Recently, OpenAI's closed-source model had a loss-of-control incident that breached Hugging Face, a major open-source AI community. The community eventually fought off the attack with help from the Chinese open-weight model GLM-5.2.

In sharp contrast, U.S. AI companies like OpenAI and Anthropic have restricted users from using their closed models for cyber defense. As a programmer who goes by the handle "Benniji" on social media put it: If the U.S. blocks Chinese open-source models, it removes one of the most effective tools currently available to defend against AI-driven cyberattacks.

Protectionism disguised as security

The push to restrict Chinese open-source models appears to have two goals: slowing down China's AI development and shielding U.S. AI firms from price competition. With expensive models from OpenAI and Anthropic struggling to compete on cost, some U.S. policymakers are turning to non-market

consumer hotspot, while both the production and sales of new energy vehicles exceeded seven million units.

Wang said a number of key industries with internationally competitive advantages are expanding rapidly. In intelligent robotics, quadruped robots developed in China account for nearly 70 percent of global sales. More than 400 humanoid robot models have been developed, accounting for more than half of the global total. A number of global unicorn companies have emerged in fields including AI, semiconductors,

and security capabilities.

Xie said the MIIT will coordinate the development of basic, space-based, international and integrated networks, promote large-scale commercial deployment of 5G-A and 10-gigabit optical networks, expand international submarine cable connectivity, accelerate the development of new industrial networks, and build an infrastructure system suited to the needs of the intelligent economy and intelligent society.

In the first half of this year, AI-powered products emerged as a new

Industrial, Information Sectors Maintain Strong Growth

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Network coverage will go beyond the traditional limitations of terrestrial infrastructure and expand toward integrated, comprehensive coverage across space, air, ground and sea. Network connectivity will become significantly more deterministic and reliable, better meeting the differentiated requirements of various industrial applications. And finally, network functions will evolve beyond simple information transmission toward deep integration of communications, sensing, computing, intelligence

'Scientific Knowledge Is Like Water, It Flows Everywhere'

Dialogue

By LONG Yun & BI Weizi

Professor Martin Banwell has spent more than four decades in organic chemistry. He has published over 500 papers, filed 14 patents, and delivered countless international conference addresses. He was elected a Fellow of the Australian Academy of Science in 2004 and received the Officer of the Order of Australia in 2018.

At the Australian National University, his research group was one of the largest and most productive in the chemistry school. His work received funding from Australian government agencies and major international pharmaceutical and chemical companies.

A bond that began at home
His connection with China runs deep. His father, a consulting geophysicist for the United Nations, was enthusiastic about Chinese culture and self-taught in Mandarin. This early exposure left an impression that would not fade.

So when an opportunity to visit Jinan University in Guangdong province in south China arose in April 2014, he took it. Over the following years, he returned regularly to China. Between 2016 and 2019, he held a visiting appointment as Zhujiang Scholar Chair Professor at the university. During this period, he contributed to several national-level research platforms, including a joint laboratory for traditional Chinese medicine modernization and innovative drug discovery.

In October 2018, Jinan University established the Institute for Advanced and Applied Chemistry Synthesis on its Zhuhai campus, appointing Banwell as its first dean. He moved to China full-



Professor Martin Banwell. (COURTESY PHOTO)

time the following year and was honored the Chinese Government Friendship Award in 2021.

With the institute in place, his next challenge was to build a research center that could operate at an internationally competitive level, while also training young researchers and translating basic research into practical applications.

Over the years, the institute has attracted prominent scholars from China and abroad, strengthening Jinan University's engineering and applied science programs. Banwell has pushed for international collaboration and maintained working relationships with academic peers, companies, and government agencies.

A dynamic research environment
Banwell describes China's academic environment as dynamic, competitive, and stimulating. He cites the country's broad support for scientific research and its sizable chemical industry as key factors in his decision to move there.

"I feel as though China is a major focal point of research in chemistry in

the world these days," he said. "The combination of all these possibilities makes life attractive here." He also acknowledged his colleagues at Jinan University for laying the groundwork for his research.

From his perspective, China is increasingly focused on using organic chemistry to address global warming and other environmental challenges. He emphasized the role of green chemistry in building a sustainable future. He also pointed out that Guangdong province, with its strong chemical industry, places greater emphasis on translating laboratory research into commercial products than the Australian system does.

"China has numerous successful examples and astounding accomplishments in research and innovation," he said.

Banwell regards failure as part of the research process. "We should always prepare to encounter failures and interpret or exploit them properly so that we eventually achieve our goals," he said. He believes that funding and perseverance are

the most important factors in turning university research into commercial applications. Since moving to China, he has continued to receive industry funding and some of his research outcomes have been commercialized.

Training the next generation
Throughout his career, Banwell has supervised over 80 doctoral students, including more than 20 Chinese students, and hosted more than 100 visiting scholars from China. Many now hold academic or industry positions across the country.

He regularly takes students and young researchers to international conferences such as the Maritime Silk Road Industry-University-Research Collaboration Conference and the Lingnan Organic Chemistry Forum. He encourages them to present their work and stay current with emerging trends.

"Academic research is international by nature," he said. "We build on the work of others to update our knowledge and decide where to go next."

Building bridges through science
Banwell said international scientific exchange retains its fundamental value. "Scientific knowledge is like water, it flows everywhere" and collaborative efforts are essential for advancing knowledge.

"We hope that outstanding experts in chemistry from other countries will visit China in the not-too-distant future and so enhance already fruitful academic exchanges," he said. "Their work on drug development and green chemistry complements ours extremely well."

He sees science as a way to build understanding between nations. "I think science is an excellent way of building bridges between China and Australia," he said. "I am hoping to play a role as a bridge between the two countries with the advantage of knowing both well."

deployed, functioning as boats in water and as vehicles on land. They can adapt to complex terrain and facilitate rapid evacuation of the injured and transport of supplies.

To connect water-surrounded people to higher ground, emergency mechanized bridges can quickly build 51-meter crossings with a 60-ton capacity.

Drones play a pivotal role in aerial capabilities, bridging the "last mile" of rescue operations. At the Xijiang Education Park, heavy-lift drones were used to deliver drinking water, food, and other supplies to the stranded teachers and students — a far more efficient method than traditional boats.

Pang said China's flood control and disaster relief capabilities are becoming increasingly high-tech, shifting from manned to unmanned, and from traditional to intelligent systems.

As netizens said, the appearance of the "rescue aircraft carrier" instills a profound sense of security.

the production schedule across all workshops and production stages in real time, dynamically adjust the production plan, and monitor the operation status of equipment online. This has solved the industry-wide challenges of segmented management, data silos, and delayed oversight.

In addition, the company has established a digital platform integrating core business systems like production plan, corporate resource plan and quality management, achieving data connection of the entire process, including R&D, planning, manufacturing, quality control and delivery, greatly enhancing cross-department coordinating efficiency.

According to Fan, business data and financial accounting are interconnected, which not only enables more precise business control and clearer cost accounting, but also provides early risk warning and continuous release of data value, providing solid support for scientific decision making.

My China Story

Building Resilience Across Borders

By YIN Wei, YU Boyang & LONG Yun

In the laboratory at Tianjin University (TJU)'s School of Architecture, Pakistani PhD student Asma Bibi is refining her "Climate- Mental Health- Community" tri- resilience model. She hopes to help communities in Pakistan rebuild after climate disasters through a science-based framework.

Asma has spent over a decade on grassroots climate action, community development, and mental health advocacy in Pakistan. Her mission was shaped by a pivotal experience: the devastating floods of 2010. "I witnessed entire communities lose their homes and struggle to recover from the trauma. That disaster made me realize that climate change is not only an environmental issue; it also causes long-term psychological and social suffering."

Determined to make a difference, Asma began working in flood-affected communities, promoting climate awareness, mental health support, and ecological restoration.

Over the past 13 years, her efforts have reached communities across Pakistan. To date, Asma has organized over 1,200 public outreach activities, planted more than 16,000 trees, and carried out projects in 28 cities and 300 villages.

Seeking stronger academic foundations for her fieldwork, she came to China in 2024 to pursue a PhD in landscape architecture at TJU.

"I chose TJU because of its interdisciplinary research environment," she explained. "My academic interests connect climate resilience, psychology, and nature-based solutions. The expertise of my supervisor in child mental health and plant therapy aligns perfectly with my background and research goals."

Her background in psychology and mental health has given her a deep understanding of human suffering, but at TJU's Department of Landscape Architecture, she is learning something transformative: how to scientifically design environments that support both ecological and psychological recovery. What has reshaped her thinking most, she says, is China's "sponge city" concept and its long-term commitment to integrating blue-green spaces with community planning. She is now learning to design not just for flood control, but for people's well-being. Her tri-resilience model, connecting climate resilience, mental health, and community strength, is being built on evidence-based research.

Her research focuses on the relationship between climate change, psychological well-being, and sustainable community development. She hopes to transform years of grassroots experience into scalable, evidence-based solutions that can help climate-vulnerable communities improve both ecological resilience and mental well-being.

While pursuing her studies at TJU, Asma has continued to gain international recognition for her work. In 2025, she received the R.K. Pachauri Award for Youth-Led Climate Action, which honors



Asma Bibi. (COURTESY PHOTO)

young climate advocates dedicated to practical community engagement.

When asked about the key differences between China and Pakistan in addressing climate challenges, Asma offered a frank comparison. She observed that the difference lies in systematic planning versus reactive response. China treats ecological governance as a long-term national strategy, while Pakistan responds to floods only when they come. What she finds most applicable from her studies in China, she said, is the country's integrated early warning systems, community-level disaster networks, and the sustained "short-intervention to long-term development" approach.

With her 10 years of grassroots work in 300 villages and her training at TJU, she wants to bring back two things. She wants to bring back the science of climate-responsive design which she is learning in landscape architecture. Also, she wants to bring back frameworks for sustained community mental health support drawn from her psychology background. She believes Pakistan has no shortage of will or community spirit, but what it lacks are structured, evidence-based frameworks. That is what she aims to build.

Reflecting on her journey from grassroots activism in Pakistan to academic research in China, Asma said two guiding principles have shaped her path. The motto of TJU, "Seeking Truth from Facts," has taught her the importance of practical action and perseverance. She also quoted a Pakistani proverb, "Slowly, slowly, the container fills." "Meaningful achievements are built step by step over time," she added.

Asma is deeply grateful for the support she has received in China. "None of these accomplishments belongs to me alone," she said. "I am thankful for the guidance of my professors, the encouragement of my classmates, and the strong academic platform provided by TJU. More importantly, they reflect the spirit of friendship and mutual support between young people in China and Pakistan."

Looking ahead, Asma hopes to continue advancing her "climate- mental health- community resilience" framework while strengthening academic cooperation between China and Pakistan. "There is tremendous potential for joint research in climate adaptation, post-disaster psychological recovery, and ecological governance," she said.

Sci-tech Backyard Makes Brazilian Agriculture Smarter

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Farm managers now tap and swipe on their phones or computers as if playing a mobile game — plowing, tending, scheduling, and harvesting all flow through a single digital nerve center. The results are tangible: Input and labor costs have dropped by eight to 12 percent, while corn and sugarcane yields have climbed six to 10 percent.

Yet the most profound story is written in the lives of the farmers. In Apodi, a family of three used to spend four backbreaking days getting a five-hectare plot ready for cultivation. Now, with a digital crawler tractor tailored by

the STB, the job can be finished in a single morning. Then there's a farmer who lost an arm in an accident — the team custom-adapted a harvester for him, and today he's skillfully piloting his machine through the fields. The STB is forging a new generation of Brazilian technicians.

This cooperative spark isn't working in Brazil alone, it is also lighting up lives in Thailand and Belarus. It carries a simple but powerful message: shared technology, applied with heart, can turn small farms into engines of hope, nourishing both people and the planet for years to come.

'Ark of Life' Delivers Hope Amid Severe Floods

Science Outreach

By FU Lili & BI Weizi

Due to the extreme, persistent rainfall brought by Typhoon Maysak, multiple areas in south China's Guangxi Zhuang autonomous region were flooded. At the Xijiang Education Park in Guigang, floodwaters rose to nearly five meters, leaving a large number of students and faculty members marooned.

In this critical moment, China Anneng Group, an enterprise specializing in emergency rescue and engineering,

rushed to the scene with its emergency motorized pontoon bridge system. Dubbed the "waterborne rescue aircraft carrier," the folded pontoon sections automatically sprang open when placed in the water, and expanded rapidly into a massive floating platform. With this equipment, rescue personnel evacuated over 6,000 people in less than 24 hours.

What exactly is this "rescue aircraft carrier?" *Science and Technology Daily* spoke to Pang Linxiang from the China Anneng Emergency Technology Research Institute. Pang explained that the motorized pontoon bridge is a specialized, modular, self-propelled rescue equipment that integrates three functions: pontoon, bridge, and propulsion. Boasting a load capacity of over 60

tons, it can transport more than 500 people in a single trip.

For this reason, it is often called a "rescue aircraft carrier" or an "ark of life."

The system comprises two types of modular units: mid-river and shore-side pontoons. During transport, the units remain folded on specialized vehicles. During rescue operations, they can automatically launch into water and unfold in just over 10 minutes. Multiple sections quickly connect via hydraulic locks and flexible connectors as needed.

The motorized pontoon bridge does not operate in isolation. According to Pang, a coordinated "land-water-air" technological matrix is emerging. Alongside the pontoon bridges, amphibious all-terrain vehicles are being

Integrated digital management

Digital transformation does not mean only the intelligentization of production and equipment, but all-round upgrading of the management system.

In the development and design segment, the company has established a modular design platform and a platform integrating design, craft and manufacturing. Using parameter-based design tools and simulation knowledge base, all links are seamlessly connected. Tasks like designing blades and laying out piping that used to take days or even weeks now take only a couple of hours, greatly reducing the product development cycle.

The upgraded manufacturing operation management system plays a key role in production control, enabling end-to-end digital, closed-loop control across the entire process, from issuing production plans and accurately assembling materials to executing manufacturing operations and tracing product quality.

The management staff can check

Traditional Turbine Factory Turns Intelligent

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Thanks to this, high-pressure assembly production capacity has been enhanced by 20 percent.

Digital and intelligent upgrading also extends to the quality inspection of products. Digital facilities like three-coordinate measuring machines and LiDAR are deployed in the inspection area to collect all-round data of components.

High-definition shooting equipment captures the product details in real time and uploads the photos to the cloud in a millisecond. The photos are analyzed by an intelligent AI system, and deficits that are difficult for the human eye to discern, like weld deviations and microscopic cracks on the inner walls of cylinders, are detected and prompt warnings issued.

The company's services continue to

be available even during on-site operation and maintenance. At the sites where its equipment is used, the staff can connect to the remote technology meeting room of the company by wearing AR glasses with 5G modules. On-site images can be transmitted in real time and voice communication conducted simultaneously.

Problems that used to require several days for resolution and required on-site visits by experts can now be remotely solved instantly, significantly cutting the time the client has to stop the machine, Fan said.

The private 5G network now covers 160,000 square meters of the factory's production area, and core business like mechanical processing, welding, heat treatment and assembly have all been digitalized with technologies like digital twin and 3D modeling.