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A Strong Country in Sci-tech Construction Enters Fast Lane

By Staff Reporters

Since the national sci-tech conference in June 2024 underscored the importance of sci-tech modernization and innovation in pursuing Chinese modernization and high-quality development, China has entered the fast lane in building a strong country in science and technology. Its sci-tech strength has achieved overall improvement, and its innovation momentum has shifted from scaling up to a leap in quality and efficiency. The overall efficiency of the national innovation system continues to rise.

Original breakthroughs

Basic research funding rose from about 250.1 billion RMB in 2024 to 277.8 billion RMB in 2025, exceeding 7 percent of total R&D expenditure for the first time. This marks a steady increase in upstream investment, shifting the focus from quantity to quality in foundational science.

The CO₂-to-starch synthesis developed by the Tianjin Institute of Industrial Biotechnology, Chinese Academy of Sciences, has moved from the laboratory toward industrialization — a "0-to-1" breakthrough in synthetic biology and a clear case of basic research translating into industrial applications.

In computing, Jiuzhang-4 runs 1,054 times faster than the world's fastest supercomputer on specific mathematical problems. The Jiangmen Underground Neutrino Observatory has improved measurement precision for two neutrino oscillation parameters by over 1.5 times compared to previous international best levels. Chang'e-6 has decoded the moon's far-side evolutionary history, reshaping the framework of solar system evolution research.

These achievements demonstrate that basic research is no longer confined to academic inquiry but is increasingly serving as a solid foundation for fostering new quality productive forces.

Breakthroughs in core tech

The China National Nuclear Corporation has achieved independent mass production of the silicon-28 isotope with an abundance exceeding 99.99 percent. This breakthrough will facilitate independent development of core materials for silicon-based quantum computing in China. Stable isotopes also hold strategic value in precision radiotherapy, nuclear security traceability, and fundamental physics research.

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A Long March-4B rocket carrying the Haiyang-2E satellite blasts off from the Jiuquan Satellite Launch Center in northwest China, July 2, 2026. (PHOTO: XINHUA)

STI Frontier

How to Bring Organoid Cultivation into Industrial Era

By Staff Reporters

Organoids are mini lab-grown organs that help test drugs without human trials. But their cultivation has long been a gamble — poor consistency and lack of standards have blocked their clinical use.

Now, a five-year effort by Professor Gao Huijun's team at Harbin Institute of Technology, working with Chinese biotech firm BGI Genomics, has produced an intelligent manufacturing system that grows highly consistent "blood island organoids." This turns guesstimated manual work into a standardized, automated production line, bringing organoid manufacturing into the industrial age.

Conquering cell clustering

The team's first major technical battle was eliminating randomness during cell seeding. In manual operations, cells clumped together or left empty spots, causing organoids to grow with huge

shape and function differences. The team initially assumed the 100-micron needle's inner wall was the culprit, so they spent a full year testing various hydrophilic and hydrophobic coatings. Nothing worked — cells still aggregated chaotically.

Realizing the issue was control, not materials, they developed a single-cell compliant visual servo control method. Their first iteration focused solely on density control: A camera recognized cell counts and adjusted fluid pressure accordingly. This pushed the self-assembly success rate to 72 percent — but there it stubbornly stalled.

Through deeper observation, they discovered cells naturally migrate toward the center. So they added boundary constraint algorithms to let the machine detect edges and confine cells within defined zones. Yet results remained unstable. The breakthrough came in 2023

when they integrated density, boundary and spatial distribution into a single closed-loop feedback system. Instead of squeezing cells, the AI gently guides each cell to its optimal position using real-time visual feedback. This triple-parameter control finally achieved 98 percent uniformity.

Cell consumption dropped from millions to just a few hundred per batch, and the system now produces 1,000 identical organoids simultaneously — a four-fold increase in efficiency and 7.3 times better biological consistency than human hands.

Seeing inside without destroying

With uniform organoids in hand, the next hurdle was quality assessment. Traditional methods required destroying the organoid to measure drug response — a one-time snapshot that couldn't track changes over days.

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International Cooperation

Chinese Solutions Empower Malaysia's Rehabilitation System

By LI Linxu

With the rapid development of China's embodied AI industry, its technological dividends are increasingly being shared with the world.

On June 16, Malaysia's National Neuro-Robotic and Cybernetics Rehabilitation Centre in the state of Perak was officially opened.

The centre, built by the Social Security Organisation of Malaysia (PERKESO), is one of the most advanced rehabilitation facilities in Southeast Asia.

As a key partner of PERKESO, Chinese robotics company Fourier was invited to showcase its GRx humanoid robot series at the opening event, highlighting the vast potential of embodied AI in clinical rehabilitation and patient care.

"Our partnership with PERKESO was not built overnight. Rather, it has been a gradual journey of building trust since 2022, evolving from product application and research collaboration to joint project development," said Gu Jie, founder and CEO of Fourier. Today, the partnership enters a new chapter with the launch of one of the region's most cutting-edge rehabilitation facilities.

Designed to accommodate up to 700 patients at a time, the centre is built for scale and impact. Besides serving local patients, it will also serve as a global centre of excellence for PERKESO's Rehabilitation and Return to Work programs, setting a new international benchmark for technology-enabled recovery and workforce reintegration.

It features an expanded suite of Fourier's intelligent rehabilitation solutions, including its Galileo system — an advanced biomechanics analysis and rehabilitation platform — and its RehabHub devices, both deployed to support research and rehabilitation applications. The Galileo system commenced trial operations at the centre in October 2025 and has since benefited over 1,000 patients. See page 3

WEEKLY REVIEW

CSP Breakthrough in High-latitude & Extremely Cold Regions Made

On June 29, the 100,000-kilowatt concentrated solar power (CSP) plant at China General Nuclear Power Corporation's Jixi Base began operation in Da'an city, Jilin province. As China's northernmost CSP plant, this project marks a major breakthrough in the application of CSP technology in high-latitude, extremely cold regions, providing a replicable model for similar projects in comparable areas.

1st Radio Pulses Detected from Central Compact Object

A joint research team from the National Astronomical Observatories of the Chinese Academy of Sciences and Tsinghua University has, for the first time, detected radio pulses from a Central Compact Object, a class of young neutron stars long believed to be radio silent. The finding marks the first successful detection after decades of searches and provides key evidence for understanding the formation and evolution of these stars.

Graphene Can Host Multiple Superconducting States

A research team from the Massachusetts Institute of Technology found multiple superconducting states in rhombohedral graphene, a natural structure within graphite. Several of the newly discovered superconducting states remain stable even in the presence of a magnetic field, which would normally suppress superconductivity. IBM Debuts World's First Sub-1 Nanometer Chip Technology

International Business Machines Corporation (IBM) on June 25 unveiled a major semiconductor breakthrough with the introduction of the world's first sub-1 nanometer (nm) chip technology, featuring a transistor architecture at the 0.7 nm, or 7 angstrom node. The achievement marks a landmark moment for an industry facing the physical limits of traditional chip scaling.

New Graphic

By the end of May 2026

China's 5G Mobile
Phone Users Reached

1.275 Billion

Accounting for 69.3%
of all mobile phone users

Source: Ministry of Industry and Information Technology
Designed by SONG Ziyan / Science and Technology Daily

WECHAT ACCOUNT



E-PAPER



China to Scale Up High-level Education Opening Up

Policy Express

By QI Liming & GONG Qian

China's State Council has issued an outline plan for the development of the education sector during the 15th Five-Year Plan period (2026-2030), focusing on building a strong, globally competitive educational system to underpin the country's modernization drive.

By 2030, China will have essentially completed constructing a high-quality education system, establishing a society of lifelong learning and enhancing the influence, competitiveness, and voice of its education sector on the global stage.

A total of 23 key tasks have been laid out in five aspects: fostering virtue through education, strengthening education's supporting role for the development of science and technology and human resources, improving the quality of education as a kind of public service, building a higher-caliber teaching workforce, and scaling up high-level education opening up.

International exchanges and cooperation in basic research will be deepened while leading research universities



Children in Shijiazhuang, Hebei province participate in a game to celebrate the Dragon Boat Festival at their kindergarten, June 17, 2026. (PHOTO: XINHUA)

will be supported to initiate or participate in international big science programs and projects. World-class science and engineering universities from overseas are encouraged to establish joint education programs in China, and international training programs for outstanding talents will be launched.

Chinese education brands with global influence will be built. Coopera-

tive mechanisms with European and American countries will be developed and consolidated, while deepening collaboration with neighboring nations, countries participating in Belt and Road cooperation, and other Global South countries. The focus will be on sharing Chinese standards and solutions in areas such as vocational education, basic education, engineering

education, artificial intelligence education, and teacher development.

The plan emphasizes active participation in and leadership of global education governance. Multilateral platforms including international organizations will be fully leveraged to advance cooperation with UNESCO and other international bodies, as well as multilateral frameworks such as BRICS and the Shanghai Cooperation Organization.

The plan also introduces the Global Impact Enhancement Plan for Chinese Education. Key measures to be taken abroad include establishing an elite engineer training program, science and technology backyards, and traditional Chinese medicine education centers, as well as establishing or upgrading approximately 20 Luban Workshops (Chinese vocational workshops.)

Additionally, demonstration zones for international education cooperation and exchange bases for Chinese and foreign youth will be set up. Major international conferences, hosted or co-hosted by China such as the World Digital Education Conference, the World Chinese Language Conference, and the World Vocational and Technical Education Development Conference, will continue.



Case Study

Zhangjiang: Accelerating High-end Manufacturing Circle for Embodied Intelligence

By TANG Zhexiao, WANG Chun & SHEN Han

At the recently held 2026 Zhangjiang Embodied Intelligence Supply Chain Conference, a number of enterprises joined the Zhangjiang Robot Valley alliance, with a host of industrialization projects for embodied intelligent robots signed. Focusing on the emerging track of embodied intelligence, Zhangjiang is evolving from a source of innovation into an industrial hub.

In Zhangjiang, a town located in Shanghai's Pudong district, innovation in embodied intelligence is not confined to individual company labs. Technical bottlenecks are often overcome through brainstorming sessions in shared pantries.

Thanks to the industrial agglomeration effect where upstream and downstream partners work in the same building, R&D cycles have been greatly shortened. This highly efficient industrial ecosystem stems from the region's systematic planning for the industrialization of embodied intelligence.

For startups, supply chain coordination from scheme design to prototype manufacturing used to take at least one to two months. In Zhangjiang Robot Valley, the whole process can be completed within two weeks.

To accelerate robotics industrialization, Zhangjiang has unveiled an embodied intelligence supply chain platform, enabling precise cooperation matching for design, prototyping, and manufacturing of humanoid and embodied robots.

Hosting a large number of suppliers and buyers along the industrial chain, the valley provides ideal conditions for the platform's operation, said He Hongjun, head of Zhangjiang Robot Valley.

Zhangjiang's efforts go far beyond spatial agglomeration. At the supply chain conference, a large batch of orders for the platform was signed.

The platform has integrated resources from nearly 8,000 core enterprises in the embodied intelligence supply chain, enabling companies to achieve "one-day matching, three-day prototyping, and one-week trial production," He said.

The accelerated product iteration is not limited to complete machine manufacturers. Many companies along the supply chain are also speeding up. "In the first half of 2026, our dexterous hand shipments already exceeded the total for the entire year of 2025," said Wang Zhenkun, chief marketing officer of OYMotion Technologies.

He added that the lifespan of their self-developed dexterous hands has currently reached 500,000 air grasps, and the technical team is striving toward a target of two million grasps.

The implementation plan for the development of Shanghai's embodied intelligence industry, released in 2025, designates Zhangjiang as the core industrial carrier and calls for accelerated development of the full industrial chain of embodied intelligence.

At present, Zhangjiang is home to more than 130 enterprises along the embodied intelligence industrial chain, among which nearly 80 specialize in the humanoid robot sector. Centered on building a complete industrial chain for embodied intelligence, Zhangjiang covers over 70 percent of all segmented industrial sectors.

Centered on Zhangjiang, a high-end manufacturing cluster for embodied intelligence is taking shape within a 150-kilometer radius.



Robots take part in a goods transfer competition at the Zhangjiang Science Hall in Shanghai. (PHOTO: XINHUA)

National Action Plan to Promote Green Lifestyles

By Staff Reporters

China has unveiled a new national action plan aimed at mobilizing public participation in ecological conservation and promoting greener lifestyles over the next five years.

The Ministry of Ecology and Environment, together with five other government departments, jointly released a five-year plan (2026-2030) to strengthen the cultural foundation for the Beautiful China Initiative, raise public ecological awareness, promote green and low-carbon living, and establish a nationwide participation framework by 2030.

The document outlines 15 specific measures across five key areas, aiming

to continuously improve the public participation framework, stimulate society's intrinsic motivation to protect the environment, and encourage people from all walks of life to adopt green and low-carbon lifestyles.

One major focus is the preservation and promotion of ecological culture. The plan calls for incorporating ecological and environmental elements into projects under the Beautiful China Initiative, national ecological civilization demonstration zones, "lucid waters and lush mountains are invaluable assets" practice and innovation bases, national parks, and other protected natural areas. These efforts are intended to enrich ecological culture and create new "Beautiful China" landmark

destinations for public visits.

The plan also encourages museums, exhibition halls and research institutions to expand ecological exhibitions and interactive educational programs.

To encourage broader public engagement, it proposes expanding the opening of environmental protection facilities to the public. Enterprises with the necessary capacity and willingness are encouraged to make their facilities accessible, while exploring innovative formats such as virtual immersive tours and hands-on offline experiences. It also promotes integrated models combining facility visits, educational programs, cultural tourism, and consumer activities to enhance both public participation and operational safety.

In addition, the plan promotes sustainable tourism by encouraging travelers to reduce the use of disposable products and protect the ecological environment of scenic destinations. It also calls for strengthening public communication on standards, certification, and labeling for green and low-carbon products to improve consumers' ability to identify environmentally friendly goods and encourage greener consumption.

To strengthen long-term incentives, the plan proposes conducting regular surveys of citizens' environmental behaviors to assess changes in public green practices and provide data support for more targeted policymaking.



Standards Proposed for Humanoid Robots

By TANG Zhexiao

The Ministry of Industry and Information Technology has issued a notice soliciting opinions for formulating and revising plans for multiple industry standards. The proposed standards also include technical requirements for humanoid robots in scenarios such as electrical substations and home appliance manufacturing.

Electrical substations, the heart of the power grid, currently rely mainly on wheeled or tracked robots for intelligent inspection. However, approximately 30

percent of inspection points inside substations are still blind zones that wheeled robots cannot access.

Yet humanoids with their human-like mobility, bipedal walking capabilities, and multi-joint coordination can effectively compensate for the shortcomings of the existing inspection robots. However, the lack of standards has become a bottleneck restricting the large-scale application of humanoid robots in substations.

The proposed technical requirements for humanoid robots in substation scenarios will establish a termi-

nology system tailored to such robots, set out technical specifications across eight dimensions, and stipulate full-process management rules for their deployment. These standards will provide a unified technical guideline and testing evaluation methodologies for the industry.

At present, many Chinese home appliance companies have deployed humanoid robots in their manufacturing plants. Therefore, establishing evaluation standards for their operational performance is particularly crucial.

The proposed technical require-

ments will build a complete indicator system to assess the operational performance of humanoid robots used in home appliance production and define relevant evaluation methods. They will guide manufactures on technical development, enable users to more efficiently evaluate and optimize robot performance, and serve as a reference to assess the performance of humanoid robots in other fields.

Additionally, other standards proposed for approval include the general technical requirements for humanoid robot interconnection systems, technical specifications for automated battery-swapping systems, and after-sales service specifications for humanoid robots and embodied intelligence.

encourage scientists to pursue high-risk, high-reward exploration. These changes have gradually established a foundational institutional framework that supports comprehensive innovation.

By 2025, China's full-time R&D personnel had reached 7.95 million person-years, ranking first globally. China ranked second worldwide in the number of highly cited researchers. These metrics reflect a systemic shift in innovation capacity.

From upstream basic research to downstream industrial application, and from institutional restructuring to talent empowerment, these changes are collectively accelerating China's progress toward high-level self-reliance in science and technology.

A Strong Country in Sci-tech Construction Enters Fast Lane

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In integrated circuits, a complete industrial chain covering design, manufacturing, packaging and testing, equipment, and materials has taken shape. Domestically developed ultra-wide band photonic chips are providing foundational support for 6G space-air-ground integrated communications. A 35.6-tesla full-superconducting magnet has set a new world record for steady-state magnetic fields, offering technical support for materials science, life sciences, and nuclear fusion research.

In AI, several Chinese large language models have surpassed 95 percent

accuracy, matching or approaching international leaders. Humanoid robots have moved beyond prototypes into deployment in automotive manufacturing and power grid inspections. In invasive brain-computer interfaces, China has become the second country after the U.S. to enter clinical trial.

Each breakthrough strengthens a link in the industrial chain, and these cumulative advances are coalescing into a tangible driver of new quality productive forces.

Institutional reforms

Coordination between science and technology policies and fiscal, tax, and

financial policies has become more efficient. In 2025, tax reductions, fee cuts, and rebates supporting innovation and manufacturing exceeded 2.8 trillion RMB, while R&D super-deduction policies were expanded and refined.

The talent evaluation system has shifted away from sole focus on papers, titles and awards, toward criteria based on innovation value, capability, and contribution. Researchers have been given greater autonomy in sharing proceeds from the commercialization of their outcomes. Mechanisms such as "open competition for key research projects" and "racing" systems have been adopted to

Blocking Chinese Health Devices Hurts American People



By LIANG Yilian & HU Dingkun

Recently, U.S. Senator Rick Scott, chairman of the Senate Special Committee on Aging, and Senator Dave McCormick sent a letter to Federal Communications Commission (FCC) Chairman Brendan Carr, alleging that Chinese-linked wearable health devices pose data privacy risks and raise national security concerns. The senators urged the FCC to investigate such products and consider whether they should be added to the agency's Covered List of prohibited equipment.

Notably, the lawmakers' concerns extend beyond smartwatches, glucose monitors and hearing aids produced by Chinese brands. The letter also targets devices made in other countries that rely on Chinese cellular Internet of Things communication modules.

By overstretching the concept of national security, the senators have launched a highly targeted attack on China's wearable health technology sector. The timing appears carefully calculated. As they acknowledged in the letter, "while many Chinese health wearable devices are not yet widely available in the United States, many Chinese companies are expected to submit competitive bidding applications to the Centers for Medicare and Medicaid Services, risking a flood of U.S.-bound products in the coming years."

Chinese companies already play a major role in the global wearable device industry. According to technology market research firm Omdia, global wear-



Buyers check out exhibits in the smart medical area at the China Import and Export Fair in Guangzhou, south China, October, 2025. (PHOTO: XINHUA)

able device shipments exceeded 200 million units in 2025. Chinese tech giant Xiaomi ranked first worldwide with an 18 percent market share, while Huawei placed third with 16 percent.

Chinese devices are also beginning to gain traction in the U.S. market. The Amazfit Active 2 smartwatch, owned by Chinese company Zepp Health, has received positive reviews from American technology media outlets for its fitness-focused features. Xiaomi's fitness bands have also attracted growing attention on major e-commerce platforms because of their affordability and functionality.

Earlier this year, the U.S. Food and Drug Administration relaxed regulatory requirements for low-risk wearable health devices. Although the intention

was to encourage innovation among U.S. companies, it has also facilitated the entry of related Chinese products into the U.S. market.

The campaign against Chinese wearable devices is particularly puzzling given the growing emphasis in the U.S. on preventive healthcare and chronic disease management. In recent years, U.S. policymakers and public health advocates have increasingly promoted wearable health technologies to encourage healthier lifestyles and improve long-term health outcomes.

Yet affordability remains one of the biggest barriers to adoption, especially among lower-income groups and older adults. Research published in the *Journal of Medical Internet Research* in 2024 found that wearable

device usage in the U.S. declines significantly as income levels decrease.

This is precisely where Chinese products can make a meaningful contribution. Many Chinese wearable health devices are priced at a fraction of their U.S. counterparts, making advanced health-monitoring tools more accessible to consumers with limited incomes. Their availability could help narrow the "digital health divide" and enable more Americans to benefit from modern healthcare technologies.

As for the data privacy and security risks mentioned in the senators' letter, they are entirely fabricated and sensationalized. In recent years, Chinese wearable health devices have sold well around the world, and there has never been a serious data privacy issue with them. However, such problems have occurred repeatedly with similar American products.

For example, in 2025, Apple paid 95 million USD to settle a proposed class action lawsuit after its built-in AI voice assistant Siri was accidentally activated on devices including Apple Watch and secretly recorded user conversations. In 2022, regulators from 40 U.S. states reached a 391.5 million USD settlement with Google over allegations that its devices continued to track location data even after users turned off location settings.

Senators who focus specifically on aging issues should recognize that Chinese wearable health devices can provide cost-effective health services to low-income groups in the U.S., especially the elderly, instead of adopting a blanket opposition to Chinese technology. Suppressing and blocking Chinese wearable health devices will likely end up hurting ordinary American citizens.

Voice of the World

Ecological Protection in China: An Experience Shared Globally

Edited by QI Liming

Carbon emissions lead to climate change, which in turn has a significant impact on biodiversity. In recent years, China has achieved dual success in reducing carbon emissions and protecting biodiversity.

China's CO₂ emissions have now been flat or falling for 21 months as of February 2026 — not because demand stalled, but because clean-power generation has been growing faster than demand, reported Lauri Myllyvirta, co-founder of the Centre for Research on Energy and Clean Air in Helsinki, whose quarterly analyses for UK-based energy research organization Carbon Brief are widely regarded as the benchmark for tracking Chinese emissions.

Renewable energy has become one of the main drivers of China's economic development. According to Carbon Brief, by 2025, solar power, electric vehicles (EVs) and other clean energy technologies contributed more than one-third to China's economic growth and drove over 90 percent of investment growth.

"China's energy transition demonstrates the power of long-term planning," said Espen Mehlum, head of energy at the World Economic Forum (WEF). "Guided by successive Five-Year Plans, the country has improved energy security, sustainability and affordability."

In parallel, it has built globally leading capabilities in clean energy industries such as EVs, batteries and solar manufacturing: progress reflected in its strong performance in the WEF's Energy Transition Index.

The output value of China's clean energy sector reached a record high of 15.4 trillion RMB (2.1 trillion USD) in 2025, accounting for about 11.4 percent of the country's GDP — equivalent to the economy of Brazil or Canada. A February analysis by Carbon Brief stated

that between 2022 and 2025, the actual scale of China's clean energy sector nearly doubled; if treated as an independent economy, it would rank eighth globally.

While making efforts to reduce carbon emissions, China is also cooperating with other countries around the world to jointly carry out biodiversity conservation.

During a biodiversity protection training course for Belt and Road partner countries under the dual carbon framework, officials and experts from countries such as Kenya, Sierra Leone, Sri Lanka, Egypt, Ethiopia, Nepal and Thailand visited Beijing and Sichuan in southwest China. They praised China's achievements in biodiversity protection, saying China's practical experience has broadened the horizon for biodiversity protection work.

Panida Muangmor, who serves in the Thai Ministry of Natural Resources and Environment, said China has effectively implemented a series of policy measures, carried out large-scale ecological restoration projects, and engaged in international cooperation.

"We jointly carried out the protection and restoration of mangroves, promoted knowledge sharing, and established a long-term cooperation mechanism," Panida said.

Garissa, a county in Kenya, has a 50-megawatt photovoltaic power station that is a model of high-quality Belt and Road green energy cooperation between Kenya and China. It is the largest photovoltaic power generation project in East Africa, bringing significant economic, social and environmental benefits to the county and the entire country.

"We look forward to the two countries conducting more cooperation in areas such as green energy, talent cultivation, and joint monitoring, to achieve greater mutual benefit and reciprocity," Abdiladif Haret, director in charge of climate change in Garissa, said.



Egrets in the Chongqing National Wetland Park of China in 2025. (PHOTO: XINHUA)

Tech-finance Synergy Gains Greater Momentum

Opinion

By LI Linxu

Thanks to strong policy support, a favorable market environment and a sound innovation ecosystem, China's capital market and new quality productive forces are reinforcing each other in a two-way synergy, accelerating the deep integration of technological and industrial innovation.

According to China Securities Regulatory Commission's chairman Wu Qing, the technology sector currently accounts for over 30 percent of the A-share market's total market capitalization. Among the listed companies with a market capitalization exceeding 100

billion RMB, tech firms now make up 45 percent. A growing number of high-quality innovative enterprises are efficiently debuting on the A-share market, accelerating the momentum of a two-way embrace and mutual reinforcement between the capital market and new quality productive forces.

The trend is also underscored by a recent report released by global professional services and accounting firm EY. The report reveals that the A-share market exhibits a distinct sectoral divergence driven by new quality productive forces. In the first half of 2026, the A-share market is expected to have 81 initial public offerings (IPOs), raising 105.7 billion RMB. Industrials, technology and materials ranked the top three in the number of IPOs, accounting for 75 percent of the total. As for the fundraising

scale, technology ranked first in the A-share's IPO market.

From an industry perspective, filing companies are highly concentrated in strategic emerging industries, exhibiting a pronounced new quality productive forces profile. Frontier areas such as AI, humanoid robots, advanced semiconductors, new energy storage and innovative biomedicine have become the main filing forces, indicating that the capital market is efficiently allocating resources to sectors with the strongest technological moats and growth potential, effectively boosting self-reliance and strength in science and technology and industrial structure upgrading.

The Beijing Stock Exchange has been established as the primary platform for serving "innovative small and medium-sized enterprises." In the first half of

2026, nearly 50 percent of enterprises chose this segment to apply for listing.

Meanwhile, the multi-level capital market has continued to deepen synergistically. In particular, the comprehensive policy package for the reform of the Shenzhen Stock Exchange's ChiNext Board has officially taken effect, significantly enhancing market inclusivity and vitality.

As EY Greater China IPO leader Terence Ho noted, the technology attribute of the A-share market is becoming increasingly prominent, with capital markets rapidly converging towards sci-tech enterprises. Premium sci-tech enterprises that meet listing requirements are expected to be prioritized in the pipeline, aligning more precisely with the real economy's demand for new quality productive forces.

No-driver Monster Mine Truck Walks Sideways

Hi-Tech

By GONG Qian & XIA Fan

The Shuanglin K7, a pioneer driverless electric-powered mining truck, recently made its debut in Shanghai.



The Shuanglin K7, a pioneer driverless electric-powered mining truck. (COURTESY PHOTO)

Equipped with a Level 4 autonomous driving system and boasting outstanding maneuverability, the 248-tonne vehicle is capable of moving sideways like a crab and performing in-situ U-turns.

The truck's cutting-edge distributed electric drive steer-by-wire corner module system enables its groundbreaking performance, which integrates driv-

ing, braking, steering and suspension systems into the wheel assembly, making the independent steer-by-wire and control on all wheels possible. According to developers Shuanglin Co., Ltd. and Tsinghua University, this colossal truck, measuring 17.79 meters in length, 5.7 meters in height and 5.2 meters in width, is the first of its kind.

"Traditional mining trucks spend much time making U-turns on narrow loading and unloading platforms, while facing blind-spot risks. The corner module system endows vehicles with crab-walking and center-point steering capabilities, greatly improving operational flexibility and site adaptability in complex environments," said Professor Huang Jin from the School of Vehicle and Mobility, Tsinghua University.

According to the manufacturer, the vehicle supports 24/7 autonomous

operations thanks to its ultra-fast battery swapping, which takes only five minutes to change. It can also convert up to 85 percent of kinetic energy back into stored electricity via the regenerative braking system.

Powered by multi-sensor fusion perception and intelligent algorithms, the K7 supports all-weather unmanned transportation, automatic platooning and following, as well as precise automatic docking and loading/unloading with electric shovels and crushing stations.

Projections show that the K7's grouped unmanned operations can boost transport efficiency by 35 percent, reduce mine accidents on site by 90 percent, and cut full-lifecycle maintenance and tire costs by around 25 percent, compared to traditional diesel machinery.

Chinese Solutions Empower Malaysia's Rehabilitation System

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The center's opening event offered a glimpse into the future of rehabilitation and clinical care through live humanoid demonstrations. The GRx showcased its capabilities in fitness routines, and its potential role in supporting occupational therapy in clinical research settings.

Together, these applications highlighted the expanding role of humanoid robotics in patient care, with future possibilities spanning mobility assistance, ward patrols, and patient companionship.

Beyond deploying advanced rehabilitation technologies, Fourier and PERKESO have reaffirmed their shared commitment to innovation through collaborative R&D initiatives. They will invest in R&D across multimodal robotics, embodied AI, and emerging rehabilitation technologies including brain-computer interfaces, functional electrical stimulation and virtual reality.

"Embodied AI is still evolving rapidly. Our true aspiration is to work alongside global peers to drive the maturity of this technology within real-world scenarios," said Gu.

4

LIFE IN CHINA

China Excels in Turning Vision into Reality

Dialogue

By LONG Yun & YANG Yan

Shahid Afraz Khan has spent the last 10 years navigating China's media landscape as an Urdu expert at China Media Group (CMG). From a senior producer at Radio Pakistan to a multifaceted media personality in Beijing, Khan's perspective offers a blend of an insider's view and a foreign observer's curiosity. With a background in chemistry, an MBA and a master's in mass communication, he reaches millions of Urdu speakers across Pakistan, India, the Middle East, Europe and the U.S.

A reflective evolution
Khan's personal evolution mirrors the changing environment of China's media. In Pakistan, producers stay behind the camera and reporters stay in the field. In China, Khan found a system that demands and nurtures versatility. "In Pakistan, jobs are very specialized. If you are a producer, you never appear on air. In China, we are expected to multitask. It forces you to be more creative. "In China, we have multitasking," he explains. "We have to do all these things, which makes us more creative."

He credits CMG with providing the freedom to explore different facets of media, from news editing and radio hosting to becoming a social media influencer. The working environment encourages ideas, which Khan says makes China a good place for learning and creating.

When he first arrived in Beijing in 2015, he could not read a single Chinese character and worried about food and language barriers. "When I came here and saw things firsthand, I said, these are all misconceptions," he recalls. "Life is very easy here. You can find everything, and you never feel like you are in a strange place."

From vision to reality
One of the things Khan has witnessed



Shahid Afraz Khan. (COURTESY PHOTO)

during his decade in China is the country's ability to translate visions into practical steps. "The best thing I have learned from China," he says, "is that they know the art of transforming vision into practical steps."

He recalls his early days in Beijing in 2015, when winter pollution was a significant issue. A colleague mentioned the aspiration for a "blue sky Beijing." He was skeptical, drawing parallels to the smog in Lahore and Karachi that had persisted for decades. "Now blue skies are a reality in Beijing. I have seen it with my own eyes," he says.

This experience shaped his understanding of Chinese governance. He contrasts this with other political systems where the promises made in speeches are sometimes forgotten: In China, "whatever they say, they do it practically." He has watched the buses go from petrol to electric and the subway lines multiply. "I am not talking about mega-projects," he says. "I am talking as a common man who uses these facilities every day."

This consistency of policy and the ability to set realistic goals have impressed him, proving that long-term planning yields tangible results for the public.

Humanity at the core
While China's speed of innovation is well known, Khan is most struck by how technology is anchored in a people-centric philosophy. "All of their approaches are people-centric," he says. "They want to bring tangible solutions for ordinary citizens. And because they are practical, they achieve what they set out to do."

He cites elder care as a prime example. During his reporting, he saw robots helping the elderly with medication, detecting falls and providing companionship. "Robots are involved in humanistic ways," he says.

He also points to AI-driven garbage sorting that turns waste into energy. "Not a single thing in China is wasted," he says. "In Pakistan, we still struggle with waste management. Here, it has become a resource."

Beyond social care, he highlights environmental transformations, such as the repurposing of Shougang Park, a former steel complex, into a hub for international activities. "That is the vision of the leadership," he says. "They want to set an example that industry should be environment-friendly."

Whenever he visits exhibitions, he sees new products, robotics and AI-driven solutions. "Every time, we find a new solution," he says. "If I explain it simply, China is making miracles."

Innovation without borders
Khan's role as a bridge between China and the Urdu-speaking world has allowed him to witness how Chinese technological achievements are reaching other developing countries. He speaks about cooperation in space, citing Pakistan's partnership with China in satellite development and the use of China's BeiDou navigation to monitor climate change. "Pakistan is one of the countries most affected by global warming," he says. "With satellite data, we can predict floods and droughts much better."

In agriculture, Chinese experts have helped Pakistan combat locust invasions. Chinese hybrid rice is now grown in Pakistan, using less water. Pakistani students who studied in China returned and introduced inter-cropping techniques, boosting yields. "They told us they are using Chinese methods to grow more food with fewer resources," Khan says.

In infrastructure, the Orange Line Metro in Lahore, built with Chinese assistance, serves millions of commuters. Chinese electric-vehicle manufacturers like BYD are setting up plants in Pakistan.

"China has made technology accessible to everyone in the world," Khan says. "Earlier, technology was so expensive that developing countries could not afford it. Now with Chinese technology, it is accessible to people in Pakistan, Africa and Southeast Asia."

He also mentions Chinese involvement in disease prevention in Africa and projects in Sri Lanka. "China's development is not limited to Chinese only. It is beyond China's borders."

When asked about China's role as a major power, he says, "After my decade of experience, I must say China's sci-tech rise is about making technology affordable and sharing solutions. That is serving millions of people across the world."

Tech+Culture

Sci-tech Brings to Life Longmen Grotto Relics

By Staff Reporters

The Longmen Grottoes are located on both sides of the Yi River south of the ancient capital of Luoyang in Henan province, central China. The grottoes comprise more than 2,300 caves and niches carved into steep limestone cliffs over a one-kilometer long stretch. In 2000, the site was added to the UNESCO World Heritage List as "an outstanding manifestation of human artistic creativity" due to its perfection of an art form.

Cave number 140, also known as the Middle Binyang Cave, has its ceiling engraved with a blossoming lotus flower, eight apsaras playing music, two apsara attendants, a tassel, and drapery patterns.

However, partly because of their high location — above nine meters — and long-term weathering, the intricate patterns and exquisite craftsmanship of the carvings can't be observed minutely by visitors with the naked eye.

To address this, the Longmen Grottoes Research Institute used cutting-

edge digital technology to accurately restore the cultural relics and created the "Cloud Longmen" digital exhibition platform. This platform brings the magnificent scenes of celestial music and dance from a thousand years ago back to life.

Li Linlin, a Longmen Grottoes Research Institute researcher, said color analysis technology was used to identify more than a dozen types of mineral pigments used on the carvings. Based on historical photographs, the original polychrome paintings were restored and brought to life through animated displays.

Since 2005, the institute has been creating a digital archive of the grottoes. Using technologies such as laser scanning, high-definition photography and 3D modeling, it has collected data on the cultural relics and conducted comprehensive digital documentation of numerous caves. This initiative has ensured the preservation of these millennia-old stone carvings in digital form.



A researcher at the Longmen Grottoes Research Institute restores a Buddha head artifact at the institute's Cultural Heritage Conservation Technology Center. (PHOTO: XINHUA)

Traditional Eastern Wisdom

Fujian's Irrigation System a World Heritage Site

By BI Wei

The Mulanbei Water Conservation Project in Mulan, a village southwest of Putian city of Fujian province in southeast China, has been in operation for nearly 1,000 years. It adopted unique planning, design and construction techniques well ahead of its contemporaries to retain fresh water and resist saline water intrusion. The structure was completed in 1083.

It was designed for water retention, tide prevention, flood discharge, sand removal and water diversion. The location of the weir was chosen based on previous experience to perfectly balance the impact of upstream floods and downstream tidal surges. Due to its location on a weak riverbed near the ocean, the project's headwork structures included an overflow weir, a gravity dam, a diversion dike, a sluice gate, and diversion mouths on both riverbanks. The raft foundation alleviates pier pressure per unit area. The sluice foundation and the weir are made of local granite.

The gate walls or piers were built on the weir, and stone pillars inserted

through the walls or piers into the riverbed base rock. Pig iron was then melted to fill the gaps. The pier stones of the weir and the gate stones were linked with shoe-shaped iron ingots. As such, the weir and the gate formed an integrated whole. The iron ingots were used to ensure the project operated effectively for more than 930 years. To this day, it retains its basic engineering construction from the historical period.

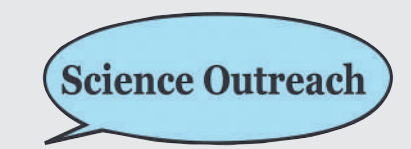
The Mulanbei Water Conservation Project has contributed to the development of the Xinghua Plain, a highly fertile coastal plain in Putian. It supplies water for industrial and agricultural production and domestic use, and also plays a part in shipping and aquaculture. It is especially important for flood defense. The project saw southern China's population increase and agriculture develop rapidly.

Mulanbei serves as a microcosm of Putian's historical development, providing a concrete example for the study of social change in the region. In September 2014, the International Commission on Irrigation and Drainage included this project in the inaugural list of World Heritage Irrigation Structures.



The Mulanbei Water Conservation Project in Mulan, a village southwest of Putian city of Fujian province in southeast China, has been in operation for nearly 1,000 years. (PHOTO: VCG)

The Secret of Midday Naps



By Staff Reporters

Summer heat often brings fatigue and drowsiness, and a midday nap can offer relief for both body and mind. However, how long should a nap be? And why do some people wake up feeling exhausted? *Science and Technology Daily* consulted two medical experts

for the answers.

Huang Hongfei, an attending physician in the Department of Psychiatry and Psychology at the General Hospital of the Northern Theater Command in Shenyang city, northeast China, said napping can significantly boost attention and alertness, regulate moods, and reduce irritability, impulsivity, and emotional exhaustion.

It also lowers sympathetic nervous system activity, which slows the heart rate, stabilizes blood pressure, and alleviates daytime stress, ultimately reducing the risk of conditions such

as coronary heart disease.

However, the benefits of napping depend on an appropriate duration, which varies significantly age-wise. Preschoolers require longer naps to support their brain development. For adolescents and adults, 20 to 30 minutes is ideal, while older adults, who often experience lighter nighttime sleep, should limit naps to 15 to 30 minutes.

"Adults should not nap for too long or too late in the day as this can disrupt nighttime sleep and do more harm than good," he added.

Ren Gang, an associate chief physician in the Department of Neurology at Shanxi Bethune Hospital in north China, said not everyone needs to nap. Those who get sufficient sleep at night and

have plenty of energy during the day can skip it. However, for those experiencing sleep deprivation and daytime drowsiness, a moderate nap is beneficial, and the duration should be carefully managed to avoid entering deep sleep.

"Excessively long naps can fragment nighttime sleep, which is a major risk factor for hypertension and cardiovascular disease," he said.

Ren recommended engaging in light activity after a meal and before going to bed, for instance, a half-hour walk or waiting for 20 minutes before napping. Furthermore, listening to guided audio to enter a state of deep relaxation can help relieve stress and improve concentration.

How to Bring Organoid Cultivation into Industrial Era

From page 1

The team proposed a radical solution: injecting magnetic micro-nanobots (each the size of a single cell) into the organoid, then manipulating them externally to probe internal mechanical properties.

But controlling a robot in a microscopic space demands an exceptionally stable magnetic field — a global engineering challenge. "Move the magnet by a hair, and the robot instantly veers off course," explained doctoral student Lin Chengqian. For two years, they iterated coil designs, recalculated magnetic circuits, and refined control algorithms.

In 2024, the team succeeded with an octupole electromagnetic coil system that generates a perfectly uniform field within the tiny chamber. This allows the robot to gently touch cell walls and translate displacement signals

into mechanical data — measuring elasticity, stiffness, and structural integrity — all without harming the organoid. This turned a destructive "snapshot" into a multi-day "continuous health record" for the first time.

Simultaneously, they tackled another pain point: Sending samples to external labs for gene expression analysis took two weeks, by which time the biological state had already changed. Their solution was a dual-channel compressed sensing technology that captures both mechanical and genetic data at an ultra-low sampling rate (just six percent of conventional data).

Now, researchers get both datasets within two hours, on-site, boosting efficiency by over 10 times. This precise quantification replaces guesswork, providing reliable metrics for tumor grading and drug efficacy evaluation.

AI-driven automatic system

Despite breakthroughs in cultivation and sensing, the lab remained a chaotic battlefield. Temperature control, imaging, culturing, and detection were scattered across separate devices; researchers had to set alarms for midnight liquid changes; lens fogging from humidity fluctuations ruined experiments; and commercial AI couldn't remember protocols or connect to hardware.

From 2024 to 2025, the team partnered with Yongjiang Laboratory to build an integrated, unattended system. Software and hardware sub-teams worked in parallel. The software group digitized over a decade of experimental logs, extracting standard protocols to build a domain-specific AI agent from scratch. The hardware team reconfigured every device, rewriting communication protocols to bridge the gap between instruments.

After countless on-site debugging sessions, they succeeded. The proprietary AI agent now autonomously controls timing, coordinates robotic arms for liquid handling, adjusts magnetic fields and temperature, and manages imaging. The system operates on a closed-loop logic of perception, decision, control and feedback, solving chronic industry problems like timeline chaos and data memory loss.

The final integrated smart manufacturing instrument, unveiled in late 2025, represents a complete leap from manual craft to industrial-scale production. Its achievements have been published in *Science Advances*.

"This system doesn't alter how life develops; it provides the engineering stability needed to bridge basic research and clinical translation," said Lai Yiwei, lead scientist at BGI Genomics.

Their next goal? To push this technology into personalized medicine, making organoid-based drug screening a practical tool for patients, said Gao.