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Robotics Marches Toward Real Business World

By LI Linxu

The world records set by humans in sports events are being broken one after another — and the remaining ones seem to be on the verge of being overtaken as well. And the record breakers are a new species — humanoid robots.

A Chinese humanoid robot ran 100 meters in 9.39 seconds in a preliminary heat at the second World Humanoid Robot Games in Beijing on August 22, beating the men's world record of 9.58 seconds set by Jamaican sprinting great Usain Bolt in 2009.

Then only three days later, the robot broke its own record, clocking 8.86 seconds at the semifinal. And this record too was shattered at the event's final on August 26, with a new benchmark of 8.64 seconds.

Besides the 100-meter sprint, Chinese humanoid robots have also broken human world records in events such as the 400-meter and 1,500-meter races, and the high jump.

These record-breaking performances were one of the main attractions at this year's World Humanoid Robot Games, where more than 2,000 robots from 666 teams across 16 countries competed in 51 events including football, dancing, boxing, and industrial-task contests.

In August, another major event in the robotics industry — the 2026 World Robot Conference (WRC) — also attracted global attention.

For years, major tech expos displayed robots doing backflips or waving at crowds. The WRC 2026 marked an industrial pivot toward commercial viability. Over 300 exhibitors showcased more than 3,000 robotic products, including more than 300 debuts, where the spotlight shone on applications automating onerous manual tasks.

These events serve as a critical barometer for the robotics industry. The most striking trend observed at the events is a fundamental change in evaluation metrics. The era of robots merely showcasing flashy tech is yielding to a rigorous assessment of functional stability, signaling a profound shift from laboratory novelty to pragmatic, real-world applications.

Of particular note is that the number of scenario-based competitions in this year's World Humanoid Robot Games has increased from six to 21, covering nine major real-world scenarios, including households, hotels, industrial settings, and emergency rescue operations. *See page 2*

New Graphic

IN THE FIRST HALF OF 2026

Revenue of China's
robotics sector reached

165.5 billion
RMB
▲24.5% y-o-y

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



Robot "Zhuifeng Zaizai" (R), robot of Jinghong Dynamics Team (C) and robot of Honor Shuangchi Team compete during the Large Group 400m race of the 2nd World Humanoid Robot Games in Beijing on August 23. (PHOTO: XINHUA)

STI Frontier

When Sand Wears 'Nano Raincoat'

By LU Zijian & WANG Yuhan

In the exhibition hall of Xi'an Meinan Biotechnology Co., Ltd. (Maenam High-Tech), an experiment catches visitors' eye: Water is poured onto ordinary sand and it quickly seeps through. But when poured onto water-resistant sand, the droplets roll across the surface of the grains without penetrating at all.

This independently developed micro- and nano-scale coating technology enables sand grains to prevent water loss while retaining and storing water, effectively giving each grain a "nano raincoat."

Tackling coating barriers

Lu Wei, founder and chairman of Maenam High-Tech, first encountered the challenge of preventing water leakage while working on tunnel construction projects early in his career.

Organic waterproof membranes are prone to rapid aging and leakage at joints, so Lu thought about developing a kind of waterproof material that is durable and environmentally friendly. The rainy engineering environment in Thailand reinforced this idea.

The R&D began in 2021. The biggest challenge was forming a dense, stable waterproof coating on the rough surfaces of sand grains — one that was robust and heat-resistant enough to withstand abrasion from windblown sand.

The team tried dozens of solutions, but in vain. The breakthrough came from optimizing the material formulation.

They mixed dozens of ore bodies in a certain proportion and achieved coordination effects by micro- and nano-scale grinding technology. Rather than adopting the conventional spraying methods,

the team chose the physical, high-temperature and high-pressure technology to make sure that the waterproof coating adheres evenly to the surface of the sand grains.

By the end of 2022, the team managed to build a stable micro- and nano-scale coating structure on sand grains, and the key performance indicators, including water resistance, adhesion and durability, all met the required standards.

Exploring diverse application scenarios

The hydrated water-retaining agent developed by Maenam High-Tech can absorb more than 1,200 times its own weight in water. The innovative "waterproof sand + water-retaining agent" mode can firmly hold rainwater or irrigation water at the roots of plants, greatly reducing evaporation.

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Reusable Rocket: More than One Technical Path

By LU Zijian & FU Yifei

The Zhuque-3, a reusable launch vehicle developed by Chinese commercial aerospace company LandSpace Technology Co., Ltd., was launched from the Dongfeng commercial space innovation pilot zone in northwest China on August 19, and its first stage successfully landed at the designated location in the recovery area.

This mission marks China's first successful on-land recovery of a launch vehicle's first stage and first recovery using landing legs, representing a major breakthrough in reusable rocket technology.

There are different choices over the body materials and recovery solutions of reusable rockets. What are the

advantages and shortcomings?

Stainless steel or aluminum alloy?

The rocket body structure primarily consists of fuel tanks, casing sections and other components, and the materials to build the structure affect the rocket's payload capacity, cost and manufacturing.

The mainstream choice for expendable rocket structure is aluminum alloy, which is also used in many reusable rockets such as SpaceX's Falcon 9 and China Aerospace Science and Technology Corporation's Long March 10B.

Stainless steel has become another popular option for commercial rockets in recent years. Both the Zhuque-3 and SpaceX's Super Heavy used this material.

Aluminum alloy has high intensity, which helps reduce the rocket's weight

and increase its payload capacity, whereas stainless steel has large density. Limited by welding techniques, stainless steel has to be constructed to a certain thickness, which makes the rocket heavier.

This, however, changes with the rocket size. Calculations show that using aluminum alloy can significantly reduce weight and improve efficiency when the rocket body diameter is no more than five meters. As the diameter increases, the designed thickness of the rocket body gets closer to the thickness determined by welding techniques, and stainless steel's impact on payload capacity decreases. For heavy rockets whose diameters reach 10 meters, stainless steel materials can enhance their comprehensive competitiveness. *See page 4*

International Cooperation

Chinese-built Solar Project Energizes Northern Laos

Edited by WANG Xiaoxia

A 1,000-megawatt solar farm spread across 2,100 hectares of mountainous terrain in northern Laos began commercial operation in April, marking a major step in the country's push to become a regional clean energy hub.

The project, developed by China General Nuclear Power Corporation (CGN), is the largest single-phase solar installation in Southeast Asia and the first utility-scale photovoltaic plant built on mountain slopes in Laos. It serves as the anchor power source for the 500-kilovolt China-Laos transmission interconnection, which went live alongside the plant.

On clear days during the dry season, the facility generates more than five million kilowatt-hours daily, according to Wang Yang, operations manager at CGN Laos. The annual output is projected at 1.65 billion kilowatt-hours, tantamount to preventing roughly 1.3 million tonnes of carbon emissions each year, he said.

The electricity is collected at an on-site substation and transmitted through northern Laos' grid to southern China via the cross-border high-voltage line. Lao officials say the project has significantly eased power shortages in the north and reduced the country's dependence on imported electricity.

The project has driven local green transformation and economic and social development, and at the same time enhanced power interconnection between northern Laos and southern China, said Thongphath Inthavong, former deputy minister of energy and mines of Laos.

In March, Laos and China jointly established a clean energy power standards research institute in Vientiane. The institute is working to align technical and operational standards between the two countries, a move officials say will smooth future regional grid integration.

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WEEKLY REVIEW

Reconfigurable Optical Arithmetic Logic Unit Chip Developed

A research team from Lanzhou University in northwest China has developed a reconfigurable optical arithmetic logic unit chip that integrates various logical and arithmetic operations onto a single hardware platform. This work provides a new implementation path for building high-density, low-power, reconfigurable photonic arithmetic logic processing chips.

AI Model Detects Liver Cancer from Earlier Missed Tumors

Alibaba's DAMO Academy and its collaborators developed DAMO LiON, an AI model for diagnosing liver cancer that can identify microscopic cancerous lesions in the liver using CT scans. During a two-month real-world prospective clinical trial, the AI model detected 15 previously missed malignant tumors, enabling patients to receive timely surgical or drug treatment.

Microcomb Developed to Empower 6G Networks

Researchers have developed a microchip that produces a stable, high-quality microcomb, which can be converted into multiple precisely spaced millimeter-wave frequencies at the same time. The technology could increase the speed and capacity of future 6G networks, while its high precision may also benefit quantum timing, navigation, radar and space applications.

APOE4 May Alter Brain Years Before Alzheimer's Symptoms

Scientists discovered a possible reason for APOE4, a major Alzheimer's risk gene, to change brain activity long before the symptoms show up. In mice, APOE4 led to the increase of a protein called Nell2, causing neurons to shrink and become abnormally active. This hyperactivity in younger times predicted worse memory later in life. Lowering Nell2 levels in adult mice reversed the abnormalities, pointing to a potential strategy for intervening before Alzheimer's disease advances.

WECHAT ACCOUNT



E-PAPER



Plan to Spur Safety & Emergency Equipment Industry

Policy Express

By TANG Zhexiao

Since the 14th Five-Year Plan period (2021- 2025), China's safety and emergency equipment industry has developed rapidly, with the output in key areas exceeding 1 trillion RMB in 2025. As the country enters the 15th Five-Year Plan period (2026-2030), the overlapping risks of natural disasters and various public safety challenges pose higher demands for safety and emergency equipment.

Therefore, to boost the safety and emergency equipment industry, the Ministry of Industry and Information Technology and the Ministry of Emergency Management have released a five-year plan.

The plan sets out that by 2030, the industry's scale, technological capabilities, and product quality will significantly improve, with the output in key areas reaching 1.4 trillion RMB. Ten highly competitive industrial clusters and 70 characteristic industrial parks for safety and emergency equipment



A firefighter demonstrates fire-fighting equipment to students in Jiaozuo city, Henan province. (PHOTO: XINHUA)

will be established.

The plan also sets goals for breakthroughs in a number of key core technologies, establishing a batch of priority application scenarios for safety and emergency equipment, enhancing the availability of safety and emergency prod-

ucts for households and communities.

Targeting key links in industrial development, 15 concrete tasks have been specified in four areas: boosting industrial innovation, advancing equipment promotion and application, fostering and expanding market entities, and

optimizing the industrial ecosystem.

Major measures include scaling up promotion of household emergency kits and key home safety and emergency products, encouraging leading enterprises to integrate industrial chain resources, and supporting safety emergency equipment manufacturers to pursue intelligent upgrading enabled by the "AI Plus" initiative.

Industrial innovation has been prioritized as the core task and five special columns have been outlined, covering key generic technology research and emerging technology integrated innovation. These efforts will empower safety and emergency equipment with cutting-edge technologies including AI, embodied intelligence, brain-computer interfaces and satellite remote sensing.

The safety and emergency equipment industry serves as the material foundation and technological guarantee for preventing and mitigating major risks and enhancing the ability to respond to emergencies, said Ao Li, vice president of the China Academy of Information and Communications Technology.



Physics of Fluids: Advancing Understanding of Fluid Phenomena

By Savvas G. Hatzikiriakos & Gerald G. Fuller

Physics of Fluids (PoF) was founded in 1958 on the recognition that fluid motion lies at the heart of countless natural phenomena and technological innovations and the deepest understanding of fluid motion emerges from a physics-based perspective. From the flow of blood in the human body to atmospheric and oceanic circulation, from energy production and advanced manufacturing to aerospace transportation and environmental sustainability, fluid mechanics continues to shape our understanding of the world and our ability to improve it.

Physics first

For nearly seven decades, *PoF* has remained committed to publishing research that advances the fundamental understanding of fluid phenomena. Although many engineering applications are rooted in fluid mechanics, the journal maintains its distinctive focus on the underlying physics.

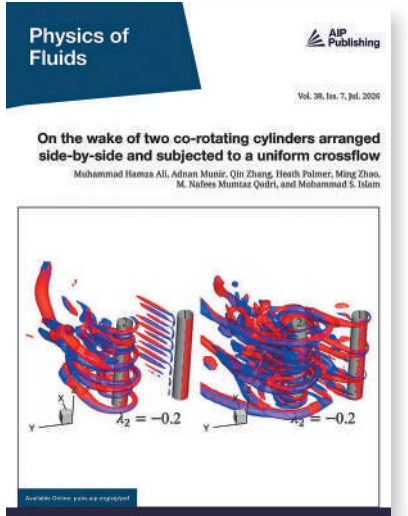
This focus is more important than ever. As fluid systems and the methods used to study them become increasingly complex, physical principles provide the foundation needed to interpret results, distinguish discoveries from purely computational or empirical observations, and transform application-specific findings into broadly applicable knowledge. We therefore seek contributions that disclose not only how fluid systems behave, but also why they behave the way they do.

Today, fluid mechanics is undergoing a remarkable revolution. Advances in high-performance computing, machine learning and AI, soft matter physics and multiphase flows are opening new avenues of discovery. *PoF* has responded by refocusing its scope and introducing special collections in emerging areas, while ensuring that new methods, simulations, and applications produce meaningful physical insight that readers can apply to new applications.

As its editors-in-chief, our vision for *PoF* is simple: physics-first, faster and fairer. We believe that scientific publishing should emphasize new physical insights and fundamental understanding, provide fair, constructive and transparent peer review based solely on scientific merit. Our objective is not only to identify and publish the highest-quality research, but also to help authors communicate the significance of their scientific contributions as clearly and effectively as possible.

Cross-community collaboration

Many significant advances now emerge from research conducted jointly across disciplines, institutions, and national borders, bringing together complementary expertise to address complex problems. *PoF* serves this global community of researchers, reviewers, and editors, united by a shared commitment to understanding



Front cover of *Physics of Fluids*, Volume 38, Issue 7. (COURTESY PHOTO)

fluid physics and its applications.

Chinese researchers have made strong contributions to fluid mechanics, providing the rigorous, innovative and physics-based studies that *PoF* aims to publish. Their work has become an important part of the journal's continued development and the broader advancement of modern fluid mechanics.

During our recent two-week visit to eight leading Chinese universities and research institutions, we saw these priorities reflected in the excellence, creativity, and engagement of researchers and students. They have contributed strongly in physics of fluid areas through papers, peer review, special collections and conference organization.

Response to emerging societal challenges

The challenges facing society, ranging from sustainable energy and climate change to advanced healthcare, transportation and manufacturing, will increasingly require breakthroughs rooted in fluid mechanics.

For example, turbulence control can improve the energy efficiency of aircraft, vehicles, pipelines, and industrial processes, while multiphase-flow research can advance carbon capture and clean-energy technologies. Progress in these areas will depend on the collective efforts of researchers working across disciplines and national borders.

Our newly formed international editorial leadership brings together expertise from leading institutions across Asia, Europe, North America and beyond, enabling the journal to identify emerging research directions and foster collaboration.

We are fortunate to live in an era of unprecedented scientific connectivity. *PoF* invites researchers worldwide to strengthen our community by contributing their finest work, serving as dedicated and fair reviewers, and helping advance fluid mechanics for the benefit of science and society.

The authors are the co-editors-in-chief of Physics of Fluids.

Journal Review

Since the 20th century, fluid mechanics has developed into one of the foundational disciplines of modern science and technology. As the field increasingly intersects with AI, data-driven modeling, soft matter, biofluids and microfluidics, it will continue to play a vital role in addressing major scientific and societal challenges.

PoF provides authoritative insight into the latest advances in fluid mechanics. Guided by its "physics-first" vision, it publishes theoretical, computational and experimental research that not only describes how fluid systems behave but also reveals the physical mechanisms governing

that behavior.

Looking ahead, *PoF* is expected to continue its tradition of excellence as a premier journal for research on fluid phenomena. By embracing emerging tools such as AI while addressing critical challenges in energy, sustainability and healthcare, *PoF* will help lead fluid physics into a new era of discovery and innovation.

— Dimitris Vlassopoulos, professor at the University of Crete, and affiliated faculty at the Institute of Electronic Structure and Laser of the Foundation for Research and Technology-Hellas, Greece

1st Mandatory Standard for L3, L4 Autonomous Driving Unveiled

Edited by TANG Zhexiao

China has released its first mandatory national standard for autonomous driving systems.

According to the Ministry of Industry and Information Technology (MIIT), the standard Intelligent and Connected Vehicle — Safety Requirements of Combined Driver Assistance System (GB 44721-2026) will come into force on July 1, 2027.

The standard applies to Class M and Class N vehicles equipped with level

3 or level 4 autonomous driving systems, excluding autonomous parking systems.

It requires potential safety hazards of autonomous driving systems to be reduced at the source. Vehicle manufacturers are specified to set up and enforce safety safeguards covering four dimensions: safety policy, risk management, safety assurance and safety improvement. These measures include relevant simulation, closed-site and road tests throughout the research and validation phase of autonomous

driving systems.

The standard also mandates improved performance when the system carries out dynamic driving tasks to guarantee operational safety. It lays down specifications for human-machine interaction and user notifications to prevent misuse or abusive use.

The activation and deactivation of the autonomous driving system must be carried out safely, with clear guidelines for indicators and alerts for system states including standby, active and deactivated modes.

Shandong: Building World-class Innovation Ecosystem

Case Study

By TANG Zhexiao & WANG Yanbin

China has made a significant breakthrough in deep-sea engineering equipment, with its domestically developed chain trenching robot completing sea trials in the Yellow Sea and setting a new record for the deepest trenching operation in Asia.

The 30-tonne deep-sea operating robot manufactured by Shandong Future Robot, capable of working at a depth of 3,500 meters, has filled a domestic gap, while a 20-plus-ton cable-laying robot for 1,500-meter depths has achieved full, independent control over the entire industry chain.

Jiang Libin, director of the Project Department of Shandong Future Robot, said government support during critical phases of the startup and technical R&D has been the cornerstone of its success

in mastering core deep-sea equipment technologies.

The rapid growth of the company is a vivid microcosm of Shandong's efforts to build a world-class sci-tech innovation ecosystem.

In recent years, Shandong has optimized its innovation environment across eight dimensions, including government administration, talent, industry, and enterprise development, enhancing the overall innovation atmosphere.

The focus of Shandong's strategy is strengthening the central role of enterprises in sci-tech innovation. In the advanced steel industry chain, Tianrun Industry Technology Co., Ltd. targeted foreign technological monopolies.

In the third-generation semiconductor sector, Shandong Crystal GaN Semiconductor Co., Ltd. partnered with Shandong University to overcome the challenge of developing gallium nitride (GaN) single crystals.

To support enterprise innovation, Shandong has rolled out a tiered, post-

investment policy for corporate R&D. Companies with R&D expenses accounting for over five percent of their revenue will receive priority support in land allocation and energy consumption.

Additionally, Shandong is creating 30 distinctive demonstration scenarios in fields like autonomous driving and the low-altitude economy, and promoting first trial and application of 200 new technologies and products.

To address the persistent disconnect between scientific research and industrial application, Shandong has put in place a system where "industry poses the questions, science provides the answers, and the market evaluates the results," to bridge the last mile from the laboratory to the production line.

For instance, the deep-sea aquaculture technology breakthroughs of the Marine Instrumentation Institute of Shandong Academy of Sciences were shared with Qingdao enterprises through the online marine technology

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In addition, the newly added high-intensity competitive events — such as long jump, weightlifting, tug-of-war, and table tennis — are all ultimate tests of the robots' "brain," "cerebellum," physical structure, and core components.

"Every extra centimeter in a robot's long jump and every extra kilogram it lifts on the competition field are the re-

sults of engineers' continuous optimization of joint motors and reducers, precision machining, and rigorous testing and verification," said Jiang Guangzhi, executive deputy director of the Organizing Committee of the World Humanoid Robot Games.

At the 2026 WRC, exhibitors demonstrated robots capable of autonomous navigation, dynamic task scheduling, and

real-time error correction in unpredictable environments. No longer restricted to pre-programmed dances or static laboratory demonstrations, the latest generation of robots is proving that they can think, adapt, and work alongside humans.

This pragmatic shift is underpinned by a maturing industrial ecosystem and a double-digit industrial growth rate. Latest data reflects this mo-

mentum: The operating revenue of industrial enterprises above designated size in China's robotics sector exceeded 300 billion RMB in 2025, with an average annual growth rate of more than 20 percent over the past five years.

As the curtain fell on the WRC 2026 and the second World Humanoid Robot Games, the goal for robots is not only to "win medals," but also to "secure orders."

U.S. Pressuring Countries to 'Pick Sides' in AI Is Tech Hegemony



By GONG Qian & HU Dingkun

Reuters reported that the U.S. State Department is drafting a letter to inform the signatories to Joint Statement on AI Opportunity Partnership that they would be excluded from a U.S.-led AI coalition if they join a "competing framework" opposed to Washington.

The joint statement was released at the second Pax Silica Summit in the U.S. in June. The 35 signatories include more than 20 members of the Pax Silica initiative launched by the U.S. in December 2025, and other countries that have expressed interest in cooperating with the U.S. on AI.

Reuters quoted a U.S. official as saying, "It's difficult to see how a country can credibly position themselves as trusted partners in one technology ecosystem while simultaneously signing up for an initiative designed by China to advance a competing vision for AI."

The so-called Pax Silica initiative is ostensibly to secure supply chains for frontier AI models, semiconductor chips, and critical minerals. The U.S. has pledged to provide Pax Silica member countries with relevant technologies for shaping their AI economy.

It is clear that security is merely a pretext for the U.S. to launch the initiative, whose real objective is to contain China. As Trisha Ray, a researcher at the U.S. think tank Atlantic Council, wrote, Pax Silica aims at establishing an economic bloc to compete with China



Visitors observe robots working at the smart pharmacy during the 2026 World Artificial Intelligence Conference held in Shanghai on July 19. (PHOTO: XINHUA)

across the full technology stack.

The subtext of the U.S. letter is obvious: If you pursue in-depth AI cooperation with China, you must decouple from the U.S.-dominated supply chain. Access to U.S. advanced chips, closed-source large language models, and other AI technologies may be cut off.

Ironically, the U.S. frequently claims that its AI supply chain is threatened by other countries and has rallied alliances under the banner of "supply chain security." And now it is using the "supply chain" itself as a tool to threaten and bind its own partner nations.

The attempt to force countries to "pick sides" runs counter to the national interests of many within the so-called Pax Silica economies, particularly developing countries. While advanced U.S. AI technologies are certainly attractive,

China's open-source ecosystem also offers a more cost-effective path to intelligent transformation. Engaging in in-depth AI cooperation with both China and the U.S. simultaneously, and integrating different supply chains and technological pathways based on their own conditions is often more aligned with the development needs of developing countries.

For example, Kazakhstan has joined the Pax Silica initiative and is also one of the founding members of the World AI Cooperation Organization initiated by China. In July, the Chilean think tank AthenaLab noted in a report that although Chile has joined the Pax Silica Declaration and has access to U.S. frontier AI models, it doesn't make it immune to dependence on other countries' AI technologies. "What real alternatives

exist outside that bloc" should be one of Chile's core considerations. The alternatives include increasingly accessible Chinese models.

Demanding that countries make an "either- or" choice between different technological systems is, in essence, interference in their sovereignty and right to development, and a typical manifestation of "technological hegemony." The U.S. attempt to turn Pax Silica into an exclusive bloc is distorting technological cooperation into a bargaining chip for geopolitical games, running counter to the spirit of openness and sharing in technological development.

Pressuring Pax Silica economies to pick sides is nothing short of a reversal of previous commitments. Jacob Helberg, U.S. Under Secretary of State for Economic Affairs, said in an interview with *The Straits Times* in May that Pax Silica is not an exclusive organization and the signatories are not being forced to choose between the U.S. and China. Helberg was hoping the assurance would allay the concerns of ASEAN countries and persuade them to join the initiative. But the leaked letter makes it clear that the assurance was a hollow one.

The world today has no place for bloc confrontation or zero-sum games. As the world's leading AI developers, China and the U.S. should strengthen cooperation in areas such as technology accessibility and security governance, and jointly lead the global transition to an intelligent era. All countries should have full freedom to choose solutions suited to their own development paths. Forcing countries to "pick sides" will win the U.S. no support and ultimately, leave it isolated.

Two Blockbuster Listings Mark China's Hard-tech Rise



Edited by GONG Qian

Chinese pioneering humanoid robot maker Unitree Robotics made its stock market debut on the Shanghai Stock Exchange's technology-focused Star Market on August 19, becoming the first of its kind listed on the A-share market. The company has won global attention with its humanoid and quadruped robots that can run, dance and do backflips and kung fu.

It is going to be "the bellwether for the humanoid robotics industry," Lian Jye Su, chief analyst at the Singapore-based market research firm Omdia, told CNBC. Ethan Qi, associate director at market analysis firm Counterpoint Research, called it a milestone for the hu-

manoid industry. Qi told CNN that this can "serve as a benchmark for other initial public offerings in the pipeline."

The listing has given the public a rare chance to invest in a humanoid robotics company and could set a benchmark for other manufacturers, Jack Pearson from investment firm RoboStrateg told BBC.

China is solidifying its dominance in the world's robotics supply chain, and it holds an unrivaled grip on the manufacturing ecosystem for humanoid bodies, according to *The Wall Street Journal*.

The country dominates the humanoid robotics market, generating 90 percent of the global output, according to Interact Analysis. Among them, Unitree and AgiBot, another Chinese company specializing in embodied intelligence, each shipping more than 5,000, together accounted for 71 percent of the nearly

13,000 humanoid robots shipped globally in 2025, according to Omdia.

Morgan Stanley predicts overall humanoid-robot shipments in China will reach 50,000 units this year and more than 440,000 by 2030.

"China's microelectronics, their motors, their rare earth, their magnets — which is foundational to robotics — they are the world's best," NVIDIA CEO Jensen Huang said in a podcast in March.

Unitree's debut followed another blockbuster listing in Shanghai by the Chinese memory chipmaker ChangXin Memory Technologies (CXMT) in July. In its debut, CXMT soared nearly 466 percent, making it the most valuable China-listed company. This was evidence of increased investor interest in China's efforts at self-reliance, Wu Zhuoyin, senior economist at French investment bank Natixis, told Nikkei.

CXMT is the world's fourth biggest

producer of dynamic random-access memory (DRAM), with its market share of about 7.7 percent in 2025, only behind Samsung Electronics, SK Hynix, and Micron Technology, Inc.

"Amid persistent supply shortages, many customers are seeking to diversify their memory supplier base, which should significantly benefit CXMT and create more business opportunities," Ellie Wang, an analyst at TrendForce, a technology research firm, told Reuters. According to Nomura, a leading financial services group, CXMT's share of the global DRAM market could rise to about 18 percent by the end of 2028.

"I have no doubt the company is going to grow to be a global leader. It's maybe just a question of time that it can be not only a challenger, it can be a global champion in this particular sector," Yiyi Capital CEO Theodore Shou told CNBC.

for path tracking. This significantly improved the drones' resistance to external disturbances. Field tests showed that the drone's straight-line tracking error could be controlled within ±10 centimeters, while the unmanned vehicle maintained a straight-line path tracking accuracy within ±5 centimeters.

Field trials demonstrated that the optimal operation paths automatically planned by the upper-level control system eliminated the need for highly experienced drone operators. Daily operation costs could be reduced by around 200 RMB, while route repetition rates dropped from 10–15 percent to below five percent under skilled manual operation.

The time required for a single drone liquid refill was shortened from five minutes to less than two minutes, doubling effective operating time. A single liquid-refilling unmanned vehicle can simultaneously support two spraying drones, enabling operators to complete an entire operation cycle without having to manually refill pesticides.

AI for All

China's Open-source AI Benefits All

By GONG Qian & CUI Shuang

Chinese AI developers are increasingly embracing open source to speed up technological iteration and ecosystem development.

Recently, MiniMax officially open-sourced its H3 model. Within just three days, it had topped the trending chart on Hugging Face, the world's largest open-source AI platform. Over a hundred enterprises integrated it immediately, with full-stack compatibility from chip makers to inference frameworks.

MiniMax H3 showcased its dominance in video generation, ranking first across three categories — multi-image-to-video, image-to-video, and video editing — on the Design Arena platform.

Emad Mostaque, an iconic figure in the open-source community and founder of Stable Diffusion, said on X, "Bravo to MiniMax AI some interesting things in here."

This is not just a case of overnight success for a single model, but further solid evidence of the collective rise of China's open-source AI models. Major players like DeepSeek, Kimi, and Qwen have released and open-sourced their latest-generation models.

The primary value of open source lies in technological spillover. It tears down barriers of closed-door R&D, making advanced model capabilities accessible to a broad range of developers and enterprises instead of being available exclusively to a handful of tech giants. Such spillover quickly energizes the entire industrial chain: Chip vendors can optimize hardware tailored to model features, inference frameworks deliver instant compatibility, and application developers pursue innovation at far lower costs. The full-stack compatibility rolled out immediately after MiniMax H3's launch exactly illustrates such synergy.

Furthermore, open source is reshaping how technology evolves. Improvements contributed by diverse teams flow

back into the model ecosystem at an accelerated pace, creating a self-reinforcing cycle of continuous advancement. This mechanism boosts efficiency and strengthens the overall competitiveness of China's AI system. Open source is not only a technical choice for Chinese companies but also a competitive strategy to expand market space through ecosystem building and openness.

The significance of this strategy stretches far beyond individual companies or a single country. For global developers, Chinese open-source models deliver more cost-effective alternatives and significantly lower the barriers to deploying AI.

According to *The Economist*, Martin Casado, a partner at the U.S. venture-capital firm Andreessen Horowitz (a16z), revealed that up to 80 percent of U.S. AI startups use Chinese open-source models during their fundraising pitches. MiniMax now serves over one million enterprises and developers worldwide, a five-fold increase from six months ago.

According to Hugging Face, China surpassed the U.S. in monthly downloads and overall downloads, with its open-source models accounting for 41 percent of downloads between February 2025 and February 2026, compared with 36.5 percent in the U.S. Chinese large language models took the top six spots in global usage rankings during the week from March 30 to April 5, according to OpenRouter.

Industry leaders also support the pathway of open source. Jensen Huang, founder of NVIDIA, has repeatedly stated that open-source models enhance cybersecurity, accelerate innovation and knowledge sharing, and help all nations meet their development goals. He has stressed that China is poised to deliver outstanding AI technologies, and the world should keep learning from and cooperating with China.

As tributes to China's open-source innovations evolve from individuals' praise into a widespread consensus, the global benefits brought by Chinese open-source AI are vividly demonstrated.



MiniMax demonstrates its latest AI model MiniMax H3 at the 2026 World Artificial Intelligence Conference. (PHOTO: VOG)

When Sand Wears 'Nano Raincoat'

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This solution has found its place in restoring ecology in extreme environments. Domestically, it has been adopted to address desertification in the Taklimakan Desert, northwest China's Xinjiang Uygur autonomous region, and the Kubuqi Desert in north China's Inner Mongolia autonomous region.

The products have also been sold to over 40 Belt and Road partner countries, including the United Arab Emirates, Saudi Arabia and Türkiye. A desert greening project in Dubai used a whole set of solutions provided by the company.

Li Xiaobo, general manager of Maenam High-Tech, said they launched a new product named "Mars Water-Retaining Sand," a new material specifically developed for extreme environment in deep space like Mars and the Moon.

Able to block, retain and store water, the material remains stable in super large temperature fluctuation between -90°C and 250°C. This precisely matches the characteristics of soil on Mars and solves the problem of water control in extreme environments.

Customized service brings customers Domestic customers were satisfied

with their products and recommended them to overseas partners, Li said. That was how they gained cooperation opportunities with customers from Guyana in South America.

According to Li, customers in South America have two distinct requirements for the material: vibrant colors and durability. The company's waterproof colored sand meets both requirements.

Most of the waterproof materials in the market are organic, which eventually leads to problems like oxidation, paint peeling and cracking, Li said. Maenam High-Tech develops inorganic materials, with its products designed to last as long as the buildings themselves.

The exported waterproof-colored sand comes in a wide range of colors and has self-cleaning properties, allowing rainwater to wash away surface dirt and leave the walls looking fresh and clean.

During this year's spring Canton Fair in Guangzhou in south China, there were prospective customers from South Africa, the Middle East, Southeast Asia and part of Europe. "Our goal is clear: to become a global leader in the field of eco-friendly new materials and to let hard tech set the trend," Lu said.

Air-ground System Keeps Spraying Drones Flying Longer



By Staff Reporters

A research team led by Professor Ding Shihong of the School of Electrical and Information Engineering at Jiangsu University in east China has successfully completed key functional tests of an



The air-ground collaborative autonomous liquid-refilling platform. (COURTESY PHOTO)

"air-ground collaborative autonomous liquid-refilling platform." The system enables drones to land with pinpoint precision and automatically refill pesticides, executing the entire process without human intervention.

For agricultural drone operators working in large fields or hilly areas, the biggest headache is often not pests or diseases, but the limited payload capacity of the drones. A single drone typically has to return for refilling less than 10 minutes after takeoff. Each round trip can take more than 10 minutes. When three to five drones operate simultaneously, operators can find themselves overwhelmed.

This system consists of two spraying drones, a refilling unmanned ground vehicle, and a unified intelligent ground station — simply put, the drones are only responsible for flying, while the unmanned vehicle handles the "liquid delivery."

The concept is straightforward: while the drone carries out spraying from the air, the unmanned vehicle waits at a designated location along farm roads. When the pesticide supply runs low, the system automatically calculates the optimal landing point. The drone then flies to the vehicle, lands precisely, and refills automatically before resuming operations — eliminating the need to return to a fixed base.

To accelerate the transition from laboratory research to real-world agricultural applications, the team moved its testing center directly to farmland. However, the complex wind conditions in hilly areas created significant challenges. The drones would sometimes drift during flight, deviating from planned routes.

To address the problem, the team applied a self-developed generalized super-twisting sliding mode control algorithm

4

LIFE IN CHINA

'Mathematics Gives Meaning to Life'

Dialogue

By Staff Reporters

The moment a mathematician receives the Fields Medal, their inbox crashes and their private life suddenly becomes public property. Yet while the medal creates a dazzling public spotlight, famous mathematician and Tsinghua University professor Caucher Birkar, who won the prize in 2018, sees a remarkably practical side to it.

While calling the honor "one of those exceptional things that can happen to anyone," he explained that it provides him a platform to communicate ideas more easily, especially to the general public, because he becomes a reference point. It makes him busier, he admitted, but overall, it's positive because he can effect change more easily than before.

The village boy who demystified genius

Long before the medal, Birkar grew up in a remote Kurdish village in Iran, drawn to mathematics by an elder brother. "I liked mathematics from primary school, partly due to my older brother, who was also interested in math and technology," he said. "I started learning from him, then read a lot on my own, and got deeper into it." He described finding many interesting things in mathematics, whether learning it, coming up with new ideas, or solving problems. "It became an enjoyable way of life, much like people enjoy sports."

This personal joy forms the bedrock of his philosophy. "Personally, mathematics gives meaning to life," he said. "It's a journey of passion and pleasure, and you feel you're doing something valuable. That personal drive is



Professor Caucher Birkar. (COURTESY PHOTO)

essential for success." When asked if one needs to be born with a special gift to be a mathematician, Birkar's answer is remarkably grounded: Not every businessperson becomes the richest, but many succeed. If someone has a passion, they should follow it. "Almost anyone can become a mathematician, but the goal is not to be the best in the world; it's to do your best."

This conviction is rooted in his own life. Moving from a village school to a city high school was intimidating. "When I moved to the city for high school, I thought I couldn't compete with city students," he admitted. "But I soon realized they were just like me, nothing special."

The same thing happened when he went to university in the capital. From this experience, he offers a message to students in remote areas today. "It's about you, your books, and your study. It doesn't matter where you come from."

Mapping the unseen landscape

Birkar's intellectual home is

algebraic geometry, a field so abstract that he acknowledges how hard it is to explain his work to the public. "Mathematics has its own language," he said. His domain is the study of spaces defined by polynomial equations, the kind most people know from high school. Instead of simply solving those equations, he and his colleagues study the spaces of their solutions. He likened the process to grouping people by gender, age, or wealth, categorizing these spaces and seeing how they relate. His specific work focuses on describing their properties, exploring how many spaces belong to a group and how they interact.

His move to Tsinghua has not altered the fundamental nature of this research. "The research and teaching themselves will be the same; my projects won't change," he confirmed. What differs is the potential for new collaborations. He expects to communicate more with colleagues here, including those outside the field of

mathematics. While algebraic geometry already has deep connections with theoretical physics, Birkar sees emerging links in cryptography, biology, chemistry, and computer science. Though he hasn't worked in applied directions himself, he remains open to surprise. "Talking to someone might spark new ideas," he said.

From looking up to lifting others

To understand what the Fields Medal truly means to Birkar, one has to go back to his student days in University of Tehran. He would look up at pictures of Fields Medal winners on the walls of his math club, wondering if he would ever meet one. At that time in Iran, he couldn't even imagine going to the West. The distance between a Kurdish village boy and those icons on the wall felt unbridgeable until it wasn't.

Now, that same boy has chosen to write his next chapter at Tsinghua University in Beijing. His arrival is not a sudden leap but a considered step. He had visited in 2017 and again in 2019 for a conference, staying for more than two weeks. "Before I received the invitation, I was already in contact with Tsinghua," he said. "So I had some familiarity with the university and knew some people here."

What drew him back was both academic strength and something more personal. "Tsinghua is a very strong university, attractive from a mathematical point of view," he said. "But also, I wanted to experience a different culture and a different way of life in China."

His first impressions have been warm. "My impression of Tsinghua and of people in China is that they are very welcoming and hospitable. I really like that." He also appreciated the logistical ease. "They make practical things easy. So I don't have to worry about small matters."

My China Story

A Cameroonian Witness to China's Technology for People

By LONG Yun & QIN Mian

Kenne Michel Olivier arrived in China from Cameroon with a student's curiosity and a wallet full of cash. Today, the wallet has become a relic, but his curiosity remains. The young scholar has become a witness to a defining feature of China's development: technology that works for the people.

"I rarely need to carry cash," said Olivier, now a lecturer at Tianjin University's School of Foreign Languages. "Whether buying food at a small street market, taking a taxi, paying utility bills, or shopping in a supermarket, everything is done with a QR code. This has made my daily life much more convenient and efficient."

It may sound like a small thing, but for Olivier, this simple fact captures something profound about China's technological rise.

Innovation empowers daily life

Regarding the concept of science and technology serving the people, he is deeply impressed by how innovation is closely connected with improving people's daily lives. "Rather than developing technology only for economic growth, China has made remarkable efforts to ensure that technological progress directly benefits the people," he said.

Beyond mobile payment platforms like Alipay and WeChat Pay, another technology has redefined his experience: the high-speed railway network. "The high-speed trains are punctual, comfortable, affordable, and environmentally friendly," he said. What impresses him even more is the integration of digital technologies, as ticket booking, seat selection and identity verification can all be completed through mobile applications, making long-distance travel extremely convenient.

Olivier has also observed the rapid development of smart public services. Many administrative procedures that once required in-person visits to government offices can now be completed online, from healthcare to transportation. For him, being advanced and practical are two major characteristics of China's scientific and technological

achievements, which, he believes, "make society more efficient, convenient and inclusive."

Olivier finds these technologies demonstrate how innovation can be used to improve people's quality of life on a large scale. "They also offer valuable experiences that (other) developing countries can learn from when promoting digital transformation and inclusive development," he said.

A bridge for shared development

Olivier notes that while pursuing development, China also shares its scientific, technological and educational resources with other countries. His own experience bears this out. As an international student who became a university teacher in China, he has personally benefited from this openness through educational opportunities and academic exchanges. A recipient of a Chinese scholarship himself, he sees investment in education as one of the most sustainable ways to share knowledge and technology.

His perspective extends to tangible China-Africa cooperation. In Cameroon, Chinese companies have helped build telecommunications networks, roads, hospitals, and other public infrastructure. In his view, such cooperation goes beyond construction; it is about sharing development experiences and helping partner countries strengthen their capacities through technology transfer and skill-building.

In his own field of international Chinese language education, Olivier has witnessed similar openness. China supports the localization of language education by training local teachers, developing localized materials, and encouraging collaborative research with overseas universities. His own research on Chinese language teacher training in Cameroon has been inspired by these initiatives, which he says contribute to sustainable educational cooperation.

This young scholar believes that China seeks to share its achievements to promote mutual development and long-term partnerships. This openness, he adds, has strengthened people-to-people exchanges and fostered greater international collaboration.



The high-speed railway from Xi'an, Shaanxi province to Shiyan, Hubei province opens on June 30. (PHOTO: XINHUA)

Chinese-built Solar Project Energizes Northern Laos

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The project's environmental footprint was a central concern from the outset. Developers pledged to avoid all residential land, rice paddies, and primary forests — a commitment they say was fully honored. Through design adjustments, including raised panel brackets and optimized foundation layouts, the actual land disturbance was reduced by 1,565 hectares from initial plans.

Construction techniques minimized soil and vegetation disruption. Workers used manual drilling instead of heavy excavation and applied careful pouring methods to prevent runoff contamination. Today, the site includes lookout points and flowering pathways that have made it a local attraction.

The project has also delivered direct social benefits. At peak construction, it employed nearly 3,000 local workers. A vocational training program — combining Chinese language instruction with technical skills — has produced nearly 100 certified Lao

technicians, 31 of whom have been hired as permanent staff.

Community infrastructure has been upgraded as well. The renovated Muangxay Secondary School, part of CGN's overseas social responsibility project, now boasts a rooftop solar system that cuts the school's electricity bills. Five roads and bridges have been repaired or reinforced, and a hospital in nearby Luang Namtha province had a new operating room and medical equipment.

Souvath Mahavongsanan, Vice Governor of northern Laos' Oudomxay province, said the collaboration has gone beyond power generation. "This is deep cooperation that improves our local economy and industrial ecosystem," he said. "Both sides are benefiting."

A wind-solar hybrid expansion is scheduled to break ground later this year, with biomass and multi-source complementary projects also under consideration as Laos moves to consolidate its role as a clean-energy supplier for Southeast Asia.

High Stress, Poor Sleep and Unhealthy Diet Hurt Immune System

Science Outreach

By Staff Reporters

Recently, a resident of Chengdu city in southwest China used AI tools to create an intense weight-loss plan. He lost 20 kilograms in 45 days, and then fell into a sudden coma. When he was rushed to the ICU, doctors diagnosed him with multiple organ dysfunction syndrome: A combination of chronic sleep deprivation, irregular eating habits, and high-intensity exercise had disrupted his immune system.

Why does the immune system become dysregulated? How can people scientifically safeguard their immunity? *Science and Technology Daily* spoke with experts about this topic.

"The immune system is like a

defense force within the human body. Under normal conditions, it identifies and eliminates harmful agents, such as viruses and bacteria, without attacking the body's healthy cells and tissues," said Dr. Li Junti, director and chief physician of the Department of Traditional Chinese Medicine Hematology at the 970th Hospital of the People's Liberation Army (PLA) Joint Logistics Support Force.

When problems arise within this "force," they typically manifest in three ways. The first is "insufficient manpower": Immune function is low, and bodily resistance drops, making one prone to recurrent colds and slow wound healing. The second way is "overzealous defense": The immune response is excessive, causing immune cells to attack normally harmless substances, such as pollen or dust mites. This condition is commonly known as an allergy. The third way is "inability to distinguish friend from foe": The immune

system mistakenly identifies the body's own tissues as "enemies" and attacks them. This can potentially trigger autoimmune diseases.

Dr. Li added that serious complications resulting from immune dysregulation, such as myocarditis, interstitial pneumonia, and nephritis, can be life-threatening if not treated promptly.

Unhealthy lifestyle choices play a significant role in the immune system dysfunction. When immune system issues arise, many people's first instinct is to try to "boost immunity." However, Dr. Zhang Huanping, director of the Department of Allergy and Immunology at Shanxi Bethune Hospital, pointed out that maintaining immune system balance is more important than simply boosting immunity. She suggested focusing on the following areas:

First is emotional management. Persistent psychological stress places a heavy burden on the immune system. Practices such as meditation, yoga,

deep breathing, and listening to music can help alleviate stress and foster a positive, stable mindset.

Second is ensuring adequate, high-quality sleep. Getting seven to eight hours of high-quality sleep each night and avoiding staying up late are crucial.

Third is maintaining balanced nutrition. Try to eat a mix of whole foods in the right proportions: fill half your plate with fruits and vegetables, one-quarter with lean proteins, and one-quarter with whole grains, while staying hydrated with water and limiting processed foods, added sugars, and unhealthy fats.

"There are no shortcuts to maintaining immune system balance," said Dr. Zhang. Leading a regular lifestyle, practicing scientific prevention, using medication rationally, and seeking timely medical attention when discomfort arises are the most practical and effective ways to protect the immune system.

Reusable Rocket: More than One Technical Path

From page 1

Dong Kai, deputy chief designer of the Zhuque-3, said the cost of the rocket's stainless steel raw materials and manufacturing was about one fifth of those of aluminum alloy. Stainless steel parts offer higher forming efficiency and better material utilization, making the material more suitable for large-scale industrial applications.

While there are reasons for stainless steel's popularity, aluminum alloy will also not be discarded.

Landing legs or net-capture recovery?

Various launch vehicle recovery approaches have been explored internationally. They include parachute, hori-

zontal and vertical recovery. At present, vertical recovery is the dominant approach worldwide, with the Falcon, New Glenn, Long March 10B and Zhuque-3 all adopting vertical recovery.

The deployable landing leg solution used by the Zhuque-3 was verified hundreds of times by the Falcon 9, offering a clear technical pathway and a high degree of engineering certainty. It can meet the demands of high-frequency reuse but the thrust-control precision and the landing cushioning system requirements are very stringent.

The requirement for the landing site is relatively low, so is the cost of its construction and maintenance. Shen Chao,

deputy commander-in-chief of the Zhuque-3, said the square landing pad at the Zhuque-3 recovery site measures less than 400 square meters. A control area has been built at the rear of the site to support telemetry, tracking and command throughout the rocket's return and landing, as well as post-landing processing.

On the other hand, the Long March 10B used China's proprietary sea-based net-capture and recovery technology with high load-bearing and buffering capacity. High-altitude cables to arrest the descending rocket were deployed on a seaborne platform. When the rocket descended to a certain altitude, its on-board cable-catching mechanism was caught by four cables arranged in a cross-shaped configuration, completing the capture and recovery.

Compared with other vertical recov-

ery approaches currently in use, net capture and recovery is more accommodating of rocket landing requirements in several respects. The rocket does not need to be equipped with landing legs, thereby simplifying its structure and reducing the weight.

Also the system has greater tolerance for deviations in the rocket's landing point, as the net-based system can effectively expand the capture window and improve the success rate of capture and buffering.

Finally, the recovery system can be designed as a series of standardized configurations to accommodate rockets of different sizes.

The drawbacks are also obvious: Not everyone can build — or afford to build — such a complex and massive recovery platform.