Chinese Sci-tech Contributes to Solving Global Challenges

Voice of the World

By Staff Reporters

China's sci- tech innovation has topped a recent series of prestigious lists, injecting new vitality into the global quest for sustainable development.

Taking into account scientific research cities, disciplinary contributions, and international leadership, China's "meteoric rise" in research capabilities augers well for the international research ecosystem.

The advance of Chinese research cities

According to Nature Index 2025 Science Cities supplement, six Chinese cities are among the world's top 10 scientific research hubs. Data shows that Beijing has topped the list for nine consecutive years, while Shanghai, Guangzhou, Wuhan, Nanjing and Hangzhou have all made it into the top 10. China has historically held the majority of the list's top 10 global scientific research cities.

On the Global Innovation Index 2025, published by the World Intellectual Property Organization, China has become one of the top 10 most innovative economies in the world for the first time, and it ranks first in the world in many sub-indicators related to intellectual property rights. Meanwhile, "Shenzhen- Hong Kong- Guangzhou" ranked first globally as a sci-tech cluster.

In terms of the key indicator contribution share, Chinese cities have demonstrated a strong growth momentum. Data shows that the research output in Beijing increased by over nine percent between 2023 and 2024, while Shanghai's grew by 20 percent.

A Chinese researcher checks the dryness of seeds in a biodiversity laboratory. (PHOTO: XINHUA)

The research output of other Chinese cities in the Nature Index top 10 list also rose, with a commentary pointing out that these changes in rankings reflect "a broader trend that China is expanding its leading edge."

Moreover, in terms of disciplines, the Nature Index shows that Chinese cities continue to dominate the lists in the fields of chemistry, physical sciences, and earth and environmental sciences.

Chinese scientific researchers making their mark

The development of scientific research cities in China cannot be separated from the tireless research capabilities of scientists. Against the backdrop of an overall increase in scientific research output, the international influence of Chinese scientists has also continued to grow.

A recent study published in the *Proceedings of the National Academy of Sciences (PNAS)* highlights this structural shift. Data shows that Chinese scientists now lead more than half of all joint research projects with peers in the UK, with similar leadership patterns emerging in collaborations with partners in the U.S. and Europe.

Analysis by the Swedish Foundation for International Cooperation in Research and Higher Education offers further validation. Its November report noted that when ranked by high- impact publications, rather than total volume, China has surpassed the U.S. in research strength, particularly in mathematics, computing and engineering.

"I have witnessed first-hand the developments that have led to what many may find a surprising, even shocking, development," said Erik Forsberg, the report's author, referring to the rapid evolution of China's academic capabilities over the past two decades.

Chinese research aiding global sustainable development

The academic achievements of Chinese research have been increasingly applied in policy- making, especially in the sustainable development fields.

A recent global report released by Springer Nature, a world- renowned scientific publishing organization, shows that China is the largest contributor to papers related to the Sustainable Development Goals (SDGs). Chinese scientific achievements are playing an increasingly important role in the formulation of global SDG policies.

China's SDG- related research findings have been widely cited in various SDG policy documents, with 25 percent of citations coming from international organizations such as the World Health Organization. Since 2022, the impact of Chinese SDG- related papers on global health and environmental policy documents has been particularly significant, the report said.

"China's research results are widely cited across different countries," said Nicola Jones, director of the SDG Programme at Springer Nature, highlighting the global utility of Chinese scientific output.

This aligns with a broader trend noted by *Nature* Editor-in-Chief Magdalena Skipper. Skipper observed that while scientific research is a global endeavour, China is making an increasingly influential contribution to the global research ecosystem across multiple metrics.

Opinion

China's AI Ascent Draws Int'l Interest

By SUN Jin & ZHANG Hao

As China's advancement in AI draws global attention, Andrey Belevtsev, senior vice president and head of technology at Russia's Sberbank, shared his perspective on China's evolving AI landscape in an interview with *Science and Technology Daily*.

Belevtsev identified China's competitive advantages. On the one hand, the Chinese government encourages competition. On the other hand, China excels at bridging the gap between technology and business, accelerating technology transfer.

Most importantly, China also possesses a reliable talent foundation: a large pool of highly skilled engineers.

"AI should serve as a complementary technology that extends human intellect and capacity," he said.

He observed that across human history — particularly throughout the evolution of information and communication technologies — technological enhancement of human capabilities has never triggered widespread unemployment. Instead, these innovations propel economic growth.

Educationally speaking, it is imperative to expedite public competency in AI application, encompassing both its potential outcomes and inherent constraints. Rather than fearing AI, we should effectively govern associated risks.

For AI governance, Belevtsev stressed the necessity of ethical oversight while cautioning against excessive restrictions.

When specific technological domains undergo accelerated advancement, it's important to uphold ethical imperatives vis- a- vis innovation. That said, the systems and approaches adopted should primarily be enterprises' own responsibility.

Excessive regulations may become obstacles hindering the pace and quality of technological advancement. However, technologies implemented in education, healthcare, or public administration must comply with local laws, traditions and cultural norms.

Andrey Belevtsev. (COURTESY PHOTO)

"As the 21st century's foundational technology, AI will penetrate every economic sector," he said. "Hence, it is essential to consider how to properly formulate risk management policies from the outset. Risk management should focus on self- regulation and multi- stakeholder cooperation between institutions, enterprises and market actors."

"We have a strong interest in the work of our Chinese partners and in our joint research projects. We are confident that our collaboration will achieve mutual benefit and win- win outcomes," Belevtsev added. "We hold the highest regard for Chinese enterprises and scientists' work in AI. Our cooperation, particularly in research, proves important to advancing global AI development and delivering benefits across nations."

Next Step for Humanoids: From Puppets to Partners

Comment

By LI Gangyang, WANG Xinlong & LUO Shaqi

The last few years have seen a dazzling spectacle of robotic achievements. We have seen humanoid robots execute flawless backflips and intricate dance routines. These demonstrations, by established industry pioneers as well as ambitious new entrants, are remarkable feats of engineering, proving that we can build machines with the kinematic complexity to mimic human movement.

But what will it take to transition them to the real world?

Today's most impressive humanoid demonstrations are triumphs of dynamic locomotion and trajectory tracking. But when faced with strong resistance, these systems often fail. A robot may over- torque its joints, overheat, or lose balance entirely. It was trained to move, not to struggle. Closing this gap demands "whole- body intelligence," the ability to coordinate every limb and joint to generate and withstand force while remaining stable.

Two challenges stand out. First, robots lack a human- like reaction mechanism. When we push a heavy object, we automatically adjust posture, shift weight, and engage core muscles — subtle biomechanical strategies missing from most control frameworks.

Second is the notorious "curse of high- dimensionality": with dozens of joints and hundreds of sensory inputs, effective whole- body coordination is an immense learning problem. Reinforcement learning must navigate vast state and action spaces, often leading to unstable or inefficient behaviors.

A new paradigm is emerging to overcome these limits. Rather than scripting responses, researchers are enabling robots to learn the fundamental principles of physical interaction from the ground up.

A prime example of this trend is the Thor framework developed at the Beijing Academy of Artificial Intelligence (BAAI). When a 35 kg Thor robot pulled a 1,400 kg vehicle, it was not executing a rigid plan; it had learned to use its entire body to manage force, much like a trained athlete.

This new solution is characterized by two key insights: reward learning that encourages human- like biomechanics, and control architectures that break whole- body coordination into manageable components. The result is generalizable physical intelligence.

A robot capable of understanding force interaction can apply the same principles across tasks — from opening heavy doors to stabilizing loads or maintaining controlled pressure on a surface. The robot is no longer just a collection of moving parts — it becomes a holistic physical agent, demonstrably stronger, more stable, and vastly more capable in the real world.

Across the industry, a consensus is emerging: Mastering physical interaction is the next milestone. In this sense, work on frameworks like BAAI's Thor is not an isolated effort, but part of a broader transition toward "whole- body, force- aware" humanoids. We are finally moving away from simply programming robots to do tasks, toward teaching them to understand the physics of the work itself.

The ultimate goal is not just to build smarter machines, but to build a future where humans and robots can work side- by- side to solve humanity's grand challenges.

Achieving this vision will require an open, global and collaborative ecosystem, where foundational research is shared to accelerate progress for all. We are proud to contribute our research to this collective endeavor toward a future where humanoid robots can finally, and reliably, stand their ground in the real world.

The authors are from BAAI.

China Holds Central Economic Work Conference to Plan for 2026

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The country will implement more proactive and impactful macroeconomic policies, formulate more far- sighted, more targeted and better- coordinated policies, continuously expand domestic demand and optimize supply, and develop new quality productive forces according to local conditions.

Efforts will be made to develop a unified national market and continuously prevent and defuse risks in key areas. It is imperative to secure the steady development of employment, businesses, markets and expectations, getting the 15th Five-Year Plan (2026-2030) off to a good start.

China will continue to implement a more proactive fiscal policy and maintain necessary fiscal deficits, overall debt levels and expenditure scale, while standardizing tax incentives and fiscal subsidy policies.

China will continue implementing a moderately loose monetary policy, employ various monetary policy tools such as reserve requirement ratios and interest rates in a flexible and efficient manner to maintain ample liquidity.

China will guide financial institutions to scale up support for domestic demand expansion, sci- tech innovation, micro, small and medium enterprises, and other key areas.

The RMB exchange rate will be kept generally stable at an adaptive, balanced level, the meeting said, adding that China will make macro policy orientations more consistent and effective, and refine expectations management mechanisms to bolster social confidence.

In terms of tasks of next year's economic work, the meeting said domestic demand will remain as a focus in building a robust domestic market.

Special initiatives should be advanced to boost consumption, and the supply of high- quality consumer goods and services should be expanded. Unreasonable restrictions in the consumption sector should be removed, and the potential of service consumption should be unlocked.

China will work to stabilize and revive investment, appropriately increase the scale of investment within the central government budget, and continue to leverage the role of new policy-based financial instruments. China will also advance urban renewal in a high-quality manner.

It will be essential to enhance innovation- driven development to accelerate the cultivation of new growth drivers. China will develop international technological innovation centers in Beijing (Beijing- Tianjin- Hebei region), Shanghai (Yangtze River Delta), and the Guangdong-Hong Kong-Macao Greater Bay Area.

Efforts will be made to advance the AI Plus Initiative, improve AI governance and foster innovation in science and technology finance.

The meeting underscored the need to steadily advance institutional opening up, expand self- initiated opening up in the service sector in an orderly manner, and make solid progress in developing the Hainan Free Trade Port.

Source: Xinhua

Energy Cooperation Gets New Direction

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Wang Peng, executive dean of the National Energy Development Strategy Institute at North China Electric Power University, said that President Xi's message charts the course for safeguarding the stability and smooth operation of global energy industrial and supply chains. China stands as both an active advocate and steadfast practitioner in establishing a fair, equitable, balanced and inclusive global energy governance system.

Facing the highly globalized nature of industrial and supply chains, China maintains a dialectical understanding of the relationship between self- reliance in energy technology and international cooperation. It is expanding and deepening joint scientific research with other countries, strengthening global energy technology cooperation, and helping to enhance the resilience of the global energy industrial and supply chains, said Wang.

President Xi's emphasis on "injecting greater stability into world energy security and the green and low-carbon transition," has strengthened the power industry's commitment to green development, said Yang Kun, executive vice chairman of the China Electricity Council.

In this regard, China has achieved power grid interconnection with multiple countries and provides clean energy products and services to over 200 countries and regions. In the past year, exports of wind and solar power products helped reduce global carbon emissions by approximately 2.65 billion tonnes, according to Yang. The council will continue to engage deeply in global and regional energy governance, contributing China's strength to the global energy transition, he added.

Igor Artemyev, president of the St. Petersburg International Mercantile Exchange in Russia stated President Xi's congratulatory message emphasized "promoting the establishment of a more fair, just, balanced and inclusive global energy governance system." This statement has also fostered consensus for cooperation between the two countries, according to Artemyev.

Both sides can join hands to establish an autonomous and controllable trading and pricing platform, forming a more credible and practical price reference system that better aligns with the realities of the global energy market. This will not only build a solid barrier for the security and stability of China-Russia energy trade, but also provide diverse and inclusive pathways for countries to participate in energy cooperation, Artemyev noted.

The National Energy Administration (NEA) will continuously deepen practical energy cooperation with key countries including Russia, safeguard China's energy security under open conditions, and advance the construction of a more equitable, fair, balanced and inclusive global energy governance system, said Wei Xiaowei, director general of the Department of International Cooperation at the NEA.

Wei added that President Xi's message fully affirmed the achievements in China- Russia energy cooperation and provided directional guidance for future collaboration.