



Science and Technology Daily

VOL.5-NO.219

DECEMBER 6-7, 2025

Innovation Pathway

15th FYP Underscores Sci-tech Innovation

By Staff Reporters

The results of sci-tech innovation during the 14th Five-Year Plan (FYP) period (2021-2025) have laid a solid foundation for building a country strong in science and technology, and the 15th FYP period (2026-2030) is a crucial and critical time for achieving this goal, said Yin Hejun, Minister of Science and Technology.

Yin made the remarks during an interview with *Science and Technology Daily*, sharing his insights on the ministry's plans to promote sci-tech development in the next five years.

He called the 14th FYP period a milestone in the development history of China's science and technology cause.

China's capacity for sci-tech innovation has steadily improved. The integration between technological and industrial innovation is accelerating, with new quality productive forces flourishing. Sci-tech innovation achievements have benefited people's well-being.

Substantial improvement in sci-tech self-reliance and strength is listed as a major objective for national economic and social development during the 15th FYP period. To achieve greater self-reliance and strength in science and technology and steer the development of new quality productive forces, measures will be taken in four specific aspects.

Yin said promoting advances in original innovation and breakthroughs in core technologies in key fields would strengthen the foundation of technological support; promoting in-depth integration between technological and industrial innovation would enable coordinated development of sci-tech and industry, accelerating the cultivation of new quality productive forces.

The integrated development of education, science and technology, and human resources plays a fundamental and strategic supporting role in Chinese modernization. Advancing the Digital China initiative means seizing the opportunities of the new technological revolution and industrial transformation, and giving new impetus to economic and social development.

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Xinhai Harbour, located in Haikou, Hainan province, serves as a gateway port for the Hainan Free Trade Port. The Hainan Free Trade Port will launch island-wide independent customs operations on December 18. (PHOTO: VCG)

STI Frontier

'Future' Drives Deep-Sea Exploitation Green Progress

By LU Zijian & JIN Feng

"Future", China's first deep-sea green and intelligent technology experimental vessel, recently completed its first deep and remote sea test since its delivery in July this year.

After six years of tackling key research problems, design and construction, the vessel described as a "mobile offshore laboratory," can conduct tests for new type green intelligent technologies, provide application and testing support for deep-sea equipment, and assist scientists in conducting deep-ocean surveys, said Ye Cong, director of the China Ship Scientific Research Center of the China State Shipbuilding Corporation (CSSC) and chief commander of the "Future" construction project.

Green "heart"

"Future" is equipped with four major diesel generators and six propellers.

Zhou Yu, the on-site in charge of the vessel's power system from Shanghai Marine Diesel Engine Research Institute, CSSC, said researchers tried to make the generators adjust rotational speed and output power based on the demand for electricity.

The initial mooring trials encountered challenges, one of which was the power oscillation when the four generators were in parallel operation, resulting in unstable power generation.

A container at the shipyard dock became the meeting room at that time. Researchers discussed test programs in the container and then did tests in ship cabins that were under construction.

After hundreds of parallel operation tests and multiple rounds of technical reviews and discussion, the researchers found a solution.

In April this year, a new round of mooring trials took place, and the power

output of the generator sets steadily increased during parallel operation and ultimately stabilized at rated load. According to Zhou, with this set of technologies, the generators can save 456 tonnes of diesel per year, decreasing circa 1,420 tonnes of carbon emission, which equals the emission of 560 cars per year.

Elevator for submersibles

A crucial mission of "Future" is to provide support for deep-sea equipment operations. A moon pool, which is a vertical opening in the hull of the vessel that provides direct access to the sea from inside the vessel, plays an important role in operating submersibles.

Liu Yang, head of the vessel's construction supervision team, said the influence of severe sea conditions like violent storms and waves could be eased when deep-sea equipment is deployed into the ocean for operation via the moon pool. See page 2

International Cooperation

China, South Africa Jointly Promote Science Popularization

By Staff Reporters

On November 21, L.I.S.T.E.N Science Space, an interactive hub to explore science beyond borders jointly built by the China Science and Technology Museum and the Sci-Bono Discovery Center of South Africa, opened to the public, marking new progress in sci-tech cooperation between China and South Africa.

More than 100 representatives from the scientific and academic circles as well as students from South Africa attended the launching ceremony.

China and South Africa, both early members of BRICS, have forged a strong and profound friendship. During the Beijing Summit of the Forum on China-Africa Cooperation last year, the China Association for Science and Technology (CAST) and South Africa's Department of Science and Innovation (DSI) signed a memorandum of understanding (MoU) to deepen bilateral cooperation in such areas as public participation in science and technology, sci-tech and cultural exchanges, mutual recognition of engineers, engineering and mathematics education, and women's participation in science and technology.

In March 2025, a delegation from CAST visited the Sci-Bono Discovery Centre and both organizations signed an MoU. The interactive hub is a significant step to implement this agreement.

With an area of approximately 200 square meters, the hub is located in the Sci-Bono Discovery Centre, integrating scientific exhibitions, interactive experiences, and cultural exchanges. It is not merely a simple addition to the existing scientific education infrastructure of China and South Africa but an important practice for the two countries to jointly promote innovative development of science education.

Chen Jingquan, minister counsellor at the Chinese Embassy in South Africa, said scientific popularization and participation are the key ways to achieve sci-tech equality. Everyone has the right to access, use and enjoy scientific achievements. The mission of science diplomacy is to transform innovative achievements into the common wealth of all humanity and make them a driving force for sustainable development. See page 4

WEEKLY REVIEW

China's Single Largest Gas Turbine Starts Operation

According to China Energy, the No. 1 gas turbine unit of the Zhejiang Anji Power Plant began to work on November 30, marking the official commercial operation of the largest single-unit capacity and most efficient gas turbine in China. It has an efficiency rate as high as 64.15 percent.

China's 1st Sea-based Rocket Recovery Platform Delivered

"Linghangzhe," meaning Pathfinder, China's first seaborne platform designed for rocket recovery using a net system, was delivered on November 30. It is a critical piece of infrastructure for reusable rocket launch and comes after the launch of Chinese commercial rocket firm i-Space's landing vessel in August.

First Single-dose Dengue Vaccine Approved

Brazil has recently approved the world's first single-dose dengue vaccine. The "Butantan-DV" dengue vaccine, developed by the Butantan Institute in São Paulo for people aged 12 to 59, demonstrated 91.6 percent effectiveness in preventing severe dengue fever.

Russia Grows Barley on Simulated Mars Soil

Researchers from the Southern Federal University in Russia have for the first time grown barley seedlings in a substrate that simulates the composition of Martian soil. By adding a special mixture of microorganisms to the substrate taken from the Mojave Desert, they created a layer rich in nutrients and successfully grew barley.

New Graphic

In terms of total brand value of the
top 5,000 global brands,
Chinese brands rank

2nd
reaching
1.81 trillion USD

Source: China National Intellectual Property Administration
Designed by SONG Ziyao / Science and Technology Daily

WECHAT ACCOUNT



E-PAPER



Action Plan to Unlock Consumption Potential

Policy Express

By LIANG Yilian

China has unveiled a 19-point action plan to upgrade its consumer goods sector, aiming to cultivate trillion-RMB consumption markets and strengthen the role of consumption in driving economic growth.

According to the plan released on November 26 by the Ministry of Industry and Information Technology (MIIT) and five other government departments, by 2027 the supply structure of consumer goods should be significantly optimized.

Under the plan, three trillion-RMB consumption sectors — elderly care products, intelligent connected vehicles and consumer electronics — will be formed by 2027. Also, 10 consumption hotspots will be nurtured, each valued at over 100 billion RMB.

The plan also targets creating globally recognized, culturally rich, high-quality Chinese consumer brands. By 2030, a high-quality development pattern marked by virtuous interaction between supply and demand should take shape, with consumption contributing more steadily to economic expansion.

Central to the plan is the idea of "adaptation," meaning that producers should proactively respond to evolving consumer trends, beginning with product design. The goal is to achieve dynamic alignment between supply and demand in terms of quality, structure,



A visitor experienced a home hyperoxic chamber suitable for the middle-aged and elderly at the exhibition area of the China International Import Expo. (PHOTO: XINHUA)

and utility.

"What people want and like should guide and encourage enterprises to think, innovate, and produce accordingly," Xie Yuansheng, vice-minister of MIIT, said at a press conference. "This ensures consumers can access satisfying products and attentive services, while enterprises can offer goods that match market needs and realize value through quality."

The action plan outlines key tasks across five major areas:

- Expanding new supply by accelerating the application of new technologies and business models, including nurturing emerging industries, advancing responsive manufacturing, and

deepening the integration of AI.

- Tapping into the existing potential by increasing the supply of distinctive and next-generation products, promoting greener goods, upgrading rural consumer goods and developing leisure and sports products. It also seeks to advance health-related innovations, revitalize classic Chinese brands, and expand supply for interest-driven consumption.
- Targeting segmented markets with greater precision, such as enriching products for infants and children, improving the supply of quality student goods, expanding fashion-oriented "trend" products, and optimizing elderly-friendly offerings.
- Promoting new scenarios and

business formats, including encouraging the launch of first-edition products, advancing platform-based consumption, and supporting the orderly growth of shared consumption.

- Creating a sound business environment through stronger fiscal and financial support, themed promotional activities, and improved market regulation.

There is particular focus on accelerating the use of AI in consumer goods. AI integration will be advanced through both product innovation and scenario development, according to He Yaqiong, director of MIIT's consumer goods industry department.

As of June 30, China had 515 million generative AI users.

Yang Nie, deputy director-general of the Ministry of Commerce's department of market operation and consumption promotion, said the ministry will promote pilot reforms in automobile circulation, expand the used-car market, and broaden the auto aftermarket.

Efforts will also focus on expanding appliance and home furnishing consumption, especially products that are green and smart.

The MIIT will work to publicize and implement the plan, strengthen coordination, and guide local governments and industry associations in carrying out the measures. The goal is to continuously foster new products, new consumption scenarios, and new consumption hotspots, further unlocking China's consumption potential.



Yunnan Strengthens Innovation Links with South, Southeast Asia

By LIN Yuchen & ZHAO Hanbin

Yunnan province in southwest China has significantly expanded its international science and technology cooperation over the past five years, leveraging its border location to deepen exchanges with South and Southeast Asian countries.

At a recent press briefing, provincial officials highlighted that Yunnan's

technology-driven openness has reached a new stage during the 14th Five-Year Plan period (2021-2025), with its influence across neighboring regions continuing to rise. Through platform-building, talent exchanges, and shared research, the province has strengthened technological linkages that now serve as an engine for broader regional collaboration.

One flagship achievement is a joint

laboratory for the study of renewable energy co-established by China's Yunnan Normal University and Laos' Renewable Energy and New Material Research Institute. The laboratory has made notable progress in solar energy applications, new materials research, talent training, and technology dissemination.

Yunnan's cross-border cooperation with Vietnam has also deepened, particularly in agricultural technology. A high-quality feed research center established in recent years has evolved into one of central Vietnam's largest enterprises in the swine industry, demonstrating how technological collaboration can translate into industrial growth.

Over the past five years, Yunnan has elevated its cooperation architecture by establishing stable partnerships with multiple countries. The province has built 140 international joint laboratories and R&D centers, 10 overseas demonstration parks, and 14 national-level international cooperation bases, forming a

comprehensive network of scientific collaboration.

The Tengchong Scientists Forum has attracted global researchers. Events such as the China-South Asia Technology Transfer and Collaborative Innovation have drawn participants from diverse countries.

Talent programs have further strengthened regional scientific capacity. Nearly 200 young scientists from South and Southeast Asia have conducted research or entrepreneurship activities in Yunnan, particularly in biology and agriculture.

The province has also hosted 27 technical training programs for developing countries, training more than 7,000 professionals, and becoming a hallmark of Lancang-Mekong human-resource cooperation.

To date, these efforts have yielded 110 new crop varieties, introduced 128 advanced technologies, and exported 65 suitable technologies abroad.

'Future' Drives Deep-Sea Exploitation Green Progress

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It will also be more efficient for researchers to operate equipment for underwater observation, sampling and special operations.

Still, getting a submersible into the sea steadily via the moon pool was a challenge.

A researcher proposed securing the submersible inside the operation compartment, laying tracks from the fore cover plate of the moon pool, connecting them to the compartment's clamping device, and allowing the submersible to travel along the tracks like an elevator, directly to the ship's bottom.

This idea was impressive, but precise validation was required. For the next several months, the research team continuously improved the design of the moon pool lifting system, cover plates, tracks and clamping devices, and rein-

forced the moon pool structure.

The construction team meticulously refined their techniques, ultimately controlling the straightness deviation of the two tracks to within one millimeter, enabling the operation compartment to descend smoothly and unimpeded to the seabed.

Widely applicable testing and validation

As a pilot test platform, "Future" is equipped with more than 8,000 data collecting points to monitor the situation of equipment and sense the changes of surrounding environments.

Then a challenge occurred: How can a scientific, rational and efficient method be established for conducting real-vessel testing and validation of smart devices and systems from different manufacturers and with varying functionalities?

On the one hand, the researchers went through the technical specification formulated by the International Organization for Standardization and International Electrotechnical Commission and requirements by large classification societies, according to Yao Fengxiang, engineer for the development of dynamic testing systems of "Future".

On the other hand, Yao said, they clarified the function boundaries, performance index and test demands of smart equipment with equipment manufacturers and research institutes respectively. Test plans were formulated and an evaluation index system established subsequently.

The key challenge was how to efficiently collect the operation data of the tested equipment and systems.

"We developed a distributed intelligent data acquisition architecture that

enables real-time synchronous collection of multi-source heterogeneous data," Yao said, adding that each task is also assigned a "timestamp" to pinpoint the equipment data associated with every task via search by time.

Currently, the dynamic testing system supports the collection, storage, computation, management and application of comprehensive shipboard data, along with seamless ship-shore data connectivity. It facilitates testing, validation, analysis and evaluation of various intelligent devices and systems.

Next, "Future" will continue pilot testing of intelligent medium-speed engines, intelligent steering gear, navigation radars and other tested equipment systems. It will provide data support for product iteration and upgrades, advancing the intelligent transformation and green development of the shipbuilding industry, said Zhang Haihua, director of the Lianyungang center of Taihu Laboratory of Deep Sea Technology Science.

Case Study

Huaibei Normal University Volunteers Engage in Rural Revitalization

By CHU Changsheng & LI Linxu

In the rural areas of Anhui province in east China, a dedicated group of student volunteers from Huaibei Normal University are making an impact on rural development.

For over 12 years, the Xiao Yu Di (literally meaning "Little Raindrop") volunteer team from the School of Foreign Studies has been a dynamic force in supporting rural education. Their consistent efforts have not only nurtured rural children's growth but also contributed to the broader cause of rural revitalization.

A 12-year commitment to rural service

Since its inception, the Xiao Yu Di program has grown into a cornerstone of the university's social responsibility initiatives. Its footprint has spread across three provinces, with over 800 student volunteers participating in a relay of dedicated service. They have delivered more than 3,000 teaching sessions for youngsters, many of whom are "left-behind" children in rural areas, whose parents work away in cities.

Daxu, a village in Anhui, sent a heartfelt thank-you letter to the team in this August, commending the volunteers for their outstanding contribution to rural education and revitalization.

This summer, six members of the Xiao Yu Di team went to Daxu. They not only meticulously planned summer classes for teenagers, offering academic tutoring and interest development courses, but also conducted field research on key issues of rural revitalization, such as industrial development and cultural inheritance.



A member of Xiao Yu Di team from Huaibei Normal University conducts summer volunteer teaching activities at the Nishui Central Primary School in Qianshan city, Anhui province. (COURTESY PHOTO)

Promoting Embodied AI Tech and Context Application

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In addition, more than 20 embodied AI enterprises presented their products on site, including an integrated physiotherapy bed and an AI-powered traditional Chinese medicine diagnosis robot.

Xing Huaibin, director of the New Quality Productive Forces Promotion Center, said AI has become a crucial engine driving the development of new quality productive forces. Embodied AI, an important frontier direction, has realized deep integration of cognitive intelligence and physical entities. It is rapidly transitioning from laboratory research to industrial implementation, demonstrating robust development momentum and broad application prospects.

In the future, the center will continue to track and collect cutting-edge technological information, strengthen analysis and assessment of the commercialization and application of frontier technological achievements, and conduct precise matching between supply of sci-tech achievements and demand for innovation. It will accelerate the efficient

commercialization and application of sci-tech achievements.

Wang Junming, member of the editorial board of *Science and Technology Daily* and president of *Context Innovation* magazine, said the key to context-driven development of embodied AI lies in advancing it from "laboratory technology" to "scalable application."

Embodied AI's "perception-decision-action" capability can optimize resource allocation through real-time data, and transform "contexts" into hubs connecting technology and industry. With onsite verification, data feedback, model iteration and scalable service, it can drive continuous emergence of new productive forces, Wang said.

The conference aligned with the requirements outlined in the guidelines released by the General Office of the State Council in November on accelerating scenario cultivation and opening up and promoting large-scale application of new scenarios.

It built a bridge between technologies and applications, and fostered a shared vision for the industry's development.

Peddling 'Fake Tiangong Experiment' Claim Backfires



By LIANG Yilian & HU Dingkun

Recently, a cluster of overseas social media accounts have been circulating a screenshot taken from a video showing the interior of China's Tiangong Space Station. The image shows a cup of water on a table in front of a Chinese astronaut.

Because the water does not appear to float in microgravity, these accounts are accusing China of staging or faking the footage. Some posts have received millions of views, fueling yet another round of misinformation.

Germany's Deutsche Welle (DW) interviewed the national aerospace agency and experts, who dismissed the allegation.

A spokesperson for the German Aerospace Center said: "We have reviewed the footage involving the water and found no indication of fakery."

A scientist at the University of Bremen explained that the cup was specially designed so that the water would stay in the position and shape seen in the image.

A closer look at several of the influential rumor-spreading accounts cited by DW reveals that many regularly post anti-China content. This suggests that certain actors with ulterior motives are simply exploiting the public attention focused on the Shenzhou-20 mission.

In fact, the screenshot originates from the December 2021 livestream of the first "Tiangong classroom" by Shenzhou-13 astronauts Wang Yaping, Zhai



Real-time footage of the communication between the Shenzhou-20 astronaut crew and the Shenzhou-21 astronaut crew on November 1, 2025. (PHOTO: XINHUA)

Zhigang, and Ye Guangfu. From 2022 to the present, the same rumor has resurfaced at least four times internationally.

The first major resurgence came in June 2022, when posts on Facebook and other platforms suddenly circulated images and text accusing China of faking its space station environment.

According to an investigation by Factcheck Lab, the rumor likely originated within communities of conspiracy theorists who subscribe to the "flat Earth" belief, with several anti-China accounts amplifying the narrative.

On June 30, the China Aerospace Science and Technology Corporation and the media platform "Our Space" quickly clarified that the cup was fixed to the table to facilitate experiments, and that surface tension kept the water from floating away.

Several international outlets report-

ed these explanations accurately, helping dispel the rumor. Both Chinese institutions and domestic and international media have repeatedly debunked the allegations with clear scientific explanations.

In June 2023, another video — this time deliberately circling the cup to spotlight it — spread widely on overseas platforms, accompanied by the question: "Why doesn't the water spill out of the cup?"

The Associated Press (AP) responded with a detailed fact-check, citing University of Chicago postdoctoral researcher Jordan Bimm. Bimm said "Water molecules like to stick to glass and also to other water molecules more than they like to disperse in the air."

He added that surface tension "also works to help maintain the static shape and presents the illusion of how water

would act on the ground."

The rumor resurfaced yet again this June, pushed by conspiracy theorists recycling the same claim. Media outlets including the BBC and *The Sun* cited the AP's 2023 report to clarify the science and dismiss the accusation.

The cyclical reappearance of the "China faked its space station" rumor, despite repeated and authoritative debunkings, reflects several underlying factors. Conspiracy theorists unfamiliar with the physics of space flight actively search for "evidence" to validate their beliefs. Anti-China accounts eager for attention willingly spread falsehoods without regard for facts.

While public enthusiasm for space exploration creates high traffic for related content, advanced scientific knowledge about microgravity is relatively limited, making some viewers uncertain when confronted with misleading images.

But today, after multiple rounds of fact-checking and scientific outreach by Chinese and international media, fewer people appear willing to believe such claims. In the comment sections of the recent rumor-spreading posts, the overwhelming majority of users expressed skepticism or disapproval.

Some patiently explained the scientific principles involved. Others urged the posters to "read more."

China's progress in space station construction, lunar exploration, and other aerospace technologies — and its significant contributions to exploration of space — are recognized across the world. Spreading absurd claims like "China faked its space station" wins no support and only brings ridicule upon those who make them.

Comment

Int'l Community Rebukes Japan for Damaging Post-war Order

Eighty-two years ago, in a hotel perched near the Giza pyramids outside Cairo, the leaders of China, the United States and Britain issued the Cairo Declaration, laying down not only an Allied consensus but a legal foundation for the post-war order that followed Japan's surrender.

That history has taken on new urgency recently. China's Foreign Ministry repeatedly invoked the Cairo Declaration to rebut comments by Japanese Prime Minister Sanae Takaichi, whose recent erroneous remarks on Taiwan, alongside Tokyo's plans to expand its military capabilities, have drawn sharp criticism.

Observers say Takaichi's statements cross a "historical red line" set in the 1940s — a challenge to the documents that shaped Asia's post-war settlement and remain embedded in international law.

Released on December 1, 1943, the Cairo Declaration affirmed that the territories Japan had seized from China, including Taiwan and the Penghu Islands, were to be restored to China after the war.

The declaration was reinforced two years later by the Potsdam Proclamation, issued by China, the United States and Britain and later endorsed by the Soviet Union. Japan accepted those terms when it signed the Instrument of Surrender in September 1945, pledging to fulfill the obligations laid out in the Potsdam terms.

Together, these documents formed the international legal basis for China's recovery of territories taken by Japan, and, more broadly, were seen as essential elements of the post-war order in the Asia-Pacific.

The principle that Taiwan is part of China underpinned another landmark moment decades later. The United Nations General Assembly voted by an overwhelming majority in 1971 to adopt Resolution 2758, a landmark decision that affirmed the international community's clear commitment to the one-China principle.

Analysts warn that by linking a "survival-threatening situation" for Japan to the Taiwan question, hinting that Japan might intervene militarily in the Taiwan Strait, Takaichi is openly defying the one-China principle cemented in international legal documents like the Cairo Declaration.

Beyond requiring Japan to return the territories it stole from China, the Cairo Declaration, the Potsdam Proclamation, and other binding documents underscored Japan's aggressive wartime conduct and imposed clear obligations on the defeated state, including complete

disarmament and a ban on industries that could support rearmament.

Japan's right-wing politicians, however, have been chipping away at these restraints in recent years, eroding military limits and sidestepping the constitution's exclusively defense-oriented policy. Takaichi accelerated the process, aiming to revise both the Three Principles on Transfer of Defense Equipment and Technology and the Three Non-nuclear Principles.

Russian Foreign Ministry Spokesperson Maria Zakharova said, "Eighty years have passed, and Japan still refuses to recognize the results of World War II, as enshrined in international law."

"We know, regrettably, how Japanese militarism ended — what sacrifices it cost the whole world, and Japan itself," she said. "Therefore, the politicians who come to govern the country in Japan should remember this and understand what irresponsible statements can lead to, and refrain from them."

Japanese people recently held multiple protests in front of the prime minister's official residence in Tokyo, demanding that Takaichi retract her recent erroneous remarks on Taiwan and offer an explanation and apology.

The protestors called for an end to the resurgence of militarism in Japan, holding signs with slogans such as "Retract remarks, oppose war," "This is all because of Takaichi," and "Takaichi step down."

Observers warn that Takaichi's provocative actions flout international justice and violate the fundamental principles of international relations.

South Korean National Assembly Speaker Woo Won-shik said on social platform X that Takaichi's moves revealed Japan's "irresponsible attitude" and lack of reflection on history, warning that its push to amend the constitution is "even more concerning" as it would "transform Japan into a 'country capable of waging war.'"

Richard A. Black, the Schiller Institute representative at the United Nations in New York, said Takaichi's latest moves are "gravely dangerous," noting her long history of visiting the notorious Yasukuni Shrine, a spiritual tool and symbol of Japanese militarists responsible for the war of aggression, and downplaying Japan's wartime crimes.

"So China is right to be angry, right to be upset and right to take strong actions to prevent it from getting any further," Black said.

Source: XINHUA

China's Trillion-RMB Ice-snow Economy



By QI Liming

The scale of China's ice and snow industry will exceed one trillion RMB this year, a sure sign that the ice and snow economy has become an emerging force in China's economic development.

That's according to the Snow Industry Development Research Report (2025), released recently at the main forum of the World Winter Sports Expo (WWSE). Many heads of international sports organizations have praised the sustainable development of China's winter sports, expressing their willingness to deepen cooperation with China, promote the projects and strengthen the cultivation of young talent.

Contributions to global winter sports

More than 500 internationally renowned and domestic brands from countries such as Austria, Italy, Canada, Finland, and Slovenia took part in the WWSE. The participants said that the successful hosting of the Beijing 2022 Winter Olympic Games and the effective utilization of the Winter Olympics'

legacy have made significant contributions to the development of global winter sports.

Giovanni Malago, president of the Italian Olympic Committee, said the 2008 Beijing Summer Olympics and Beijing 2022 Winter Olympic Games have left significant Olympic legacies, bringing the younger generation closer to sports activities.

The cooperation between China and Finland in the field of winter sports is very close. From the construction of facilities for the Beijing 2022 Winter Olympics Games, to coach training and the utilization of post-event legacies, both sides have completed many successful exchanges. Lauri Kangasniemi, the Embassy of Finland, Beijing Counselor, said winter sports have become a bond for cooperation between China and Finland.

Johan Eliasch, president of the International Ski and Snowboard Federation was deeply impressed by the high-standard snowfield facilities in China. "More and more teenagers are stepping onto the ski slopes, not only promoting the popularization of winter sports, but also [helping] the [whole of] Asia play a more significant role in the winter sports landscape."

Expanding into a multi-sectoral economy

The Chinese ice and snow industry is undergoing a transformation from a "game-driven" model to a "consumption-oriented" one. Ice and snow sports are evolving into a diversified and multifaceted experience known as "ice and snow plus".

In 2024, an iiMedia Research report on the winter sports industry's prospects for the coming winter in 2025, said the market was worth just under 1.05 trillion RMB, and could surpass 1.5 trillion RMB by 2029.

The report said more than half of the participants are aged between 24 and 30, and over 70 percent are women. Meanwhile, more than 60 percent buy equipment each season, typically budgeting 1,000 to 2,000 RMB, which has fueled growth in domestic supply chains for snow suits and goggles, along with

those for the ice- and snow-making machines demanded by the expanding winter sports industry.

Samuel Ventura, manager of the Asian Region of Italy's TechnoAlpin, said that the Chinese market has become one of the most dynamic and promising regions in the global snow and ice equipment sector. "We hope that through technology and cooperation, the snow and ice economy can become more environmentally friendly and sustainable," he said.



The Lianhueshan Ski Resort in Changchun of northeastern China opened for visitors. (PHOTO: VCG)

15th FYP Underscores Sci-tech Innovation

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To implement the national blueprint and promote full integration between technological and industrial innovation, the Ministry of Science and Technology (MOST) will guide the construction of a modern industrial system, and strengthen the coordination of all entities, promoting in-depth integration of industry, university and research institutions, with enterprises playing a leading role.

Efforts will be made to deepen reform and allow more application scenarios to be developed and opened to accelerate the transformation and application of major sci-tech achievements.

The allocation efficiency of resources will be improved and policy guarantees strengthened to create a favorable ecosystem for deep integration of sci-tech and industrial innovation, as well as building an open and

innovative ecosystem with global competitiveness.

In terms of promoting integrated development of education, science and technology and talents, MOST will improve the coherence of planning, coordination of policies, management of resources and evaluation.

Yin underlined the guidance of sci-tech innovation in talent cultivation to build a leading innovation team during the implementation of major national

sci-tech tasks and the construction and operation of high-level sci-tech infrastructure.

In addition, the prediction of supply and demand for sci-tech personnel and feedback would be improved.

Scientists would be given greater autonomy in scientific research and the use of funds, and the establishment of a classified evaluation system for personnel would be accelerated.

Hi-Tech

By QI Liming

Recently, a 14-year-old junior high school student Jia Mingxuan from Chifeng, Inner Mongolia, China, won the gold award at an International Exhibition of Inventions Nuremberg, Germany, with his invention of an automatic watering device for trees in arid areas.

Inspired by the phenomenon of water droplets forming on the lid of a pot and then sliding down when it's being heated for cooking, along with the condensation principle in physics, Jia came up with the idea of using the water vapor in the air to automatically water the trees.

The temperature difference between day and night in the Chifeng area is quite large during summer. The average temperature during the day is approximately 27°C, while the average temperature at night is about 14°C.

Automatic Watering Device for Trees

This device utilizes the temperature difference between the ground surface and underground soil, to allow air to circulate inside hollow steel pipes buried vertically in the soil. Fans are installed at the top of the pipes to direct the outside air to the bottom of the pipes. This enables the water vapor in the air to condense into small water droplets underground, which then penetrate the tree roots to provide water for the trees, achieving automatic watering and reducing the cost of afforestation.



Demonstration of the automatic watering device for trees in arid areas. (PHOTO: XINHUA)

Responsible AI Formation with Concerted Efforts

Dialogue

By LONG Yun & BI Weizi

Renowned historian and anthropologist Nicholas B. Dirks has spent much of his life building bridges between disciplines, countries, and people. The former executive vice president for arts and sciences at Columbia University, he helped establish global centers in Beijing, Paris, and six other cities and was also instrumental in launching the Tsinghua-Berkeley Shenzhen Institute in south China, deepening academic ties between China and the United States.

Now, as AI reshapes the landscape of scientific research, Dirks brings the same global, humanistic perspective to a new frontier. In a recent interview, he reflected on AI's promise, pitfalls and what it means for the future of knowledge and humanity.

A scientific accelerator with limits
Dirks began by tracing the creation of AI: "AI is a form of technology that has been developing for decades. The term artificial intelligence itself was first used in 1956 at a conference at Dartmouth College, the United States."

Each decade has brought new breakthroughs and today, AI has reached a point "where it is not only a tribute to and an outcome of extraordinary work across science, technology and the like, but also coming to the point where it can be, and I think it will go on to show this in very dramatic ways, a huge benefit for the advance of science."

He cited AlphaFold, the AI system developed by Google DeepMind, as a



Professor Nicholas B. Dirks. (COURTESY PHOTO)

turning point. "We saw this, for example, quite clearly in 2018, when AlphaFold for the first time was able to begin to detect the code and identify the process of protein unfolding. Now this is something that used to take teams of human researchers years, it was incredibly time-intensive and also human-intensive."

The impact extends far beyond biology: "AI is assisting in all kinds of other scientific modes of both exploration and discovery. It's being used in drug repurposing, the development of new therapeutics, and even diagnostics."

The human-AI equation
However, "a recent study showed that while machines are typically better than humans, they're not always better. And when humans use machines and the two are interacting, there are times when the outcome of an interaction is worse than either just a human working on their own or machine intelligence,"

he warned.

His conclusion: "Human intuition, human scientific capacity is certainly not infallible. But we shouldn't just because of the incredible power and speed of AI assume that machine intelligence or machine learning is going to be infallible either."

More troubling is AI's capacity to reinforce and worsen human bias. Ethical guidelines, he pointed out, aren't enough on their own. "There has to be a way to bring the human intelligence and machine intelligence together, have them constantly interact and really learn how to use machines in the same way and following some of the same lessons that we've learned how to educate and work with human intelligence — both its huge potential but also its manifest liabilities."

The ideal is synergy between humans and machines: "Only after human and machine get together means one

plus one, larger than two. One plus one can either be less than two or more than two."

Key to using AI
Another danger is that AI can be weaponized or used "in the field of autonomous lethal weapons to do things that could be very deleterious to human well-being. There are many scientists and many people in civil society who are calling for a pause or even for a cessation of work — at least in some areas of AI, especially around the goal for super intelligence. And I understand why they feel that way."

However, he is against halting all work: "I also know from human history that technology has constantly created both new opportunities and new challenges for all of us as humans."

The key is thoughtful governance, not fear. "The key is to figure out how to obviously optimize the adoption and use of any new technology," whether it's the combustion engine, nuclear power, or now AI. "And the same will be true with quantum computing very soon."

AI's rise demands a new kind of scientific literacy, one that goes beyond coding. "Science is going to have to think about the nature of its databases in a different kind of way than it has done before," he said. Researchers must ensure the data is "adequate to the task, appropriate for the task, and interrogated at the level of really making sure that it's good data and not contaminated by one issue or problem or another."

For Dirks, the mission of the university has never been more vital. "My big hope is that we can harness the power of AI both for science and technology on the one side, but also for human development on the other."

My China Story

Scientific Success Built on Practical Value

By LONG Yun & BI Weizi

Biomonitoring has immense potential to become a standard part of preventive healthcare, identifying risks of exposure to pollution long before symptoms appear.

This was the thrust of a recent interview by Dr. Shahid Iqbal, assistant professor in renewable energy and energy storage at the University of Nottingham Ningbo China (UNNC).

"Hair, nails and blood act as recorders of long-term exposure to pollutants and nutrients," he said.

Could this kind of testing become part of our routine checkups in the future? "Absolutely," he answered without hesitation. "This kind of biomonitoring has immense potential to become a standard part of preventive healthcare, moving us from treating disease to preventing it by identifying exposure risks long before symptoms appear."

Iqbal's work spans two areas that might seem unrelated but are, in his view, deeply connected: environmental health and clean energy. Both aim to reduce the harm pollution inflicts on human life.

His team recently analyzed more than 800 samples of hair, nail, and blood from advanced-stage breast cancer patients and healthy volunteers. The results showed consistent imbalances: elevated levels of toxic metals such as lead, cadmium, chromium, nickel, and cobalt, alongside lower concentrations of essential elements like zinc, selenium, and iron.

But he is careful not to overstate the findings. "We need studies and longitudinal studies to confirm whether these imbalances are a cause or consequence of disease," he said. "We must establish standardized lab reference ranges for each biomarker across diverse populations. We also need to develop and validate cost-effective, high-throughput assays for clinical use."

The ultimate aim is to move beyond correlation. "The goal is to move from association to actionable insight. But significant translational work is still required."

For that translation to happen, science must reach people directly. "Scientists must make the knowledge accessible," he said. "This means moving beyond academic papers to create clear public-facing resources that explain what these biomarkers mean, where exposure might come from in our daily life, and what actionable steps individuals can take to reduce them."

He also emphasized collaboration with medical professionals. "We must work closely with doctors to develop standardized interpretation guidelines, empowering them to integrate this data into personalized health plans. The goal is to transform complex data into practical, empowering knowledge for everyone."

Beyond environmental health, Iqbal's core research focuses on advanced materials for clean energy. He sees no contradiction between the two pursuits. "Replacing fossil fuels does not just cut CO2. It prevents millions



Dr. Shahid Iqbal. (COURTESY PHOTO)

of premature deaths from air pollution," he said.

When asked which part of his work excites him most, he described a future many would welcome: "Imagine your smartphone charging in a minute. An electric car topping up as fast as filling a gas tank."

Two-dimensional hydrostructures enable this through their unique architecture. "These materials allow ions and electrons to move at incredible speed, enabling ultrafast charging."

In solar panels, similar materials can be engineered to capture more sunlight and convert it more efficiently into electricity. "Ultimately, they translate to everyday devices with longer battery life, dramatically faster charging times, and more powerful, efficient renewable energy systems. This will change our daily lives."

But turning laboratory discoveries into real-world solutions remains challenging. "The greatest challenge is bridging the gap between a reliable prototype and a viable product," he said. "A material that performs exceptionally well in a coin-sized cell is useless if we cannot manufacture it cost effectively on a large scale or if it degrades rapidly after a few hundred charge cycles."

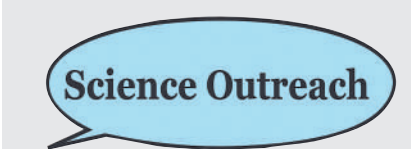
Diagnostic methods like biomonitoring involve clinical validation and regulatory approval. "We must prove test reliability in large, diverse populations and develop affordable, standardized assays. Ultimately, vision is not just about scientific success. It is about demonstrating practical, economic, and robust value for end users."

This journey from discovery to real-world impact depends not only on scientific rigor but also on the research ecosystem that supports it. Iqbal earned his PhD at the University of Chinese Academy of Sciences. "China is the most ideal place where different scientists can work together," he said.

At UNNC, he has sustainable funding and can work "very efficiently." "I have the opportunity to collaborate with other teams," he added.

Iqbal praised China's research environment. "If you get the chance to do PhD here in China, you will learn a lot. You can study any topic from very basic to fundamental to advanced level because China has all the research facilities that scientists can imagine."

Things to Know about Satellite IoT Services



By CUI Shuang & BI Weizi

China's Ministry of Industry and Information Technology has recently launched a two-year program of commercial trials of Internet of Things (IoT) services.

The aims of the program include expanding the range of satellite communication services and assisting new industries such as commercial aerospace and the low-altitude economy with data link ups.

What is satellite IoT?
It utilizes satellite communication technology to connect a large number of devices on the ground, in the oceans and in the air, providing data collection and transmission services. Its application

scenarios include marine fisheries, transportation and logistics, energy and water resources, emergency communications, the low-altitude economy, and industrial Internet.

Yu Xiaohui, president of the China Academy of Information and Communications Technology (CAICT), said that previous IoT networks relied on terrestrial connections, which left many areas inaccessible, including remote regions, the sky and the ocean. Satellite IoT offers comprehensive coverage.

What role can it play in new industries?

Relying on space-based networks, satellite IoT can achieve real-time global tracking and data transmission of low-altitude aircraft, precisely addressing the communication shortcomings in the low-altitude economy. In low-altitude fields such as drone logistics, for example, insufficient terrestrial base station coverage previously caused signal interruptions, affecting flight safety

and efficiency. Satellite IoT enables real-time global tracking and data transmission of low-altitude aircraft via space-based networks.

Satellite IoT can also expand the range of applications in the low-altitude economy. Zhu Keli, founding president of the China Institute of New Economy, provided the following examples: when agricultural drones operate across borders, satellite communication can facilitate cross-regional scheduling and data transmission.

Similarly, when emergency rescue drones lose terrestrial network coverage in disaster-hit areas, they can rely on satellites to maintain communication with the command centre. He believes that this technological integration will attract more capital and resources to low-altitude airspace, promoting the coordinated development of the entire industry chain, including drone manufacturing, airspace management and data services. This will create

a virtuous cycle of technology-scenario-industry.

What is the future of the 'Internet of Everything'?

Currently, the three major telecommunications companies — China Telecom, China Mobile, and China Unicom — are all qualified to legally operate satellite mobile communications services. This enables them to provide direct mobile phone connections to satellites, deepen the application of emergency, maritime, and remote area communications, and enrich the supply of communication services and products.

On November 21, China Telecom launched a trial commercial service for its domestically developed, satellite-based, high-precision positioning service, "Tiantong + Beidou", which provides coverage to remote areas, oceans, low-altitude regions, and low-orbit areas where there is currently no or weak network coverage.

In the future, scenarios such as drone inspections and delivery, and low-altitude general aviation, will benefit from stronger signal support.

suanshu), literally means the "art of calculation."

This book exerted a deep influence on Japan and Korea, becoming a foundational text for their mathematical development. Its principles spread to the Korean Peninsula during the Sui dynasty (581- 618 CE) and to Japan during the Tang dynasty (618- 907 CE). Including topics such as areas, volumes, and linear equations, the text became a model for later East Asian mathematical works and played a key role in a shared mathematical tradition that also influenced architecture and administration. It has been translated into several languages, including Japanese, Russian, German, English and French.

Nine Chapters on Mathematical Art

Traditional Eastern Wisdom

By BI Weizi

The Nine Chapters on the Mathematical Art is one of the earliest surviving mathematical texts from China. Composed by several generations of scholars between the 10th and 2nd centuries BCE, the book sets out an approach to mathematics focused on finding the most general methods of solving problems. This can be contrasted with the approach of ancient Greek mathematicians, who tended to deduce propositions from an initial set of axioms.

The original version of *the Nine Chapters on the Mathematical Art* presented rules and algorithms, but lacked formal proof or derivation. Later, the mathematician Liu Hui provided a written commentary that justified the techniques used.

Studying sections of *the Nine Chapters on the Mathematical Art* and solving some of the problems in the text, is an effective way to understand how the development of mathematics in Asia was influenced by the organization of life and society there. The book deals more in practical problem solving rather than theory. It is a practical manual consisting of 246 example problems and their solutions.

In ancient times, Asians were far more adept at arithmetic than Westerners. *The Nine Chapters on the Mathematical Art* employed decimal place-value arithmetic at a time when Europeans were still using Roman numerals or other cumbersome systems. The ancient Chinese were also the first to use negative numbers, a practice that was not adopted in Europe until the 15th century. Centuries before other civilizations, the Chinese had developed algorithms for solving linear problems, including matrix methods and excess- and- deficit techniques.

The Chinese word suanshu, which appears in the title of *the Nine Chapters on the Mathematical Art* (jiuzhang

China, South Africa Jointly Promote Science Popularization

From page 1

The opening coincided with South Africa hosting the G20 Leaders' Summit. The hub, integrating the wisdom of China and South Africa, is a demonstration project for friendly cooperation between China and Africa, and showcases the achievements of scientific and cultural exchanges to the guests from various countries attending the summit.

In the future, both countries will use the platform to expand their areas of cooperation. Through joint research on educational content, establishing digital resource libraries, and personnel exchanges, they will add momentum to the China-Africa friendship and promote mutual understanding among the people.