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Innovation Pathway

China Unlocks Bold Tech Transfer Efforts

Edited by WANG Xiaoxia

As China accelerates its pursuit of high-quality development, the transformation of scientific and technological achievements has become a strategic priority.

During this year's Two Sessions, the Jiangsu delegation emphasized the need to explore new pathways for integrating innovation, industry, capital, and human resources — which would address bottlenecks in turning lab breakthroughs into real productive forces.

Enterprises take the lead

To bridge the gap between research and industrial demand, China is strengthening the principal role of enterprises in innovation. Rather than leaving new technologies on the drawing board, enterprises are enabled to take the lead in decision-making, R&D investment, and application.

This has led to Beijing launching an "open competition" mechanism to select the best performers for key tech tasks, resulting in 169 locally made automotive-grade chips. Meanwhile, in the Yangtze River Delta, 24 innovation consortia led by tech giants have been established, uniting enterprises across the entire industrial chain and universities to tackle shared challenges. These model examples are reorienting research toward market pain points and real-world applications.

Financial support deepened

Given the high costs, risks, and long cycles of tech innovation, targeted financial support is critical. Policymakers are calling for robust sci-tech finance that directs capital toward early-stage, small-scale, and long-term "hard tech" ventures.

The relending quota for technological innovation and equipment upgrades has been increased to 1.2 trillion RMB, now covering private small and medium-sized enterprises with relatively high levels of R&D investment.

New tools have also been launched to share risks for corporate bonds for tech and private firms, backed by central bank relending. In addition, a policy framework for tech insurance is being developed, enriching product offerings and stabilizing innovation-driven growth.

Talent development reshaped

Recognizing that human resources are the most essential part of technological transformation, China is advancing integrated education, science, and talent strategies. See page 3



A dynamic positioning pile-driving vessel, with a pile frame height of 156 meters, is delivered in Nantong city, east China's Jiangsu province. (PHOTO: XINHUA)

STI Frontier

HEPS: Super Microscope for Micro World

By LU Zijian & LU Chengkuan

From above, it looks like a giant magnifying glass. The High Energy Photon Source (HEPS), located in Huairou district, Beijing, is China's first high-energy synchrotron light source and Asia's first fourth-generation synchrotron light source, according to Pan Weimin, director of the HEPS project and researcher at the Institute of High Energy Physics (IHEP), Chinese Academy of Sciences (CAS).

Since December 2025, HEPS has been under trial operation and by mid-February, it had supported 222 project experiments from 91 institutions, providing nearly 5,000 hours of user computing time. On the back of this, HEPS recently launched its first official call for proposals.

How HEPS works

"Like a large microscope in the hands of scientists, HEPS can help us to see the experiment samples clearly and analyze the microstructure and evolving

process of materials," Pan said.

For example, HEPS can observe the changes of atomic structure of metal materials under extreme conditions, helping scientists design stronger alloys. It can also inspect chip circuits — which are a thousand times thinner than a human hair — for defects, making sure that smartphones and computers operate more efficiently.

In the HEPS storage ring, electrons travel at close to the speed of light. As they pass through bending magnets, they emit extremely bright synchrotron radiation along the tangent of their orbit. This radiation is directed to beamline stations, where it "illuminates" experimental samples like a spotlight, allowing researchers to uncover the secrets of the microscopic world.

"This process is similar to when we spin an umbrella quickly on a rainy day: droplets of water fly off along the tangent to the edge of the umbrella," Pan said. The accelerator for the light source acts

like this umbrella, and the flying droplets are the X-rays, called synchrotron light.

Compared with the third-generation synchrotron light source, HEPS can "see" samples more clearly and faster, according to Pan. The electron beam has an energy of six billion electron volts, enabling it to emit X-rays of 300 kilovolt-electron volts or higher, allowing for the clear visualization of thicker samples.

Meanwhile, its brightness is one trillion times that of sunlight, making it capable of capturing molecular motion at the scale of one-ten-billionth of a second.

Tackling key tech bottlenecks

The overall performance of HEPS has reached a "leading level" among similar international facilities, with a source brightness nearly 100 times higher than that of third-generation facilities, enabling a continuous supply of high-quality X-rays, according to Dong Yuhui, deputy director of the HEPS project and researcher at IHEP.

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Largest Observation Network Empowers Agriculture

By LU Zijian & FU Lili

China has built the world's largest agrometeorological observation network, according to the China Meteorological Administration (CMA). Latest data from the CMA shows that the meteorological authorities have established a modern agrometeorological observation system, comprising 642 manual observation stations, 738 automatic observation stations, 15 specialized service centers and 91 experimental stations.

Under this system, manual and automatic observation complement each other, and observation and experimentation are conducted in a coordinated manner. This structure strengthens the weak

links in operations in core agricultural areas and extends the vision several hundred kilometers in the sky through remote sensing satellite monitoring.

In major crop production areas like Henan province in central China, products can be monitored with a resolution ratio of 10 meters with the help of 48 sets of phenological observation systems and data from the Fengyun satellites and unmanned aerial vehicles (UAVs).

The most salient feature of this observation network is the combination of intelligence and accuracy, Wu Dongli, deputy head of the system division of the CMA Meteorological Observation Center, said.

Empowered by cutting-edge technol-

ogies like AI, laser and hyperspectral technology, China has become the only country to possess a complete set of automated observational data on crop growth stages, with the accuracy of core data exceeding 90 percent.

The intelligence of the observation network is transforming into a productive force against natural disasters.

In pest and disease control, the meteorological authorities have developed innovative monitoring and identification technologies for insects and birds based on multi-band radars. These can precisely detect and follow the trajectory of migratory pests, providing accurate decision-making support for agricultural authorities. See page 3

International Cooperation

Chinese Project Boosts Water Access in Angola

Edited by WANG Xiaoxia

A major water supply project constructed by China Railway 20th Bureau Group (CR20G) Angola International has significantly improved access to clean water for more than 600,000 residents across Angola's northern Cabinda province, marking a milestone in Sino-Angolan infrastructure cooperation.

The project, the largest of its kind in Angola, was built to Chinese standards and features a fully integrated water supply network designed to serve approximately 92 percent of Cabinda's population. With a daily treatment capacity of 50,000 cubic meters, the system includes 80 kilometers of pipelines and 74 public water supply points.

The centerpiece of the project is the water treatment plant, a 19,200-square-meter facility that processes water drawn from the Chiloango River. The treatment process includes mechanical rapid mixing, flocculation, sedimentation, filtration and storage, ensuring consistent water quality before distribution to communities.

The construction posed significant technical and logistical challenges. The river intake pump station required 64 cast-in-place piles, each 30 meters deep, to secure the structure on soft silt foundations.

Nearly 200 types of equipment and materials were sourced from China, Portugal, and neighboring countries, requiring complex coordination across long supply chains. The project team also carried out over 10 design adjustments to adapt to the region's prolonged rainy season.

Beyond infrastructure delivery, the project created substantial local employment opportunities. During construction, it provided an estimated 2,000 to 3,000 jobs and offered technical training to more than 500 Angolan workers, some of whom now contribute to ongoing operations and maintenance.

For local residents, the impact is tangible. The new supply points have replaced the former daily routine of walking up to two kilometers to the river.

The project stands as a model of how international engineering collaboration can address critical infrastructure needs while empowering local development.

WEEKLY REVIEW

New World Record Set for Deepest Hot-Water Drilling

According to China's Ministry of Natural Resources, the 42nd Chinese Antarctic Expedition successfully completed the country's first hot-water drilling experiment in the ice-covered Qilin Subglacial Lake region of East Antarctica. The drill reached a depth of 3,413 meters, surpassing previous world record of 2,540 meters for polar hot-water drilling.

First Extragalactic Ultra-compact X-ray Binary Discovered

Researchers from China's Xiamen University and Nanjing University have discovered M31 UCXB-1, the first extragalactic ultra-compact X-ray binary. The binary system is located in the Andromeda Galaxy, about 2.5 million light-years from Earth. It is an extremely compact binary composed of a stellar-mass black hole and a white dwarf.

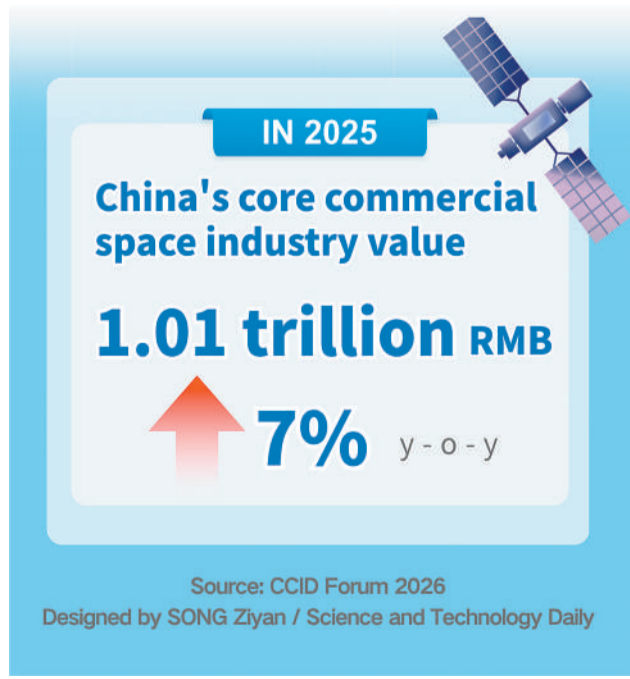
Bacterial Immunity Far More Extensive than Expected

Using machine learning and deep learning models, scientists from the U.S. and France unveiled the complexity and diversity of bacteria's immune systems that protect them from viral infections. The two mutually independent groups of researchers discovered a large number of new candidate antiphage families from bacterial genome data, offering resources for future biotechnology development.

Memory Device Surviving up to 700°C Developed

Researchers at the University of Southern California have developed a new type of memory device that continues to store data and perform calculations even at 700°C. Notably, 700°C is only the limit of the testing equipment, not the physical limit of the device itself.

New Graphic



WECHAT ACCOUNT



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