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Innovation Pathway

Zhejiang's Path to Independent Innovation

By WANG Xiaoxia, JIANG Yun & ZHANG Gailun

In 2006, Zhejiang province set itself the goal of "becoming one of China's innovative provinces within 15 years and building a strong province in science and technology." Armed with this blueprint, the province's independent innovation efforts went into overdrive.

By 2020, Zhejiang had established itself as an innovation-driven province. Four years later, the R&D expenditure of large-scale industrial enterprises in Zhejiang reached 372 billion RMB, representing a year-on-year growth of 5.5 percent. The added value of high-tech industries exceeded 1,550 billion RMB, increasing by 8.3 percent year-on-year.

Building tech platforms

At the beginning of the 21st century, Zhejiang had improved its market economy, but it also had the disadvantage of outdated industrial structure and insufficient science and technology expertise to drive economic development.

To make up for the shortcomings, Zhejiang established major research institutions for technology innovation, and a base for scientific and technological achievement transfer.

For example, Zhejiang Provincial Government and Tsinghua University co-founded the Yangtze Delta Region Institute of Tsinghua University, Zhejiang, which is actively involved in technology innovation and services, training and hi-tech commercialization. To date, the institute has achieved remarkable results, establishing five national-level research platforms, undertaking over 1,500 research projects, and obtaining 834 authorized patents.

Based on social and economic development demands, Zhejiang released favorable policies, attracting a number of leading universities including Peking University, Beihang University and Xidian University to establish institutions. By the end of 2024, Zhejiang had recognized 117 provincial-level new research institutions, becoming a major engine for technology innovation and transfer.

Laying solid foundation

Entering the building of the College of Biomedical Engineering and Instrument Science at Zhejiang University, the first thing that catches the eye is a sign on the wall saying, "Try more interdisciplinary research."

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Shougang Park, the venue of the 2025 China International Fair for Trade in Services (CIFTIS), in Beijing, capital of China. This year's CIFTIS is being held here from September 10 to 14. (PHOTO: XINHUA)

STI Frontier

JUNO to Reveal Nature of Matter and Universe

Edited by WANG Xiaoxia

The Jiangmen Underground Neutrino Observatory (JUNO) in south China successfully filled its 20,000-ton liquid scintillator detector and begun data taking on August 26.

Located 700 meters underground in Kaiping, Jiangmen city in Guangdong province, JUNO is the first of a new generation of ultra-large and ultra-precision neutrino experiments to reach this stage and has set multiple world records in technology. Its operation will help answer fundamental questions about the nature of matter and the universe.

Elaborate planning

Proposed in 2008 and approved in 2013, JUNO went through more than a decade of preparation and construction, tackling numerous challenges in designing and engineering.

Back into 2012, the Daya Bay Reactor Neutrino Experiment in Guangdong

discovered an unexpectedly large neutrino oscillation related to the mixing angle, which brought China's neutrino experimental research from scratch to the forefront of the world.

The more advanced and larger-scale JUNO shoulders a greater mission: to tackle one of this decade's major open questions in particle physics -- the ordering of neutrino masses, and thereby exploring the mysteries of the origin of the universe.

Physical sensitivity analysis specified that the experimental site should be within an area 50 to 55 kilometers away from the nuclear reactor and less than 200 meters wide.

Therefore, JUNO has been located 53 kilometers away from the Taishan and Yangjiang nuclear power plants, which is perfect for detecting the antineutrinos produced by them and measuring their energy spectrum with record precision.

The key to revealing the ordering of

neutrino masses lies in the design and construction of the central detector, according to Heng Yuekun, deputy project manager in charge of JUNO's detector.

From 2013 to 2015, after considering various factors such as the detector's performance, cost, construction feasibility, risk, and lifespan, it was ultimately decided to use acrylic spheres to load the liquid scintillator, pure water as the shielding liquid, and a steel grid structure to support the entire structure.

Challenging experiment

After the detector's design was finalized, construction began, with groups of engineers and workers descending to the canyon 700 meters underground from the spring of 2015.

The JUNO experiment hall is the largest-span underground chamber in China. Its top arch has a span of 49.5 meters, making it a world-class extraordinary underground project.

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CIFTIS Puts Cooperation on Fast Track

By LU Zijian & YU Haoyuan

"It's just started, but I'm very excited. There are people from different countries and there are also a lot of different products," Jay Kerekes, head of operations at Haikou Quanlian International Trading Co., told *Science and Technology Daily (S&T Daily)* on September 10, the first day of the China International Fair for Trade in Services (CIFTIS).

Held in Beijing's Shougang Park, a transformed industrial area, this year's CIFTIS, as always, is a grand international gathering, with more than 80 countries and international organizations exhibiting or holding events.

First-timers and old hands

Dairy products from Australia, woolen clothes from Mongolia, hand-made iron kettles from Japan...numerous eye-catching products were on display in Hall 1. The lively music and singing from the Slovakia booth drew *S&T Daily* reporters' attention.

Kerekes from Slovakia said it was his first time at CIFTIS, calling it a great opportunity to promote his company's products as well as his country, learn the preferences of Chinese consumers, and get their response to the products.

"But most importantly, it's to build a bridge," he said. "Many people don't even know what Slovakia is, so this is a great opportunity to put our country on the map."

It was also the first time for Mandefro Shiferaw, minister counselor of the Ethiopian Embassy in Beijing, though the embassy has attended CIFTIS multiple times.

The main goal this year, he said, was to promote coffee from Ethiopia, the birthplace of the beverage. Today, Ethiopia is renowned for its high quality coffee such as Arabica, and China is the fifth largest importer of Ethiopian coffee.

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WEEKLY REVIEW

World's Longest Cable-stayed Bridge Opens to Traffic

On September 9, the Changtai Yangtze River Bridge — the world's longest cable-stayed bridge — officially opened to traffic. Spanning 10.03 kilometers across the river, the bridge integrates expressway, intercity railway and ordinary highway functions. It reportedly holds six world records, including being the longest span cable-stayed bridge.

Brain-inspired Large Models Issued

Researchers from the Institute of Automation, Chinese Academy of Sciences, released SpikingBrain, a family of brain-inspired models designed for efficient long-context training and inference. The model achieves performance comparable to open-source Transformer baselines while using only about 150B tokens for continual pre-training. The full training and inference process of the model was done on a domestic GPU computing platform.

AI-powered BCI Helps Paralysis Patients Use Devices

Researchers from the University of California, Los Angeles have developed a brain-computer interface (BCI) using AI as a co-pilot to help people with paralysis to complete tasks. The BCI helps infer user intent and complete tasks by moving a robotic arm or a computer cursor. It could pave the way for a variety of assistive technologies that would enable people with limited physical capabilities to handle and move objects more easily and precisely.

First Complete Animal Brain Activity Map Unveiled

A large international collaboration of neuroscientists unveiled the first complete activity map of decision-making in the animal brain. The findings were published in two papers in *Nature*, revealing how decision-making unfolds across the entire brain in mice at the resolution of single cells. This brain-wide activity map challenges the traditional hierarchical view of information processing and demonstrates that decision-making is distributed across multiple regions in a highly coordinated manner.

New Graphic

China, for the 3rd consecutive year, leads with the most clusters (24) among the world's top 100 innovation clusters.

WECHAT ACCOUNT



E-PAPER



By Staff Reporters

In a major step toward reimagining urban life, China has unveiled a comprehensive blueprint for high-quality city development, setting a vision for innovation, sustainability, resilience, and inclusivity.

As urbanization accelerates, policymakers and urban planners are turning to technology and regional collaboration to shape the future of Chinese cities. From the bustling Yangtze River Delta to the innovation hubs of Shenzhen and Wuhan, a new urban paradigm is emerging where technology serves people, heri-

tage is preserved, and cities grow not just bigger, but better.

Powering growth through regional synergy

The future of Chinese cities isn't confined by borders. In the Yangtze River Delta, home to Shanghai, Jiangsu, Zhejiang, and Anhui provinces, cities are no longer operating separately. Instead, they're forming a tightly integrated network where innovation, talent, and services flow seamlessly across regions.

Take Yunxi Quantum Technology, a Hefei-based company that partners with research institutions in Shanghai and en-

terprises in Hangzhou and Lianyungang to turn breakthroughs into real-world applications. This kind of cross-provincial collaboration is now the norm, thanks to platforms like the Yangtze Delta's "One-Stop Online Service," which enables businesses to handle administrative tasks across jurisdictions with ease.

"We're connecting cities and integrating their strengths into a unified engine of growth," said Zeng Gang, director of the Urban Development Research Institute and the Center for Modern Chinese City Studies of East China Normal University.

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