



Science and Technology Daily

VOL.5-NO.184

MARCH 29-30, 2025

2025 ZGC Forum: Advancing Global Sci-tech Cooperation, Innovation

By YU Haoyuan & LU Zijian

The 2025 Zhongguancun (ZGC) Forum Annual Conference, with the theme "New Quality Productive Forces and Global Science and Technology Cooperation," commenced on March 27 and will run until March 31.

During the opening ceremony, Chinese Vice Premier Zhang Guoqing said China is willing to work with other countries to explore new models of mutually beneficial and win-win sci-tech cooperation to drive the development of new quality productive forces amid the deepening new round of sci-tech revolution and industrial transformation.

China has been implementing an innovation-driven development strategy and achieving results in the integration of sci-tech and industrial innovation, while strengthening the momentum of new industrialization and steadily developing new quality productive forces, Zhang added.

A highlight of the opening ceremony was the release of China's Top 10 Scientific Advances in 2024 by the National Natural Science Foundation of China. These achievements are in the fields of mathematics, physics, astronomy, information science, chemistry, materials science, energy, earth and environmental science, as well as life and medical science.

The feats include findings from the Chang'e-6 lunar mission, which cast light on volcanic activity on the far side of the moon 2.8 billion years ago. The progress in allogeneic CAR-T therapy for autoimmune diseases, which marks new frontier in medical science, was another accomplishment.

The forum also presented 10 groundbreaking scientific and technological achievements in 2024. These included EAST's record-breaking 1066-second steady-state high confinement plasma operation and the High Energy Photon Source's successful emission of its first synchrotron radiation light. The achievements were innovations of far-reaching global significance, heralding new era of scientific exploration.

This year's forum has five distinct

segments: meetings, technology trade fairs, achievement announcements, frontier competitions, and supporting events. The discussions are on cutting-edge fields such as AI, embodied AI, digital technologies, quantum technology, biomedicine, 6G, and brain-computer interfaces. Over the course of five days, 128 activities are being held, offering a rich panorama of insights and innovations.

Experts, policymakers, and entrepreneurs from over a hundred countries and regions have congregated to deliberate on the most pressing development issues, aiming to unlock the vast potential for international cooperation in science and technology.

The Open Science International Forum, a parallel session of the forum, was held on March 28 on the theme "Open Sharing for further International Scientific Cooperation."

It focused on key issues in open science, such as the strategies, policies and mechanisms of global open science cooperation. Domestic and international experts discussed promoting global collaboration in fundamental research, technological innovation and academic exchange.

Another key event, the International Forum on Science and Diplomacy, is scheduled for March 31 on the theme "Promoting International Scientific and Technological Cooperation and Building."

The participants will discuss how science and technology can act as a catalyst for cooperation among nations. This will be a high-level platform for constructive dialogue, promoting mutual understanding, and contributing to a more open, inclusive, and collaborative global innovation ecosystem.

The annual ZGC Forum, launched in 2007, covers a wide gamut of topics today. From China's latest breakthroughs in basic research and the intricacies of cross-border data flows, to the innovative applications of green financing and the transformative potential of AI models in industry, the forum has become a crucible of ideas and innovation, and a testament to the infinite possibilities of human creativity.



Zhongguancun International Innovation Center, venue for the 2025 Zhongguancun Forum (ZGC Forum), in Beijing. (PHOTO: LU Zijian/Science and Technology Daily)

Innovation Frontier

Intelligent Solutions Expand Automated Farms

By LIANG Yilian, MA Aiping, LIU Shu & LI Kun

As spring planting season begins, farmers across China are working at full capacity, with technology-driven agriculture leading the way. Intelligent farming solutions are accelerating the expansion of unmanned farms, transforming traditional agriculture with automation.

Boosting efficiency through automation

In Weili county in southern Xinjiang Uygur autonomous region, a 3,000-mu unmanned farm showcases cutting-edge agricultural innovation. Developed by XAG, a smart agriculture technology company, this high-tech demonstration project integrates aerial and ground robots, agricultural Internet of Things (IoT), and an intelligent farm management system.

Unlike traditional farms, the super cotton field is dominated by smart machines that work autonomously. According to Ai Haipeng, the farm's manager, 75 per-

cent of the farm has been automated since 2021, with last year's cotton yield reaching 529 kilograms per mu.

"The unmanned farm relies on IoT, big data, AI, 5G, and robotics to remotely control agricultural equipment, enabling fully automated farming," said Wu Hua-rui, a researcher at the Beijing Academy of Agriculture and Forestry Sciences. The primary goal is to reduce labor dependency, particularly in large-scale farming, where machines have taken over tasks from planting to harvesting.

Over the years, research institutions and enterprises in China has explored unmanned agricultural technologies.

In Taigu district, Jinzhong city, Shanxi province, an unmanned system was used to plant and harvest carrots, significantly increasing productivity.

Traditionally, harvesting a 200-mu carrot field required 20 to 30 workers. In contrast, an unmanned harvesting machine is nearly ten times more efficient than

manual labor.

Challenges in automation

Despite rapid advancements, key challenges remain. The core technologies of unmanned farms revolve around four major processes: plowing, planting, managing, and harvesting.

For example, Wu notes that mechanization rates for transplanting and harvesting vegetables remain below 10 percent. "Current domestic automatic transplanters have a 10-20 percent seedling failure rate, requiring manual replanting," Wu said.

Additionally, the diversity of vegetables and their varying growth environments pose further obstacles. "Most existing Chinese harvesting machines can only handle a single crop," Wu said. These challenges go beyond mechanical reliability and involve systemic issues such as machine-friendly crop breeding and standardized seedling production.

See page 3



Themed "New Quality Productive Forces and Global Science and Technology Cooperation", 2025 ZGC Forum is held in Beijing. (PHOTO: Science and Technology Daily)

BDS Navigates South Africa's Smart Agriculture

International Cooperation

By Staff Reporters

In Limpopo province, South Africa, the use of China's BeiDou Navigation Satellite System (BDS) is transforming traditional farming methods. The introduction of technologies based on the BDS is helping local farmers overcome weather constraints and injecting new impetus into the modernization of South Africa's agriculture.

Upgrading traditional farming

Limpopo province is an important food-producing region in South Africa, and agricultural production has long been limited by low levels of mechanization and a waste of resources due to climate change. How to improve efficiency, reduce costs and cope with extreme weather have been an urgent need for local agricultural development.

To address these issues, in December 2021, the South African National Space Agency (SANSA) and China Satellite Navigation Office (CSNO) signed an MoU for cooperation in satellite navigation. Limpopo province was selected as the first pilot area for digitized agriculture.

In September 2024, the China-Africa Joint Laboratory for BDS and Remote Sensing Applications was officially launched. In October that year, the first data receiving station was installed and operated at the farm of University of Venda (UNIVEN).

Through the deployment of Beidou ground-based augmentation stations, intelligent terminal equipment and technical training, the BDS has brought profound changes to South African farmland.

Smart agriculture

Applying the BDS to crop field management can realize real-time monitoring of crop growth, fertilization and insect pests, and minimize the impact of natural disasters, said Ms Thifheli Gloria Kutama, experimental

farm manager in the faculty of Science Engineering and Agriculture of UNIVEN.

When the navigation system works with intelligent agricultural machinery, it can achieve linear sowing with centimeter-level accuracy according to the preset path, avoiding duplication or omission, and greatly improving the utilization rate of seeds, said Kutama.

Meanwhile, agricultural machinery equipped with soil composition sensors can analyze the nitrogen, phosphorus and potassium content in real time, and apply fertilizer variably on demand to reduce the amount of fertilizer used.

Another important function is smart irrigation and disaster warning. Relying on BDS positioning and remote sensing data, farmland can be divided into multiple grids. As the humidity sensors transmit the data to a cloud platform, farmers can remotely control irrigation equipment via a mobile phone app, which significantly reduces water consumption.

See page 4

WECHAT ACCOUNT



E-PAPER

