



Science and Technology Daily

VOL.5-NO.199

JULY 12-13, 2025

Innovation Gives Traditional Industries New Life

By Staff Reporters

During his inspection tour of Shanxi province in north China this week, President Xi Jinping called on the province to further promote the transformation and development of the resource-based economy and strive to write its own chapter in advancing Chinese modernization.

When inspecting the Yangquan Valve Co., Ltd., Xi was briefed on the province's progress in industrial transformation and upgrade in recent years. He also learned about the production and sales of some valve products at the company's workshop.

He emphasized that traditional manufacturing is an important part of the real economy, and called for efforts to respond to market demand and enhance sci-tech innovation to breathe new life into traditional industries.

This vision is taking shape at Yangquan Valve. Founded in 1924, it has solidified its position as a trailblazer in China's industrial valve sector by embracing cutting-edge technology and green transformation. Valves, called the "gatekeepers" of modern industry, are critical components in fluid control systems, and Yangquan Valve's performance underscores its resurgence. Its revenue in the first quarter of 2025 surged 223 percent year on year, with profits up 163 percent.

Investing in high precision

Many years ago, Yangquan Valve faced challenges, such as aging facilities, outdated equipment, and tightening environmental regulations. "We hit a wall," admitted Yang Yarong, the company chair. The turning point came in 2021 when the company relocated to Yangquan's High-Tech Zone Intelligent Manufacturing Industrial Park, investing over 30 million RMB in digital upgrades.

Today, its workshops have become high-precision: Its CNC milling machines, laser cutters, and welding robots produce valves with micrometer-level accuracy. A 5.7-meter vertical CNC lathe, for instance, can make giant gate valves up to 2.8 meters in diameter. Its 58 valve varieties have filled domestic gaps and 10 achieved global benchmarks.

Its low-pressure, large-diameter gas valves now dominate the domestic market with 60 percent market share, and products like electric flap valves and hard-sealed butterfly valves are exported worldwide. These advancements have propelled Yangquan Valve to "little giant" status, a national designation for specialized, innovative firms.

See page 2



The International Deep Space Exploration Association (IDSEA), an international academic organization dedicated to deep space exploration, is launched on July 7 in Hefei city, Anhui province. Photo shows guests at the exhibition room of the Deep Space Exploration Laboratory, one of the initiators of the IDSEA. (PHOTO: XINHUA)

Chang'e-6 Samples Unlock Secrets of Moon's Farside

By ZHANG Mengran & ZHANG Jiaxin

The Moon's near and far sides exhibit striking asymmetry — from topography and crustal thickness to volcanic activity — yet the origins of these differences long puzzled scientists. China's Chang'e-6 mission, launched on May 3, 2024, changed this by returning 1,935.3 grams of material from the lunar farside's South Pole - Aitken Basin (SPA), the Moon's largest, deepest and oldest known impact structure, measuring 2,500 kilometers in diameter. The samples arrived on Earth on June 25, 2024.

Previous studies indicated that the SPA was formed by a colossal impact approximately 4.25 billion years ago, releasing energy greater than that of a trillion atomic bombs. But the effect of this impact on lunar geology and thermal evolution was one of planetary science's greatest unsolved questions until recently.

In the past year, research teams led by CAS institutions including the Institute of Geology and Geophysics (IGG) and the National Astronomical Observatory (NAOC), along with Nanjing University and others, have made four landmark discoveries based on the SPA samples. Their findings were published in four cover articles in the journal Nature.

According to Prof. WU Fuyuan, a member of the Chinese Academy of Sciences and a researcher at IGG, the profound geological consequences of the impact that formed the SPA are, for the first time, revealed collectively in these four Nature papers.

The cover stories focus on the following areas:

Prolonged Volcanic Activity: Analysis identified two distinct volcanic phases on the lunar farside — 4.2 billion and 2.8 billion years ago — indicating that volcanic activity persisted for at least 1.4

billion years, far longer than previously thought.

Fluctuating Magnetic Field: Measurements of paleomagnetic intensities in basalt clasts revealed a rebound in the Moon's magnetic field 2.8 billion years ago, suggesting that the lunar dynamo, which generates magnetic fields, fluctuated episodically rather than fading steadily.

Asymmetric Water Distribution: The farside mantle was found to have significantly lower water content than the near-side mantle, indicating that volatile elements are unevenly distributed within the lunar interior — adding another aspect to the Moon's asymmetry.

Mantle Depletion Signatures: Geochemical analysis of basalt points to an "ultra-depleted" mantle source, likely resulting from either a primordial depleted mantle or massive melt extraction triggered by large impacts.

See page 2

Innovation Frontier

Xin Hong Zhuan: China's Solution to Intelligent Sailing

By LU Zijian & ZHANG Yun

Xin Hong Zhuan, the world's first intelligent ship that integrates remote control, autonomous sailing and teaching practice recently set sail from Dalian, northeast China's Liaoning province. Jointly developed by China COSCO Shipping Corporation Limited and Dalian Maritime University (DMU), the vessel's intelligent capabilities are world leading.

A decade of tackling barriers

Intelligent sailing technology is key to intelligent vessels. Dalian has a comprehensive ship industrial system and leads the country in terms of enterprise scale, economic aggregate, R&D capacity and new product development. The Dalian Science and Technology Bureau and

Dalian High-tech Industrial Zone began planning the development of intelligent sailing in 2015. Different sectors have been collating their research since then.

The China Academy of Launch Vehicle Technology and DMU teamed up to develop core chips and equipment for maritime communications and navigation, according to Yuan Chi, director of the Dalian Science and Technology Bureau.

Relying on the R&D advantages of DMU, Zhilong (Dalian) Marine Technology Co., Ltd. brought the shore-based "digital head" of Xin Hong Zhuan from lab to industrial application. The COSCO Shipping Heavy Industry (Dalian) Co., Ltd. took the lead in the development of an intelligent sailing system for ships.

A decade of hard work enabled the 4000-nautical-mile voyage of Xin Hong

Zhuan. The vessel's voyage is a highlight of China's smart shipping innovation, Yuan said, emphasizing "It takes 10 years to sharpen a sword."

Hardcore technology facilitates smart sailing

Xin Hong Zhuan is equipped with the country's first domestic smart sailing system for ships based on the ship-end e-sailing structure, according to Wang Jin, division chief for the commercialization of sci-tech achievements at the Dalian Science and Technology Bureau.

Connected with the comprehensive smart shore-based digital operation and control center, also the first of its kind in China, the system can coordinate the multi-domain work of underwater robots and smart vessels, Wang said.

See page 4

BRICS Summit Strengthens Sci-tech Collaboration

International Cooperation

By Staff Reporters

The 17th BRICS Summit was held in Rio de Janeiro from July 6 to 7, for the first time in its expanded format, focusing on Global South cooperation and partnerships for social, economic and environmental development. Science and technology-related topics like AI, climate change and health care are among the expanded BRICS' key aspects for further cooperation.

The BRICS leaders issued a joint declaration, titled "Strengthening Global South Cooperation for More Inclusive and Sustainable Governance," reaffirming that the ultimate purpose of the bloc's cooperation in science, technology and innovation is to forge new productive forces for the development of member countries and advance sustainable development in its three dimensions. This will be done through a partnership rooted in collaboration, contributing to strengthening friendship, mutual understanding and peaceful relations among BRICS nations.

AI represents a milestone opportunity to boost development for a better future, but the risks relating to misappropriation and misrepresentation of knowledge, heritage, and cultural values are insufficiently represented in the data sets and AI models.

The leaders recognized the two sides of AI and underscored that global governance of AI should mitigate potential risks and address the needs of all countries. A collective global effort is needed to establish an AI governance that upholds shared values, addresses risks, builds trust, and ensures broad and inclusive international collaboration and access, in accordance with sovereign laws, including capacity building for developing countries, with the United Nations at its core.

See page 3

WEEKLY REVIEW

Chinese Scientists Develop Non-invasive Blood Sodium Tracker

A Chinese research team has developed a novel system to enable non-invasive and dynamic monitoring of blood sodium levels, which addresses critical needs in managing dehydration, kidney diseases and neuroendocrine disorders. The findings of the study, conducted by Tianjin University, were recently published in the journal *Optica*.

China-led Int'l Standard for Autonomous Driving Test Scenarios Released

An international standard on test scenarios for autonomous driving systems has been officially released, the Ministry of Industry and Information Technology of China said on July 7. The standard, led by China during its formulation, outlines the evaluation procedures and test methods.

New AI Model Improves Cardiac Risk Predictions

Researchers at Johns Hopkins University have developed a new AI model that significantly outperforms current clinical guidelines in identifying patients at high risk of sudden cardiac death, according to a study recently published in the journal *Nature Cardiovascular Research*. The AI system integrates cardiac MRI images with a wide range of patient health records to detect hidden warning signs, offering a new level of precision in cardiovascular risk prediction.

New Framework for Deep-sea Mining Impact Assessment Set

An Australian study has set a new global benchmark for assessing the environmental risks of deep-sea mining. The study provides science-based tools to help decision-makers evaluate the potential impacts and viability of extracting critical minerals from the ocean floor, according to a statement by the Commonwealth Scientific and Industrial Research Organization, Australia's national science agency which led the research.

New Graphic

In the first five months of 2025,

the total value of tax and fee reductions and tax refunds,

which were geared toward supporting technological innovation and the development of advanced manufacturing reached

636.1 billion RMB



Source: China's State Taxation Administration
Designed by YAO Yiu / Science and Technology Daily

WECHAT ACCOUNT



E-PAPER

