

SPECIAL | Eyes on Academic Publishing in AI Era

At a time when artificial intelligence (AI) is permeating many aspects of human life, academic publishing is faced with new challenges: How should academic journals safeguard scholarly quality and research integrity against AI misuse? How should we improve efficiency with the aid of AI? How should we fight academic misconduct? How should the academic evaluation system be reformed to address the emerging challenges? As part of the celebration for its 70th founding anniversary, the Academic Divisions of the Chinese Academy of Sciences invited representatives from different fronts of the industry, including international



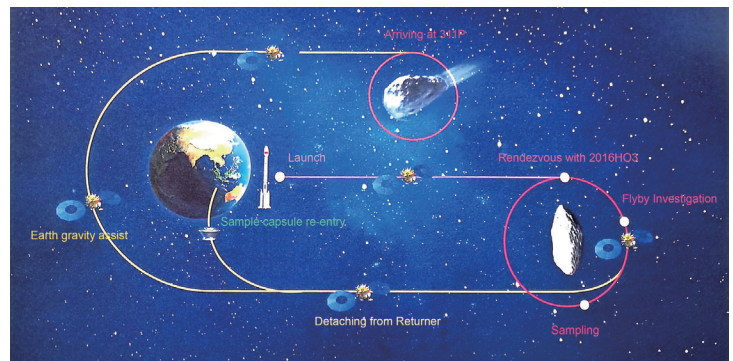
(Photo: Science China Press)

publishers, trade associations, high-level journals, and the research community, to share their best thoughts and practices. For detail, please turn to page 70.

IN FOCUS | China's New Mission to Explore Asteroid and Comet

On May 29, *Tianwen-2*, the second mission of China's Planetary Exploration Program, was launched to retrieve samples from an asteroid and investigate a comet in the main asteroid belt of our solar system. The probe is expected to return a "drop-box" of samples from the asteroid 2016HO3 by the end of 2027, and then head to the comet 311P for a flyby investigation. It will take it several more years to arrive at the comet.

The mission might help scientists pursue a series of open questions, including the origin of the Moon and the early evolution of the solar system. It might also inspire



(Image: CNSA)

China's later attempt to retrieve samples from Mars. For more, please see page 87.

IN FOCUS | Sino-French Satellite Delivered to Users with Bumper Harvest from Commissioning Observation



(Image: microsat, CAS)

To observe and explore gamma-ray bursts (GRBs), fierce cosmic explosions that unleash an unimageable amount of high-energy radiation in just milliseconds, a powerful instrument has been built joining forces from China and France. Launched last June, this satellite, the Space-based multi-band Variable Objects Monitor (SVOM), demonstrated excellent performance in its in-orbit calibration and commissioning phase. Now it was officially delivered to science users, with a bumper harvest from its commissioning observation — a total of over 100 GRBs detected, with some special ones deserving further explorations.

For detail, please turn to page 90.

IN FOCUS | Quantum Mechanics at Your Fingertips

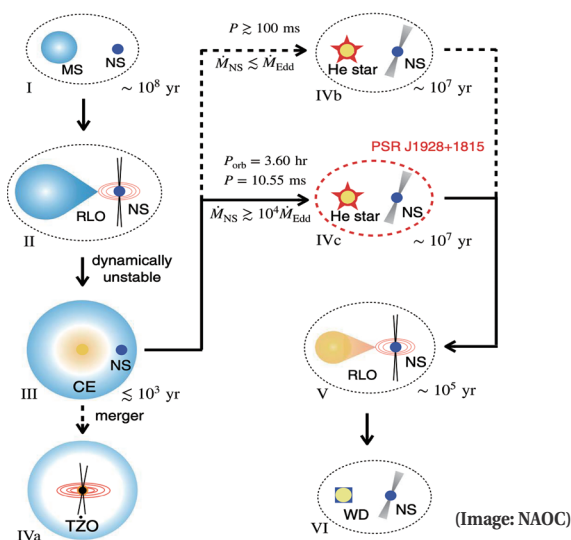
Since its founding a century ago, quantum mechanics has greatly changed human life. The advancement of many technologies nowadays, including semiconductors, laser, superconductivity, and magnetic resonance imaging, has benefited a lot from the science revolution inspired by this enigmatic discipline. To communicate knowledge of quantum mechanics to the public, an exhibition has unveiled in celebration of the UN International Year of Quantum Science and Technology. Sponsored by the University of Science and Technology of China of the Chinese Academy of Sciences, it provides visitors with opportunities to feel and experience the magic.

Read more on page 93.



(Image: USTC)

HIGHLIGHTS | Rare Binary Pulsar Offering Insights into Stellar Evolution and Accretion Physics



Using FAST, the Five-hundred-meter Aperture Spherical radio Telescope of China, a team led by Prof. HAN Jinlin from the National Astronomical Observatories, Chinese Academy of Sciences (NAOC) detected an unusual millisecond pulsar that bursts out radio beams intermittently. Based on their observations lasting for 4.5 years, the team eventually made clear that the pulsar is eclipsed by its companion, a helium star. This discovery hence unveiled an ephemeral scenario in stellar binary evolution, pertaining to some long-pursued open questions in astrophysics and cosmology.

For detail, please turn to page 99.

HIGHLIGHTS | Saving Our Citrus

Citrus lovers and growers, rejoice! A recent study reveals a potent weapon against Huanglongbing (HLB)—aka citrus greening—the devastating bacterial disease that has destroyed orchards worldwide, causing \$10 billion in annual

Huanglongbing (HLB), also known as citrus greening, is a deadly bacterial disease spread via Asian citrus psyllid insects and causes \$10 billion in annual crop losses by killing trees within years of infection. Scientists have discovered natural plant defenses against HLB and engineered therapeutic peptides showing potential to rescue infected trees. (Photo by WANG Xuefeng)



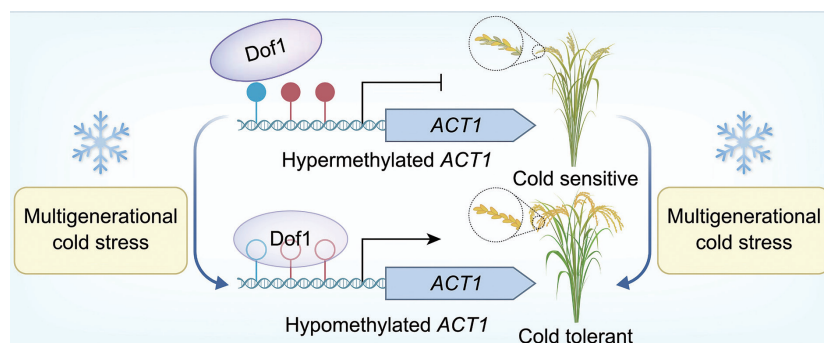
losses. Published in *Science* (April 11, 2025) by Dr. YE Jian's team from the Institute of Microbiology, Chinese Academy of Sciences, the research exposes a molecular betrayal within infected trees. Leveraging this insight, the team used AI to engineer a thera-

peutic peptide, APP3-14. The infected trees treated with APP3-14 regrew healthy leaves and saw bacterial levels plummet—often to zero—offering a potential cure.

For further insights, please refer to page 103.

HIGHLIGHTS | Passing Down “Learned” Cold Tolerance in Rice

A breakthrough study from the Chinese Academy of Sciences has challenged conventional evolutionary wisdom by demonstrating that rice plants can acquire cold tolerance within just three generations and transmit this survival trait to their offspring—not through genetic mutations, but through molecular “memory marks” that remember environmental stress. Published in *Cell* on May 22, 2025, this research led by CAS Member Prof. CAO Xiaofeng and Dr. SONG Xianwei from the Institute of Genetics

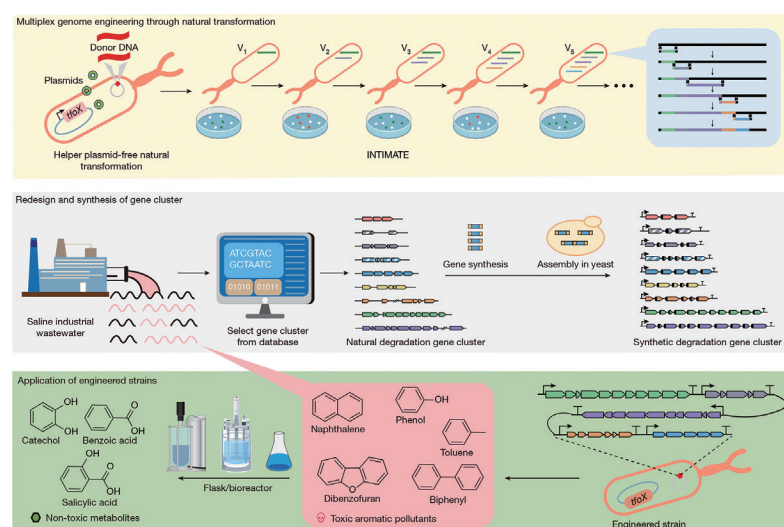


Cold exposure over generations removes epigenetic “off switches” from the rice gene *ACT1*, yielding heritable cold tolerance. (Graphic: IGDB)

and Developmental Biology (IGDB) represents the first clear evidence of inheritable acquired characteristics in a major crop species.

For further detail, please turn to page 107.

HIGHLIGHTS | Engineered Microbes Can Remediate Five Pollutants at Once

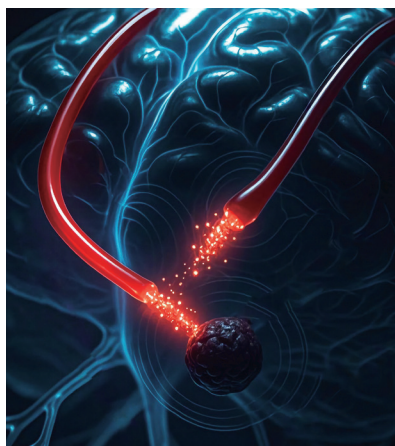


Schematic of the development of bacterial strain *Vibrio natriegens* VCOD-15, which can remediate five organic pollutants. (Graphic: Su, *et al.*, 2025)

Scientists have engineered a marine bacterium capable of simultaneously remediating five hazardous organic pollutants—toluene, phenol, naphthalene, biphenyl, and dibenzofuran—marking a breakthrough in synthetic biology. The engineered *Vibrio natriegens* strain, dubbed VCOD-15, integrates five distinct pollutant-degrading gene clusters to create a biological “super-cleaner” for contaminated industrial wastewater and saline soils. Published in *Nature* on May 7, 2025, this research demonstrates remarkable efficiency in both laboratory and real-world conditions, offering new hope for tackling complex environmental contamination.

For further insights, please turn to page 111.

HIGHLIGHTS | Blood, Magnets, and the Battle Against Brain Tumors



As appeared in *Nature Biomedical Engineering* (May 1, 2025), researchers from the CAS Shenzhen Institutes of Advanced Technology (SIAT), Shenzhen University and The Chinese University of Hong Kong unveiled biodegradable blood hydrogel fibers (BBHFs) that combine a patient's own blood with magnetic nanoparticles to treat brain tumors. Guided by external magnets and tracked via X-ray, these soft, worm-like fibers navigate cerebrospinal fluid to release drugs on demand. This innovation sidesteps invasive surgery and systemic chemo side effects, offering hope for hard-to-reach cancers.

For further insights, please refer to page 114.

Biodegradable fibers, made from magnetic particles and the patient's own blood, offer a new way to fight brain tumors. (Graphic: AI generated)

PERSPECTIVE | Unveiling the Secrets of Life

Resulting from its 96-year explorations, the Institute of Zoology (IOZ), Chinese Academy of Sciences has achieved a series of world-leading scientific and technological achievements, deepening our understanding of issues ranging from microscopic regulation of fundamental life activities to animal taxonomy and evolution. The illustration, a viable mouse created from induced pluripotent stem cells, represents a milestone of their long journey.

For a review of IOZ's trajectory, turn to page 117.



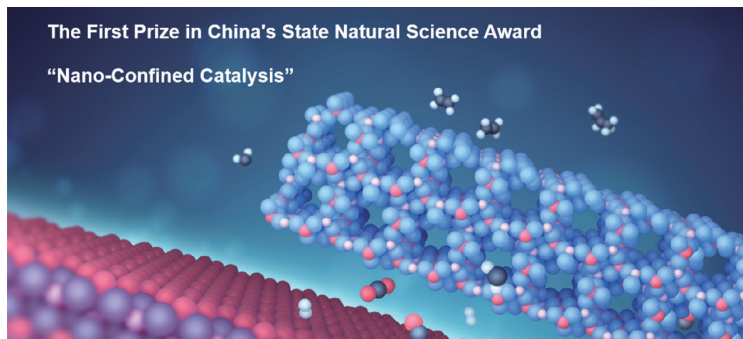
(Image: IOZ)

PERSPECTIVE | Innovating for a Greener Tomorrow

For over 70 years, the Dalian Institute of Chemical Physics (DICP), Chinese Academy of Sciences, has spearheaded energy innovation. Today, they're tackling global sustainability challenges with

cutting-edge solutions, including innovating methanol-to-olefins technology to reduce fossil fuel reliance, converting CO₂ into valuable chemicals to curb emissions, and advancing vanadium redox flow batteries for stable renewable energy storage. Its secret lies in a unique fusion of basic research, applied science, and engineering—turbocharging commercialization to support China's carbon neutrality goals. This multidisciplinary engine isn't just transforming energy security; it's accelerating global clean energy progress.

For a closer look at how science turns ambition into action, turn to page 127.



Schematic diagram of OXZEO catalyst, designed around the concept of nano-confined catalysis. (Graphic: DICP)