中国科学技术协会
China Association for Science and Technology

No.63
December 2025

CAST Newsletter

Tengchong Scientists Forum 2025 opens in Yunnan

Headlines

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Opening ceremony of the Tengchong Scientists Forum 2025

On December 6, the Tengchong Scientists Forum 2025, co-hosted by the Yunnan provincial government and CAST, opened in Tengchong, Yunnan Province. Continuing its vision of "Guiding the Future with Technology," this year's forum is themed "Science: AI Changing the World." The program features a main forum, ten parallel sessions, and more than a dozen supporting activities.

At the opening ceremony, the 2025 Tengchong Science Award was presented, and the winners of the inaugural Tengchong Outstanding Young Scientist Award were announced. The forum also released the Top Ten Forum Achievement Transformation Cases, Top Ten Academic Achievements, Top Ten Science and Technology Cooperation Programs, and the report *Tech Predictions and Future Visions 2049*. In addition, the Yunnan provincial government signed cooperation agreements with seven universities and finalized agreements for thirteen investment projects.

The forum brought together an exceptional lineup of global scientists, including Nobel Prize-winning physicist Konstantin Novoselov, Fields Medalist Efim Zelmanov, and Turing Award laureate Andrew Chi-Chih Yao, along with 133 academy members from China and abroad, 77 university presidents, more than 400 experts and scholars, and over 600 entrepreneurs and financial leaders. Discussions focused on artificial intelligence, life sciences and public health, biodiversity and modern agriculture, innovation in health tourism and medical care, and scientific and cultural exchange in the Lancang-Mekong region, aiming to advance scientific cooperation and foster innovation-driven development.

2025 Lancang-Mekong Engineers Forum explores pathways to regional sustainable development

From December 7 to 8, the 2025 Lancang-Mekong Engineers Forum was held in Kunming, Yunnan Province. As part of the Tengchong Scientists Forum's Lancang-Mekong Regional Science and Cultural Exchange Series, the forum was organized by the Chinese Society of Engineers (CSE) under the theme "Green Engineering and Sustainable Development in the Lancang-Mekong Region." Seven engineering specialists from China and abroad delivered keynote addresses, including Li Wenchang, head of the National Outstanding Engineering Team, and Jeffrey Chiang Choong Luin, President of the Institution of Engineers Malaysia. Discussions focused on cutting-edge technologies and real-world engineering applications. Participants also took part in workshops and site visits to energy and power enterprises.

The forum also marked a significant milestone in mutual professional qualification recognition between China and Myanmar. In 2025, ten Chinese engineers obtained licensed professional registration in Myanmar, while five Myanmar engineers were admitted as senior members of CSE. Certificates were formally presented to the newly recognized engineers at the forum's opening ceremony.

(Source: Official WeChat account of the China Center for International Science and Technology Exchange)

Africa Engineering Capacity-Building Program endorsed by UN International Decade of Sciences for Sustainable Development

The Africa Engineering Capacity-Building Program, jointly initiated by CAST and the World Federation of Engineering Organizations (WFEO), has recently been officially endorsed by the United Nations International Decade of Sciences for Sustainable Development (2024-2033).

As a flagship global initiative to advance engineering capacity, the program aligns with worldwide trends toward intelligent and green transformation and is strategically designed around the pivotal role of engineering science and technology in sustainable development. It places particular emphasis on deploying emerging engineering approaches, such as artificial intelligence and digital technologies, in key sectors including energy, agriculture, water resources, and infrastructure. Through an integrated "digitalization plus engineering" framework, the program

aims to strengthen engineering education in Africa, expand continuing professional development training, and promote engineering-based solutions for sustainable development. Over the next decade, it seeks to train 100,000 African engineers, enabling engineering science and technology to serve as a strong driving force in achieving the UN 2030 Sustainable Development Goals (SDGs).

The International Decade of Sciences for Sustainable Development was proclaimed by the UN General Assembly in August 2023 and is being implemented under the leadership of UNESCO. Its goal is to accelerate global sustainable development through deeper integration of scientific knowledge systems and enhanced innovation-driven collaboration. The inclusion of the Africa Engineering Capacity-Building Program reflects international recognition of the foundational role of engineering in sustainable development and opens new avenues for strengthening global engineering governance and advancing international cooperation.

(Source: Official website of CAST)

Commemorative events honoring ancient mathematician Liu Hui held in Azerbaijan

A series of commemorative events marking the anniversary of the birth of ancient Chinese mathematician Liu Hui, titled "The Harmony of Millennia in Mathematics: Dialogue with the Universe," was recently held in Baku, the capital of Azerbaijan. The events were co-hosted by CAST and the Azerbaijan National Academy of Sciences (ANAS).

Held under the theme "Mathematical Exchange along the Silk Road," the program featured thematic exhibitions and lectures, fostering scientific and cultural exchange between China and Azerbaijan. In his opening remarks, Isa Habibbayli, President of ANAS, reaffirmed Azerbaijan's strong support for and active participation in the Belt and Road Initiative, highlighting the country's role as a bridge between Europe and Asia. He noted that commemorating Liu Hui pays tribute to a great scientific pioneer and helps inspire today's researchers to continue exploring the frontiers of knowledge. Amid the rapid development of artificial intelligence and digital technologies, he expressed hope that the event would create new opportunities for cooperation with China and further strengthen bilateral scientific and cultural exchange.

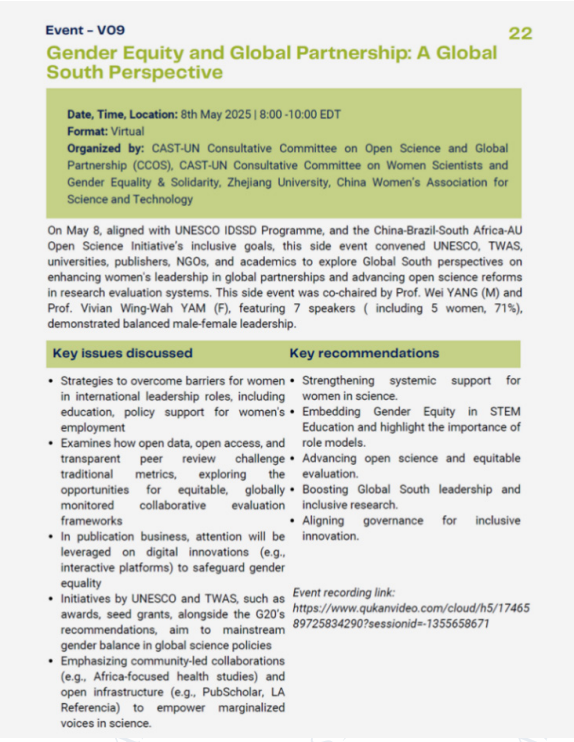
Liu Hui, a mathematician of the Wei-Jin period (roughly 220-420 CE), was a principal found-

er of classical Chinese mathematical theory and holds a prominent place in the history of world mathematics. His works, including *Commentary on The Nine Chapters on the Mathematical Art* and *The Island Mathematical Manual*, exerted a lasting influence on generations of mathematicians. In November 2023, the 42nd session of the UNESCO General Conference approved the commemorative program proposed by CAST and designated 2024-2025 as the 1800th anniversary of Liu Hui's birth.

(Source: Official WeChat account of the China Center for International Science and Technology Exchange)

Gender Equity and Global Partnerships: A Global South Perspective included in UN Compilation of 10th STI Forum Side Event Reports

The United Nations Department of Economic and Social Affairs (UNDESA) has recently released the *Compilation of the Side Event Reports of the 10th Multi-stakeholder Forum on Science, Technology and Innovation for the Sustainable Development Goals* (STI Forum), which brings together summary reports from 54 side events worldwide. Among them is the report from the side event titled "*Gender Equity and Global Partnerships: A Global South Perspective*," jointly organized by the CAST-UN Consultative Committee on Open Science and Global Partnerships (CCOS), the CAST-UN Consultative Committee on Women Scientists and Gender Equity & Solidarity, Zhejiang University,



Event – VO9 22

Gender Equity and Global Partnership: A Global South Perspective

Date, Time, Location: 8th May 2025 | 8:00 -10:00 EDT
Format: Virtual
Organized by: CAST-UN Consultative Committee on Open Science and Global Partnership (CCOS), CAST-UN Consultative Committee on Women Scientists and Gender Equality & Solidarity, Zhejiang University, China Women's Association for Science and Technology

On May 8, aligned with UNESCO IDSSD Programme, and the China-Brazil-South Africa-AU Open Science Initiative's inclusive goals, this side event convened UNESCO, TWAS, universities, publishers, NGOs, and academics to explore Global South perspectives on enhancing women's leadership in global partnerships and advancing open science reforms in research evaluation systems. This side event was co-chaired by Prof. Wei YANG (M) and Prof. Vivian Wing-Wah YAM (F), featuring 7 speakers (including 5 women, 71%), demonstrated balanced male-female leadership.

Key issues discussed

- Strategies to overcome barriers for women in international leadership roles, including education, policy support for women's employment
- Examines how open data, open access, and transparent peer review challenge traditional metrics, exploring the opportunities for equitable, globally monitored collaborative evaluation frameworks
- In publication business, attention will be leveraged on digital innovations (e.g., interactive platforms) to safeguard gender equality
- Initiatives by UNESCO and TWAS, such as awards, seed grants, alongside the G20's recommendations, aim to mainstream gender balance in global science policies
- Emphasizing community-led collaborations (e.g., Africa-focused health studies) and open infrastructure (e.g., PubScholar, LA Referencia) to empower marginalized voices in science.

Key recommendations

- Strengthening systemic support for women in science.
- Embedding Gender Equity in STEM Education and highlight the importance of role models.
- Advancing open science and equitable evaluation.
- Boosting Global South leadership and inclusive research.
- Aligning governance for inclusive innovation.

Event recording link:
https://www.qukanvideo.com/cloud/h5/17465897258342902?sessionid=-1355658671

Side event report *Gender Equity and Global Partnerships: A Global South Perspective*

and the China Women's Association for Science and Technology.

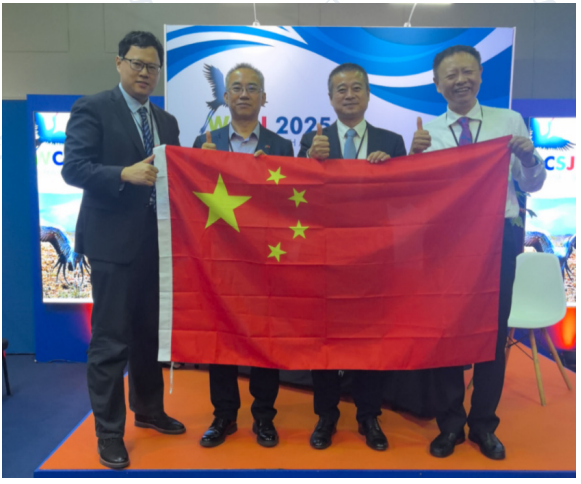
The STI Forum is a core component of the Technology Facilitation Mechanism under the 2030 Agenda for Sustainable Development. This year's forum focused on "Advancing sustainable, inclusive, and evidence-based, science and technology solutions and innovations for the 2030 Agenda and its SDGs for leaving no one behind." Within this framework, the side event was held on May 8, 2025, with discussions centered on pathways to gender equity and international cooperation from a Global South perspective.

Grounded in SDG 5 (Gender Equality), SDG 8 (Decent Work and Economic Growth), and SDG 17 (Partnerships for the Goals), the side event explored ways to strengthen women's leadership in global partnerships, advance open science-oriented reforms in research evaluation systems, and build a more equitable and inclusive global research governance framework. The discussions produced a set of action-oriented recommendations to support progress toward the SDGs, including strengthening systemic support for women in science, embedding gender equity in STEM education and highlighting the role of role models, advancing open science and equitable evaluation, boosting Global South leadership and inclusive research, and aligning governance innovation.

(Source: Official WeChat account of the China Center for International Science and Technology Exchange)

Academic Exchange

CSSTJ wins bid to host World Conference of Science Journalists in 2029



CSSTJ secures hosting rights for WCSJ 2029

The Chinese Society for Science and Technology Journalism (CSSTJ) has won the bid to host the World Conference of Science Journalists (WCSJ) in 2029, marking the first time the global event will be held in China. The decision was announced at the 13th World Conference of Science Journalists, held from December 1 to 4, 2025, in Pretoria, South Africa, where CSSTJ formally presented its proposal to the World Federation of Science Journalists (WFSJ). Following a vote by the WFSJ Board, CSSTJ was awarded the hosting rights.

Held under the patronage of UNESCO and organized by WFSJ, the World Conference of Science Journalists is the world's leading forum for science journalism. It addresses global issues shaping the future of the profession and emerging industry trends, while providing a platform to share influential science reporting and best practices, supporting the professional development of science journalists worldwide. CSSTJ is a founding member of WFSJ.

(Source: Official website of CAST)

International Awards

Chinese Scientist Gao Fu wins UNESCO-Equatorial Guinea International Prize for Research in Life Sciences

Gao Fu in the laboratory

Chinese scientist Gao Fu, a member of the Chinese Academy of Sciences and a professor at the Institute of Microbiology of the Chinese Academy of Sciences (IMCAS), has recently been awarded the 9th UNESCO-Equatorial Guinea International Prize for Research in the Life Sciences. Established in 2008 by the UNESCO Executive Board and funded by the Government of the Republic of Equatorial Guinea, the prize is a prestigious international honor recognizing scientists worldwide for groundbreaking

contributions to the life sciences and for advancing human health and quality of life.

The awards ceremony was held on November 25, 2025, in Equatorial Guinea. Professor Gao was honored alongside Saudi Arabian physician Abderrezak Bouchama and Cameroonian malaria expert Rose Gana Fomba Leke for their outstanding contributions in areas including heatstroke, malaria, emerging infectious diseases, and public health.

In his remarks at the ceremony, Professor Gao noted that the award recognizes not only his own research, but also the collective efforts of the global scientific community to safeguard human and animal health and maintain ecological balance. He called for an international research cooperation framework centered on collaboration, healthy competition, communication, and coordination, urging scientists worldwide to work together to address future public health challenges.

(Source: Official WeChat account of IMCAS)

Han Fang reelected Secretary of World Sleep Society

Photo of Han Fang

Recently, at the World Sleep Congress organized by the World Sleep Society (WSS), Professor Han Fang of Peking University People's Hospital and the IDG–McGovern Institute for Brain Research was reelected WSS Secretary, becoming the first Chinese scientist to serve two terms in this position.

Professor Han has long served as President of the Asian Society of Sleep Medicine, where he has actively promoted regional research collaboration and the joint development of clinical guidelines, enabling China's experience in sleep medicine to gain wide recognition across Asia. As a co-chair of the annual themes for World Sleep Day (March 21), he has consistently brought China's clinical priorities into the global agenda, helping introduce Chinese concepts and approaches in sleep medicine to the international community.

Sleep disorders have emerged as a major global public health challenge. Professor Han's reappointment is expected to further integrate China's clinical achievements and research expertise into global sleep health governance, contributing Chinese solutions to the improvement of sleep health worldwide.

(Source: Official WeChat account of IMCAS)

Scientist Profile

Dai Lei: Tracking changing "winds" of space

Dai Lei is a research fellow and doctoral supervisor at the National Space Science Center (NSSC) of the Chinese Academy of Sciences (CAS). He earned his bachelor's degree in space physics from the University of Science and Technology of China in 2004 and received his PhD in physics from the University of Minnesota in 2009. His research focuses on space physics, where he has developed analytical solutions describing the micro-scale electromagnetic field structures of magnetic reconnection regions and identified a new mechanism driving global convection in Earth's magnetosphere. He currently serves as chief scientist of the Science Application System for the China-Europe SMILE satellite mission and lead scientist for the Light Ion Analyzer (LIA) aboard SMILE. He has also proposed the self-Adaptive Magnetic reconnection Explorer (AME) mission to enable cross-scale *in situ* measurements of magnetospheric dynamics.

Photo of Dai Lei

When asked to describe himself in a single word, Dai responds without hesitation: "steadfast." He explains that the character "Lei" in his name is composed of three stones stacked firmly together—a fitting reflection of his character. Once he sets a direction, he pursues it with unwavering focus. Over more than two decades, he has advanced step by step across the vast frontier of space physics, steadily carving out his own path of discovery among the stars.

Uncovering new patterns of magnetospheric convection

In 2015, Dai Lei joined NSSC, where he has focused on the dynamic evolution of Earth's magnetosphere. In 2022, his team launched a research program on the large-scale evolution of magnetospheric convection. As Dai explains, "The evolution of magnetospheric convection directly affects how efficiently solar wind energy is transferred into near-Earth space and is key to understanding space weather events such as magnetic storms and substorms."

At an early stage of the study, the team identified a clear mismatch between observational data and classical models of magnetospheric convection. Conventional theory holds that solar wind disturbances drive convection from the nightside magnetosphere, causing nightside convection to appear first. However, Dai's team observed that dayside convection began 10 to 20 minutes earlier than its nightside counterpart. When the findings were submitted for publication, reviewers questioned data that contradicted established theory. After repeated verification confirmed the observations, Dai began to reconsider the validity of the classical model itself.

To test this new hypothesis, the team conducted an in-depth analysis of extensive datasets. Dai first proposed a preliminary phenomenological model, then led systematic cross-validation between numerical simulations and observational evidence. The results revealed a previously unrecognized evolutionary pattern: following the interaction between the solar wind and the magnetosphere, convection first emerges on the dayside and then gradually expands toward the nightside.

In early 2024, the findings were published in *Nature Communications*, providing a more robust scientific basis for forecasting space weather events such as magnetic storms and substorms.

Driving breakthroughs in space physics through satellite systems

Dai Lei is currently leading the development of the Science Application System for the Solar Wind Magnetosphere Ionosphere Link Explorer (SMILE) satellite mission. Often described as the satellite's "brain," the system is responsible for three core functions: scientific data processing, mission operation planning, and preparatory scientific research. Its performance is essential to fully unlocking the mission's scientific potential.

For Dai and his team, the transition from purely fundamental research to a field that closely integrates with complex engineering has posed a significant new challenge. Their previous work focused primarily on localized physical processes, whereas the SMILE mission emphasizes observations of large-scale magnetospheric evolution—requiring a fundamental shift in research perspective and methodology.

The Science Application System has now successfully passed both software and hardware pre-acceptance reviews, with system integration and joint testing completed on the first attempt. It is fully prepared for

mission operations. "We're ready—now we're waiting for the satellite launch in 2026," Dai said.

Reflecting on the broader development of space physics research in China, Dai spoke candidly: "China still lacks enough landmark achievements in this field. We need to push harder and deliver more truly groundbreaking scientific results."

(Source: Science and Technology Daily)

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