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CAST Newsletter

**WCSL 2024 held to enhance science literacy
and empower joint development**



Headlines

WCSL 2024 held to enhance science literacy and empower joint development / 01

Tengchong Scientists Forum 2024 focuses on scientific frontiers and high-quality joint development / 02

International Association for Green Aviation launched to drive low-carbon transition / 03

Portrait exhibition of Sino-French female researchers debuts in Beijing / 04

Chinese Nursing Association delegation attends 22nd Asia Workforce Forum in Malaysia / 05

Tengchong Science Award 2024 honors scientists in quantum physics and biophysical chemistry / 06

Chinese scientist Wang Shuangjie's journey in permafrost engineering / 07

Headlines

WCSL 2024 held to enhance science literacy and empower joint development



Opening ceremony of WCSL 2024
Photo credit: Official WeChat account of VOC

From December 5 to 6, the 2024 World Conference on Science Literacy (WCSL 2024), hosted by CAST, was held in Beijing. Under the theme “Enhancing Science Literacy, Empowering Joint Development,” the conference focused on global priorities such as the United Nations’ resolution *International Decade of Sciences for Sustainable Development, 2024-2033*. It brought experts from around the world together to explore strategies for advancing public science literacy, promoting social sustainability, and strengthening international scientific and cultural exchange.

In his opening address, CAST President Wan Gang outlined 3 key initiatives: fostering a shared understanding to cultivate momentum for global development, promoting mutual learning to tackle development challenges, and advancing collaborative actions toward sustainable development. He emphasized the importance of upholding principles of equality, mutual learning, dialogue and fostering openness,

trust, and cooperation. Wan also highlighted the potential of platforms like WCSL and the forthcoming World Organization for Science Literacy (WOSL) to deepen international cooperation on science literacy and contribute to building a global community of shared future.

Mustapha Shehu, President of the World Federation of Engineering Organizations (WFEO), stressed that shared development is not only a strategic necessity but also a moral responsibility that benefits everyone.

Ana Cristina Amoroso das Neves, Vice Chair of the United Nations Commission on Science and Technology for Development (UNCSTD) highlighted the transformative potential of artificial intelligence (AI) in enabling personalized learning experiences. By tailoring content to individual knowledge gaps and learning styles, AI

can play a critical role in advancing science literacy.

Ezra Clark, Special Representative of the UNESCO Assistant Director-General for Natural Sciences, added that improving science literacy enhances public understanding, ensuring the effective implementation and adoption of scientific and technological advancements.

Since its inception in 2018, WCSL has served as a driving force in fostering international collaboration on public science literacy. CAST has also led efforts to establish WOSL, now supported by 45 member and observer organizations in its preparatory committee. This year's conference reinforced WCSL's role as a catalyst for WOSL's growth and expanded membership.

(Sources: Official website of CAST and official WeChat account of VOC)

Tengchong Scientists Forum 2024 focuses on scientific frontiers and high-quality joint development



Opening ceremony of TSF 2024

Photo credit: Official WeChat account of VOC

From December 6 to 8, the 2024 Tengchong Scientists Forum (TSF 2024) took place in Tengchong, Yunnan Province. Co-hosted by CAST and the Yunnan Provincial Government, the forum was themed “Science, Global Innovation, and the Mission of Scientists—Empowering High-Quality Development.” It brought leading scientists, entrepreneurs, and financial sector representatives from across the globe together to discuss technological innovation, higher education, sustainable corporate development, and cutting-edge scientific advancements.

Luo Hui, member of the Party Leadership Group of CAST and Director General of CAST's Department of International Affairs, highlighted several guiding principles of the forum, including fostering innovation to drive regional development, building trust and openness within the scientific community, prioritizing human well-being through engineering and technology, and supporting young scientists to develop a forward-looking vision. Luo emphasized the forum's goal of creating an open hub for global

innovation resources and establishing a new model of collaboration in the Lancang-Mekong region.

Experts at the forum underscored the pivotal role of innovation as the primary driver of development. TSF serves not only as a bridge for dialogue among scientists, educators, and entrepreneurs but also as a platform that integrates science, technology, and real-world applications.

As part of TSF 2024, the Lancang-Mekong Region Science and Technology Cultural Exchange Series was held from December 5 to 8. The series featured three major events: the Lancang-Mekong Traditional Medicine Academic Exchange Conference, the Lancang-Mekong Young Scientists Forum, and the Lancang-Mekong Engineers Forum, attracting active participation from experts, young scientists, and representatives of key institutions.

During the series, four landmark achievements in Lancang-Mekong cooperation were announced:

1. The launch of an initiative to develop international standards for traditional medicine in the Lancang-Mekong region, marking a significant step toward standardization and regulation in the field.

2. A showcase of key outcomes from the 2024 Lancang-Mekong Traditional Medicine Exchange and Cooperation program, highlighting achievements in knowledge sharing and collaboration.

3. An announcement by the Chinese Society of Engineers (CSE) to open its sustainable capacity-building resources to engineering organizations in the Lancang-Mekong region. Moreover, CSE and the Myanmar Engineering Council (MEC) jointly recognized a new group of

engineers, promoting cross-border mobility of talent and advancing professional standards.

4. A proposal to establish a collaborative network for young scientists in the Lancang-Mekong and Southeast Asian regions, aimed at fostering exchange, cooperation, and innovation.

(Source: Official WeChat account of VOC)

Academic Exchange

International Association for Green Aviation launched to drive low-carbon transition

On November 13, 2024, during the 15th China International Aviation & Aerospace Exhibition (Airshow China), the Chinese Society of Aeronautics and Astronautics (CSAA) hosted a launch ceremony for the International Association for

Green Aviation (IAGA), marking a significant step toward advancing sustainability in the aviation sector.

At the event, CSAA announced that IAGA would initially establish six specialized branches: the International Hydrogen Propulsion Committee, the International Sustainable Aviation Fuel (SAF) Committee, the International Airworthiness Committee, the International Electric Aviation Committee, the International Sustainable Composite Materials Committee, and a special task force for the Global Student Case Study Competition. The secretariat of IAGA will be located in Xi'an, Shaanxi Province.

Speaking at the ceremony, Yao Junchen, Vice President of CSAA, highlighted the global aviation industry's goal of achieving net-zero emissions by 2050. He emphasized that sustainable aviation fuel (SAF)

is currently the most practical and effective means to meet this target. SAF's compatibility with existing aircraft and engine structures and its ability to blend with traditional jet fuel make it an optimal solution for reducing emissions. Yao stressed the importance of establishing IAGA to accelerate progress on SAF and drive the industry's green transformation, noting China's commitment to contributing expertise and resources to the global low-carbon transition.

CSAA is working with over 60 organizations and individuals from nearly 20 countries to establish IAGA. Guided by principles of cleanliness, safety, intelligence, and innovation, IAGA aims to foster sustainable aviation development through technological advancements and international cooperation.

(Source: CSAA)

Portrait exhibition of Sino-French female researchers debuts in Beijing



Portraits of 40 Sino-French female researchers
Photo credit: Official WeChat account of VOC

The world needs science and science needs women. In France, women make up only 35% of scientific researchers, with just 11% holding senior academic

positions. To address this disparity, the French National Center for Scientific Research (CNRS) and the FEMMES & SCIENCE association (F&S) launched the Portrait Exhibition of Sino-French Female Scientists. This exhibition celebrates the achievements of female scientists, highlighting the diverse disciplines and career paths in science and technology. Its goal is to inspire audiences—especially women—to explore and pursue careers in science. The organizers explained that the portraits aim to “spotlight exceptional female scientists, bringing them into focus.” In honor of the 60th anniversary of diplomatic relations between China and France, the exhibition has now made its debut in China.

On November 18, 2024, the exhibition opened at the National Communication Center for Science and Technology

(NCCST) in Beijing. Co-hosted by NCCST and the French Embassy in China, the event features portraits of dozens of outstanding Chinese and French female researchers, celebrating their contributions to science while challenging gender stereotypes.

The exhibition includes 20 newly captured portraits of Chinese female scientists, showcasing their expertise and the importance of Sino-French collaboration in advancing science. It also features 20 portraits of French female scientists previously displayed in six cities across France: Toulouse, Paris, Lyon, Grenoble, Clermont-Ferrand, and Marseille.

Confident and resilient, female scientists are increasingly making their mark on the global stage. They have achieved groundbreaking successes in traditional fields like life sciences, physics, and chemistry, while also driving innovation and leadership in emerging areas such as artificial intelligence, quantum computing, and sustainable energy. They are becoming a powerful force in shaping scientific and technological advancement.

(Source: Official WeChat account of VOC)

Chinese Nursing Association delegation attends 22nd Asia Workforce Forum in Malaysia



Group photo of leaders of national nursing associations attending AWFF
Photo credit: Official WeChat account of CNA

From November 20 to 21, 2024, the 22nd Asia Workforce Forum (AWFF), organized by the International Council of Nurses (ICN), took place in Kuala Lumpur, Malaysia. The Chinese Nursing Association (CNA) participated by sending a delegation to the event.

During the forum, representatives from national nursing associations made presentations and discussed critical issues such as the global state of nursing, workforce strategies, and improving the technical skills of nurses. CNA Vice President Li Zheng delivered a keynote address outlining the status and future development of nursing resources in China, highlighting the achievements and plans to strengthen the nursing workforce. ICN Chief Executive Officer Howard Catton commended China's progress in expanding its nursing workforce and improving working

conditions for nurses.

At a session focused on new technologies and nursing health, Wu Ying, another CNA Vice President, shared China's successful practices in using technology to advance nursing. Catton praised these advancements, recalling his visit to hospitals in Beijing during CNA's 115th anniversary celebration. He noted how cutting-edge technologies have been effectively used to improve nursing efficiency and patient care.

On November 23, the CNA delegation visited the Kuala Lumpur Hospital (HKL) for in-depth exchange on the application of nursing technologies, talent development, and opportunities for mutual learning and visits. It paved the way for deeper partnerships between China and Malaysia in the field of nursing.

(Source: Official WeChat account of CNA)

International Awards

Tengchong Science Award 2024 honors scientists in quantum physics and biophysical chemistry



Tengchong Science Award 2024 winners on stage
Photo credit: Science and Technology Daily

On December 6, 2024, the recipients of the Tengchong Science Award 2024 were announced. This prestigious accolade was awarded to Xue Qikun, a member of the Chinese Academy of Sciences (CAS), professor at Tsinghua University, and President of Southern University of Science and Technology (SUSTech), and Xiaoliang Sunney Xie, also a CAS member and Director of Changping Laboratory.

Xue Qikun was recognized for his leadership in the experimental

discovery of the quantum anomalous Hall effect and interface-enhanced high-temperature superconductivity. These breakthroughs represent landmark contributions to fundamental physics and are regarded as critical milestones in global basic research.

Xiaoliang Sunney Xie was honored for his pioneering

work in single-molecule biophysical chemistry, coherent Raman scattering microscopy, and single-cell genomics. His team's development of whole-genome amplification technology has helped over 10,000 families affected by single-gene genetic disorders prevent the transmission of these diseases to future generations.

The Tengchong Science Award celebrates scientists who push the boundaries of frontier science and technology, address global challenges through innovation, and achieve far-reaching economic and social impact with their research.

(Source: *Science and Technology Daily*)

Scientist Profile

Chinese scientist Wang Shuangjie's journey in permafrost engineering



"I am just a blade of grass on the frozen roads of the plateau."

Wang Shuangjie, Chief Engineer of China Communications Construction Company Ltd., Director of the National Key Laboratory for Green and Long-Life Roads in Extreme Environments, and a National Master of Engineering Survey and Design, is a trailblazer in permafrost highway technology. With nearly 40 years of work on the Qinghai-Xizang Plateau, Wang has led his team in developing a comprehensive system of theories, technologies, and standards to address road damage and mitigate uneven thaw settlement in newly constructed highways. His innovations have successfully tackled the challenge of controlling deformation caused by the uneven thawing of heat-absorbing asphalt roads.

Wang Shuangjie with colleagues in his lab
Photo credit: youth.cn

Among Wang's most notable achievements is the design of the Gonghe-Yushu Highway, a 635-kilometer route connecting Gonghe County in Hainan Tibetan Autonomous Prefecture to Yushu Tibetan Autonomous Prefecture. This highway, the first of its kind to traverse the permafrost regions of the Qinghai-Xizang Plateau, is widely regarded as a milestone in international permafrost engineering. Wang's leadership in designing and implementing this project cemented his reputation as a pioneer in the field. For more than four decades, Wang has dedicated his career to advancing the construction and maintenance of permafrost highways. Today, he continues to lead research and innovation in the field. Reflecting on his work, Wang humbly describes himself as "just a blade of grass on the frozen roads of the plateau."

Career forged in permafrost

Wang's connection to permafrost began in 1983, shortly after graduating with a degree in highway engineering from Xi'an Highway University (now Chang'an University). He was assigned to what is now known as the First Highway Consultants Co., Ltd. under the Ministry of Transport as a technician. The following spring, he traveled to the Karakoram Mountains to survey and design a border road at an altitude of 4,700 meters in a permafrost zone—his first encounter with the demanding conditions of frozen soil.

The harsh environment quickly tested Wang's resolve. He suffered severe altitude sickness and relentless headaches. The physical hardships were compounded by the intense ultraviolet radiation, which caused his face and hands to

peel. Nights were spent in canvas tents, and drinking water was a constant challenge, with snow melted in iron barrels serving as the only source. Yet Wang persevered, staying on the plateau for over a year and successfully completing the mission.

This experience shaped Wang's career path. He resolved to dedicate his life to mastering the complexities of permafrost engineering.

Building Gonghe-Yushu Highway

In the 1950s, shortly after the Qinghai-Xizang Highway opened to traffic, thawing permafrost began causing severe collapses in the road surface and subgrade. Wang Shuangjie and his team conducted extensive monitoring and investigations, gathering critical data that would later play a pivotal role in the construction of the Qinghai-Xizang Railway.

Wang's expertise was later put to the test when he was tasked with leading the design of the Gonghe-Yushu Highway, the first highway to traverse the permafrost regions of the Qinghai-Xizang Plateau. The project presented formidable challenges: the highway required a wide subgrade and a thick asphalt surface, which absorbed heat but dissipated it poorly. It passed through regions of severe permafrost degradation, necessitating measures to minimize ecological disruption while addressing foundational energy balance issues exacerbated by global warming. With no existing international benchmarks to rely on, Wang's team had to innovate from the ground up.

The team delved into the mechanisms behind thaw settlement in permafrost foundations. They built

indoor models, developed a parameter system, and conducted numerous simulation experiments. Their efforts culminated in the establishment of a theoretical framework for permafrost energy balance. This framework allowed the team to calculate the heat absorption and transfer properties of highway subgrades and surfaces under warming conditions and to predict heat transfer patterns. Using these insights, they developed a comprehensive set of construction techniques. "We incorporated technologies like ventilation, insulation, and heat conduction," Wang explained. "For example, we installed ventilation pipes within the subgrade and used crushed stones to construct the road base."

Initially, many international permafrost engineering experts doubted the feasibility

of the project. However, after conducting on-site inspections, they were unanimously impressed by its success. The Gonghe-Yushu Highway became a trailblazer, earning recognition as a "new milestone in international permafrost engineering."

Reflecting on his team's progress, Wang remarked, "We've advanced from understanding permafrost damage to unraveling its underlying mechanisms, from reacting to permafrost hazards to proactively preventing them, and from applying basic solutions to developing a comprehensive theoretical system. With the completion of the Gonghe-Yushu Highway, China's permafrost highway construction technology has truly reached a new level."

(Source: *Science and Technology Daily*)

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