



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

No.47
November 2024

CAST Newsletter

Special Issue

WSTDF 2024 advances global science for
sustainable development



Headlines

WSTDF 2024 advances global science for sustainable development / 01

WSTDF 2024 strengthens international collaboration for sustainable development / 03

WSTDF 2024 thematic session focuses on AI innovation and global governance / 04

WSTDF 2024 spotlights youth technological innovation / 04

CAST and ISC launch exchange program for early- to mid-career scientists / 06



WSTDF thematic session addresses climate change through ocean negative emissions and interdisciplinary integration / 07

Science and technology enhance risk awareness for climate change and complex disasters / 08

WSTDF roundtable dialogue champions women's role in science and technology / 09

Jon Kleinberg: Building a world of intersecting information flows / 10

Cover Story

WSTDF 2024 advances global science for sustainable development



Opening ceremony of WSTDF 2024 in Beijing
Photo credit: Official website of WSTDF 2024

From October 22 to 24, the 2024 World Science and Technology Development Forum (WSTDF 2024), hosted by CAST, organized its main events in Beijing. Themed “Science and Technology for the Future,” the forum brought participants from 33 countries and regions together to engage in in-depth discussions on critical topics, including AI governance and sustainable development solutions. In line with the vision of building

a global community of shared future, the forum supported the implementation of the Global Development Initiative, the Global Security Initiative, and the Global Civilizations Initiative and harnessed global expertise to promote high-quality development and people-to-people exchange in science.

At the opening ceremony, Wan Gang, Chairman of WSTDF 2024 and President of CAST, delivered an opening

address. He outlined four key proposals: deepening global cooperation on basic research, promoting healthy development of artificial intelligence, supporting young scientific talent in innovation and creativity, and enhancing global science and technology governance through openness and collaboration. Wan emphasized the importance of sharing insights and collective wisdom to foster mutual benefits, unity, and cooperation. He called for joint efforts

to create technological solutions for sustainable development and contribute to building a global community of shared future.

This year's forum featured six thematic sessions, three roundtable dialogues, and various cultural exchange activities. Over 350 participants from 33 countries and regions attended the Beijing events including 14 laureates of the Nobel Prize, the A.M. Turing Award, and the Lasker Awards, 27 leaders of international scientific organizations, 41 members of Chinese and international academies, and more than 200 experts from universities, research institutions, and enterprises.

(Source: Official website of WSTDF)

WSTDF 2024 delivers key outcomes for sustainable development

WSTDF 2024 unveiled several impactful outcomes, reinforcing

the forum's commitment to leveraging international collaboration among scientific, educational, and corporate sectors to advance technological innovation and sustainable development. Notable highlights include:

IUPAC's 2024 Top Ten Emerging Technologies in Chemistry

The report identified ten cutting-edge technologies in chemistry that align with the United Nations Sustainable Development Goals including frustrated Lewis pairs, triboelectric nanogenerators, aptamers, MXenes, hydration lubrication, bioinspired nanofluidic iontronics, KRAS inhibitors, neural network potentials, active adsorption, and electrochemical nitrogen cycle.

2024 Outlook for the Top 10 AI Frontier Technology Trends

The report categorized emerging AI technologies into four major

areas—general-purpose AI technologies, large-scale pre-trained models, embodied intelligence, and generative AI—and identified ten specific advancements within these domains.

New Marine Negative Emission Productivity Report

Based on the microbe carbon pump theory, this report presented a series of oceanic negative emission solutions by enhancing coordination of multi-carbon pump systems.

Recommendations for Collaboration in Open Science Infrastructure: Vision for the Sciences Decade

This initiative focuses on four core pillars: building a global network, adhering to open principles, promoting sustainable development, and fostering mutual trust to advance collaboration in open science infrastructure.

CAST-ISC Early- to Mid-Career Researchers Exchange Program

Titled “Empowering and Elevating the Voices of Early- and Mid-Career Researchers in International Science and Global Policy Processes,” this program aims to foster partnerships among young scientists at the national, regional, and global levels. It emphasizes collaboration, resource sharing, and strengthening a robust ecosystem of partnerships.

2024 China-ASEAN Engineers Forum Initiative to Strengthen Engineering Capacity Building

This initiative focuses on collaboration in engineering education, continuous professional development, and the capacity building of young engineers. It aims to enhance the China-ASEAN Engineers Forum mechanism and promote cross-regional mobility for engineers.

Initiative to Facilitate International Mobility for Scientists

Advocating five guiding principles—Openness, Cooperation, Mobility, Inclusiveness, and Trust—this proposal outlines measures to improve international mobility for scientists and strengthen knowledge exchange.

(Source: Official website of CAST)

WSTDF 2024 strengthens international collaboration for sustainable development

On October 23, 2024, Chinese Vice Premier Ding Xuexiang met with international scientists attending WSTDF 2024 in Beijing.

During the meeting, Ding emphasized that strengthening international cooperation and advancing sustainable development through scientific innovation are urgent priorities. These efforts reflect the

expectations of both the global scientific community and people around the world. As the international landscape grows increasingly complex, China remains committed to openness and inclusivity. Ding reaffirmed China’s dedication to upholding principles of open, fair, equitable, and non-discriminatory international scientific collaboration with the goal of advancing joint research on major scientific challenges, fostering an open and innovative ecosystem, sharing scientific achievements, and creating greater benefits for humanity.

Twelve scientists from countries including the United States and across Europe expressed strong support for openness and collaboration. They conveyed a willingness to deepen exchange with China, pursue innovative breakthroughs through partnerships, and work together to promote global sustainable development.

(Source: Xinhua News Agency)

Events in Focus

WSTDF 2024 thematic session focuses on AI innovation and global governance



Thematic session on AI Governance Innovation
Photo credit: Official website of WSTDF 2024

On October 23, WSTDF 2024 hosted a thematic session titled “AI Governance Innovation: Building an International Trust Foundation for Cultivating the Ecology of Science and Technology Governance.” The session brought leading global experts, scholars, and representatives from international organizations together to explore breakthroughs in artificial intelligence, industrial applications, emerging use cases, and strategies for risk governance, aiming to chart a path for the future of AI-driven innovation.

Jun-Youn Kim, chief representative of the Korea-China Science & Technology Cooperation Center and chief researcher at the Software Policy Institute under South Korea’s Ministry of Science and Technology, described the current era as a “Cambrian explosion” of AI development, with hundreds of new AI services emerging every day. By 2030, the scale of AI is expected to grow tenfold.

In discussing the risks and challenges of AI, many

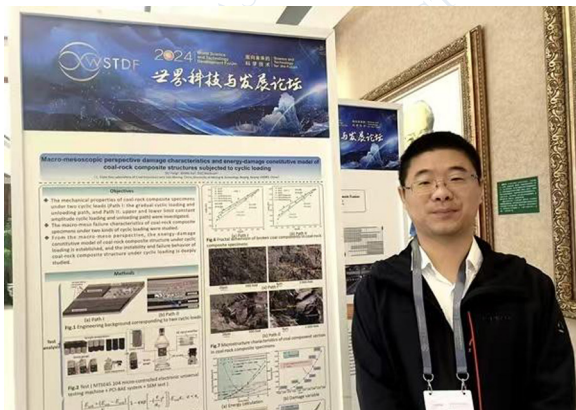
speakers highlighted the urgent need for international cooperation and global governance. Huang Tiejun, Chairman and former President of the Beijing Academy of Artificial Intelligence and professor at Peking University, underscored the critical role of global collaboration in developing effective AI governance frameworks. This is a shared challenge for humanity, requiring technological measures to promote responsible AI use and prevent misuse.

(Source: *Global Times*)

WSTDF 2024 spotlights youth technological innovation

Youth are the driving force behind the future of nations and the advancement of global science and technology. At WSTDF 2024, a dedicated interaction zone was created for young scientists and emerging talent to showcase their research, share expe-

riences, and engage in meaningful exchange with laureates of the Nobel Prize, the A.M. Turing Award, and the Lasker Awards.



Associate Professor Du Feng from the Emergency Management and Safety Engineering School of China University of Mining and Technology-Beijing with his poster

Photo credit: china.com.cn



Associate Professor Meng Qingxiang from the Geotechnical Research Institute of Hohai University with his poster

Photo credit: China Science and Technology Press

Associate Professor Du Feng from the School of Emergency Management and Safety Engineering at the China University of Mining and Technology-Bei-

jing, an expert in coal mine safety and clean coal utilization, shared his perspective on the qualities essential for young scientists. “Diligence and conscientiousness are fundamental,” he remarked. “While intelligence is helpful, it’s not crucial. An open mind, active engagement with others, and staying informed about global technological advancements are far more important.” He also highlighted the forum’s unique opportunity to learn from renowned scientists from China and around the world.



Tsinghua University High School student Zhang Hongxi (far left) in discussion with A.M. Turing Award laureate Professor Martin Hellman

Photo credit: China Science and Technology Press

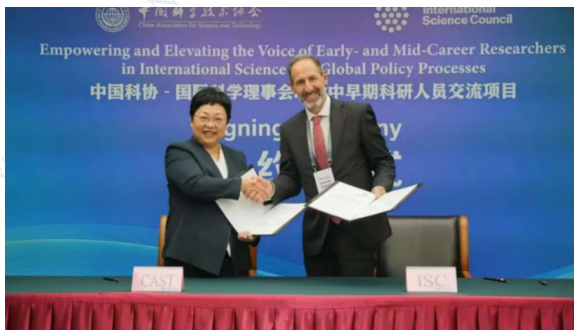


Su Hang from the High School Affiliated to Beijing Normal University in conversation with Nompumelelo Obokoh, CEO of the South African Council for Natural Scientific Professions
Photo credit: China Science and Technology Press

Rainer Frietsch of the Fraunhofer Institute for Systems and Innovation Research in Germany emphasized a need for global support of young scientists. “Nations must strengthen cooperation to provide more scholarships, research funding, and employment opportunities,” he urged. “These measures are vital to support young researchers in the early stages of their careers.”

(Source: china.com.cn)

CAST and ISC launch exchange program for early- to mid-career scientists



Signing ceremony of the exchange program agreement
Photo credit: Official WeChat account of China Center for International Science and Technology Exchange

Early- to mid-career researchers often face significant challenges in their academic and research journeys, such as securing funding and accessing resources. They need not only mentorship, but also opportunities to build collaborative networks within the global scientific community.

To address these needs, during WSTDF 2024 on October 23, CAST and the International Science Council (ISC) signed an agreement on a new exchange program titled “Empowering and Elevating the Voices of Early- and Mid-Career Researchers in International Science and Global Policy Processes.” The program aims to amplify the voices of early-career scientists in international science and policy discussions and will include activities such as international science leadership training, production of an ISC podcast series, exchange visits focused on sustainability research, and support for early-career scientists to participate in global science conferences.

Salvatore Aricò highlighted the program’s goals:

“This initiative focuses on strengthening the leadership skills of early- to mid-career researchers in areas like science advising, policy, diplomacy, and communication. It also aims to enhance their participation and representation in major scientific events and exchange. The ultimate objective is to train a new generation of scientists equipped with interdisciplinary approaches to address complex challenges and provide timely, evidence-based recommendations to policymakers.”

(Sources: Xinhua News Agency and the official WeChat account of China Center for International Science and Technology Exchange)

WSTDF thematic session addresses climate change through ocean negative emissions and interdisciplinary integration



Thematic session on Interdisciplinary Science-Based Solutions towards Sustainable Development

Photo credit: Official website of WSTDF 2024

On October 23, WSTDF 2024 hosted a thematic session titled “Interdisciplinary Science-Based Solutions Towards Sustainable Development.” The session focused on tackling climate change and

advancing sustainable development by leveraging interdisciplinary approaches to propose ocean-based solutions. These solutions aim to reduce pollution, mitigate carbon emissions, and enhance carbon sequestration through “negative emissions,” offering a path to address persistent challenges while balancing economic growth with environmental protection.

Jiao Nianzhi, Chief Scientist of the Global Ocean Negative Carbon Emissions (Global-ONCE) program and a member of the Chinese Academy of Sciences (CAS), underscored the importance of balancing emission reduction with the needs of economic development. He emphasized that for Global-ONCE to achieve global implementation, a robust framework of international standards—from theoretical methodologies to technical guidelines—must be established. “We’ve taken a significant step

forward,” Jiao noted. “Global-ONCE has been approved by the International Organization for Standardization (ISO), and a dedicated working group is now developing international standards for ocean negative emissions and carbon neutrality.”

Peter Thomson, the UN Secretary-General’s Special Envoy for the Ocean, highlighted the necessity of integrating expertise from diverse fields such as engineering, marine biology, economics, policymaking, and innovation. He stressed the importance of designing solutions that are not only technologically sound but also legally compliant and economically sustainable. “International cooperation is crucial,” Thomson stated, “to scale up these innovations and ensure that countries most vulnerable to climate change can benefit from these breakthroughs.”

(Source: china.com.cn)

Science and technology enhance risk awareness for climate change and complex disasters



Thematic session on Science and Technology for Risk-informed Sustainable Development”

Photo credit: Official website of WSTDF 2024

On October 24, a thematic session titled “Science and Technology for Risk-informed Sustainable Development” brought experts together to address the growing challenges of climate change and the rising frequency of complex disasters. The session explored how international collaboration in science and technology can significantly reduce disaster risks and promote sustainable development.

As global climate change accelerates and risks become more intricate,

the urgency for transnational scientific cooperation has intensified. Wu Guoxiong, a member of the Chinese Academy of Sciences (CAS) and a research fellow at its Institute of Atmospheric Physics, emphasized the crucial role of international partnerships in early disaster warning systems. He highlighted the Subseasonal to Seasonal (S2S) Prediction Project as a prime example of global cooperation. This initiative, involving countries such as China, the UK, the US, and Japan, enables real-time comparison of national prediction models, strengthening collective efforts to address climate-related disasters.

Rajib Shaw, Chair of the United Nations Office for Disaster Risk Reduction (UNDRR) Asia-Pacific Science Technology Advisory Group (AP-STAG), underscored the need for enhanced global collaboration, particularly between the Global North and South, to close technological

gaps. “Advanced technologies such as artificial intelligence and drones are crucial for disaster risk management,” he said. “However, many Southern countries lack access to these tools, making North-South cooperation indispensable.”

(Source: china.com.cn)

WSTDF roundtable dialogue champions women’s role in science and technology



Roundtable dialogue encouraging women’s participation in science and technology

Photo credit: Official website of WSTDF 2024

On October 24, a WSTDF roundtable dialogue titled “Encouraging Women’s Participation in Science and Technology” brought over 50 distinguished women scientists together from around the globe. The event aimed to inspire and empower more women to engage in scientific innovation and leadership.

Susan Wessler, Distinguished Professor of Genetics at the University of California, Riverside, the Neil A and Rochelle A Campbell Presidential Chair for Innovations in Science Education, and a member of the US National Academy of Sciences, delivered a keynote address recounting her personal journey balancing career and family. “Women scientists should seek life partners who support their careers, choose workplaces with convenient commutes, create joyful work environments, and boldly pursue promotions and awards,” she said.

During the panel discussion, Amy Gladfelter, Professor of Cell Biology at Duke University School of Medicine, highlighted the importance of gender equity in science. “If we don’t support women in science, we are wasting 50% of the world’s intelligence and creativity,” she declared.

Cao Xiaofeng, a CAS member and research fellow of its Institute of Genetics and Developmental Biology, Co-Director of the CAS-JIC Center of Excellence for Plant and Microbial Science (CEPAMS), and Vice President of the China Women’s Association for Science and Technology (CWAST), echoed this sentiment. She emphasized the mutual benefits. “The world needs science, and science needs women,” she said. “I hope more young women will dedicate themselves to science and help make the world a better place.”

(Source: china.com.cn)

Dialogue with Scientists

Jon Kleinberg: Building a world of intersecting information flows

On October 25, WSTDF 2024 hosted one of its institutionalized international sci-tech exchange activities: the Opening Ceremony of the 2024 WLA Forum & the Award Ceremony of the 2024 WLA Prize. At the ceremony, the 2024 WLA Prize in Computer Science or Mathematics was awarded to Jon Kleinberg, Tisch University Professor of Computer Science and Information Science at Cornell University, for his groundbreaking contributions at the intersection of computer science and social science, particularly his intellectual leadership in the fields of social networks and algorithmic fairness.

In the digital age, algorithms shape much of how we consume information. From endless scrolling through videos to personalized web page recommendations, algorithms act as the “eyes” behind the software, analyzing user behavior and preferences to deliver content tailored to individual tastes. While this personalization offers convenience, it also reinforces “information cocoons,” where users are fed content that aligns with their existing beliefs. This insular way of communication limits dialogue and erodes social cohesion.

Jon Kleinberg’s research explores interplay between algorithms and human behavior and offers insights into challenges posed by social networks. Through interdisciplinary thinking, he highlights the need to design algorithms that consider their social implications and adhere to ethical standards. Kleinberg advocates for artificial intelligence systems that not only prioritize efficiency but also reflect the ethical



Press conference of the 2024 WLA Prize laureates
Photo Credit: Official website of WSTDF 2024

principles of human society.

“Human society must collectively decide what we truly want,” said Kleinberg at the press conference. One solution he proposes is fostering “intersecting information

flows,” which integrate diverse and heterogeneous information across disciplines and domains. This approach incorporates human intervention into algorithm design to address relationships between individuals, their environments, groups,

and broader society. The ultimate aim is to prioritize the production and recommendation of content that holds public value and fosters meaningful dialogue.

(Source: *Science and Technology Daily*)

♥ Introducing VOC – Your gateway to China’s science and technology news

✈ VOC (Voice of CAST) seeks to share innovative, collaborative, eco-friendly, inclusive, and globally accessible developments with science enthusiasts and professionals worldwide. It is your go-to platform for academic forums, cutting-

edge research, popular science resources, English journal abstracts, and international science and tech conferences happening in China.

 Subscribe now by scanning the QR code for VOC's official WeChat account or clicking this link: <https://voc-gj.cast.org.cn/>.



Editor: Ying Wenqi
Proofreader: Wei Yumeng
Designer: Zhang Shan

CAST is the largest non-governmental organization of scientific and technological professionals in the world. Through its 220 member societies and local branches all over the country, CAST maintains close ties with millions of Chinese scientists, engineers, and other professionals working in fields of science and technology.

<http://english.cast.org.cn/>

newsletter@cast.org.cn