



中国科学技术协会
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CAST Newsletter

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Headlines

CAST President Wan Gang leads delegation to BEYOND Expo 2023



Opening ceremony of BEYOND Expo 2023
Photo credit: Official website of CAST

From May 8 to 11, 2023, CAST President Wan Gang led a delegation to Macao to attend the 3rd BEYOND International Science and Technology Innovation Expo (BEYOND Expo 2023) and the International Hydrogen and Fuel Cell Standards Summit.

The expo, organized by the Macao Technology General Association, focused on three sub-brands: BEYOND Healthcare, BEYOND Sustainability, and BEYOND ConsumerTech. Its primary goal was to facilitate efficient allocation and integration of technological resources and innovation across different sectors in the region. It also provided an international platform for global companies to interact and collaborate with counterparts in China.

A central event at the expo was the International Hydrogen and Fuel Cell Standards Summit. Themed “Standard-Defined Hydrogen World,” the summit was jointly organized by the International Hydrogen Fuel Cell Association (IHFCA), the Macao Techno-

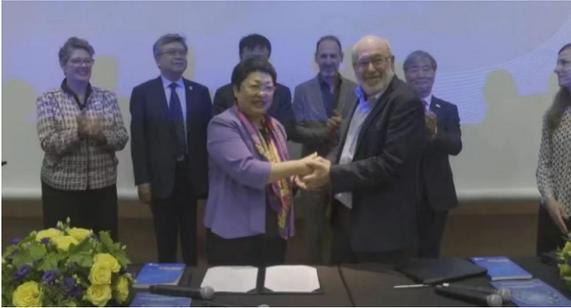
gy General Association, and the Association for Promotion of Science and Technology of Macao (MAPST). It aimed to drive the development and certification of international standards for the hydrogen and fuel cell vehicle industry and promote high-quality and sustainable growth within the global hydrogen and fuel cell industry.

During the expo, Wan Gang also had the opportunity to engage in discussions with Ho Iat Seng, Chief Executive of the Macao Special Administrative Region (SAR). Alongside officials from the Macao SAR, they held in-depth discussions on topics such as nurturing innovative talent and leveraging international cooperation for scientific and technological advancements. Additionally, they explored ways to strengthen collaboration between the scientific and technological communities in Macao and the Chinese main-

land, foster consensus, and create new opportunities for Macao's diversified economic development.

(Source: Official website of CAST)

CAST disaster reduction research cooperative agreement with ISC



CAST International Affairs Director General Luo Hui and ISC President Peter Gluckman at the signing ceremony
Photo credit: Official WeChat account of the China Centre for International Science and Technology Exchange

On May 11, CAST and the International Science Council (ISC) signed the second-phase cooperation agreement on the Integrated Research on Disaster Risk (IRDR) Program in Paris, France.

The IRDR Program is a comprehensive international sci-tech disaster reduction program that consolidates professional knowledge in science, technology, and engineering to improve understanding of various disaster risks. It explores solutions for disaster reduction and enhances the ability of human society to respond to disaster risks and post-disaster recovery and reconstruction through international exchange and cooperation. The program was jointly established in 2009 by ISC, the United Nations Office for Disaster Risk Reduction (UNDRR), CAST, the Chinese Academy of Sciences (CAS), and the Aerospace Information Research Institute (AIR) under CAS.

The program now has 13 National Committees, 1 Latin American Regional Committee, and 18 International Centers of Excellence (ICoE) focused on disaster reduction worldwide.

Created through the merger of the International Council for Science (ICSU) and the International Social Science Council (ISSC), ISC is a non-governmental international scientific organization devoted to natural and social sciences. Headquartered in Paris, ISC boasts a diverse membership from over 100 countries and regions. One of its member units is CAST.

(Source: Official website of CAST)

CAST video conference with South Africa's Department of Science and Innovation

On April 24, 2023, Luo Hui, Director General of the Department of Inter-

national Affairs of CAST, held a video conference with Daan Du Toit, Deputy Director-General of South Africa's Department of Science and Innovation (DSI). During the conference, they discussed methods to promote science and technology as well as cultural exchange between China and South Africa. They agreed on the need for further collaboration and expressed intentions to jointly sign a bilateral Memorandum of Understanding (MoU) to formalize cooperation.

Luo Hui emphasized the significance of South Africa as a valuable partner for China. She expressed CAST's commitment to enhancing communication and cooperation with DSI and the scientific and technological community in South Africa. She also expressed hope that both sides would work to facilitate dialogue among scientists, engineers, and young professionals on global issues of common concern such

as the Sustainable Development Goals, foster academic exchange, promote collaboration in science museums, and establish a high-level platform for dialogue and exchange between the scientific and technological communities of China and South Africa.

Daan Du Toit highlighted DSI's responsibilities to ensure the effective functioning of South Africa's research system through policy formulation, the cultivation of scientific and technological talent, and support for international exchange. He expressed desire for deeper collaboration between the two parties in areas such as science popularization, science communication, science museum exhibitions, and advancement of female scientists and technologists.

DSI provides guidance, policy, and funding to support the generation and application of knowledge and inno-

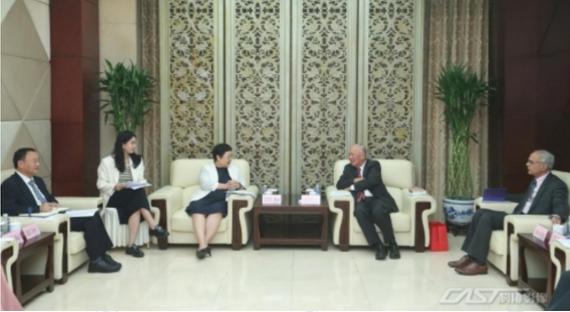
vation to promote South Africa's socio-economic development. Its work is performed with collaboration from the National Advisory Council on Innovation, the South African Council for Natural Scientific Professions, the Academy of Science of South Africa, the National Research Foundation, the Technology Innovation Agency, the South African National Space Agency, the Council for Scientific and Industrial Research, and the Human Sciences Research Council.

(Source: Official website of CAST)

CAST International Affairs Director General Luo Hui holds meeting with BRISECC delegation

On May 18th, 2023, Luo Hui, the Director General of the Department of International Affairs at CAST, had a meeting in Beijing with a delegation from the Belt and Road International Science

Education Coordinating Committee (BRISECC). The delegation was led by Lee Yee Cheong, President of the committee, and Manzoor Hussain Soomro, Vice President of the committee.



CAST International Affairs Director General Luo Hui in meeting with BRISECC President Lee Yee Cheong and his delegation
Photo credit: Official website of CAST

Luo Hui conveyed her appreciation for BRISECC's efforts in promoting scientific and educational collaboration among the countries and regions along the Belt and Road. She stressed the firm commitment of CAST to foster an environment of openness, trustworthiness, and cooperation within the international scientific and technological community. Furthermore, she highlighted the importance of establishing an inclusive and collaborative scientific and cultural exchange network, facilitating joint endeavors through discussion and collaboration, and encouraging the exchange of scientific knowledge and mutual learning among countries and regions along the Belt and Road.

Lee Yee Cheong emphasized the proactive role of BRISECC in enhancing international scientific and educational collaboration and fostering cultural exchange. The committee's Belt and Road Teenager Maker Camps, initiated within its framework, have attracted participation from teachers and students

representing more than 70 countries and regions. Manzoor Hussain Soomro expressed his commitment to establishing a scientific communication and cooperation network for the China-Pakistan Economic Corridor. He aimed to develop more scientific and technological professionals to meet the developmental requirements of the countries along the Belt and Road, while also promoting scientific and cultural exchange.

Founded in 2018 in Beijing, BRISECC strives to foster the sharing of scientific and educational resources and promote information and talent exchange among the participating nations. Manzoor Hussain Soomro, as the vice president of the Committee, received the esteemed Chinese Government Friendship Award in 2020 in recognition of his outstanding efforts in advancing scientific and educational exchange and collabora-

ration for the Belt and Road Initiative.

(Source: Official website of CAST)

CAST-UN Consultative Committee on Disaster Reduction side event at 8th STI Forum



Side event at the 8th STI Forum
Photo credit: Official website of CAST

On May 2, US Eastern Standard Time, the CAST-UN Consultative Committee on Disaster Reduction and the International Research Center of Big Data for Sustainable Development Goals (SDG Center) jointly hosted a side event titled “Earth Big Data, Strengthening Potential of Digital Technologies for SDGs in Post-COVID World” as part of the 8th Multi-Stakeholder Forum on Science, Technology and Innovation for the Sustainable Development Goals (STI Forum).

Guo Huadong, Director General of the SDG Center, emphasized the importance of Earth big data and digital technology in achieving the Sustainable Development Goals (SDGs). Given the numerous challenges that emerged due to the COVID-19 pandemic, he highlighted the pressing need to bridge the data gap, ensure equitable data access, and leverage Earth big data effectively. Such endeavors are vital for the mid-term review of SDG progress

and for monitoring and evaluating future steps towards achieving the SDGs.

During the discussion session, experts exchanged views on global challenges regarding data infrastructure and real-life application and conducted in-depth discussions on interdisciplinary and cross-sectoral multilateral cooperation. Johannes Cullman, chief scientific advisor to the president of the 77th UN General Assembly, specifically attended the side event and joined the discussions.

The 8th STI Forum took place from May 2 to 4 at the United Nations headquarters in New York under the theme “Science, technology, and innovation for speeding up the recovery from COVID-19 and achieving the 2030 Sustainable Development Goals (SDGs) at all levels.” The forum’s goal was to facilitate discussions on science, technology, and

innovation cooperation in support of the SDGs and provide mandated inputs for the High-Level Political Forum on Sustainable Development. Participants included representatives from United Nations member states, international organizations, academic institutions, media, and various sectors.

(Source: Official website of CAST)

International Panel of Mesoscience first general assembly and council meeting

On April 27, 2023, the International Panel of Mesoscience (IPM) held its first general assembly and council meeting. Over 50 members from Asia, Europe, the Americas, Australia, and Africa took part in the event in hybrid mode.

Participants held discussions about the development goals and strategic plans of IPM.

They emphasized the importance of fostering collaboration among members and leveraging mesoscience to effectively tackle significant global challenges, particularly in the field of understanding the spatio-temporal dynamic structure of complex systems.

IPM aims to promote mesoscience across various disciplines such as natural sciences, engineering, and social sciences. By establishing an international platform for dialogue and cooperation, it strives to facilitate academic exchange, foster interdisciplinary collaboration, drive technological innovation, support education initiatives, and encourage international cooperation. The Secretariat of IPM is based in Beijing.

(Source: Official website of CAST)

Academic Exchange

2023 International Forum on Food Safety and Health in Beijing

On April 26, 2023, the 2023 International Forum on Food Safety and Health, hosted by the Chinese Institute of Food Science and Technology (CIFST) and the International Union of Food Science and Tech-



Entrepreneurs Dialogue Summit of the forum
Photo credit: Official WeChat account of CIFST

nology (IUFoST), was held in Beijing. Themed “Food Safety and Health in the Age of Innovation,” the forum featured keynote speeches, an entrepreneurs dialogue summit, themed sessions, and networking events. It brought together professionals from industry and academia to explore how the food safety and the health sector can embrace technological advancements to foster high-quality development in this era of innovation.

Ensuring global food safety through risk assessment

Li Ning, Vice President of the Chinese Institute of Food Science and Technology (CIFST) and Director of the China National Center for Food Safety Risk Assessment (CFSA), emphasized that risk assessment serves as the foundation for effective risk management. China has made continuous improvements in basic data and

technical research in risk assessment since adopting the risk assessment system. Over 100 risk assessment projects have been implemented in the country, and they have played a crucial role in food safety regulation, standard formulation, emergency response, risk communication, and international trade.

Professor Patrick Wall from the School of Public Health, Physiotherapy, and Sports Science at the University College Dublin acknowledged that the growing usage of whole genome sequencing and bioinformatics has provided food safety professionals with new tools to promptly identify microbial contaminants. This creates significant advantages for the fast-moving consumer goods industry, which often faces challenges due to shorter product shelf life.

John Szpylka, President of the Association of Official Analytical Chem-

ists (AOAC INTERNATIONAL), highlighted the organization’s efforts to tackle global food safety challenges. AOAC continuously launches and updates its services and programs including establishing standards in areas such as infant formula, adult nutritional products, heavy metals, PFAS, and natural color additives. The organization also has plans to launch new projects to address emerging global issues such as alternative protein sources for innovative food products.

(Sources: Official WeChat account of the China Centre for International Science and Technology Exchange, xinhuanet.com)

12th Asian-Australian Conference on Composite Materials

On April 25 to 28, 2023, the 12th Asian-Australian Conference on Composite Materials (ACCM) took place in

Hangzhou, Zhejiang Province. The conference, organized by the Chinese Society for Composite Materials (CSFCM) and Zhejiang University, focused on the theme “Composites for Quality of Life.” More than 600 professionals from over 10 countries attended to share knowledge on the latest advancements, trends, and applications in the field of composite materials and explore future development and collaboration opportunities.



12th Asian-Australasian Conference on Composite Materials
Photo credit: Official website of CSFCM

The conference delved into the latest advancements in materials sciences, design manufacturing, performance testing applications, and development. It featured a range of engaging events including plenary and keynote talks, topical sessions, an industrial exhibition, a forum for composite journal editors, an industrial application forum, and poster displays. These activities aimed to encourage interdisciplinary innovation in international composite materials research and facilitate adoption of new composite materials in the industrial sector.

During the plenary session, Rodney S. Ruoff, Distinguished Professor in the Department of Chemistry and Director of the Center for Multidimensional Carbon Materials (CMCM) at the Ulsan National Institute of Science and Technology (UNIST), presented ground-

breaking research on the dissolution and growth of diamonds. His innovative approach to diamond-like molecular protonation using theoretical models of different diamond-like molecules represents a significant milestone in carbon materials research.

In addition to the academic program, the conference also included an exhibition featuring more than 20 composite material companies showcasing their products and services. The exhibition aimed to provide opportunities for businesses to explore potential collaborations and find suitable methods for market development.

ACCM is a major international academic conference on composites with great influence in the Asian-Australasian region and worldwide. Since the first international conference in Japan in 1998, ACCM has been held biennially, rotating among



Exhibitors and conference participants at the exhibition
Photo credit: Official website of CSFCM

various cities in countries such as South Korea, New Zealand, Australia, China, and Malaysia. Twelve

conferences have been organized to date, offering a high-quality platform for professionals in the field to exchange ideas and contribute to the global development of the composite materials industry.

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

Scientist Profile

Deng Dehui: “Armored” warrior in chemical physics



Deng Dehui is a researcher and doctoral supervisor at the Dalian Institute of Chemical Physics (DICP) under the Chinese Academy of Sciences (CAS). He is the recipient of China's National Science Fund for Distinguished Young Scholars award. Specializing in noble metal-substituted nanocatalysts, his work delves into the intricate world of surface regulation and the basic principles and applications of two-dimensional nanomaterials and hybrid materials. Boasting 82 publications in prestigious international journals, Deng's work has amassed over 13,000 SCI citations. He also holds an impressive 84 patents both domestically and internationally, with 34 officially authorized and an additional 10 PCT patents.

Photo credit: *China Science Daily*

Deng wields an indomitable spirit, believing that “a daring and proactive approach is vital to yield innovative results in research.” His notebook, a constant companion, is a testament to every “spark of inspiration” he encounters on his research journey. Looking ahead, Deng aspires to transform every “scientific dream” into reality in his future research endeavors.

Back in 2013, Deng and his team pioneered the notion of “armored catalysis” internationally. Since then, they have continued to refine and expand its practical applications. In recent years, they’ve successfully leveraged armored catalysis in complex systems like water electrolysis to overcome stability issues affecting non-noble metal catalysts under extreme conditions. Building on this foundation, the team engineered high-current density,

low-energy-consumption systems for hydrogen and oxygen production through electrolysis and even developed a highly efficient 250 kW water electrolysis device. This groundbreaking work is poised to propel the growth of large-scale green hydrogen energy and life health industries in China.

Bolstering catalysts with protective “armor”

Catalysis plays a crucial role in modern chemical industries, directly or indirectly contributing to 20%-30% of global domestic product. In catalytic reactions, catalysts have a significant influence on the speed of chemical processes.

“Many catalysts are produced from precious metals such as the platinum used in women’s jewelry,” said Deng. “Yet, these valuable metals have dwindling reserves and steep price tags. Thus, slashing

costs while enhancing stability is crucial for the practical application of catalysts.”

His team initially considered swapping precious metals with economical and abundant materials. However, these alternatives fell short under demanding reaction conditions, exhibiting diminished stability and a fleeting lifespan. As they delved deeper into their research, they found an unexpected savior in corrosion-resistant two-dimensional materials such as graphene. They can function as protective “armor,” securely encasing less stable non-precious metals and effectively addressing stability issues.

However, encasing nano-sized metal particles found in the catalyst with graphene presented a challenge due to the minuscule size. Ingeniously, the team decided to first create nanoscale particles of non-precious metals, then employed

chemical vapor deposition to shroud them in a graphene cover.

“Graphene acts as a warrior’s protective ‘armor’,” Deng Dehui explained. “It not only shields the inner non-precious metals from corro-

sion, but also ensures that the encased catalyst maintains its activity. It enables a more efficient electron transfer from the inner metal to the “armor’s surface, essentially kick-starting the previous inert ‘armor’ into a catalyst for reactions.

This approach addresses both issues of instability and reduced activity that often plague traditional non-precious metal catalysts.”

(Source: *China Science Daily*)

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CAST is the largest non-governmental organization of scientific and technological professionals in the world. Through its 215 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.

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