



上海交通大学
SHANGHAI JIAO TONG UNIVERSITY



中国工程热物理学会

The 2nd International Conference on ***Carbon Neutrality*** (ICCN-2025)

2025碳中和国际学术会议

Conference Program

September 5-7, 2025
Shanghai, China

WELCOME

It is our great pleasure to welcome you to the 2nd International Conference on Carbon Neutrality (ICCN-2025), hosted by Shanghai Jiao Tong University and the Chinese Society of Engineering Thermophysics, organized by the journal Carbon Neutrality (2024 Impact Factor: 12.5, Q1), co-organized by the University of Edinburgh. It is sponsored by the Asian Union of Thermal Science and Engineering (AUTSE), Journal Center of Shanghai Jiao Tong University, China-UK Low Carbon College of Shanghai Jiao Tong University, School of Mechanical Engineering of Shanghai Jiao Tong University.

Building upon the success of the inaugural ICCN-2023, which attracted over 200 participants worldwide, ICCN-2025 will continue to serve as a dynamic and multidisciplinary platform to exchange knowledge, inspire innovation, and advance global collaboration in carbon neutrality. This year's conference will feature an expanded range of plenary, keynote and invited speakers from academia, industry, and policy, as well as diverse thematic sessions that reflect the rapid developments in this field. Topics include Hydrogen and Renewable Energy Technologies, Catalysis and Environmental Science, Advanced energy storage, Negative Emission Technologies, Carbon Finance and Management, Emerging Low Carbon Technologies and Applications, and more.

The primary mission of ICCN is to bring together academic researchers, engineers, industry practitioners, and policymakers to share their experiences, scientific findings, and technological innovations that can accelerate progress toward global carbon neutrality. In particular, ICCN-2025 continues to place a strong emphasis on fostering the next generation of young researchers, providing them with an international stage to present their work, exchange ideas, and build global networks.

Conference Chairs:

Changying Zhao, Shanghai Jiao Tong University

Margaret Graham, University of Edinburgh

Qibin Liu, Institute of Engineering Thermophysics, CAS

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Carbon Neutrality

Carbon Neutrality was launched by **Shanghai Jiao Tong University and Springer Nature** in 2021 with an aim to achieve the global goal of carbon neutrality.

Carbon Neutrality is an international, multi-disciplinary open access journal in the areas of low carbon science, technology, and policy. The mission of Carbon Neutrality is to communicate the most cutting-edge technologies in carbon neutrality to the research community, policy decision-makers, and other types of stakeholders. The journal aims to establish itself as a flagship and leading international journal in the field of low carbon, publishing advanced and up-to-date original research and review papers with highest quality in the area, promoting information and knowledge exchange on frontier scientific research, and contributing to the sustainable development of the world. **It is an Open Access journal, yet the Article Processing Charges (APC) are fully waived.**

Carbon Neutrality has been indexed in ESCI, EI, Scopus, CAS and DOAJ. It is also a High-start Journal of the Excellence Action Plan of China's STM Journals (中国科技期刊卓越行动计划高起点新刊). 2024 Impact Factor (首个影响因子): 12.5, Q1.

Carbon Neutrality welcomes submissions related to low carbon that include, but are not limited to:

1.Low Carbon Energy

- Integrated smart energy systems
- Renewables and energy storage
- Decarbonization of traditional energy
- Carbon capture, utilization and storage
- Low carbon energy materials

2.Ecosystem Carbon Sink and Environmental Governance

- Carbon sink and carbon sequestration of marine and terrestrial ecosystem
- Carbon footprint and emission monitoring
- Synergic governance of environment and climate change
- Waste resource recycling and utilization

3.Carbon Finance, Management and Policy

- Carbon pricing theory and market practice
- Climate investment and finance
- Low carbon policy and governance
- Transition to carbon neutral economy

The Editor-in-Chief is Changying Zhao, Chair Professor of Shanghai Jiao Tong University. The Editorial Board is composed of more than 40 renowned, world-leading scientists around the world, including more than 10 Academicians and 26 international Editorial Board members. The research areas of the Editorial Board cover various disciplines, including energy, environment, carbon finance, carbon management, carbon sink, geology and climate change etc.

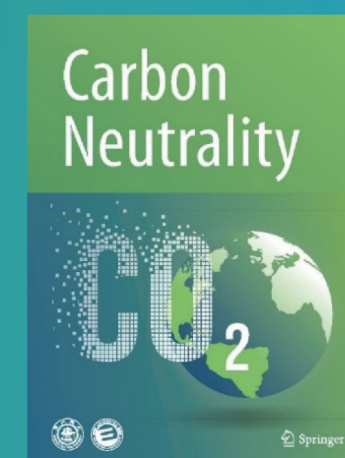
Carbon Neutrality welcomes researchers around the world to become our readers, authors or reviewers, and co-create a global research community aiming for a carbon neutral future!

If you have questions or need any assistance, please contact the editorial office:

CN_Editorial@sjtu.edu.cn

Journal website: www.springer.com/journal/43979

Editorial Manager Submission system: www.editorialmanager.com/lowc/default.aspx



Journal website



Wechat

LinkedIn: @Carbon Neutrality

Twitter: @CN_Editorial

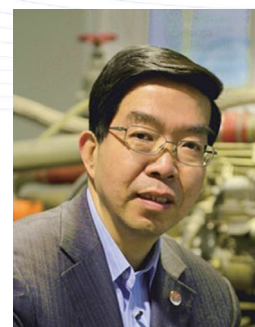
Facebook: @CarbonNeutralityCN

CONFERENCE ORGANIZATION

International Scientific Committee Chairs:



Hongguang Jin
Institute of Engineering Thermophysics,
CAS, China



Zhen Huang
Shanghai Jiao Tong University, China

Conference Chair and Co-Chairs:



Changying Zhao
Shanghai Jiao Tong University, China



Margaret Graham
The University of Edinburgh, UK



Qibin Liu
Institute of Engineering Thermophysics,
CAS, China

Local Organizing Committee

Chair:

Changying Zhao, Shanghai Jiao Tong University, China

Conference Secretary:

Tao Ren, Shanghai Jiao Tong University, China
Shenghong Ju, Shanghai Jiao Tong University, China
Qian Wang, Shanghai Jiao Tong University, China
Xiaoxin Wu, Shanghai Jiao Tong University, China

Members (In alphabetic order):

Xi Chen, Shanghai Jiao Tong University, China
Xue Chen, Shanghai Jiao Tong University, China
Qian Chu, Shanghai Jiao Tong University, China
Tao Deng, Shanghai Jiao Tong University, China
Ya Ji, Shanghai Jiao Tong University, China
Yili Ji, Shanghai Jiao Tong University, China
Xinyu Jiao, Shanghai Jiao Tong University, China
Daoping He, Shanghai Jiao Tong University, China
Jia Li, Shanghai Jiao Tong University, China
Shangchao Lin, Shanghai Jiao Tong University, China
Chang Liu, Shanghai Jiao Tong University, China
Xia Long, Shanghai Jiao Tong University, China
Kangkang Tong, Shanghai Jiao Tong University, China
Ying Wang, Shanghai Jiao Tong University, China
Rui Wu, Shanghai Jiao Tong University, China
Yuan Xue, Shanghai Jiao Tong University, China
Jun Yan, Shanghai Jiao Tong University, China
Wenbin Zhang, Shanghai Jiao Tong University, China
Yaoxin Zhang, Shanghai Jiao Tong University, China
Yuquan Zhang, Shanghai Jiao Tong University, China

CONFERENCE INFORMATION

Conference Venue

- Chen Ruiqiu Building, No. 800, Dongchuan Road, Minhang District, Shanghai, China
上海市闵行区东川路 800 号上海交通大学闵行校区陈瑞球楼

Onsite Registration

- Registration hours:
13:30-23:00, Friday, September 5th, 2025
- Location:
Shanghai Minhang Platinum Hanjue Hotel (Dalinghao Bay International Conference Center Branch)
上海闵行白金汉爵大酒店（大零号湾国际会议中心店）

Presentation Types

- Plenary Lecture 40 minutes (Including Q&A)
- Keynote Speech 30 minutes (Including Q&A)
- Invited Talk 15 minutes (Including Q&A)
- General Oral Presentation 10 minutes (Including Q&A)

Dining Arrangement

Date	Time	Meal	Location
Friday, September 5	17:30-20:30	Dinner	24 Hour Canteen 1st floor of Shanghai Minhang Platinum Hanjue Hotel
Saturday, September 6	11:50-13:30	Lunch Buffet	Restaurant on the 2nd Floor of Academic Activity Center, SJTU Minhang Campus
Saturday, September 6	18:00-20:00	Welcome Banquet	
Sunday, September 7	12:10-13:30	Lunch Buffet	

Meal Tickets can be found in the conference bag.

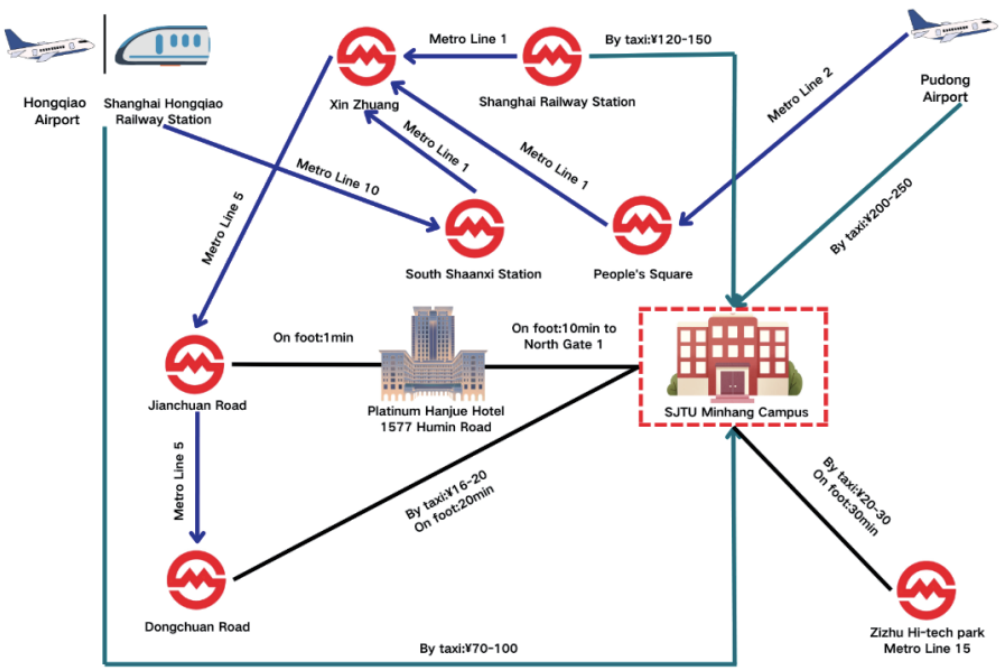
Transportation

By taxi:

- From Pudong International Airport (PVG): 60 minutes, CNY 200-250.
- From Hongqiao International Airport (SHA): 35 minutes, CNY 70-100.

By subway:

- From Pudong International Airport (PVG): Take Metro Line 2, transfer (at People's Square Station 人民广场站) to Metro Line 1, and transfer (at Xinzhuang Station 莘庄站) to Metro Line 5, and get off at Dongchuan Road Station 东川路站 (to Siyuan Gate 思源门) or Jianchuan Road Station 剑川路站 (to North Gate 1).
- From Hongqiao International Airport (SHA): Take Metro Line 10 (at Terminal 2), transfer (at South Shaanxi Road Station 陕西南路站) to Metro Line 1, and transfer (at Xinzhuang Station 莘庄站) to Metro Line 5, and get off at Dongchuan Road Station 东川路站 (to Siyuan Gate 思源门) or Jianchuan Road Station 剑川路站 (to North Gate 1 北一门).
- Shanghai Minhang Platinum Hanjue Hotel is located near Jianchuan Road Metro Station, just a 200-meter walk from Exit 1.



Shuttle Bus Service

There will be shuttle buses commuting between Platinum Hanjue Hotel and Chen Ruiqiu Building each day. The timetable is as follows:

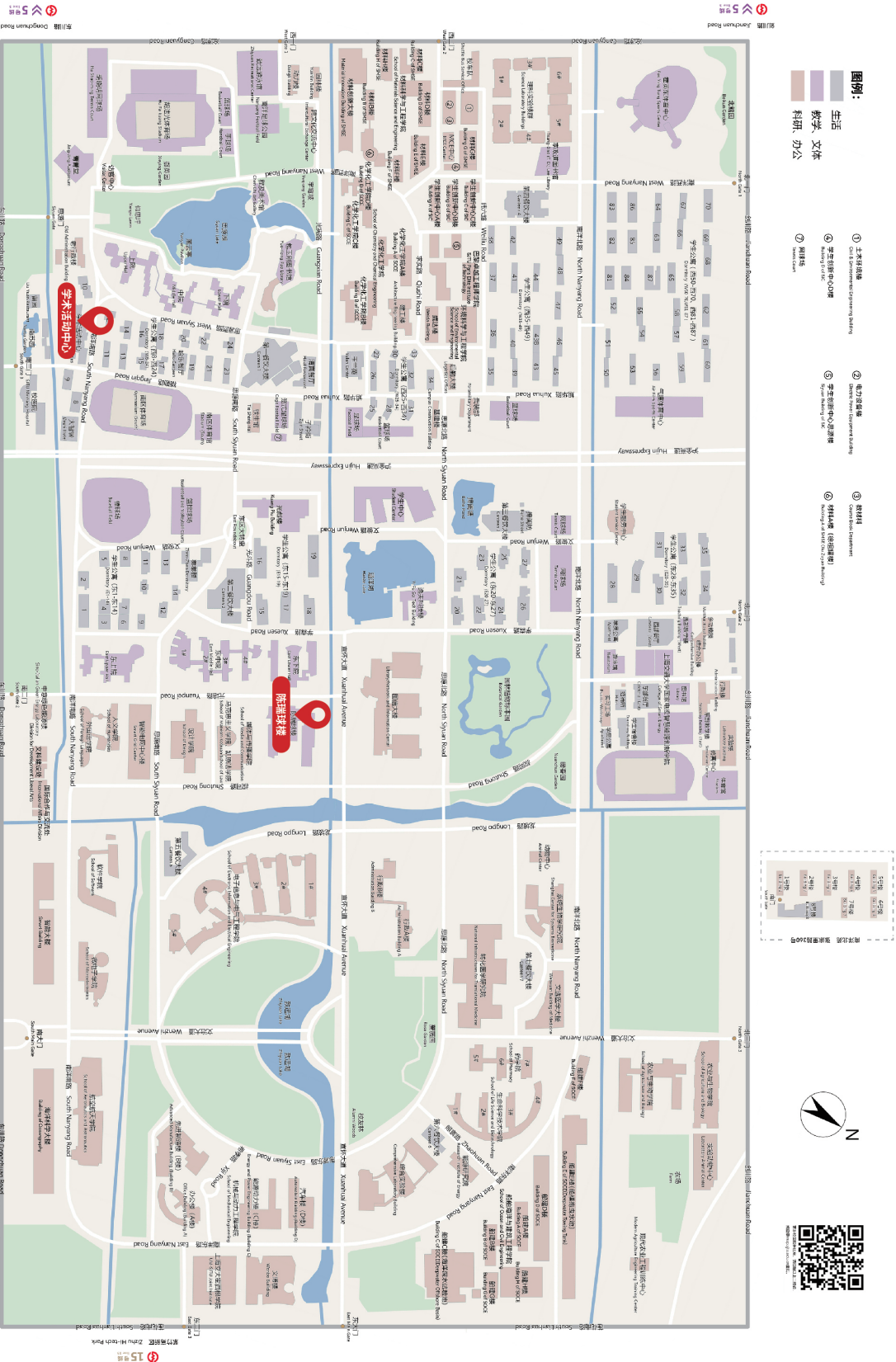
Date	Time	Route
Sept 6	07:50	Platinum Hanjue Hotel→Chen Ruiqiu Building
	11:30-12:15	Chen Ruiqiu Building→Academic Activity Center
	12:30-13:00	Academic Activity Center→Chen Ruiqiu Building
	17:50	Chen Ruiqiu Building→Academic Activity Center
	20:00	Academic Activity Center→Platinum Hanjue Hotel
Sept 7	07:50	Platinum Hanjue Hotel→Chen Ruiqiu Building
	12:00-12:15	Chen Ruiqiu Building→Academic Activity Center
	13:00-13:15	Academic Activity Center→Chen Ruiqiu Building
	17:00	Chen Ruiqiu Building→Platinum Hanjue Hotel

Internet Access

WIFI: SJTU-Guest

- User name: 2025ICCN
- Password: ICCN2025SJTU

Eduroam is available on campus as well.



PLENARY SPEAKERS



Xinhe Bao
Fudan University, China
Dalian Institute of Chemical Physics, CAS, China

Biography

Academician of the Chinese Academy of Sciences, Fellow of The World Academy of Sciences (TWAS), and Honorary Fellow of the Royal Society of Chemistry; currently Professor of Chemistry at Fudan University and Founding Director of its Advanced Institute for Future Energy; formerly President of the University of Science and Technology of China (USTC), Executive Vice President of Fudan University, and Director of the Dalian Institute of Chemical Physics (DICP), Chinese

Academy of Sciences; research centers on catalytic fundamentals and applied catalyst development for efficient energy conversion, having pioneered "Nanoconfinement Catalysis" and developed both the OXZEO® single-step synthesis of lower olefins from coal-derived syngas and catalytic systems for direct methane conversion; current research integrates renewable and fossil energy to engineer near-zero-emission coal chemical processes; honored with the China Catalysis Achievement Award (2023), Tan Kah Kee Prize in Chemical Sciences (2018), Alwin Mittasch Prize from the German Catalysis Society (2017), Outstanding Achievement Award in Natural Gas Conversion (2016), Zhou Guangzhao Foundation Prize (2015), Ho Leung Ho Lee Prize for Scientific Advancement (2012), and the National Natural Science Award (First Class, 2020).

Opportunities and Challenges in Fossil Energy Conversion Under Carbon Neutrality Goals

Abstract:

Under China's unwavering commitment to carbon peak and carbon neutrality goals—aligned with building a global community of shared future—a pivotal policy shift will transition "dual controls" from energy consumption to carbon emissions by 2026, establishing a paradigm for global climate governance. Despite rapid expansion of solar and wind power, fossil fuels (coal, oil, natural gas) still dominate China's energy structure at 80%, necessitating breakthrough technologies for efficient and low-carbon utilization of fossil resources. This presentation will introduce our laboratory's innovations in green fossil conversion: high-temperature plasma-enabled direct coal-to-acetylene production; single-step conversion of coal-derived syngas to lower olefins, bypassing the traditional Fischer-Tropsch synthesis route with high water consumption and high emissions; catalytic transformation of natural gas to lower olefins and aromatics; and carbon looping systems via high-temperature electrocatalytic CO₂ reduction for circular coal chemistry—collectively addressing decarbonization challenges during energy transition.

PLENARY SPEAKERS



Peixue Jiang
Tsinghua University, China

Biography

Professor, Academician of the Chinese Academy of Sciences. Vice president of Tsinghua University. He is Member of the Ninth Degree Committee of The State Council, Chairman of China Energy Conservation Association, Vice President of Chinese Association of Degree and Graduate Education, Director of Heat and Mass Transfer Branch of Chinese Society of Engineering Thermophysics, Vice Chairman of Beijing Association for Science and Technology. He is Deputy Chief Engineer of a Major National Project, Director of the Ministry of Education Key Laboratory, Chairman of the Beijing International Heat Transfer Conference, Academic leader of Innovation group and Excellence Research Group of National Natural Science Foundation of China. He is Honorary Professor of University

of Nottingham in UK and Russian State Research University (National Research University Moscow Power Engineering Institute). Prof. Jiang has been engaged in the research of heat and mass transfer under extreme conditions in the field of energy and power engineering. Based on the characteristics of the micro/nano structure, high temperature and high pressure, strong variation of physical properties, extremely high heat flux and hypersonic speed in the field of low-carbon energy and aerospace power system, the theory of heat and mass transfer under extreme conditions is enriched and developed, the enhanced heat transfer method of micro/nano structure and the prediction method of supercritical fluid heat and mass transfer are proposed, the key technologies of thermal protection for high-temperature surfaces, trans-critical CO₂ heat pump and CO₂ enhanced, unconventional oil/gas recovery are developed. The research results are applied in the fields of renewable energy, aerospace, CO₂ utilization and geological storage. He won the second prize of the National Natural Science Award in 2014 and the second prize of the National Technology Invention Award in 2020, Prize for Scientific and Technological Progress by the Ho Leung Ho Lee Foundation in 2019, and National advanced worker in 2020.

Research Progress on Key Technologies for Large-Scale CO₂ Storage in Deep Saline Aquifers

Abstract:

In the context of China's unique resource endowment and immense energy demand, CCUS is a key technology for achieving near-zero emissions from fossil fuels, ensuring the energy security while advancing carbon neutrality goals. CO₂ geological storage in deep saline aquifer has gained significant attention due to its vast potential. However, it faces challenges such as difficulties in site selection, low injection capacity, and insufficient safety. The geology of China's deep saline aquifers is complex, and their strong heterogeneity results in large errors in sequestration capacity assessments, limited injection capacity, and high monitoring costs, all of which hinder the commercialization of the technology. This talk will be focused on site selection, injection, and monitoring, achieving the following progress: 1) developing a CO₂ geological storage site selection technology system suitable for China's heterogeneous deep saline aquifers; 2) developing an internationally leading multi-scale experimental platform for CO₂ injection and migration and establishing a preliminary engineering technology system; 3) developing a low-cost, multi-parameter joint monitoring system covering surface, wellbore, and subsurface monitoring; 4) independently developing numerical simulation software for CO₂ storage migration and an integrated intelligent decision-making platform for CO₂ geological storage. These achievements provide technical support for China's carbon geological storage projects, promoting the large-scale application of site selection, injection, and monitoring technologies, and ensuring progress towards carbon neutrality goals.

PLENARY SPEAKERS



Xing Zhang
Tsinghua University, China

Biography

Professor Xing Zhang is a renowned expert in engineering thermophysics enjoying special government allowances from the State Council of China. He received his Ph.D. in Engineering from Tsinghua University in 1988. Afterwards, he served as a faculty member at Kyushu University, Japan. Since 2005, he serves as a professor and Director of the Institute of Engineering Thermophysics at the School of Aerospace Engineering, Tsinghua University. His research mainly focuses on microscale/nanoscale heat transfer, efficient utilization of renewable energy, thermophysical property measurement in hydrogen energy application, real-time detection and optimization of multi-physical fields in power chips, development of high-performance all-solid-state lithium-ion batteries, and precise early detection and screening of multiple cancers. He has published over 400 SCI-indexed journal papers including Science, Joule, PRL, and Nature Communications, and has given over 60 invited lectures at major International Conferences. He has led one National Key Research and Development Program project in the 13th Five-Year Plan, one Japanese Major International Cooperation Project, one 863 Project, one National Major Scientific Instrument Project, and one National Scientific Instrument Special Project. He has also been in charge of three Key Projects and two General Projects of the National Natural Science Foundation of China. He has received numerous awards, including the Second Prize of Natural Science from the State (2011), the First Prize of Natural Science from the Ministry of Education twice (2018, 2007), the "Hartnett-Irvine Award" from the International Center for Heat and Mass Transfer twice (2023, 2018), the "Thermal Engineering Award" for International Activity from the Japan Society of Mechanical Engineers (2020), the Academic Award from the Japan Heat Transfer Society twice (2021, 2008), and the "Significant Contribution Award" for Asian Thermophysical Properties Research (2013). He has been recognized as a "Highly Cited Chinese Scholar" by Elsevier for 11 consecutive years. He serves as the Vice President of the Chinese Society of Engineering Thermophysics (2014.11 - 2025.04), the Director of the Heat and Mass Transfer Branch (2009.11 - 2025.04), the Director of the Thermal Property Professional Committee of the Chinese Society for Measurement (2017.05 - present), the President (2022.10 - 2024.09), Vice President (2015.11 - 2022.09), the Chairperson of the Award Committee (2015.11 - 2022.09), and a Founding Fellow (2021 - present) of the Asian Union of Thermal Science and Engineering. He is also an Executive Committee Member (2010.08 - 2022.12) and Scientific Council Member (2008.01 - present) of the International Center for Heat and Mass Transfer (ICHMT), and the Chinese representative to the ICHMT. He was the President of the Assembly for International Heat Transfer Conferences (2018.08 - 2023.08). He serves as Associate Editor and Editorial Board member for several domestic and international top journals.

Thermophysical Property Characterization and Process Analysis of Hydrogen Mixtures at High Temperatures and High Pressures for Carbon Neutrality Applications

Abstract:

As hydrogen emerges as a pivotal clean energy carrier, understanding the thermophysical properties and behaviors of high-pressure hydrogen mixtures is critical for safe and efficient storage, transport, and utilization. This plenary lecture presents a comprehensive study on the thermophysical characterization and process analysis of high-pressure hydrogen-containing mixtures, which is critical in hydrogen infrastructure development. In the first part, the thermophysical properties of high-pressure hydrogen mixtures are systematically investigated. The homogeneity of the hydrogen-containing mixtures is validated via thermodynamic calculations of compressibility, phase equilibria, and critical points. The PVT (pressure-volume-temperature) property is measured under varying compositions and pressures, and a virial equation of state is developed based on the PVT data. Subsequently, the viscosity and thermal conductivity of these mixtures are evaluated, with emphasis on the impact of impurities (CH₄, CO₂, etc.) and chemical reactions under high-temperature conditions. A thermophysical property database is established for hydrogen and hydrogen-containing mixtures, providing essential data for system design. In the second part, critical thermophysical processes are characterized and analyzed to assess operational risks and efficiency. The jet flow characteristics of high-pressure hydrogen mixtures through orifices are measured and modeled to quantify leakage dynamics and dispersion. Permeation mechanisms in storage tanks are analyzed, considering material compatibility and pressure effects. Additionally, the influence of thermal radiation on mixture stability in storage tanks is evaluated, addressing safety concerns under abnormal fire outbreaks. The lecture will summarize the original innovations on principle, methodology, and apparatuses and recommend for future work in hydrogen mixture standardization and risk mitigation. This lecture bridges fundamental thermophysical insights with practical applications, offering actionable guidelines for hydrogen infrastructure optimization. The findings contribute to the safe scaling of hydrogen technologies, supporting global carbon neutrality goals.

PLENARY SPEAKERS



Haisheng Chen
Institute of Engineering Thermophysics, Chinese Academy of Sciences, China

Biography

Professor Haisheng CHEN, BEng, PhD, born in 1977, is currently the Director of Institute of Engineering Thermophysics (IET), Chinese Academy of Sciences (CAS). He received his bachelor from University of Xi'an Jiaotong University in 1997 and Ph.D from IET-CAS in 2002. He joined IET-CAS in 2009 as a "100-Talents" professor after previous employments with University of Leeds, IET-CAS, Vrije University of Brussels and Beihang University. He has been working on fundamental study, technological development and systems of large scale physical energy storages, especially compressed air energy storage for over 20 years. He has been awarded 40+ research projects and his research has led to 600+ peer-reviewed papers, 10+ books and 300+ patents. His publications have received 30000+ citations. He has been awarded 10+ high level prizes including Special Award of China Science and Technology Award for Young Talents, The XPlorer Prize 2021 and Newton Advanced Fellowship of the Royal Society etc. He is now the President of Energy Storage Alliance, China Energy Research Society and vice president of China Society of Engineering Thermophysics. He is currently the deputy editor-in-chief of 5 peer reviewed journals and the chair or co-chair of 8 international and China's national conferences.

Research progress in China's energy storage technology

Abstract:

This paper provides a comprehensive review of the research progress in China's energy storage technology. By reviewing and analyzing fundamental study, technical research, and integrated demonstration, the major technological advancements in China's recent energy storage field are summarized. A comprehensive analysis indicates that China's energy storage sector has experienced a rapid development, with significant achievements made in fundamental research, key technologies, and integrated demonstrations. China is now the most active country globally in all the three fields of fundamental research, technology development, and integrated demonstrations in energy storage. Moreover, the installed power of new energy storage technologies has surpassed that of pumped hydro storage for the first time, marking a historic milestone.

PLENARY SPEAKERS



Margaret Graham
The University of Edinburgh, UK

Biography

Professor Margaret Graham is the Director of the Edinburgh Earth Initiative, which supports the delivery of the University of Edinburgh's strategies on Climate and Environment. Its remit is to develop the transdisciplinary partnerships that will tackle current and future challenges within six thematic areas: Clean Energy Systems, Sustainable Future Cities, Circular Economies, Future Food Systems, One Health, Data/AI and Sustainability (www.earth.ed.ac.uk). She is the University of Edinburgh lead for our Low Carbon College partnership with Shanghai Jiao Tong University that won the 2022 British Chamber of Commerce/British Business Council Award for an

Education Partnership. Professor Graham is also Co-Director of the International Institute for Environmental Studies (IIES), a virtual network of ~30 universities (including the University of Edinburgh and Shanghai Jiao Tong University) that supports academic and research enterprises in the areas of environmental science, environmental management and sustainability studies. The Institute fosters international exchanges of research scientists, field experts, faculty members, post-doctoral fellows and students as well as facilitating exchange of ideas research needs, and results among IIES members (www.ii-es.com). Professor Graham holds a Personal Chair in Environmental Geochemistry at the University of Edinburgh. Her research interests include soil and groundwater geochemistry, climate change and biogeochemical cycles, environmental analytical chemistry, isotopic composition and ICP-MS techniques, nanofiltration and membrane fouling in water treatment. She is an International Board Member of the International Water Association, a member of the UK Drinking Water Reservoir Management Group and has been an invited expert for the US Environmental Protection Agency, the Drinking Water Quality Regulator (Scotland) and Scottish Water.

Carbon neutrality and sustainable water systems: addressing climate-induced impacts on drinking water quality

Abstract:

Global goals of providing 'clean drinking water for all' increasingly brings challenges for curtailing carbon emissions. In the context of climate change, there are growing issues around source water contamination including elevated concentrations of manganese, taste-and-odour, harmful algal blooms as well as a range of emerging contaminants such as PFAS, plastics, pharmaceutical and viruses. This paper will focus on the growing global issue of elevated dissolved manganese levels in shallow surface drinking water sources. Manganese at low concentrations is an essential element for all living organisms but excessive concentrations in drinking water pose a risk to human health. It affects cognitive function and the central nervous system, and is linked to manganism in adults and a reduction in IQ levels in children. There is growing recognition that manganese in drinking water is becoming a pressing global problem, affecting countries such as Bangladesh, Cambodia, Canada, China, Germany, Korea, UK, US among others. High concentrations are not only found in groundwater but in surface waters, where rapid seasonally related increases can overwhelm water treatment systems and result in impaired tap water for the consumer. Moreover, where lead pipes remain in distribution systems, high dissolved manganese concentrations has also been linked with enhanced lead release, providing an additional neurological risk to health. Particle releases from manganese deposits within distribution systems have also been implicated in virus release. There is a clear need for effective water treatment methods to protect human health but these must be balanced against their likely efficacy under ambient conditions within natural systems and the potentially considerable carbon (energy, chemicals, infrastructure) costs. Current water treatment approaches include filtration (e.g. reverse osmosis) and oxidation (e.g. ozonation, permanganate) or in-situ methods such as hypolimnetic oxygenation (HOx; e.g. bubble curtains) and reservoir mixing (e.g. ResMix). This paper will review the processes underpinning the solubilisation of manganese in shallow surface drinking water sources and their impacts upon the costs and effectiveness of manganese removal approaches.

PLENARY SPEAKERS



Yong Tae Kang
Korea University, Korea

Biography

He received his BS and MS at Department of Mechanical Eng., Seoul National University in 1987 and 1989, respectively, and PhD at Department of Mechanical Eng, The Ohio State University in 1994. After spending two years at the OSU as a postdoctoral researcher, he joined JST as a special researcher and TUAT, Tokyo, Japan as a visiting professor in 1997. After spending three years at JST and TUAT, he joined the faculty at Kyung Hee University, Korea in 2000, and moved to Korea University as a full professor in 2014. His research focuses on thermal energy systems including absorption heat pumps, heat exchanger design, refrigeration systems, thermal energy storage, CO₂ capture using nanoabsorbents and sorption thermal battery. He published more than 450 international papers and more than 250 conference papers. He is now a member of ASHRAE (American Society of Heating, Refrigeration, and Air-Conditioning Engineers), KSME (Korean Society of Mechanical Engineers), IIR (International Institute of Refrigeration), JSHRAE (Japanese Society of

Heating, Refrigeration, and Air-Conditioning Engineers) and SAREK (Society of Air-Conditioning and Refrigeration Engineers of Korea). In 2010, his lab. was designated as a National Research Lab. by the Ministry of Science and Technology. In 2015, he received the Asian Academic Award jointly from SAREK/CAR/JSRAE. In 2017, he received the best research award from Korea University. In 2019, he was elected as a fellow of The Korean Academy of Science and Technology. He was also elected as a fellow of National Academy of Engineering of Korea in 2020. He served as a director of BK21 plus center for creative research engineers of convergence mechanical systems, School of Mechanical Engineering, Korea University. He is a former president of SAREK in 2022 and now fellow of SAREK and AUTSE. Now he is a director of Research Center for Plus Energy Building Innovative Technology (ERC) sponsored by Korea Government.

Sorption thermal battery and CO₂ capture-integrated ERV system for plus energy building applications

Abstract:

A key strategy for realizing a plus-energy building, beyond the net-zero energy building, is to utilize renewable energy sources such that the amount of generated energy exceeds the energy consumed. Due to the mismatch between energy supply and demand, the application of a high-performance energy storage system is essential for the effective utilization of renewable energy. Additionally, minimizing unavoidable energy consumption within buildings is also important. Among such energy loads, ventilation plays a vital role in maintaining comfortable indoor air quality, particularly by regulating indoor CO₂ concentrations. Accordingly, this study introduces two key technologies of plus energy building: adsorption-driven sorption thermal battery (STB), and a CO₂ capture-integrated energy recovery ventilation (CERV) system. First, the STB stores thermal energy by utilizing renewable sources (e.g., solar energy) during off-peak periods and discharges it whenever thermal loads exist. It operates via a reversible solid-gas reaction, storing energy as chemical potential without losses. During the charging process, the sorbate acquires sufficient momentum to overcome the binding forces with the sorbent, resulting in phase separation and energy storage. Conversely, discharging occurs when the sorbate undergoes a phase change upon re-contact with the sorbent, releasing heat for practical use. This form of thermal storage eliminates the need for thermal insulation and allows for compact systems with high energy storage density. To enhance system-level performance, this study proposes and validates a generalized optimization methodology for STB reactor employing a LiOH-impregnated zeolite 13X (LiOH@Z-13X) composite adsorbent. A lab-scale STB system is constructed, and dynamic simulations are performed using a simplified breakthrough curve model to identify key operating parameters. Combined with material characterization, the effects of operating conditions are experimentally investigated to optimize performance at both the particle and reactor levels. To the best of our knowledge, this is the first study to evaluate the reactor-scale performance of an STB using a LiOH@Z-13X composite, bridging the gap between material-scale properties and system-scale applications. The breakthrough curve approach enables a comprehensive assessment of key factors such as packing density, reactor length, vapor concentration, and flow rate. These variables are unified into a dimensionless moisture-adsorption distance (ξ), allowing for generalized prediction of system performance. Model predictions are experimentally validated, and optimal operating conditions are identified to achieve desired thermal output. The optimal operating range is determined to be $\xi = 0.105\text{--}0.118$, achieving a maximum system-level ESD of 188.4 kWh m⁻³, which represents a 38 % improvement compared to 136.3 kWh m⁻³ at $\xi = 0.038$. Furthermore, a high-performance STB system must not only exhibit high energy density but also ensure stable thermal output. To this end, a novel adaptive vapor flux regulation strategy is developed and experimentally validated to mitigate thermal attenuation. Under identical operating conditions, the application of adaptive flux control extended the stable heat output duration from 80 minutes (in constant flux mode) to 226 minutes. These results provide practical insights for the real-world deployment of high-performance STB systems. Next, to address the lack of conventional indoor CO₂ control technologies, this study further proposes a novel CO₂ capture-integrated energy recovery ventilation (CERV) system that incorporates a high-performance CO₂ filter, enabling continuous indoor CO₂ removal while reducing ventilation-related energy consumption. An amine-functionalized sorbent is developed and characterized, and its durability is evaluated under repeated adsorption-desorption cycles to confirm its applicability in indoor environments. Sorbent performance is quantified and integrated into a CO₂ concentration-based feedback control algorithm to assess its impact on CO₂ reduction and ventilation energy savings. Simulation-based evaluations under varying indoor conditions revealed that, under optimal control strategies, the proposed system reduced annual heating and cooling loads by 52.6% and 27.9%, respectively, compared to a conventional ERV system. In parallel with this ventilation load reduction strategy, the study further explores a novel direction by developing a lab-scale prototype CO₂ capture filter and evaluating its performance under realistic indoor conditions, thereby assessing the practical feasibility of its indoor implementation.

PROGRAM OVERVIEW

Friday, September 5, 2025
Shanghai Minhang Platinum Hanjue Hotel
上海闵行白金汉爵大酒店

Time	Location	Content
13:30-23:00	The lobby of Shanghai Minhang Platinum Hanjue Hotel	Onsite Registration
17:30-20:30	24 Hour Canteen 1 st floor of Shanghai Minhang Platinum Hanjue Hotel	Dinner

Saturday, September 6, 2025
Chen Ruiqiu Building 100, Shanghai Jiao Tong University (Minhang District)
上海交通大学（闵行校区）陈瑞球楼 100 号报告厅

Time	Content
08:30-09:10	Opening Ceremony & Welcome Speech
09:10-09:20	Group Photo
09:20-09:30	Introduction to <i>Carbon Neutrality</i>
09:30-10:10	Plenary Lecture: Xinhe Bao
10:10-10:30	Coffee Break
10:30-11:10	Plenary Lecture: Peixue Jiang
11:10-11:50	Plenary Lecture: Yong Tae Kang
11:50-13:30	Lunch Break Restaurant on the 2nd Floor of Academic Activity Center, SJTU Minhang Campus

PROGRAM OVERVIEW

Saturday, September 6, 2025
Chen Ruiqiu Building, Shanghai Jiao Tong University (Minhang District)
上海交通大学（闵行校区）陈瑞球楼

Time	Location	Content
Keynote, Invited and Oral Presentations		
13:30-15:00	Chen Ruiqiu Building 117	Session 1 - Hydrogen and renewable energy technologies
	Chen Ruiqiu Building 121	Session 2 - Catalysis and environmental science
	Chen Ruiqiu Building 216	Session 3 - Advanced energy storage
	Chen Ruiqiu Building 219	Session 4 - Negative emission technologies
	Chen Ruiqiu Building 114	Session 5 - Smart energy, low carbon technologies and applications
15:00-15:15	Coffee Break	
15:15-16:45	Chen Ruiqiu Building 117	Session 6 - Hydrogen and renewable energy technologies
	Chen Ruiqiu Building 121	Session 7 - Catalysis and environmental science
	Chen Ruiqiu Building 216	Session 8 - Carbon finance, management and policy
	Chen Ruiqiu Building 219	Session 9 - Negative emission technologies
	Chen Ruiqiu Building 114	Roundtable of Top Journal Editors
16:45-17:45	Poster Session	
18:00-20:00	Welcome Banquet Restaurant on the 2nd Floor of Academic Activity Center, SJTU Minhang Campus	

Sunday, September 7, 2025
Chen Ruiqiu Building 100, Shanghai Jiao Tong University (Minhang District)
上海交通大学（闵行校区）陈瑞球楼 100 号报告厅

Time	Content
08:30-09:10	Plenary Lecture: Xing Zhang
09:10-09:50	Plenary Lecture: Haisheng Chen
09:50-10:30	Plenary Lecture: Margaret Graham
10:30-10:50	Coffee Break

PROGRAM OVERVIEW

Sunday, September 7, 2025
Chen Ruiqiu Building, Shanghai Jiao Tong University (Minhang District)
上海交通大学（闵行校区）陈瑞球楼

Time	Location	Content
Keynote, Invited and Oral Presentations		
10:50-12:10	Chen Ruiqiu Building 117	Session 10 - Hydrogen and renewable energy technologies
	Chen Ruiqiu Building 121	Session 11 - Catalysis and environmental science
	Chen Ruiqiu Building 216	Session 12 - Advanced energy storage
	Chen Ruiqiu Building 219	Session 13 - Negative emission technologies
	Chen Ruiqiu Building 114	Session 14 - Smart energy, low carbon technologies and applications
12:10-13:30	Lunch Break Restaurant on the 2nd Floor of Academic Activity Center, SJTU Minhang Campus	
13:30-15:00	Chen Ruiqiu Building 117	Session 15 - Hydrogen and renewable energy technologies
	Chen Ruiqiu Building 121	Session 16 - Advanced energy storage
	Chen Ruiqiu Building 216	Session 17 - Negative emission technologies
	Chen Ruiqiu Building 219	Session 18 - Carbon finance, management and policy
	Chen Ruiqiu Building 114	Session 19 - Smart energy, low carbon technologies and applications
15:00-15:15	Coffee Break	
15:15-16:30	Chen Ruiqiu Building 117	Session 20 - Catalysis and environmental science
	Chen Ruiqiu Building 121	Session 21 - Advanced energy storage
	Chen Ruiqiu Building 216	Session 22 - Negative emission technologies
	Chen Ruiqiu Building 219	Session 23 - Carbon finance, management and policy
	Chen Ruiqiu Building 114	Session 24 - Smart energy, low carbon technologies and applications
16:30-17:00	Closing Ceremony and Awarding Chen Ruiqiu Building 100, Shanghai Jiao Tong University (Minhang District) 上海交通大学（闵行校区）陈瑞球楼 100 号报告厅	

CONFERENCE PROGRAM

Saturday, September 6, 2025
Chen Ruiqiu Building 100, Shanghai Jiao Tong University (Minhang District)
上海交通大学（闵行校区）陈瑞球楼 100 号报告厅

Time	Content	
Opening Ceremony & Welcome Speech Host: Changying Zhao		
08:30-08:40	Changying Zhao (Welcome and Introduction to VIP) Conference Chair, Editor-in-Chief of Carbon Neutrality Chair Professor, Shanghai Jiao Tong University	
08:40-08:50	Vice President Shanghai Jiao Tong University	
08:50-09:00	Hongguang Jin Academician of the Chinese Academy of Sciences, Honorary President of the Chinese Society of Engineering Thermophysics International Scientific Committee Chair, Honorary Editor-in-Chief of <i>Carbon Neutrality</i>	
09:00-09:10	Deputy Director Shanghai Municipal Development & Reform Commission	
09:10-09:20	Group Photo	
09:20-09:30	Introduction to <i>Carbon Neutrality</i> , Changying Zhao	
Plenary Lectures (Chairs: Peixue Jiang, Xing Zhang)		
09:30-10:10	Plenary Lecture	Xinhe Bao, Fudan University; Dalian Institute of Chemical Physics, CAS Title: Opportunities and Challenges in Fossil Energy Conversion Under Carbon Neutrality Goals
10:10-10:30	Coffee Break	
10:30-11:10	Plenary Lecture	Peixue Jiang, Tsinghua University Title: Research Progress on Key Technologies for Large-Scale CO ₂ Storage in Deep Saline Aquifers
11:10-11:50	Plenary Lecture	Yong Tae Kang, Korea University Title: Sorption thermal battery and CO ₂ capture-integrated ERV system for plus energy building applications
11:50-13:30	Lunch Break Restaurant on the 2nd Floor of Academic Activity Center, SJTU Minhang Campus	

CONFERENCE PROGRAM

Session 1: Hydrogen and renewable energy technologies

Chairs: Yaoxin Zhang, Tao Xie 13:30-15:00, Saturday, September 6 Location: Room 117, Chen Ruiqiu Building	
13:30-14:00	Keynote Lecture
Title	Use of cracked ammonia for the transition to zero carbon heating
Authors	Agustin Valera Medina, Balakrishnan Aravind, Sivachidambaram Sadasivam, Marco Jano-Ito, Jordan Davies, Daisuke Sato, Syed Mashruk
Affiliation	Cardiff University
14:00-14:15	Invited Talk
Title	Green ammonia synthesis via air-plasma oxidation and electrocatalytic reduction
Authors	Ali Jalili
Affiliation	University of New South Wales
14:15-14:30	Invited Talk
Title	Analysis of catalytic mechanism and system integration characteristics of solar-driven photothermal catalytic methane reforming process
Authors	Tao Xie, Zhenyu Zhang, Jilong Yao
Affiliation	Xi'an Jiaotong University
14:30-14:40	Oral Presentation
Title	Weak flame bifurcation in NH ₃ /H ₂ O ₂ counterflow flame extinction: dual-mode combustion dynamics and kinetic pathway analysis
Authors	Jiuyi Zhang, Yinhu Kang
Affiliation	Chongqing University
14:40-14:50	Oral Presentation
Title	Controllable synthesis of two-dimensional high-entropy transition metal oxides for enhanced oxygen evolution reaction catalysis
Authors	Yilin Dong, Xia Long
Affiliation	Shanghai Jiao Tong University
14:50-15:00	Oral Presentation
Title	Microwave-absorbing Ni/CaO-CNT catalyst for enhanced transesterification: bridging magnetic loss to energy-efficient FAME production
Authors	Weiguo Liu, Hui Li
Affiliation	Shandong Jianzhu University
15:00-15:15	Coffee Break

CONFERENCE PROGRAM

Session 2: Catalysis and environmental science

Chairs: Jia Li, Xinghui Liu 13:30-15:00, Saturday, September 6 Location: Room 121, Chen Ruiqiu Building	
13:30-13:45	Invited Talk
Title	From waste to power: graphene synthesis from spent lithium-ion batteries for supercapacitors
Authors	Jia Li
Affiliation	Shanghai Jiao Tong University
13:45-14:00	Invited Talk
Title	Dual-functional electrosynthesis: concurrent production of 5,5'-azotetrazolate energetic materials and hydrogen
Authors	Huizhen Jin, Hongchao Ma, Xinghui Liu
Affiliation	Hubei Institute of Aerospace Chemical Technology
14:00-14:10	Oral Presentation
Title	Molten salt-assisted pyrolysis for the synthesis of efficient Fe-N-C electrocatalysts for oxygen reduction reaction from coal gasification fine slag
Authors	Zheng Gao, Zirun Li, Jixuan Zhang, Xiangxin Han, Jianguo Liu
Affiliation	Shanghai Jiao Tong University
14:10-14:20	Oral Presentation
Title	Tailoring interlayer microenvironment of two-dimensional layered double hydroxides for CO ₂ reduction with enhanced C ₂ ⁺ production
Authors	Tong Wu, Xia Long
Affiliation	Shanghai Jiao Tong University
14:20-14:30	Oral Presentation
Title	Monte-Carlo ray tracing simulation of view factors for diffuse solar radiation determination in a cylindrical photobioreactor array for microalgae cultivation
Authors	Yihan Zheng, Lifeng Li, Shengkai Dai, Donghang Liu, Hao Zheng, Song Yang, Yanming Guo, Muhammad Rafique, Bo Wang, Chi-Hwa Wang, Yong Shuai
Affiliation	Harbin Institute of Technology
14:30-14:40	Oral Presentation
Title	Efficient low temperature degradation of perfluorinated gas via thermal-dynamic guided couple reaction
Authors	Boxu Dong, Yaru Zhang, Menghan Yang, Jiantao Zai, Xuefeng Qian
Affiliation	Shanghai Jiao Tong University
14:40-14:50	Oral Presentation
Title	Integrated reaction-extraction systems catalyzed by type III porous liquid for enhanced the cycloaddition efficiency of CO ₂ and styrene oxide
Authors	Zhiwei Dong, Yudong Ding, Hong Wang, Min Cheng, Xun Zhu, Qiang Liao
Affiliation	Chongqing University
14:50-15:00	Oral Presentation
Title	Tuning the active phase of Fe @ C catalyst enables highly active and selective towards CO ₂ reduction to CO: an Experimental combining DFT study
Authors	Yang Gao, Jingbo Du, Fayi Jin, Zhiyu Chen, Xiaoli Yang, Zhen Huang, Jia Yang
Affiliation	Shanghai Jiao Tong University
15:00-15:15	Coffee Break

CONFERENCE PROGRAM

Session 3: Advanced energy storage

Chairs: Jun Yan, Yuan Xue 13:30-15:00, Saturday, September 6 Location: Room 216, Chen Ruiqiu Building	
13:30-14:00	Keynote Lecture
Title	New thermodynamic mechanism and method study for solar thermochemical fuel production
Authors	Qibin Liu
Affiliation	The Institute of Engineering Thermophysics, Chinese Academy of Sciences
14:00-14:15	Invited Talk
Title	Research on energy storage based on gas-solid chemical reactions
Authors	Jun Yan
Affiliation	Shanghai Jiao Tong University
14:15-14:30	Invited Talk
Title	Recent progress on Halide all-solid-state batteries
Authors	Changhong Wang
Affiliation	Eastern Institute of Technology, Ningbo
14:30-14:40	Oral Presentation
Title	CuO-CeO ₂ lattice matching for large-scale and long-term thermochemical energy storage
Authors	Lei Liu, Zijian Zhou, Xiaowei Liu, Minghou Xu
Affiliation	Huazhong University of Science and Technology
14:40-14:50	Oral Presentation
Title	Tunable marangoni flow inside plasmonic droplet
Authors	Dezhao Huang, Jiajie Lei, Bokai Liao, Yanan Yue
Affiliation	Wuhan University
14:50-15:00	Oral Presentation
Title	Adaptive parametric tuning of cobalt oxide redox reactors for enhanced thermochemical energy storage
Authors	Danni Ma, Shuo Zhang, Boxi Geng, Boshu Jiang, Tiantian Yan, Wei Wang, Bachirou Guene Lougou, Yong Shuai
Affiliation	Harbin Institute of Technology
15:00-15:15	Coffee Break

CONFERENCE PROGRAM

Session 4: Negative emission technologies

Chairs: Tao Ren, Yan Jing 13:30-14:50, Saturday, September 6 Location: Room 219, Chen Ruiqiu Building	
13:30-14:00	Keynote Lecture
Title	Progress and challenges of integrated technology for carbon dioxide geological storage and enhanced oil recovery
Authors	Bo Peng
Affiliation	China University of Petroleum, Beijing
14:00-14:15	Invited Talk
Title	Deep learning in satellite remote sensing of greenhouse gases
Authors	Tao Ren
Affiliation	Shanghai Jiao Tong University
14:15-14:30	Invited Talk
Title	Electrochemically induced carbon dioxide capture with aqueous redox sorbents
Authors	Yan Jing
Affiliation	National University of Singapore
14:30-14:40	Oral Presentation
Title	Thermal degradation mechanism and inhibition strategy of triamine-based absorbents in CO ₂ capture: an integrated experimental and molecular simulation study
Authors	Yongkang Cui, Xinyue Chen, Xiaokai Gu, Zhonghao Wang, Shujuan Wang
Affiliation	Tsinghua University
14:40-14:50	Oral Presentation
Title	Energetically autarkic direct air capture of carbon dioxide
Authors	Jian Zeng, Hsinhan Tsai, Jeffrey R. Long, Ravi S. Prasher, Sean Lubner
Affiliation	The Hong Kong University of Science and Technology (Guangzhou)
15:00-15:15	Coffee Break

CONFERENCE PROGRAM

Session 5: Smart energy, low carbon technologies and applications

Chairs: Shangchao Lin, Changying Xiang 13:30-15:00, Saturday, September 6 Location: Room 114, Chen Ruiqiu Building	
13:30-14:00	Keynote Lecture
Title	Machine-learned atomistic modeling of carbon for sustainable energy applications: phase diagrams, heat conductivity and interaction with salt ions
Authors	<u>Tapio Ala-Nissila</u> , Miguel A. Caro, Zheyong Fan, Alexis Front, Arsalan Hashemi, Heikki Muhli, Yanzhou Wang
Affiliation	Aalto (FIN) and Loughborough University (UK)
14:00-14:15	Invited Talk
Title	Green and scalable solid-state cooling based on colossal barocaloric plastic crystals
Authors	<u>Shangchao Lin</u>
Affiliation	Shanghai Jiao Tong University
14:15-14:30	Invited Talk
Title	Façade-integrated photovoltaics for low-carbon buildings- case studies in Hong Kong
Authors	<u>Changying Xiang</u>
Affiliation	The Hong Kong University of Science and Technology
14:30-14:40	Oral Presentation
Title	Oxygen plasma-assisted pulsed laser deposition of terbium doped Ga ₂ O ₃ films
Authors	<u>Qixin Guo</u> , Yuki Kawano, Kento Imari, Katsuhiko Saito, Tooru Tanaka
Affiliation	Saga University
14:40-14:50	Oral Presentation
Title	Equivalent analysis of ejector in high-temperature heat pump systems with zeotropic refrigerant for industrial waste heat recovery
Authors	<u>Zhengyong Li</u> , Youcai Liang, Yan Zhu, Kai Ye, Jidong Lu
Affiliation	South China University of Technology
14:50-15:00	Oral Presentation
Title	Preparation of green cementitious composite-based CO ₂ foam concrete and the macro-/micro-properties and mineralization mechanism
Authors	<u>Chuanqi Wen</u> , Jingwei Li, Yanhui Liu, Xinyu Wang, Wenlong Wang
Affiliation	Shandong University
15:00-15:15	Coffee Break

CONFERENCE PROGRAM

Session 6: Hydrogen and renewable energy technologies

Chairs: Yong Ren, Yue Yang 15:15-16:45, Saturday, September 6 Location: Room 117, Chen Ruiqiu Building	
15:15-15:30	Invited Talk
Title	Photocatalytic hydrogen evolution based on core-shell Ni/NiO/Ni ₂ O ₃ /TiO ₂ -CNT composites
Authors	Jiayou Mou, Chenxi Wang, <u>Yong Ren</u>
Affiliation	University of Nottingham Ningbo China
15:30-15:45	Invited Talk
Title	Investigation of the energy-saving and daylighting features of a novel multifunctional PV/T window
Authors	Mostafa M. Abd El-Samie, <u>Yue Yang</u>
Affiliation	Harbin Institute of Technology
15:45-15:55	Oral Presentation
Title	Modeling of a graded metal foam flow channel in PEMFC with enhanced oxygen transport and distribution
Authors	<u>Jiacheng Li</u> , Xue Gong , Xiaowen Hao, Fangzhou Wang
Affiliation	Harbin Institute of Technology at Weihai
15:55-16:05	Oral Presentation
Title	Analysis of mass and heat transfer in the spray mixing process of liquefied natural gas
Authors	<u>Hongpu Wang</u> , Zhiqian Wang, Tianwei Wu, Chen Jiao, Tao Liu, Guang Yang
Affiliation	Shanghai Jiao Tong University
16:05-16:15	Oral Presentation
Title	Design of thermal management system coupled with heat pump for metal hydride hydrogen storage tank
Authors	<u>Shuo Zhang</u> , Shiqing Chen, Shiwei Hu, Runze Wang, Siqi Zhang , Xinjing Zhang , Yujie Xu,Haisheng Chen
Affiliation	Shenyang Aerospace University
16:15-16:25	Oral Presentation
Title	Hydrogen production via cascade aqueous reforming of byproducts from biomass hydrothermal liquefaction
Authors	<u>Qianhui Liu</u> , Bingshuo Li, Tianhua Yang, Zhuo Wang, Rundong Li
Affiliation	Shenyang Aerospace University
16:25-16:35	Oral Presentation
Title	A novel theoretical optical efficiency limit model guiding heliostat field optimization
Authors	<u>Jiachen Li</u> , <u>Weiwei Yang</u> , <u>Yaling He</u>
Affiliation	Xi'an Jiaotong University
16:35-16:45	Oral Presentation
Title	Optimal scheduling of a low-carbon multi-energy system: integration of oxy-coal combustion and power-to-gas under material-energy flows constraints
Authors	<u>Yuting Wang</u> , Yuegui Zhou
Affiliation	Shanghai Jiao Tong University
16:45-17:45	Poster Session
18:00-20:00	Welcome Banquet Restaurant on the 2 nd Floor of Academic Activity Center, SJTU Minhang Campus

CONFERENCE PROGRAM

Session 7: Catalysis and environmental science

Chairs: Zheng Xing, Zijian Zhou 15:15-16:30, Saturday, September 6 Location: Room 121, Chen Ruiqiu Building	
15:15-15:30	Invited Talk
Title	Construction of a noble-metal-free bifunctional photocatalytic system from 1D CdS for simultaneous H ₂ fuel production and value-added organic transformation
Authors	Yuxing Chen, Hui Xie, Ming Ma, <u>Zheng Xing</u>
Affiliation	Sun Yat-sen University
15:30-15:40	Oral Presentation
Title	Hydrophobic core-shell CZ/Uio-66@mSiO ₂ -Me catalyst for enhancing CO ₂ hydrogenation to methanol
Authors	<u>Mengfan Liu</u> , Bin Hu, Yuan-gu Xia, Ji Liu, Qiang Lu
Affiliation	North China Electric Power University
15:40-15:50	Oral Presentation
Title	Bridging-toughened iron ore oxygen carriers via potassium feldspar modification: Enhanced attrition resistance and reactivity in chemical looping combustion
Authors	<u>Dan Zhu</u> , Bo Wang, Caifu Li, Chen Song, Fang Liu, Lifeng Li, Chi-Hwa Wang, Yong Shuai
Affiliation	Harbin Institute of Technology
15:50-16:00	Oral Presentation
Title	Unlocking C ₃ O ₄ products in CO electroreduction via one-step square-ring coupling on Cu ₄ -embedded carbon nitride
Authors	<u>Dewei Zhang</u> , Shenghong Ju
Affiliation	Shanghai Jiao Tong University
16:00-16:10	Oral Presentation
Title	Low temperature SCR denitration with NH ₃ via synergistic effect of highly dispersed Fe-Co sites
Authors	<u>Pengxin Zeng</u> , Zijian Zhou, Lei Liu, Ruichang Xu, Xiaowei Liu, Minghou Xu
Affiliation	Huazhong University of Science and Technology
16:10-16:20	Oral Presentation
Title	Investigation on combustion characteristics of Geldart D particles in a randomly packed bed
Authors	<u>Weiqin Lu</u> , Xueyu Tang, Yinqiang Song, Yang Zhang, Junfu Lyu, Weixiong Zheng, Xiwei Ke
Affiliation	Tsinghua University
16:20-16:30	Oral Presentation
Title	Surface reaction mechanism of CH ₄ oxidation on Fe-Al particles for sintering flue gas treatment through circulating fluidized bed combustion
Authors	<u>Xueyu Tang</u> , Weiqin Lu, Bingjun Du, Yang Zhang, Junfu Lyu, Dan Li, Xiwei Ke
Affiliation	Tsinghua University Shanxi Research Institute of Huairou Laboratory
16:45-17:45	Poster Session
18:00-20:00	Welcome Banquet Restaurant on the 2 nd Floor of Academic Activity Center, SJTU Minhang Campus

CONFERENCE PROGRAM

Session 8: Carbon finance, management and policy

Chairs: Fan Tong, Yuquan Zhang 15:15-16:45, Saturday, September 6 Location: Room 216, Chen Ruiqiu Building	
15:15-15:45	Keynote Lecture
Title	Development of the carbon market under the dual-carbon strategy
Authors	<u>Jin Li</u>
Affiliation	Shanghai Environment and Energy Exchange Ltd
15:45-16:00	Invited Talk
Title	Deep learning-based prediction of carbon prices in China
Authors	Liu Pengju, Jingwen Xu, <u>Fan Tong</u>
Affiliation	Beihang University
16:00-16:15	Invited Talk
Title	Measuring carbon footprints of waste recycling: Implications of textile vs. aluminum comparison
Authors	<u>Yuquan Zhang</u>
Affiliation	Shanghai Jiao Tong University
16:15-16:25	Oral Presentation
Title	The relationship between ESG performance and financial performance: An empirical study of Shanghai and Shenzhen A-share listed companies
Authors	<u>Jiaqing Liu</u> , Yuhan Xia, Fan Tong
Affiliation	Beihang University
16:25-16:35	Oral Presentation
Title	Transition to a Carbon-Neutral Economy: The Singapore Experience
Authors	<u>Thi Thu Huong Ha</u>
Affiliation	Singapore University of Social Sciences
16:35-16:45	Oral Presentation
Title	Multi-product CO ₂ cost accounting for an iron and steel manufacturing process
Authors	<u>Wenwu Ding</u>
Affiliation	Xihua University
16:45-17:45	Poster Session
18:00-20:00	Welcome Banquet Restaurant on the 2 nd Floor of Academic Activity Center, SJTU Minhang Campus

CONFERENCE PROGRAM

Session 9: Negative emission technologies

Chairs: Zheng Ling, Zhenyuan Yin 15:15-16:45, Saturday, September 6 Location: Room 219, Chen Ruiqiu Building	
15:15-15:30	Invited Talk
Title	Nano-clay in gas hydrate formation for carbon emission reduction: a “natural” choice
Authors	<u>Zheng Ling</u>
Affiliation	Dalian University of Technology
15:30-15:45	Invited Talk
Title	Rapid CO ₂ clathrate formation kinetics enabled by L-methionine for subsea sequestration
Authors	<u>Zhenyuan Yin</u>
Affiliation	Tsinghua University
15:45-15:55	Invited Talk
Title	Construction and validation of a high-resolution XCO ₂ dataset for eastern China: a multi-source comparative study
Authors	<u>Wenjia Li</u> , Tao Ren
Affiliation	Shanghai Jiao Tong University
15:55-16:05	Oral Presentation
Title	A machine learning surrogate model for WRF-Chem: daily high-resolution XCO ₂ estimation in east China
Authors	<u>Xijiade Aihemaiti</u> , Wenjia Li, Tao Ren
Affiliation	Shanghai Jiao Tong University
16:05-16:15	Oral Presentation
Title	Optimizing liquid CO ₂ injection for long-term sequestration as hydrates in South China Sea marine sediments
Authors	<u>Yuhang Gu</u> , Xuejian Liu, Hongfeng Lu, Chenlu Xu, Jinfeng Ren, Zhenyuan Yin
Affiliation	Tsinghua University
16:15-16:25	Oral Presentation
Title	Kinetic model describing the effect of amine loading and temperature on CO ₂ capture by solid amine adsorbent
Authors	<u>Shun Wang</u> , Yuqun Zhuo
Affiliation	Tsinghua University
16:25-16:35	Oral Presentation
Title	Formulating CO ₂ -in-H ₂ O emulsions for enhanced CO ₂ hydrate kinetics: Implications for hydrate-based CO ₂ sequestration
Authors	<u>Jiayu Sun</u> , Xuejian Liu, Zhenyuan Yin
Affiliation	Tsinghua University
16:35-16:45	Oral Presentation
Title	Investigations of NO _x reduction in ammonia-methane combustion: a combined ReaxFF molecular dynamics and machine learning approach
Authors	<u>Amirali Shateri</u> , Nasser Sherkat, Zhiyin Yang, Jianfei Xie
Affiliation	University of Derby
16:45-17:45	Poster Session
18:00-20:00	Welcome Banquet Restaurant on the 2 nd Floor of Academic Activity Center, SJTU Minhang Campus

Roundtable of Top Journal Editors

Chair: Changying Zhao 15:15-16:45, Saturday, September 6 Location: Room 114, Chen Ruiqiu Building	
	《Carbon Neutrality》 Editor-in-Chief: Prof. Changying Zhao
	《Proceedings of the Combustion Institute》 Editor-in-Chief: Prof. Fei Qi
	《Solar Energy》 Subject Editor: Prof. Yanjun Dai
	《Energy》 Subject Editor: Prof. Tianshu Ge
	《Nature Climate Change》 Senior Editor: Dr. Lingxiao Yan
	Springer Nature Publisher: Dr. Jiaxin Xia
16:45-17:45	Poster Session
18:00-20:00	Welcome Banquet Restaurant on the 2 nd Floor of Academic Activity Center, SJTU Minhang Campus

CONFERENCE PROGRAM

Sunday, September 7, 2025
Chen Ruiqiu Building 100, Shanghai Jiao Tong University (Minhang District)
上海交通大学（闵行校区）陈瑞球楼 100 号报告厅

Time	Content	
Plenary Lectures (Chairs: Margaret Graham, Qibin Liu)		
08:30-09:10	Plenary Lecture	Xing Zhang, Tsinghua University Title: Thermophysical Property Characterization and Process Analysis of Hydrogen Mixtures at High Temperatures and High Pressures for Carbon Neutrality Applications
09:10-09:50	Plenary Lecture	Haisheng Chen, Institute of Engineering Thermophysics, CAS Title: Research progress in China's energy storage technology
09:50-10:30	Plenary Lecture	Margaret Graham, The University of Edinburgh Title: Carbon neutrality and sustainable water systems: addressing climate-induced impacts on drinking water quality
10:30-10:50	Coffee Break	

Sunday, September 7, 2025

CONFERENCE PROGRAM

Session 10: Hydrogen and renewable energy technologies

Chairs: Qian Wang, Xi Gao 10:50-12:05, Sunday, September 7 Location: Room 117, Chen Ruiqiu Building	
10:50-11:20	Keynote Lecture
Title	Enhancement of heat and mass transport in direct flue gas electrolysis for fuel production
Authors	<u>Zhiguo Qu</u>
Affiliation	Xi'an Jiaotong University
11:20-11:35	Invited Talk
Title	Artificial intelligence empowered multiscale investigation of fluidized bed reactors for thermochemical conversion of biomass/plastic
Authors	<u>Xi Gao</u>
Affiliation	Guangdong Technion-Israel Institute of Technology
11:35-11:45	Oral Presentation
Title	Unique equivalent circuit model for ultra-fast and accurate performance prediction of metal hydride reactor: auto-model-generation from 2D cross-sectional bed image
Authors	<u>Wangxin Yang</u> , Weiwei Yang, Jianfei Zhang, Zhiguo Qu
Affiliation	Xi'an Jiaotong University
11:45-11:55	Oral Presentation
Title	Plasma-catalytic synthesis of ammonia over g-alumina-supported mono- and bimetallic metal catalysts based on Ni, Co and Fe
Authors	<u>Kai Ye</u> , Chun Han Lee, Cheng Tung Chong
Affiliation	Shanghai Jiao Tong University
11:55-12:05	Oral Presentation
Title	Analysis of the constraint conditions of piston inerting in limited space
Authors	<u>Jinsheng Ye</u> , Chunyu Li, Han Chen, Qingtai Cao, Pan Sun, Jingyi Wu
Affiliation	Shanghai Jiao Tong University
12:05-13:30	Lunch Break Restaurant on the 2 nd Floor of Academic Activity Center, SJTU Minhang Campus

CONFERENCE PROGRAM

Session 11: Catalysis and environmental science

Chairs: Le Zhang, Xinxing Zhou 10:50-12:00, Sunday, September 7 Location: Room 121, Chen Ruiqiu Building	
10:50-11:20	Keynote Lecture
Title	Chemical creation towards efficient and stable perovskite photovoltaics
Authors	<u>Yixin Zhao</u>
Affiliation	Shanghai Jiao Tong University
11:20-11:35	Invited Talk
Title	Utilizing magnetic field to enhance methane production from anaerobic digestion of nitrogen-rich organic wastes
Authors	<u>Le Zhang</u>
Affiliation	Shanghai Jiao Tong University
11:35-11:50	Invited Talk
Title	Volatile organic compounds emission and heavy metals leaching mechanism in carbon dots solutions
Authors	<u>Xinxing Zhou</u> , Ziyang Zhang
Affiliation	Shanxi University
11:50-12:00	Oral Presentation
Title	Electrochemical Activation of Precatalysts Tailors Cu Coordination Environments for Shifting CO ₂ RR Products from C ₁ to C ₂₊
Authors	<u>Yinbo Zhan</u> , Xia Long
Affiliation	Shanghai Jiao Tong University
12:00-13:30	Lunch Break Restaurant on the 2 nd Floor of Academic Activity Center, SJTU Minhang Campus

CONFERENCE PROGRAM

Session 12: Advanced energy storage

Chairs: Xinjing Zhang, Ting Xiong 10:50-12:10, Sunday, September 7 Location: Room 216, Chen Ruiqiu Building	
10:50-11:05	Invited Talk
Title	Study on compressed air energy storage for power system frequency regulation
Authors	<u>Xinjing Zhang</u>
Affiliation	The Institute of Engineering Thermophysics, Chinese Academy of Sciences
11:05-11:20	Invited Talk
Title	Design and practical applications of high-performance photo-rechargeable energy storage systems
Authors	<u>Ting Xiong</u>
Affiliation	University of Shanghai for Science and Technology
11:20-11:30	Oral Presentation
Title	Potential matching by DFT calculation in redox-targeting based aqueous organic redox flow batteries
Authors	<u>Sida Rong</u> , Ya Ji
Affiliation	Shanghai Jiao Tong University
11:30-11:40	Oral Presentation
Title	Performance enhancement of a double-layered annular hydrogen storage bed based on phase change materials
Authors	Chao Chang, <u>Qiangao Jiang</u> , Longda Liu, Baocai Fu, Yulong Ji
Affiliation	Dalian Maritime University
11:40-11:50	Oral Presentation
Title	Thermodynamic characteristics of multi-temperature gradient compressed air energy storage system
Authors	<u>Gen Li</u> , Huan Guo, Haoyuan Kang, Yujie Xu, Haisheng Chen
Affiliation	Jiangsu University
11:50-12:00	Oral Presentation
Title	Centralized thermal management of storage power station based on refrigeration performance enhancement, model-free control and thermal failure warning
Authors	Jinghui Meng, <u>Yan Liu</u> , Zhiqing Wang, Zijing Yang, Gu Lu
Affiliation	North China Electric Power University
12:00-12:10	Oral Presentation
Title	Effects of orifice plate on flow dynamics of liquid oxygen under variable axial and radial g-loads
Authors	<u>Qingtai Cao</u> , Rui Zhuan, Li Yue, Songyuan Guo, Jingyi Wu, Guang Yang
Affiliation	Shanghai Jiao Tong University
12:10-13:30	Lunch Break Restaurant on the 2 nd Floor of Academic Activity Center, SJTU Minhang Campus

CONFERENCE PROGRAM

Session 13: Negative emission technologies

Chairs: Lin Chen, Xuancan Zhu 10:50-12:20, Sunday, September 7 Location: Room 219, Chen Ruiqiu Building	
10:50-11:20	Keynote Lecture
Title	Research on the two-stage carbon capture cycle of biomass-doped materials
Authors	<u>Liwei Wang</u>
Affiliation	Shanghai Jiao Tong University
11:20-11:35	Invited Talk
Title	Retrospect of supercritical CO ₂ utilization as a working fluid: heat transfer modes across the critical/pseudo-critical region
Authors	<u>Lin Chen</u>
Affiliation	The Institute of Engineering Thermophysics, Chinese Academy of Sciences
11:35-11:50	Invited Talk
Title	Amine-functionalized layered double hydroxide family for direct air capture of carbon dioxide
Authors	<u>Xuancan Zhu</u> , Bingyao Ge, Zhuozhen Gan, Qingyang Shao
Affiliation	Shanghai Jiao Tong University
11:50-12:00	Oral Presentation
Title	Impact of shallow CO ₂ hydrate caps on depressurization production in deeper natural gas hydrate reservoirs
Authors	<u>Hongyu Ye</u> , Yuanxin Yao, Daoyi Chen, Xuezhen Wu, Dayong Li, Mucong Zi
Affiliation	Tsinghua University
12:00-12:10	Oral Presentation
Title	Self-assembly CO ₂ adsorbent pellets for CO ₂ capture enhancement
Authors	<u>Ronghuan Xu</u> , Seonggon Kim, Hyungseop Ahn, Seongheon Kim, Hyoun Soo Kim, Yong Tae Kang
Affiliation	Korea University
12:10-13:30	Lunch Break Restaurant on the 2 nd Floor of Academic Activity Center, SJTU Minhang Campus

CONFERENCE PROGRAM

Session 14: Smart energy, low carbon technologies and applications

Chairs: Rui Wu, Rui Jing 10:50-12:15, Sunday, September 7 Location: Room 114, Chen Ruiqiu Building	
10:50-11:20	Keynote Lecture
Title	Agile Energy Systems: Enabling the transition to a sustainable future
Authors	<u>Aristides Kiprakis</u>
Affiliation	The University of Edinburgh
11:20-11:35	Invited Talk
Title	Developing city-scale urban building energy modelling
Authors	<u>Rui Jing</u>
Affiliation	Xiamen University
11:35-11:45	Oral Presentation
Title	Metal-CO ₂ cell driven by low-concentration CO ₂
Authors	<u>Sunghun Lee</u> , Seonggon Kim, Yong Tae Kang
Affiliation	Korea university
11:45-11:55	Oral Presentation
Title	Integrated Janus evaporator design with directional fluid transport for stable solar-driven desalination
Authors	<u>Ke Mao</u> , Xuecheng Lv, Yaixin Zhang
Affiliation	Shanghai Jiao Tong University
11:55-12:05	Oral Presentation
Title	Have new energy trucks reached cost parity to conventional trucks
Authors	<u>Renhao Li</u> , Tong Fan, Yao Xiao, Xiaokang Liu, Minhan Cai, Jiaqing Liu
Affiliation	Beihang University
12:10-13:30	Lunch Break Restaurant on the 2 nd Floor of Academic Activity Center, SJTU Minhang Campus

CONFERENCE PROGRAM

Session 15: Hydrogen and renewable energy technologies

Chairs: Zhiwei Ge, Guang Yang 13:30-14:45, Sunday, September 7 Location: Room 117, Chen Ruiqiu Building	
13:30-13:45	Invited Talk
Title	Magnetic compensation microgravity experiments for cryogenic propellant management: towards carbon-neutral space travel
Authors	<u>Guang Yang</u>
Affiliation	Shanghai Jiao Tong University
13:45-13:55	Oral Presentation
Title	Utilizing Ga(X)N/Si nanoarchitectures for syngas production via methane reforming under mild conditions
Authors	<u>Yixin Li</u> , Baowen Zhou
Affiliation	Shanghai Jiao Tong University
13:55-14:05	Oral Presentation
Title	An integrated network for transport and storage of CO ₂ and H ₂ for CCUS and hydrogen industry: demands, technical feasibility, safety, and challenges
Authors	<u>Yinglong Zhang</u> , Yingying Yuan, Wenduo Wu, Pei Zhao, Yong Dong, Gongming Xin, Ning Qin
Affiliation	Shandong University
14:05-14:15	Oral Presentation
Title	Study on gas-liquid two-phase transport characteristics in alkaline water electrolysis hydrogen production systems
Authors	<u>Jiaming Yuan</u> , Zhiguo Qu, Di Tian
Affiliation	Xi'an Jiaotong University
14:15-14:25	Oral Presentation
Title	Computational design of stable anion exchange membranes: DFT assessment of cations alkaline stability
Authors	<u>Yuwei Fang</u> , Di Tian, Zhiguo Qu
Affiliation	Xi'an Jiaotong University
14:25-14:35	Oral Presentation
Title	Chiral Engineering of Metal Oxide Nanostructures for Enhanced Oxygen Evolution in Water Electrolysis
Authors	<u>Ying Li</u> , Lin Yao
Affiliation	Shanghai Jiao Tong University
14:35-14:45	Oral Presentation
Title	Thermodynamic analysis of solar-assisted power, cooling and green ammonia production system
Authors	<u>Zihan Lin</u> , Muhammad Sajid Khan, Chen Chen
Affiliation	Zhejiang University of Technology
15:00-15:15	Coffee Break

CONFERENCE PROGRAM

Session 16: Advanced energy storage

Chairs: Jiantao Zai, Yunwen Wu 13:30-15:00, Sunday, September 7 Location: Room 121, Chen Ruiqiu Building	
13:30-14:00	Keynote Lecture
Title	Battery innovation empowered by lithium bond and artificial intelligence
Authors	<u>Qiang Zhang</u>
Affiliation	Tsinghua University
14:00-14:15	Invited Talk
Title	Efficient activation and degradation technologies for fluorinated greenhouse gases
Authors	<u>Jiantao Zai</u>
Affiliation	Shanghai Jiao Tong University
14:15-14:30	Invited Talk
Title	Highly reversible Zn metal electrodeposition enabled by Nanotwinned Cu and additive design
Authors	<u>Yunwen Wu</u>
Affiliation	Shanghai Jiao Tong University
14:30-14:40	Oral Presentation
Title	Calcium-based module with closed-cell structure for high-performance thermochemical solar energy storage
Authors	<u>Sijia Guo</u> , Xikun Tian, Yuan Yao, Changying Zhao
Affiliation	Shanghai Jiao Tong University
14:40-14:50	Oral Presentation
Title	Experiment and simulation of isothermal compressor based on spray water heat transfer
Authors	<u>Siqi Zhang</u> , Bingqian Zhou, Xinjing Zhang, Shiwei Hu, Longyao Wang, Yujie Xu, Haisheng Chen
Affiliation	Institute of Engineering Thermophysics, Chinese Academy of Sciences
14:50-15:00	Oral Presentation
Title	Compressed air energy storage in porous media: a coupled modelling approach
Authors	Aibo Bian, Xinjing Zhang, Siqi Zhang, <u>Yu Jing</u>
Affiliation	The University of New South Wales
15:00-15:15	Coffee Break

CONFERENCE PROGRAM

Session 17: Negative emission technologies

Chairs: Lanlan Jiang, Chen Chen 13:30-14:55, Sunday, September 7 Location: Room 216, Chen Ruiqiu Building	
13:30-13:45	Invited Talk
Title	Experimental study on gas–liquid two-phase displacement in rock cores based on distributed fiber optic sensing
Authors	<u>Lanlan Jiang</u> , Jindi Liu, Menglan Shi, Jintao Xu
Affiliation	Dalian University of Technology
13:45-13:55	Oral Presentation
Title	In-situ CO ₂ capture-mineralization of modified coal fly ash and its utilization as building material
Authors	<u>Yanhui Liu</u> , Jingwei Li
Affiliation	Shandong University
13:55-14:05	Oral Presentation
Title	Long-Term Carbon Neutrality Dynamics: Linking Forests and Urban Environments Through Domestic Timber Utilization in Japan
Authors	<u>Tharindu Werala Vidanalage</u> , Toru Terada
Affiliation	The University of Tokyo
14:05-14:15	Oral Presentation
Title	Insight into the micro-mechanism of hydrate-based methane storage from active ice
Authors	<u>Jun Duan</u> , Keyi Zhong, Shuyi Jiang, Daoyi Chen, Guangjin Chen, Mucong Zi
Affiliation	Tsinghua University
14:15-14:25	Oral Presentation
Title	Semi-artificial photosynthetic biofilms: a promising platform for solar-driven methane generation
Authors	<u>Huize Chen</u> , Ao Xia, Yun Huang, Junyi Ji, Xianqing Zhu, Xun Zhu, Qiang Liao
Affiliation	Chongqing University
14:25-14:35	Oral Presentation
Title	Analysis of supercritical CO ₂ flow and heat transfer inside elliptical and cylindrical micromodels for carbon sequestration and storage target
Authors	<u>Jiaxin Liu</u> , Atsuki Komiya, Rachid Bennacer, Lin Chen
Affiliation	The Institute of Engineering Thermophysics, Chinese Academy of Sciences
14:35-14:45	Oral Presentation
Title	CFD modeling of aqueous mineral carbonation by Ca(OH) ₂ slurry in a bubble column
Authors	<u>Qiru Jin</u> , Weiling Li, Shunxiang Zhang, Lei Liu, Yafei Guo, Jian Sun, Chuanwen Zhao
Affiliation	Nanjing Normal University
14:45-14:55	Oral Presentation
Title	Combination of biochar and arbuscular mycorrhizal fungi to promote soil organic carbon retention and carbon stability
Authors	Shuang Han, <u>Yuan Liang</u> , Lingzhao Kong
Affiliation	Suzhou University of Science and Technology
15:00-15:15	Coffee Break

CONFERENCE PROGRAM

Session 18: Carbon finance, management and policy

Chairs: Chen Xiang, Jiaqi Lu 13:30-14:55, Sunday, September 7 Location: Room 219, Chen Ruiqiu Building	
13:30-13:45	Invited Talk
Title	Political signaling and effects of China's pilot emissions trading scheme
Authors	<u>Chen Xiang</u>
Affiliation	Shanghai Jiao Tong University
13:45-14:00	Invited Talk
Title	Carbon footprint and environmental benefits of chemical recycling for plastic waste in China: energy and bio-economy nexus
Authors	Shuying Huang, Jingwen Wang, Dungang Gu, Tingting Hu, Rui Liu, Guanghui Li, <u>Jiaqi Lu</u>
Affiliation	Shanghai University of Engineering Science
14:00-14:15	Invited Talk
Title	Disentangling China's climate policies: a new database of China's present decarbonization strategies and policy instruments
Authors	Florian Wengel, <u>Danqing Shao</u>
Affiliation	Peking University
14:15-14:25	Oral Presentation
Title	Carbon allowance allocation for the shipping industry in China's carbon trading market
Authors	<u>Hongmei Deng</u> , Lijing Liu
Affiliation	China Waterborne Transport Research Institute
14:25-14:35	Oral Presentation
Title	Assessing GHG mitigation potential associated with transmission and distribution in China's power sector
Authors	<u>Shuyue Li</u> , Linfeng Li, Yuquan W. Zhang
Affiliation	Shanghai Jiao Tong University
14:35-14:45	Oral Presentation
Title	Exploring urban carbon sequestration and emission reduction pathways through nature-based solutions: a case study of Shanghai
Authors	<u>Yuanxin Chen</u> , Kangkang Tong
Affiliation	Shanghai Jiao Tong University
14:45-14:55	Oral Presentation
Title	Impact of time-of-use tariff policies on electric vehicle charging behavior and power system operation in Beijing
Authors	<u>Pengju Liu</u> , Tong Fan, Hongyu Pu, Jinceng Luo, Fangda Wu, Xing Yao, Bowen Yi
Affiliation	Beihang University
15:00-15:15	Coffee Break

CONFERENCE PROGRAM

Session 19: Smart energy, low carbon technologies and applications

Chairs: Huan Guo, Gui Lu 13:30-15:00, Sunday, September 7 Location: Room 114, Chen Ruiqiu Building	
13:30-14:00	Keynote Lecture
Title	Progress on high-performance spectrally selective PV/T collectors with minimal heat loss
Authors	<u>Gang Pei</u>
Affiliation	University of Science and Technology of China
14:00-14:15	Invited Talk
Title	Analytical model and corresponding-point methodology for advanced compressed air energy storage systems
Authors	<u>Huan Guo</u>
Affiliation	The Institute of Engineering Thermophysics, Chinese Academy of Sciences
14:15-14:30	Invited Talk
Title	Liquid-vapor phase change immersion cooling for high-power energy storage batteries: from mechanisms to engineering applications
Authors	<u>Gui Lu</u>
Affiliation	North China Electric Power Universtiy
14:30-14:40	Oral Presentation
Title	Wastepaper cellulose could replace polyester fibre and packaging films to avoid 270 Mt CO ₂ e a ⁻¹
Authors	<u>Yunhu Gao</u> , André Cabrera Serrenho, Wei Wei
Affiliation	Shanghai Advanced Research Institute Chinese Academy of Sciences
14:40-14:50	Oral Presentation
Title	Liquid CO ₂ energy storage coupled with combined heat and power system: flue gas waste heat recovery and deep peak-shaving optimization
Authors	<u>Weiwei Zhang</u> , Yuanyuan Li, Gui Lu
Affiliation	North China Electric Power Universtiy
14:50-15:00	Oral Presentation
Title	Impact of scalable vehicle-integrated photovoltaic system on vehicle thermal environment and energy conservation
Authors	<u>Qiangyan Hao</u> , Zequan Lin, Jamile Mohammadi Moradian, Bin Zhao
Affiliation	University of Science and Technology of China
15:00-15:15	Coffee Break

CONFERENCE PROGRAM

Session 20: Catalysis and Environmental Science

Chairs: Zhicheng Luo, Guanhua Zhang 15:15-16:05, Sunday, September 7 Location: Room 117, Chen Ruiqiu Building	
15:15-15:30	Invited Talk
Title	Carbon-carbon bond cleavage for a lignin refinery
Authors	<u>Zhicheng Luo</u>
Affiliation	Southeast University
15:30-15:45	Invited Talk
Title	Thermal/cold storage systems for carbon neutrality in built environment
Authors	<u>Guanhua Zhang</u>
Affiliation	University of Shanghai for Science and Technology
15:45-15:55	Oral Presentation
Title	Modulated synthesis of hcp MOFs for preferential CO ₂ capture
Authors	<u>Jiaxi Zhang</u> , Mehak Nawaz Khan, Zhigang Hu, Jianxin Zou
Affiliation	Shanghai Jiao Tong University
15:55-16:05	Oral Presentation
Title	Performance of Ni-Co/CeO ₂ @SiO ₂ catalysts in dry reforming of methane
Authors	<u>Penglin Zhang</u> , Zhiwei Ge
Affiliation	Xi'an Jiaotong University
16:30-17:00	Closing Ceremony and Awarding Chen Ruiqiu Building 100, Shanghai Jiao Tong University (Minhang District)

CONFERENCE PROGRAM

Session 21: Advanced energy storage

Chairs: Tao Deng, Daihuo Liu 15:15-16:10, Sunday, September 7 Location: Room 121, Chen Ruiqiu Building	
15:15-15:30	Invited Talk
Title	Interfacial chemical bond reversible reconstruction of layered cathode material endowing excellent Zn ²⁺ /H ⁺ storage
Authors	<u>Daihuo Liu</u>
Affiliation	Henan Normal University
15:30-15:40	Oral Presentation
Title	Solar-integrated trans-critical compressed CO ₂ energy storage system: a key solution for long-duration energy storage application
Authors	Dong Zhang, Xinyue Su, <u>Yueyi Li</u>
Affiliation	Lanzhou University of Technology
15:40-15:50	Oral Presentation
Title	A thermodynamic model for predicting LNG evaporation in large membrane tanks under sloshing excitations
Authors	<u>Han Chen</u> , Yuanzhong Yu, Hongpu Wang, Guang Yang, Jingyi Wu
Affiliation	Shanghai Jiao Tong University
15:50-16:00	Oral Presentation
Title	Biomimetic topology optimization for uniform flow spray structures in semi-immersion cooling of energy storage batteries
Authors	<u>Xin Jiang</u> , Gui Lu
Affiliation	North China Electric Power University
16:00-16:10	Oral Presentation
Title	Performance of immersed thermal management of energy storage battery using fractal gradient honeycomb-reverse tesla valve configuration
Authors	<u>Qingfeng Cai</u> , Jinghui Meng, Gui Lu
Affiliation	North China Electric Power University
16:30-17:00	Closing Ceremony and Awarding Chen Ruiqiu Building 100, Shanghai Jiao Tong University (Minhang District)

CONFERENCE PROGRAM

Session 22: Negative emission technologies

Chairs: Xia Long, Ya Ji 15:15-15:55, Sunday, September 7 Location: Room 216, Chen Ruiqiu Building	
15:15-15:25	Oral Presentation
Title	Urban green space optimization for enhancing carbon neutrality efficiency
Authors	<u>Yang Liu</u> , Pai Wen
Affiliation	Inner Mongolia University of Technology
15:25-15:35	Oral Presentation
Title	Experimental investigation on CO ₂ adsorption performance of modified red mud adsorbents from electrolytic aluminum flue gas
Authors	<u>Pengcheng Xu</u> , Guiling Xu, Qi Zhang, Ping Lu
Affiliation	Nanjing Normal University
15:35-15:45	Oral Presentation
Title	Research on the modular application of loose aggregate plate-type PTFE membrane contactor for CO ₂ absorption using alcohol amine/Ionic Liquid combinational solution in air handling units
Authors	Zhaochuan Hou, Liqing Yang, Yang Zhu, <u>Heinz-axel Guo</u>
Affiliation	Tongji University
15:45-15:55	Oral Presentation
Title	Low-temperature regeneration of amine modified layered double hydroxide for energy-saving direct air capture
Authors	<u>Yifei Xu</u> , Xuancan Zhu
Affiliation	Shanghai Jiao Tong University
16:30-17:00	Closing Ceremony and Awarding Chen Ruiqiu Building 100, Shanghai Jiao Tong University (Minhang District)

CONFERENCE PROGRAM

Session 23: Carbon finance, management and policy

Chairs: Danqing Shao, Kangkang Tong 15:15-15:55, Sunday, September 7 Location: Room 219, Chen Ruiqiu Building	
15:15-15:25	Oral Presentation
Title	Medium and long-term decarbonization of road transportation in China toward carbon neutrality
Authors	<u>Minhan Cai</u> , Ying Fan, Fan Tong
Affiliation	Beihang University
15:25-15:35	Oral Presentation
Title	Multi-stage and cross-climate sensitivity analysis of design variables in carbon-neutral building design incorporating BIPV
Authors	<u>Ling Mao</u> , Yi Yan, Kailang Wu, Changying Xiang
Affiliation	The Hong Kong University of Science and Technology
15:35-15:45	Oral Presentation
Title	Robots and carbon emissions: temporal and spatial analysis
Authors	<u>Wenqi Zhao</u> , Kunpeng Liu
Affiliation	Zhejiang University
15:45-15:55	Oral Presentation
Title	Enabling a just net-zero energy transition in remote rural communities: the case of Stromness, Orkney
Authors	<u>Androniki Papathanasi</u> , Desen Kirli, Sasa Djokic, Daniel Friedrich, Aristides Kiprakis
Affiliation	University of Edinburgh
16:30-17:00	Closing Ceremony and Awarding Chen Ruiqiu Building 100, Shanghai Jiao Tong University (Minhang District)

CONFERENCE PROGRAM

Session 24: Smart energy, low carbon technologies and applications

Chairs: Yaoxin Zhang, Qilin Cai 15:15-16:05, Sunday, September 7 Location: Room 114, Chen Ruiqiu Building	
15:15-15:25	Oral Presentation
Title	Performance and economic analysis of a hybrid energy system coupling SOFC-GT with CCES
Authors	<u>Houqi Wei</u> , Yuzhang Wang
Affiliation	Shanghai Jiao Tong University
15:25-15:35	Oral Presentation
Title	Multi-climate analysis of optimal PCM configuration for building roofs-integrated photovoltaics
Authors	<u>Jinghang Zhou</u> , Jianhui Hu, Wujun Chen, Chengjun Gao, Saishuai Huang, Yi Xu
Affiliation	Shanghai Jiao Tong University
15:35-15:45	Oral Presentation
Title	Balanced building climatization by use of capillary tube mats
Authors	<u>Mathias Fraaß</u>
Affiliation	Berliner Hochschule für Technik
15:45-15:55	Oral Presentation
Title	Numerical investigation on CO ₂ gasification of biomass in fixed beds
Authors	<u>Yongning Wang</u>
Affiliation	Xi'an Jiao tong University
15:55-16:05	Oral Presentation
Title	Dynamic electrochromic windows based on reversible Zinc electrodeposition
Authors	<u>Ijaz ur Rehman</u> , Shenghong Ju
Affiliation	Shanghai Jiao Tong University
16:30-17:00	Closing Ceremony and Awarding Chen Ruiqiu Building 100, Shanghai Jiao Tong University (Minhang District)

POSTER PRESENTATION

PP01

Carbon-negative clarification of turbid surface water by natural self-flocculating microalgae

Jianing Xiu, Zhiyong Ou, Yuning Zhao, Xiaohui Bai

PP02

Optimization of insulation performance for large liquid hydrogen tanks based on actively cooled thermal shield insulation

Xin Wang, Ming Zhu, Shuping Chen, Wenchao Han, Guofeng Zhao

PP03

Study of cooling textiles for radiative thermal management based on density functional theory

Youshan Liang, Guanhua Zhang

PP04

Catalytic pyrolysis of plastic waste —— categories and mechanisms

Yunyi Wang, Yaqiong Wang, Jiansheng Zhang

PP05

Thermochemical reservoir heating based on electromagnetic heating

Peng Wang, Changying Zhao, Jun Yan

PP06

A full-spectrum solar energy utilization array system based on radiative cooling

Zijun Wang, Qilin Cai

PP07

Numerical study on heat transfer of non-Newtonian fluid in solid-liquid two-phase flow in elliptic twisted tubes

Licheng Chen, Guanhua Zhang

PP08

Preparation of silica substrate with dual pore structure for DAC: effects of PEG addition on silica structure

Ill Yong Kim, Yosep Han, Sung Baek Cho, Dae Yong Jeong, Young Gon Kim

POSTER PRESENTATION

PP09

Current-carrying-coil-based magnetic field (CCC-MF) favored hydrogenotrophic methanogens for enhanced methane production in high ammonium-nitrogen food waste anaerobic digestion

Rouf A. Dar, Le Zhang

PP10

Provincial power system modeling for carbon reduction: a chronological production simulation framework and decarbonization pathway analysis

Shiyu Ba, Jiahan Zhou, Chong Shao, Jing Cao, Junhong Hao, Hongtao Liu

PP11

Achieving negative emissions through combustion-based bioenergy with carbon capture and storage in China: a plant level techno-economic analysis

Marc Mate, Kaige Wang, Tan Li, Xiangkun Zhang, Mark Mba Wright, Lizhong Zhu, Xiang Gao

PP12

Sustainable halogen recovery via advanced pyrolysis: transforming waste into resources for a low-carbon future

Jiangshan Liu, Lu Zhan, Zhenming Xu

PP13

Numerical investigations on the effects of wall temperature on the characteristics of natural gas/ammonia MILD combustion in a semi-industrial furnace

Yanfei Du, Lingbo Xu, Zhou Yu, Yu Wang

PP14

Amphiphilic carbon quantum dots synergize with viscoelastic surfactants to stabilize CO₂ foams for enhanced oil recovery

Zhenghao Zhang, Bo Peng, Jindong Liu, Yijing Gao, Xuwei Sun

PP15

Metallic molybdenum sulfide drives protometabolic carbon dioxide reaction networks via hydrothermal radical coupling

Pengfei Chen, Daoping He, Fangming Jin

POSTER PRESENTATION

PP16

Ambient-pressure C–C coupling of CO₂ hydrogenation by NiFe/TiO₂ bimetallic catalyst

Mingxin Jiang, Zhi-Qiang Wang, Zhuo Li, Zhisong Liu, Yiwei Yin, Feixiang Tian, Anyu Li, Haomiao Xu, Xue-Qing Gong, Yulian He

PP17

Unveiling the gas-dependent active site evolutions on CuOx/CeO₂ catalysts for CO oxidation

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Interface modulation strategy for high-performance perovskite/silicon tandem solar cells

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