THE 4TH INTERNATIONAL CONFERENCE ON CARBON CAPTURE SCIENCE & TECHNOLOGY 2025

Online: 4-5 AUGUST 2025

CCST2025 chairs and co-chairs

Chair:

Professor Jin Shang, City University of Hong Kong

Co-chairs:

Professor Sandra Kentish, University of Melbourne

Professor Mengxiang Fang, Zhejiang University

Professor Chunfei Wu, Queen's University Belfast

CCST2025 sessions

- **Carbon capture with liquid solvents**
- **Carbon capture with solid sorbents**
- **Carbon capture with membranes**

  Biochemical carbon capture (biomass utilization)
- **Oxyfuel combustion and chemical looping**
- **Direct air capture (DAC)**
- **Biomass carbon removal and storage (BiCRS)**
- **Integrated carbon capture and utilization (ICCU)**
- **CO_2 utilization and storage**
- **Process integration, intensification, modelling, and artificial intelligence in carbon capture**
- **Techno-economic analysis, life-cycle analysis, and demonstration of carbon capture technologies**
- **Carbon capture, utilization, and storage in industry**
- **Carbon Neutral for Construction Materials (CCCM)**
- **Awards session (invited only)**

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- Akshay Modi Indian Institute of Science Education and Research (IISER) Bhopal, India
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- Rizwan Nasir University of Jeddah, Saudi Arabia
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TEAMs links:

Conference Theme: CCST Plenary & CCST Session A

https://teams.microsoft.com/l/meetup-join/19%3ameeting_MGU5YzYzMmYtNGMwMC00MGQxLTlhZDYtMWY3ZDMyODdkM2Iy%40thread.v2/0?context=%7b%22Tid%22%3a%22eaab77ea-b4a5-49e3-a1e8-d6dd23a1f286%22%2c%22Oid%22%3a%2251d684d7-fec6-4c0d-9539-b9fe19032910%22%7d

Conference Theme: CCST Session B

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Conference Theme: CCST Session C

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SCHEDULE

CCST 2025 CONFERENCE

<table>
<tr><th colspan="4">August 4/Day 1

(China Standard Time/UTC+8)</th></tr>
<tr><td>China Time</td><td colspan="3"></td></tr>
<tr><td>8:30-8:50</td><td colspan="3">Opening Ceremony
(Chair: Professor Jin Shang)</td></tr>
<tr><td>8:50-9:30</td><td colspan="3">Plenary 1: Prof. Chunshan Song
(Chair: Professor Shouliang Yi)</td></tr>
<tr><td>9:30-10:10</td><td colspan="3">Plenary 2: Prof. Shujuan Wang
Solvent Development for CO_2 Chemical Absorption Capture
(Chair: Professor Chuah Chong Yang)</td></tr>
<tr><td>10:10-10:20</td><td colspan="3">Breaks</td></tr>
<tr><td>10:20-12:00</td><td>Carbon capture with solid sorbents
Session chairs: Ahmad Salam Farooqi; Teng Zhou</td><td>Biochemical carbon capture (biomass utilization)
Session chairs: Muhammad Abdul Qyyum; Bor-Yih Yu</td><td>CO_2 utilization and storage
Session chairs: Ayesha Tariq Sipra; Guoping Hu</td></tr>
<tr><td>12:00-13:00</td><td colspan="3">Lunch</td></tr>
<tr><td>13:00-13:40</td><td colspan="3">Plenary 3: Prof. Sandra Kentish
The use of membrane technology for the capture of carbon dioxide and its utilisation for microalgal culture
(Chair: Professor Jin Shang)</td></tr>
<tr><td>13:40-14:20</td><td colspan="3">Plenary 4: Prof. Zhi Wang
Development of High-Performance Mixed-Matrix Composite Membranes for CO_2 Separation
(Chair: Professor Zhongde Dai)</td></tr>
<tr><td>14:20-14:30</td><td colspan="3">Breaks</td></tr>
<tr><td>14:30-17:00</td><td rowspan="2">Carbon capture with solid sorbents
Session chairs: Diwakar Z. Shende; Jude Okolie</td><td>Carbon capture with liquid solvents
Session chairs: Yihe Miao</td><td rowspan="2">CO_2 utilization and storage
Session chairs: Azhagapillai Prabhu; Haiping Yang</td></tr>
<tr><td>Carbon capture with membranes
Session chairs: Natsayi Chiwaye</td></tr>
</table>

SCHEDULE

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17:00-17:50	Integrated carbon capture and utilization (ICCU) Session chairs: Daxin Liang; Liang Zeng	Direct air capture (DAC) Session chairs: Teo Chee Loong; Yuan Meng	Carbon Neutral for Construction Materials (CCCM) Session chairs: Muhammad Abdul Qyyum; Wenbin Zhang
18:00-18:40	Dinner		
18:40-19:20	Plenary 5: Prof Ki Bong Lee Upcycling of Waste Plastic into Porous Carbon and Its Application to Carbon Dioxide Capture (Chair: Professor Daxin Liang)		
19:00-20:00	Plenary 6: Prof. Alexander Forse Advancing electrochemically driven carbon dioxide capture with supercapacitors (Chair: Professor Zhao Sun)		

SCHEDULE

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August 5/Day 2 (China Standard Time/UTC+8)			
China Time			
8:30-9:10	Plenary 7: Prof. James Ritter Carbon Dioxide Capture by PSA at the DOE National Carbon Capture Center (Chair: Professor Changlei Qin)		
9:10-9:50	Plenary 8: Prof. Ryan Lively Three Keys to Successful Direct Air Capture: Humidity, Degradation, and Contactors (Chair: Professor Yikai Xu)		
9:50-10:00	Break		
10:00-12:00	Process integration, intensification, modelling, and artificial intelligence in carbon capture Session chairs: Yong Wai Fen; Long Jiang	Techno-economic analysis, life-cycle analysis, and demonstration of carbon capture technologies Session chairs: Kaikai MA; Habib Ullah	Biomass carbon removal and storage (BiCRS) Session chairs: Keke Xiao; Lei Liu
12:00-13:00	Lunch		
13:00-13:40	Plenary 9: Prof. Tao Wang Carbon dioxide mineralization utilization technology based on industrial solid waste (Chair: Professor Guozhao Ji)		
13:40-14:20	Plenary 10: Prof. Xi Chen Addressing Climate Change: Negative Emission based on AI-Driven Evolution of Advanced Materials (Chair: Professor Song He)		
14:20-14:30	Break		
14:30-16:50	Process integration, intensification, modelling, and artificial intelligence in carbon capture Session chairs: Mengxian Fang; Xiaotong Zhao	Techno-economic analysis, life-cycle analysis, and demonstration of carbon capture technologies Session chairs: Kaikai MA; Huan Wang	Biomass carbon removal and storage (BiCRS) Session chairs: Yimin Shao; Lei Liu
	BSD Special keynotes Session chairs: Junhan Cheng	Carbon capture, utilization, and storage in industry Session chairs: Humbul Suleman	Oxyfuel combustion and chemical looping Session chairs: Daofeng Mei; Teerawat Sema
16:50-17:00	Break		
17:00-17:40	Plenary 11: Dr. Paul Iacomi Evaluating the influence of stream contaminants on the carbon capture potential of solid sorbents at the lab scale		

	(Chair: Professor Jingai Shao)
17:40-18:10	Awarding and Closing Ceremony (Chair: Professor Chunfei Wu)

DAY 1 SESSION A

CCST 2025 CONFERENCE

August 4/Day 1: Parallel Session A (China Standard Time/UTC+8) Topic: Carbon capture with solid sorbents			
China Time		Speaker	Title
10:20-10:40	KA1	Prof. Ken-ichi Otake (The Institute for Integrated Cell-Material Sciences (iCeMS), Kyoto University)	Harnessing the Structural Flexibility of Metal-Organic Frameworks for Efficient Gas separation
10:40-11:00	KA2	Prof. Guoping HU (Ganjiang Innovation Academy, Chinese Academy of Sciences)	Strongly polarized small-pore zeolites for the capture of CO_2 from dilute sources
11:00-11:20	KA3	Prof. Qiwei Yang (Zhejiang University) No recording of presentation	Construction of Ultramicroporous Crystalline Materials for CO_2 Separation
11:20-11:30	Breaks		
11:30-11:40	OA1	Zeyu Tao (City University of Hong Kong)	Tailoring Extra-Framework Cations in Zeolite Y to Achieve Record CH_4/N_2 Selectivity for Coal Mine Methane Purification
11:40-11:50	OA2	Xiaoliang Wang (Northwestern University)	Tailoring hydrophobicity and pore environment in physisorbents for improved carbon dioxide capture under high humidity
11:50-12:00	OA3	Chimezie Frank Onwudinjo (Bucknell University)	Synthesis and characterization of lithium orthosilicate for CO_2 capture
14:30-14:50	KA4	Prof. Ziqian Xue (School of advanced energy, Sun Yat-sen University)	Metal-Organic Frameworks-Based Electrocatalysts with Structural Heterogeneity for Green Hydrogen Energy
14:50-15:10	KA5	Dr. Tae-Hyun Bae (KAIST, South Korea)	Engineered Porous Polymers for Advanced CO_2 Separation
15:10-15:20	OA4	Zhang Man (Shanghai Jiao Tong University)	Synergistic effects of Na contents for direct air capture and in situ methanation using Ru-Na dual function materials
15:20-15:30	OA5	Yaozu Wang (Tsinghua University)	Enhancing $NaNO_3$-modified MgO with Carbonates for Intermediate-

			temperature CO_2 Capture from Flue Gas
15:30-15:40	OA6	Xin Yin (City University of Hong Kong)	Binding configuration regulating same-sized sieving by phillipsite trapdoor zeolites for inverse CO_2/C_2H_2 separation
15:40-15:50	Breaks		
15:50-16:00	OA7	Xicheng Wang (Shandong University)	Low-temperature rapid synthesis of high-purity Li_4SiO_4 adsorbent for cyclic CO_2 capture
16:00-16:10	OA8		
16:10-16:20	OA9	Anyu Liu (Ganjiang Innovation Academy, Chinese Academy of Sciences)	Interpretable Machine Learning for Rational Design of MOFs in Flue Gas CO_2 Capture
16:20-16:30	OA10	Chuhan Fu (University of Science and Technology of China)	One-step preparation of Ce-TEPA-GME zeolite molecular sieve for CO_2/N_2 separation
16:30-16:40	OA11	Yanmei Shen (Zhengzhou University)	Engineering robust Ni-CaO interaction using potassium for low-carbon deposition integrated CO_2 capture and dry reforming of methane process
16:40-16:50	OA12	Raheleh Zafari (University of Ottawa)	Improving Oxidative Stability of CO_2-Amine Adsorbents in the Presence of Air
16:50-17:00	Breaks		
Topic: Integrated carbon capture and utilization (ICCU)			
17:00-17:10	OA13		
17:10-17:20	OA14	Bocheng Yu (Tsinghua University)	The influence mechanism study of SO_2 pollutions in flue gas for ICCU-DRM with Ni-Ca dual functional materials
17:20-17:30	OA15	Wei WEi (Huazhong University of Science and Technology)	Efficient sorbent/catalyst composites for CO_2-mediated oxidative dehydrogenation of ethane via isothermal integrated CO_2 capture and utilization
17:30-17:40	OA16	Xiaotong Zhao (Queen's University Belfast)	ICCU in molten salts

17:40-17:50	OA17	MUHAMMAD MUBASHAR HANIF (University of Agriculture Faisalabad)	Smart biochar deployment for low carbon agriculture using integrated carbon capture and utilization

DAY 1 SESSION B

CCST 2025 CONFERENCE

August 4/Day 1: Parallel Session B (China Standard Time/UTC+8) Topic: Biochemical carbon capture (biomass utilization)			
China Time		Speaker	Title
10:20-10:40	KB1	Prof. Zhongbo Zhou (Southwest University)	AnMBR-algal synergy: Carbon capture and resource recovery from wastewater
10:40-10:50	OB1	Jianying Zhang (Inner Mongolia Agricultural University)	Study on the construction of wood-based porous carbon and its CO_2 adsorption performance by Fenton oxidation-KOH Synergistic activation Strategy
10:50-11:00	OB2	Yongxian Long (Changsha University of Science and Technology)	N-doped biomass carbon for CO_2 capture from humid flue gas: Insights into comprehensive effect of pore structure and functional groups
11:00-11:10	Breaks		
11:10-11:20	OB3	Jiake Wu (Zhejiang University)	An efficient biochar for CH_4/CO_2 Adsorption Separation and Its Low-Temperature Separation Performance
11:20-11:30	OB4	Xinyu Wang (Shenzhen Institutes of Advanced Technology, Chinese Academy of Sciences)	Semi-artificial carbon fixation by engineering E. coli biofilms
11:30-11:50	KB2	Guo Jiayi (Science, Technology and Research (A*STAR) Singapore)	Brush Polymer Functionalized Biomass Textile and Its Potential Capacity for Direct Air Capture of CO_2
Topic: Carbon capture with liquid solvents			
14:30-14:40	OB5	Xi Tang (School of Energy and Power Engineering, Huazhong University of Science and Technology; College of Chemistry and Chemical Engineering, Taiyuan University of Technology)	Evaluation of CO_2 capture performance of mixed amines of tertiary amines and chain diamines

DAY 1 SESSION B

CCST 2025 CONFERENCE

14:40-14:50	OB6	Yuan Meng (The Hong Kong Polytechnic University) No recording of presentation	Integrating Alkaline Industrial Wastes into Amine Scrubbing towards Sustainable CO_2 Capture and Sequestration
14:50-15:00	OB7	Xiaojun Wang (Zhejiang University)	Volatile and Aerosol-based Emissions of Phase-change and Water-lean Solvents for Postcombustion CO_2 Capture
15:00-15:10	OB8	Zhipeng Chen (Zhejiang University)	Low-energy-consumption CO_2 capture via coupling process of direct organic fluid stripping with biphasic solvents
15:10-15:30	Breaks		
Topic: Carbon capture with membranes			
15:30-15:50	KB3	Prof. Euntae Yang (Gyeongsang National University)	Development of 2D Nanomaterial-Based Mixed Matrix Membranes for Carbon Capture
15:50-16:00	OB9	Zhaochuan HOU (Beijing Twing zhihui Technology Development Co., Ltd., Beijing, China)	Research on the Application of Hollow Fiber Membrane Reactors with Alcohol Amine/Ionic Liquid Combinational Solution Absorption of CO_2 in Carbon Capture Heat and Cold Source Towers
16:00-16:10	OB10	Ying Ji (Zhejiang University)	Exceptionally active moisture swing sorption film for direct air capture
16:10-16:30	KB4	Prof. Wu Bing (University of Iceland)	Hybrid direct air capture with pressure-retarded osmosis for energy-neutral decarbonation: effect on osmosis membrane performance
16:30-16:50	KB5	Prof. Kumar Varoon Agrawal (EPFL - Swiss Federal Technology Institute of Lausanne, Switzerland)	Mechanistic Insight Based Controlled Pore Formation And Scale-up Of Porous Atom-Thin Graphene Membrane
16:50-17:00	Breaks		
Topic: Direct air capture (DAC)			

DAY 1 SESSION B

CCST 2025 CONFERENCE

17:00-17:10	OB13	Yongqiang Wang (University of Cambridge)	Toward Sustainable and Efficient Direct Air Capture: Advances in Sorbent Regeneration and CO_2 Conversion
17:10-17:20	OB11	Ma Jinchen (Huazhong University of Science and Technology)	Study on the Direct Air Capture Performance of Alkali Metal Adsorbents
17:20-17:30	OB12	Zixin Zhang (Shanghai Jiao Tong University)	Impact of Dynamic Meteorological Conditions on the Performance of Adsorption-Based Direct Air Capture System
17:30-17:50	KB6	Dr Xiangkun Cao (MIT)	Direct air capture: From centralization to distributed systems

DAY 1 SESSION C

CCST 2025 CONFERENCE

August 4/Day 1: Parallel Session C (China Standard Time/UTC+8) Topic: CO_2 utilization and storage			
China Time		Speaker	Title
10:20-10:40	KC1	Cancelled	
10:40-11:00	KC2	Prof. Shijian Lu (China University of Mining and Technology)	Research progress on low-energy consumption of flue gas CO_2 capture and utilization technology
11:00-11:10	OC1	Sheng Chen (Zhejiang University)	Study on modelling the synergistic H_2O-CO_2 sorption behavior for quaternary ammonium-based moisture swing direct air capture
11:10-11:20	OC2	Yanjun Jiang (Hebei University of Technology)	Electrocatalytic cofactor regeneration coupled with immobilized enzyme for CO_2 reduction
11:20-11:30	Breaks		
11:30-11:40	OC3	Sijan Devkota (Monash University, Australia)	Sorption Enhanced Dimethyl Ether Synthesis: A Novel Approach for Carbon Dioxide Utilization
11:40-11:50	OC4	Yuangao Wang (China University of Petroleum (East China))	Spatial distribution of oxygen vacancy on ceria catalysts for chemoselective synthesis of lignin-derived cyclohexanol
11:50-12:00	OC5	Zhou Ziqi (China University of Petroleum)	Selective Oxidation of Fructose to Glyceric Acid over Mn-BiOI Catalysts
14:30-14:40	OC6	Pengfei Chu (China University of Petroleum)	Self-Activation of Pt/NaY Catalysts via Dealuminization-Induced (Si–OH)n–Pt Interface Modification for Base-Free Oxidation of Diethylene Glycol
14:40-14:50	OC7	Renqiang Huang (China University of Petroleum (East China))	Synthesis of Fe/NaY Catalysts and its Application for Acetalization of Glycerol

DAY 1 SESSION C

CCST 2025 CONFERENCE

14:50-15:00	OC8	Tianheng Qin (University of Aberdeen)	Unveiling Structural Evolution and Catalytic Insights of Ni-CaO-Ca_2SiO_4 Catalyst in Plastic Pyrolysis-catalytic Gasification
15:00-15:10	OC9	YuYao Yang (Tsinghua University)	Modulating Pt states through hydroxyl control for low-temperature aqueous phase reforming of methanol
15:10-15:20	OC10	Toheeb Jimoh (State University of New York, Buffalo)	Selective Decomposition of Formic Acid into Hydrogen
15:20-15:30	Breaks		
15:30-15:50	KC3	Prof. James McGregor (University of Sheffield)	CO_2 capture and utilisation via chemical catalysis to longer chained hydrocarbons
15:50-16:10	KC4	Prof. Minshu Du (Northwestern Polytechnical University)	Design of CO_2 electroreduction catalysts based on the reactive thermodynamics and kinetics
16:10-16:30	KC5	Dr Inês Graça (School of Engineering, University of Aberdeen)	Innovative pathways for CO_2 conversion into fuels and chemicals: Enabling CO_2 transfer hydrogenation over zeolite catalysts
16:30-16:40	Breaks		
Carbon Neutral for Construction Materials (CCCM)			
16:40-16:50	OC11	Rukayat Salawu (University of Aberdeen)	Carbon Capture and Utilization Strategies to Produce Low-Carbon Cement
16:50-17:00	OC12	BO YANG (Kangwon National University)	Effect of Belite Cement on the Microstructure, Mechanical Properties, and Sustainability of Slag–Oyster Shell Powder–Cement Ternary Composites
17:00-17:10	OC13	Sun Feng (Kangwon National University)	Using carbon capture technology to prepare nanoscale calcite to enhance the performance of ultra-high-performance concrete containing calcined clay
17:10-17:20	OC14	MENG LIYI (KANGWON NATIONAL	Partial replacement of ordinary Portland cement with belite-rich

		UNIVERSITY)	cement to produce limestone calcined clay cement to regulate the hydration process, improve strength, and reduce carbon emissions
17:20-17:30	OC15	Yi-Sheng Wang (Kangwon National University)	Thermal activation of eggshell powder for low-carbon ternary building materials
17:30-17:40	OC16	Kang-Jia Wang (Kangwon National University)	Performance and sustainability of quaternary composite paste comprising limestone, calcined Hwangtoh clay, and granulated blast furnace slag

DAY 2 SESSION A

CCST 2025 CONFERENCE

August 5/Day 2: Parallel Session A (China Standard Time/UTC+8) Topic: Process integration, intensification, modelling, and artificial intelligence in carbon capture			
China Time		Speaker	Title
10:00-10:20	KA6	Prof. Yangyang Guo (Institute of Process Engineering，Chinese Academy of Science)	VPSA application of carbon capture from Blast Furnace Gas
10:20-10:40	KA7	Dr. Hyungwoong Ahn (University of edinburgh)	Industrial decarbonisation through PSA-SPUR technology: the innovative adsorption process for CO_2 capture
10:40-11:00	KA8	Cancelled	
11:00-11:10	Breaks		
11:10-11:20	OA18	Wanlin Wang (Zhejiang University)	Temperature vacuum swing adsorption for post-combustion carbon capture with different process configurations
11:20-11:30	OA19	Atchara Suntaro (Newcastle University)	Process Optimization of Direct DME Synthesis Coupled with Electrolyser Systems
11:30-11:40	OA20	HUANG Yan (Zhejiang University)	Absorption carbon capture assisted by absorption-compression cascade heat pump
11:40-11:50	OA21	Huzaifa Bin Abid (Univeristy of Agriculture Faisalabad)	Integrating Process Intensification and Artificial Intelligence to Optimize Post-Combustion Carbon Capture
11:50-12:00	OA22	Bin Xu (Huazhong University of Science and Technology)	Novel Mass Transfer Kinetics Model for Predicting Phase Separation Behavior in CO_2 Capture with Energy-saving Biphasic Absorbents
14:30-14:50	KA9	Dr Xi Yu (University of Southampton)	Computational fluid dynamics modelling of a chemical looping system for CO_2 utilisation

DAY 2 SESSION A

CCST 2025 CONFERENCE

14:50-15:00	OA23	Godknows Dziva (Institute of Process Engineering, CAS)	Kinetic modeling-assisted design of sorption-enhanced biomass gasification in moving beds for hydrogen production
15:10-15:20	OA24	Shashwat Srivastava (Monash University)	Sorption-Enhanced CO_2 Hydrogenation to Methanol
15:20-15:30	OA25	Boyue Zheng (Chinese Academy of Environmental Planning)	A Dynamic Source-Sink Matching Model for Full-Chain CCUS Optimization
15:30-15:40	Breaks		
15:40-16:00	KA10	Michael Short (University of Surrey)	Computational modelling and optimisation of dual function materials for direct air capture to fuel
16:00-16:20	KA11	Prof. Nannan Sun (Shanghai Advanced Research Institute)	Integrated CO_2 capture and conversion: From fundamental to demonstration
Special keynotes			
16:20-16:50	Special Keynotes	BSD Instruments	

DAY 2 SESSION B

CCST 2025 CONFERENCE

August 5/Day 2: Parallel Session B (China Standard Time/UTC+8) Topic: Techno-economic analysis, life-cycle analysis, and demonstration of carbon capture technologies			
China Time		Speaker	Title
10:00-10:20	KB7	Prof. Le Chencheng (Nanyang Technological University, Singapore)	Machine Learning-Assisted Techno-Economic Analysis of Food Waste Valorisation into Single-Cell Protein: Perspectives, Challenges, and Potential for Carbon Reduction
10:20-10:30	OB14	Yu Wei (China University of Petroleum (East China))	Green H_2 Impacts Carbon-Footprint for Bio-Based Commodities: A Gate-to-Gate Study on Production of 1,3-Propanediol
10:30-10:40	OB15	Yanli Sun (Shandong University)	Multifield-Coupled Deep Carbonation of Steel Slag: A Synergistic Strategy for Solid Waste Valorization and Carbon Neutrality in the Steel Industry
10:40-10:50	OB16	Marc Mate (Zhejiang University)	Achieving Negative Emissions through Combustion-based Bioenergy with Carbon Capture and Storage in China: A Plant Level Techno-Economic Analysis
10:50-11:00	OB17	Yipeng YAO (University of Mons)	Uncertainty Analysis in Life Cycle Assessment of CO_2 Adsorption in Energy-Intensive Industries: A Systematic Review
11:00-11:10	Breaks		
11:10-11:20	OB18	Muhammad Saddam Hussain (Tsinghua University)	Techno-economic analysis and life-cycle assessment of integrated carbon capture and utilization process for coal-fired power plant
11:20-11:40	KB8	Yiran Zhang (Shanghai Jiaotong University) No recording of presentation	Integrated carbon capture and conversion with NOx synergistic removal

DAY 2 SESSION B

CCST 2025 CONFERENCE

11:40-12:00	IB1	Prof. Chen Yun (Nanjing Normal University)	Evaluating iron dosing for carbon capture and recovery in mainstream wastewater treatment system
14:30-14:40	OB19	Pablo Comendador Morales (University of the Basque Country)	Life cycle assessment of hydrogen production from biomass fast pyrolysis and in line sorption enhanced steam reforming
14:40-14:50	OB20	Stephen Kehinde Ogunlade (African University of Science and Technology, Nigeria)	Analysis of flare gas valorisation strategies for DME synthesis
14:50-15:10	KB9	Prof. Mijndert van der Spek (Heriot Watt University)	Going net-zero with CCS and CDR
15:10-15:20	Breaks		
Topic: Carbon capture, utilization, and storage in industry			
15:20-15:40	KB10	Prof. Li Jia (Lingnan University, Hongkong)	Recent Progress in DAC development
15:40-16:00	KB11	Prof. Salman Masoudi Soltani (Brunel University of London)	Carbon Dioxide Removal from the Sea: An Investigation at Scale
16:00-16:20	IB2	Prof. Wang Houfeng (Fujian Agriculture And Forestry University)	A Systematic Investigation into the Measurement of Municipal Sludge Yield Stress and Its Applications in Dewatering Processes
16:20-16:40	IB3	Prof. Shen Nan (Nanjing Normal University)	Direct interspecies electron transfer is not the pivotal role in directing electrons toward methane production from sulfate containing wastewater
16:40-16:50	OB21	Dr Zhang Jun (Jiangnan Environmental Technology GmbH)	Carbon Capture & Utilization with Fertilizer production (CCUF)

DAY 2 SESSION C

CCST 2025 CONFERENCE

August 5/Day 2: Parallel Session C (China Standard Time/UTC+8) Topic: Biomass carbon removal and storage (BiCRS)			
China Time		Speaker	Title
10:00-10:20	IC1	Prof. Qian Tingting (Shandong Normal University)	Study on Carbon emission of Straw-Combined Heat and Power Generation
10:20-10:40	IC2	Prof. Liu Jianbo (Nanyang Technological University, Singapore)	Quorum Quenching-Based Dual Regulation for Membrane Biofouling Control and Methane Production Enhancement
10:40-11:00	IC3		
11:00-11:10	Breaks		
11:10-11:30	IC4	Prof. Jiang Yizhang (Guangdong Technion - Israel Institute of Technology)	Characterization of glycoprotein and its interaction with sludge dewatering: The neglected role of glycoprotein
11:30-11:50	IC5	Prof. Ding Wei (Guangdong Technion - Israel Institute of Technology)	Contribution of humic substances and metal ions to phosphorus bioavailability in hydrochar derived from pig manure and sewage sludge: A systematic comparison
11:50-12:00	OC17	Joni Jupesta (IPB University) No recording of presentation	The Potential of CCS from Biogas in Indonesia
14:30-14:50	IC6	Prof. Tan Ling (Guangdong Technion - Israel Institute of Technology)	The effect of light sources on the production of single-cell protein by purple photosynthetic bacteria in swine wastewater
14:50-15:00	OC18	MUHAMMAD MUBASHAR HANIF (University of Agriculture Faisalabad)	Valorizing Agricultural Waste into Bio-based Solvents for Decentralized Direct Air Capture
15:00-15:10	OC19	Lanxin Chen (Beihang University)	Catalytic Stepwise Pyrolysis of Biomass in CO_2 Environments: A Promising Route to Carbon-neutral Biofuel Production
15:10-15:20	Breaks		

DAY 2 SESSION C

CCST 2025 CONFERENCE

Topic: Oxyfuel combustion and chemical looping			
15:20-15:40	KC6	Prof. Haibo Zhao (Huazhong University of Science and Technology) No recording of presentation	Chemical looping combustion: particle reaction and synthesis
15:40-16:00	IC7	Prof. Chao He (Tampere University)	Unveil pivotal role of Ni doping in ilmenite as oxygen carrier to realize simultaneous enhanced oxygen release and inhibited phase segregation in chemical looping process
16:00-16:10	Breaks		
16:10-16:20	OC20	Alejandro Lyons Ceron (Tallinn University of Technology)	Climate-Neutral Chemical Looping Gasification of Biomass and Oil Shale: Integrated Process Development and Pilot Reactor Design
16:20-16:30	OC21	Chen Xianghang (Zhejiang University)	High-temperature dual fluidized bed calcium looping CO_2 capture with recompression supercritical CO_2 power generation process
16:30-16:40	OC22	Bo Jin (Hunan University)	Chemical looping CO_2 conversion
16:40-16:50	OC23	Yang LI (Queen's University Belfast, Dalian University of Technology)	Staged chemical looping gasification of biomass for syngas production using metallurgical slag as oxygen carrier

Professor Sandra Kentish, University of Melbourne

Title: The use of membrane technology for the capture of carbon dioxide and its utilisation for microalgal culture

Sandra Kentish is a Redmond Barry Distinguished Professor at the University of Melbourne and a Fellow of the Australian Academy of Technological Sciences and Engineering. She is an Editor of the Journal of Membrane Science and was awarded the Membrane Society of Australasia Anita Hill Leadership Award in 2022. Professor Kentish is well known for her work on carbon dioxide capture using membrane technology. Her team has worked to establish the best membranes and membrane contactors for this approach and then importantly, tested these systems at pilot plant scale. She has also developed a process to simultaneously capture carbon dioxide and to provide this as a carbon source for microalgae, in collaboration with Professor Greg Martin. This work was the basis for her selection as one of Australia's Most Innovative Engineers in 2017.

Professor Shujuan Wang, Tsinghua University

Title: Solvent Development for CO2 Chemcial Abaorption Capture

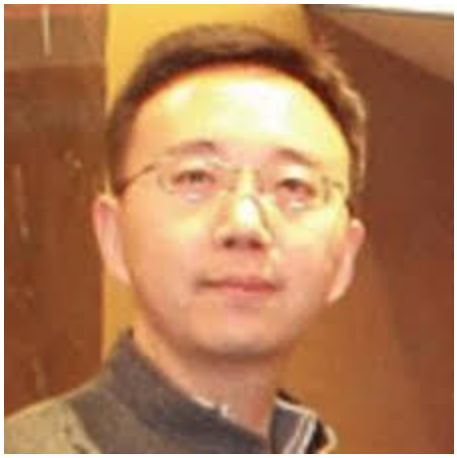
Shujuan Wang, professor in the Department of Energy and Power Engineering, Tsinghua University. She got her Ph.D in Tsinghua University in 2000. Her main research work includes CO2 capture, utilization and storage, renewable energy, clean coal technology, and Ecological Restoration. She was Director of Beijing Engineering Research Center for Ecological Restoration and Carbon Fixation of Saline-Alkali and Desert Land, member of Carbon Neutrality Council of Beijing. The related research projects undertaken by her are from the National Science and Technology Support Program, National Natural Science Foundation, and also EU FP6, FP7, H2020. She has published more than 100 papers. Her main research achievements were awarded the first prize of Science & Technology Award for Environmental Protection, and also second prize of Huaxia Construction Science & Technology Award. And she was awarded National Green Medal in 2018.

Prof. Chunshan Song, Chinese University of Hong Kong

Presentation title: High-capacity Selective Solid 'Molecular Basket' Sorbents for CO2 Capture and for SO2 Separation

Prof. Chunshan Song is the Dean of Science and Wei Lun Professor of Chemistry at the Chinese University of Hong Kong since July 2020. He is leading the Faculty of Science at CUHK including 6 major units (chemistry, physics, mathematics, statistics, life science, earth and environmental science) and several research institutes with **~600** faculty and staff offering **20** undergraduate programs with **~2700** BSc students and **21** postgraduate programs with **~1100** PhD, MPhil and MSc students. He is a Distinguished Professor Emeritus in Fuel Science and Chemical Engineering at the Pennsylvania State University, USA where he was the Director of EMS Energy Institute and founding Director of the University Coalition for Fossil Energy Research funded by US DOE. With BSc in Chemical Engineering from Dalian University of Technology and Ph.D. in Applied Chemistry from Osaka University, his research focuses on catalysis and chemistry of energy and fuels including CO_2 capture, catalytic CO_2 conversion, shape-selective catalysis and synthesis and applications of nano-porous materials. He has **~500** refereed journal articles, **8** patents, **16** edited books, 35 book chapters and has delivered over **425** invited lectures worldwide. He has received George A. Olah Award and Henry H. Storch Award from American Chemical Society (ACS), ACS Fellow, Distinguished Researcher Award from ACS Energy & Fuels Division, Outstanding Achievement from the Chinese American Chemical Society (CACS) and Distinguished Fulbright Scholar from US-UK, Herman Pines Award from Chicago Catalysis Club and Excellence in Catalysis Award from Catalysis Club of Philadelphia. Within Penn State, he has received the Faculty Scholar Medal, University Distinguished Professor, Wilson Award for Excellence in Research, Faculty Mentoring

Award, and Materials Science and Engineering Service Award. He is an advisory editor for Journal of CO_2 Utilization (Elsevier), Associate Editor for Frontiers of Chemical Science and Engineering (Springer) and served on the editorial board of 14 research journals in catalysis, chemistry, energy and fuels, and chemical engineering. He also held Visiting or Guest or Adjunct Professorship at Imperial College London, University of Paris VI, Tsinghua University, Tianjin University, Dalian University of Technology, Dalian Institute of Chemical Physics, and Taiyuan University of Technology.



Professor Tao Wang, Zhejiang University

Presentation title: Carbon dioxide mineralization utilization technology based on industrial solid waste

Dr. Tao Wang is the professor at the College of Energy Engineering, Zhejiang University, and the Chief Scientist of the National Key R&D Program. He is on the list of top 2% of global leading scientists by Elsevier. Prof. Wang focuses on research of advanced CO2 capture sorbent and economic CO2 mineralization technology, such as concrete curing. The technology has been applied in large energy enterprise, including China Energy Group and Zhejiang Energy Group. It was selected as the top ten scientific and technological innovations for China's carbon peak and carbon neutrality in 2023. Prof. Wang led the preparation of China's first industry standard for CO2 solvent management. He is also one of the leading authors of China's CCUS Roadmap.

Professor Ryan Lively, Georgia Institute of Technology

Presentation title: Three Keys to Successful Direct Air Capture: Humidity, Degradation, and Contactors

Ryan Lively is the Thomas C. DeLoach Jr. Endowed Professor in the School of Chemical & Biomolecular Engineering at the Georgia Institute of Technology. His current research seeks to revolutionize fluid separation processes critical to the global energy and carbon infrastructure. He has a specific focus on membrane- and adsorbent-based science and technology aimed at addressing some of the world's most difficult chemical separations. His group's research activities range from fundamental material science and discovery to translational engineering applications focusing on making and testing separation devices. He has received a variety of awards for his research efforts including the 2020 Allan P. Colburn Award from AIChE, and the 2022 Curtis W. McGraw Award from ASEE. He is currently an Editor for the Journal of Membrane Science, the Secretary of the North American Membrane Society, an ACS Industrial & Engineering Chemistry Division Fellow, and a Fellow of the International Association for Carbon Capture. He is the Director of the Center for Understanding & Controlling Accelerated and Gradual Evolution of Materials for Energy (UNCAGE-ME), an Energy Frontier Research Center of the US Department of Energy. He has over 200 publications in the field of separations including articles in *Science*, *Nature*, and other impactful venues.

Professor Zhi Wang, Tianjin University

Presentation title: Development of High-Performance Mixed-Matrix Composite Membranes for CO2 Separation

Zhi Wang, Chair Professor at Tianjin University, Director of the Tianjin Key Laboratory of Membrane Science and Seawater Desalination Technology, China, and Director of the State Key Laboratory of Chemical Engineering (Tianjin University). Over the years, his research has focused on membrane science and technology to address the major demands of the country and society in areas such as water treatment, seawater desalination, CO_2 capture, and gas separation and purification. He has led more than 50 research projects, including four key projects funded by the National Natural Science Foundation of China, one National Marine Public Welfare Research Project, and one National Key Research and Development Program. He has published over 300 SCI papers in high-impact journals such as Nature Materials, Advanced Materials, Angewandte Chemie International Edition, Journal of the American Chemical Society, AIChE Journal, Desalination and Journal of Membrane Science. His work has been cited over 14,000 times, and he holds 52 authorized national invention patents.

Professor Alexander Forse, University of Cambridge

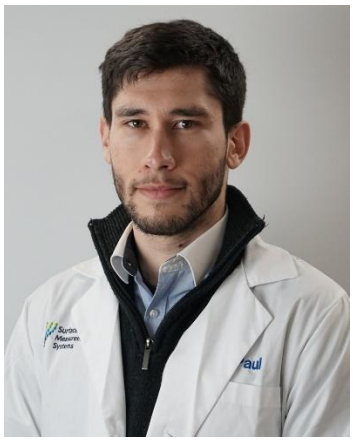
Presentation title: Advancing electrochemically driven carbon dioxide capture with supercapacitors

Alexander Forse is Professor of Materials Chemistry at the University of Cambridge, and leads a group that researches new materials that help with climate change mitigation. Prof. Forse holds a UKRI Future Leaders Fellowship and an ERC starting grant, and he was recently awarded the Anatole Abragram Prize for pioneering applications of NMR spectroscopy to energy materials. Current research interests include advancing high rate electrochemical energy storage, developing new materials for carbon dioxide capture, developing electrochemically driven carbon capture technologies, and applying NMR spectroscopy methods to understand functional materials.

Prof Xi Chen, Lingnan University

Presentation title: Addressing Climate Change: Negative Emission based on AI-Driven Evolution of Advanced Materials

Xi Chen is Chair Professor and Dean of the School of Interdisciplinary Studies at Lingnan University, and Director of Shenzhen Research Institute of Lingnan University. He received his M.S. from Tsinghua University, and Ph.D. in Solid Mechanics from Harvard University, and spent 20 years as a professor in the Department of Earth and Environmental Engineering at Columbia University, before joining Lingnan in 2023. He received numerous awards including the NSF CAREER Award, the Presidential Early Career Award for Scientists and Engineers (PECASE), ASME Sia Nemat-Nasser Early Career Award, ASME Thomas J. R. Hughes Young Investigator Award, and SES Young Investigator Medal. He is a Fellow of ASME. He has published over 400 journal papers with a h-index over 78. He uses multiscale theoretical, experimental, and numerical approaches to investigate various research frontiers in engineering science addressing real-world challenges in energy, environment, nanotechnology and biology. He pioneered the scientific and technological framework of distributed carbon capture, utilization, and sequestration (distributed CCUS), and established Asia's first direct air capture factory for carbon dioxide, and China's first carbon negative industrial park zone. His recent work in carbon neutrality has been recognized by many top awards, including No. 1 Award in Direct Air Capture and overall Top 10 in Tencent Carbon X Grand Competition, No. 1 Award in Carbon Neutrality in 6th Zhongguancun Innovation Competition, and No. 1 Prize in Bluetech Carbon Neutrality Pioneers Award. He is a World's Top 2% Most-cited Scientists published by Stanford University since 2019.



Dr Paul Iacomi, Surface Measurement Systems

Presentation title: Evaluating the influence of stream contaminants on the carbon capture potential of solid sorbents at the lab scale

Dr Paul IACOMI is a Research Manager and UKRI Future Leaders Fellow at Surface Measurement Systems (SMS). He holds an EU-funded MSCA PhD in material science from Aix-Marseille University, France. His career has been focused on the advanced characterisation of challenging novel porous materials, like defect-engineered or flexible metal organic frameworks (MOFs), alongside their integration for high-performance applications such as carbon capture, paraffin separation and sensors for satellites. At SMS, his team is leading the development of next generation of sorption methodologies, bringing together a wide range of expertise in sorption techniques and porous material/surface characterisation – including gravimetric and chromatographic (breakthrough) instruments. His research output comprises over 25 peer reviewed publications, 1 patent and 1 book chapter.

Prof James A. Ritter, University of South Carolina

Presentation title: Carbon Dioxide Capture by PSA at the DOE National Carbon Capture Center

James A. Ritter, Ph.D., is the Gibbons Teaching Professor of Chemcial Engineering, L. M. Weisiger Professor of Engineering and a Carolina Distinguished Professor in the Department of Chemical Engineering at the University of South Carolina. Professor Ritter has authored or coauthored over 171 peer-reviewed journal articles and holds 8 U. S. Patents in the areas of cyclic adsorption processes for gas separation and purification and hydrogen storage processes and materials. His current interests focus on cyclic adsorption process R&D with funding from ONR, DOE and several university centers and private companies. He has served or is serving as a consultant for more than 40 companies, government agencies and national laboratories including NASA MSFC, ExxonMobil, Shell, BP Amoco, Eastman Chemical and DOE. He has also served on the Editorial Boards of four journals: Separation Science and Technology; Adsorption, Journal of the International Adsorption Society; Recent Patents in Chemical Engineering; and Industrial and Engineering Chemistry Research. He received the AIChE Institute Award for Excellence in Industrial Gases Technology in November of 2016; and he is a co-author (M. D. LeVan, G. Carta, J. A. Ritter and K. S. Walton) of “Adsorption and Ion Exchange,” in Perry’s Chemical Engineers’ Handbook, 9th Ed., (D. W. Green and R. H. Perry, eds.), McGraw-Hill, NY (2018). He served as the Associate Editor for Adsorption, Journal of the International Adsorption Society (IAS) from January 2021 to June 2024 and he began serving as the Editor-in-Chief for Adsorption, Journal of the International Adsorption Society on July 1, 2024. Professor Ritter was named a Fellow of the ACS in July 2012, a Fellow of the AIChE in June 2013, and a Fellow of the IAS in July 2023

Professor Ki Bong Lee (李起鳳), Korea University

Ki Bong Lee received his BE and MS from Department of Chemical Engineering, Korea University, Korea in 1999 and 2001, respectively, and PhD from the School of Chemical Engineering, Purdue University, USA in 2005. He worked as a post-Doctoral research associate in Department of Chemical Engineering, Lehigh University, USA from 2006 to 2007. He was a senior researcher at the Korea Institute of Energy Research from 2008 to 2009. He has been a professor at the Department of Chemical and Biological Engineering, Korea University since 2009. He has worked on separation technologies such as adsorption, membrane separation, solvent extraction, etc. for the application to energy and environmental fields. Particularly, he has interest in novel sorption-enhanced reaction for fuel-cell grade hydrogen production, novel adsorbents and adsorption processes for CO2 and CF4 capture, adsorbents and adsorption processes for gas sensor, adsorbents for CO, NOx, water vapor, chemical warfare agents, and sulfur compounds, and design and optimization of adsorption processes. He published more than 220 research papers and has 45 applied or registered patents. He has served as editors of Journal of Industrial and Engineering Chemistry and Scientific Reports.

Prof. Kumar Varoon Agrawal, EPFL – Swiss Federal Technology Institute of Lausanne, Switzerland

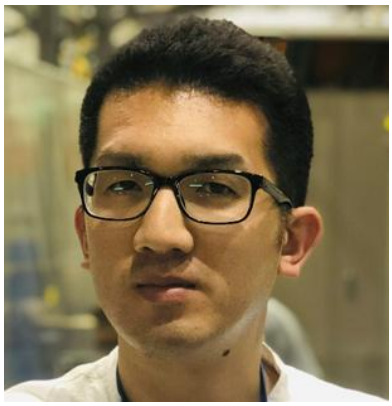
Title: 2D materials, gas separations, CO2 separations

Kumar Varoon Agrawal is an Associate Professor and head of the Laboratory of Advanced Separations at the Institute of Chemical Sciences and Engineering at EPFL. He received his undergraduate degree in Chemical Engineering from IIT Bombay in 2005. Following this, he joined the global R&D division of Procter & Gamble in Japan, working on product design (2005-2008). He received his PhD from the University of Minnesota (2013), developing two-dimensional zeolites, one of the first 2D materials demonstrated for separations. He received his postdoctoral training on carbon materials from the Strano group at MIT. His research group at EPFL is developing scalable synthetic routes for two-dimensional membranes with an emphasis on energy-efficient carbon capture. He is the recipient of the AIChE Separation Division FRI/John G. Kunesh Award, NAMS Young Membrane Scientist Award, ERC Starting Grant, etc. He is an editorial board member of the Journal of Membrane Science, and Separation & Purification Technology. He is also a co-founder of a membrane startup, Divea, which focuses on bringing porous graphene membranes to the market for carbon capture.

Prof. Yangyang Guo, Institute of Process Engineering，Chinese Academy of Science

Title: VPSA application of carbon capture from Blast Furnace Gas

Yangyang Guo, she is an associate researcher in the Institute of Process Engineering, Chinese Academy of Sciences (IPE, CAS). She received her Ph.D. degree from the Institute of Process Engineering, CAS in 2014. Her main research interests are the control of industrial flue gas pollutants and the development and application of low-carbon technologies. She has led more than 10 projects including the National Natural Science Foundation of China (NSFC), National Key Research and Development Programmes, and local enterprise projects et.al; She has published 39 SCI papers in journals such as Angew, EST. and others; been granted 15 invention patents, including 2 international patents; She has selected as ‘Youth Innovation Promotion Society’ of Chinese Academy of Sciences in 2021, and selected as Beijing Science and Technology Rising Star Programme in 2024.



Prof. Ken-ichi Otake, The Institute for Integrated Cell-Material Sciences (iCeMS), Kyoto University

Title: Harnessing the Structural Flexibility of Metal-Organic Frameworks for Efficient Gas separation

Dr. Ken-ichi Otake completed his Ph.D. in 2016 at Graduate school of Science, Kyoto university, specializing in Chemistry under the guidance of Prof. Hiroshi Kitagawa. Following this, he spent two years as a postdoctoral researcher at Northwestern University, working under the supervision of Prof. Joseph T. Hupp and Prof. Omar K. Farha. In 2018, he became an assistant professor in Prof. Susumu Kitagawa's group at the Institute for Integrated Cell-Material Sciences at Kyoto University. In 2024, he was promoted to associate professor at the same institute. His research interests include coordination chemistry, solid-state chemistry, and CO2 capture and utilization (CCU). He received the Young Scientist Award from the SPring-8 users community and the Research Encouragement Award from the Japanese Society of Coordination Chemistry in 2023, and the CSJ Award for Young Chemists from the Chemical Society of Japan in 2025.

Prof. Shijian Lu, China University of Mining and Technology

Title: Research progress on low-energy consumption of flue gas CO2 capture and utilization technology

Shijian Lu, PhD, professor and doctoral supervisor of China University of Mining and Technology, engaged in research on carbon capture and utilization. Vice President of Carbon Neutral Research Institute of China University of Mining and Technology (CUMT),Executive Deputy Director of the National Circular Economy Laboratory for Carbon Dioxide Capture, Utilization and Storage, and member of the CCUS Standardization,Working Group of the China Carbon Emission Management Standards Committee. He has led more than 20 scientific research projects, won 12 scientific and technological awards, and won the championship of the XPRIZE Carbon Removal Competition in China. He is responsible for the feasibility study and process package design of more than 10 key scientific research demonstration projects, including the 2 million tons/year CO2 capture and oil displacement storage project of Shengli Power Plant and the 150000 tons/year CO_2 capture and storage project of Jinjie Power Plant of China Energy Investment Group.

Professor Nannan Sun, Shanghai Advanced Research Institute

Dr. Nannan Sun received his PhD in physical chemistry from the Institute of Coal Chemistry, Chinese Academy of Sciences (CAS), he worked at the University of Nottingham as a post-doc in collaboration with Prof. Chenggong Sun, Hao Liu, and Colin Snape. From 2014, he joined Shanghai Advanced Research Institute (SARI), CAS, and currently he is the vice-director of State Key Lab for Low Carbon Catalysis and CO2 Utilization, director of Photon Science Research Center for Carbon Dioxide of SARI. His research focuses on strategic and technologic study of CO2 capture and utilization (CCU), including evaluation methodologies of CCU technologies, adsorption-based CO2 capture, integrated CO2 capture and conversion, etc. He has published more than 50 papers in peer-reviewed journals, such as Joule, Energy Environ. Sci., Appl. Catal. B, etc.

Prof. Haibo Zhao, Huazhong University of Science and Technology

Presentation title: Chemical looping combustion: particle reaction and synthesis

Professor Haibo Zhao received the Ph.D. degree in Thermal Engineering from Huazhong University of Science and Technology in 2007. He is currently the Vice Director of State Key Laboratory of Coal Combustion at Huazhong University of Science and Technology. His research area is chemical looping combustion, as well as combustion synthesis of functional nanoparticles. He has won the National Excellent Youth Fund, Alexander von Humboldt Foundation Fellowship and the Fellow of The Combustion Institute. His research work has won the Outstanding Paper Award of the International Combustion Institute, the Best Paper Award of the International Chemical Looping Conference.

Prof Minshu Du, Northwestern Polytechnical University

Presentation title: Design of CO_2 electroreduction catalysts based on the reactive thermodynamics and kinetics

Minshu Du, Associate Professor at the School of Materials Science and Engineering, Northwestern Polytechnical University, China. She went to the Chemistry Department of the University of Texas at Austin as a visiting scholar during 2013–2015, and received her Ph.D. in Materials Science and Engineering at China University of Petroleum at Beijing in 2016. Over the years, her research has focused on electrocatalysts design based on the thermo-kinetic synergy, single-entity electrochemistry and its application. She is currently the member of youth editorial board of Journal of Electrochemistry, Acta Metallurgica Sinica and ChemPhysMater. She has published over 50 SCI papers in high-impact journals such as Science, Advanced Materials, Journal of the American Chemical Society, Advanced Functional Materials, ACS Catalysis. She presided over 10 projects including the National Natural Science Foundation of China, Shaanxi Provincial Natural Science Foundation and Chongqing Municipal Natural Science Foundation; also participated in the National Key Research and Development Program, Key Programs of the National Natural Science Foundation of China.

Salman Masoudi Soltani, Brunel University of London

Dr Salman Masoudi Soltani is a Reader (Associate Professor) in Chemical Engineering at Brunel University of London. He joined the university in May 2017 as a founding member of the newly established Chemical Engineering Department, contributing to the design and development of its academic programs. A Chartered Engineer (CEng, MIChemE), Dr Masoudi Soltani has a strong background in both industrial and academic research within chemical and process engineering. In his current role, he serves as the Director of Research for the Department of Chemical Engineering. Dr Masoudi Soltani's primary research focuses on Separation Processes, particularly in adsorption technologies, covering both experimental and process design & modelling aspects. He has led several major research projects on carbon capture and blue hydrogen production, funded by the UK's Engineering and Physical Sciences Research Council (EPSRC), the UK Carbon Capture and Storage Research Centre (UKCCSRC), and the UK's Department for Energy Security & Net Zero (DESNZ). Before joining Brunel University of London, he worked as a postdoctoral research associate in the Clean Fossil & Bioenergy Research Group at Imperial College London, UK, the University of Nottingham, UK, and as a project engineer with A-Gas International ltd. (UK).

Prof. Ziqian Xue, Sun Yat-sen University

Presentation title: Metal-Organic Frameworks-Based Electrocatalysts with Structural Heterogeneity for Green Hydrogen Energy

Ziqian Xue obtained his doctoral degree from Sun Yat-sen University in 2020. Subsequently, he was awarded the JSPS Fellowship and joined the research group of Professor Susumu Kitagawa at Kyoto University. In 2024, he joined the School of Advanced Energy at Sun Yat-sen University as an associate professor. His research focuses on the design of structurally heterogeneous semiconductor materials with structural heterogeneity for electrocatalytic processes related to hydrogen energy.

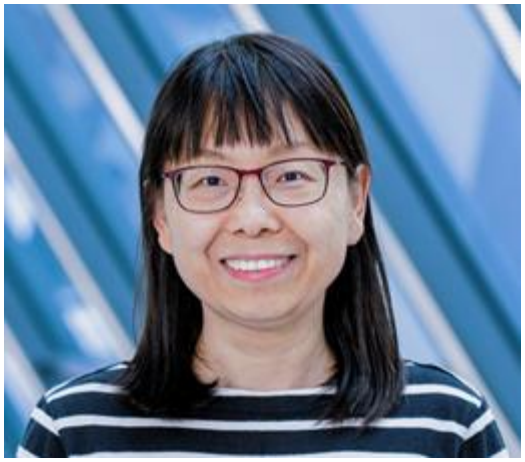
Dr James McGregor, University of Sheffield

Dr. James McGregor is a Senior Lecturer in Chemical Engineering at the University of Sheffield, UK and holds a PhD in chemical engineering from the University of Cambridge and a Master's degree from the University of Edinburgh. His research deals with sustainable catalytic science and engineering, with a particular focus on the application of waste or low-value co-products as feedstocks for the production of value-added chemicals and fuels. Current areas of research focus include CO_2 utilisation and biomass conversion, both in gas-solid and three-phase systems. He is Currently chair of the IChemE Catalysis and Reaction Engineering Special Interest Group, and is a chartered engineer, Member of the Institution of Chemical Engineers (MIChemE) and member of the Royal Society of Chemistry (MRSC). He is also an Associate Editor for Green and Sustainable Chemistry at Frontiers in Chemistry. Industrial collaborators have included Johnson Matthey, Unilever, Croda and Nouryon, with the latter naming him as an ImagineChemistry award winner in 2019.

KEYNOTE SPEAKERS

Dr Michael Short, University of Surrey

Dr Michael Short is Associate Professor (Reader) in Process Systems Engineering at the University of Surrey in the School of Chemistry and Chemical Engineering and Sustainability Fellow in the Surrey Institute for Sustainability. He obtained a PhD from the University of Cape Town in 2017 and was a Research Fellow at Carnegie Mellon University until his appointment at Surrey in 2019. His research expertise is in the development mathematical optimisation tools to create software for process systems for automated optimal sustainable, process design, renewable energy systems, policymaking, process integration, data analysis, and process control. His work has been funded by EPSRC, BBSRC, Innovate UK, FCDO, British Council, CAPES (Brazil), NRF (South Africa), and industry. Dr Short is currently Principal Investigator for the £1.4 million EPSRC-funded project 'Artificial Intelligence Enabling Future Optimal Flexible Biogas Production for Net-Zero' (EP/Y005600/1) under the scheme Artificial Intelligence Enabling the UK's Net-Zero Targets. Dr Short is also Co-I and digitalisation lead in the £5 million Supergen Bioenergy Impact Hub. He is an Editorial Board Member for the Journal of Water Process Engineering and Journal of Process Integration and Optimization for Sustainability.



Prof. Bing Wu, University of Iceland, Iceland

Presentation title: Hybrid direct air capture with pressure-retarded osmosis for energy-neutral decarbonation: effect on osmosis membrane performance

Bing Wu is currently a professor in the Faculty of Civil and Environmental Engineering, University of Iceland. Before joining University of Iceland, she was a senior research fellow from Singapore Membrane Technology Centre, Nanyang Technological University, Singapore. Her research focuses on innovative water and wastewater treatment, resource recovery, and renewable energy via advanced membrane technology and environmental biotechnology. Her research activities include process design and testing, techno-economic analysis, and life cycle assessment, towards solving the challenges in “Water-Food-Energy” nexus and strengthening climate resilience. She has completed more than 20 research and industrial projects at lab-scale or pilot-scale, and published ~90 peer-reviewed journal papers. Her team received “the President of Iceland’s Innovation Award” and “University of Iceland Technology and Progress Award”. She is an editorial board member of Journal of Water Process Engineering.

Dr. Zhongbo Zhou, Southwest University, China

Presentation title: AnMBR-algal synergy: Carbon capture and resource recovery from wastewater

Dr. Zhou is a Professor in the Department of Environmental Science and Technology at Southwest University, Chongqing, China. He obtained his Ph.D. from Sun Yat-sen University (Guangzhou) in 2014, during which he served as a visiting scholar at Delft University of Technology (TU Delft) from 2013 to 2014. His academic trajectory includes postdoctoral research at Nanyang Environment & Water Research Institute (NEWRI), Nanyang Technological University (2015–2016), followed by an appointment as Research Associate Professor at Sun Yat-sen University (2016–2019). Specializing in sustainable wastewater treatment technologies, Dr. Zhou's research focuses on the design and optimization of anaerobic membrane bioreactors and algal-bacterial symbiotic systems. His scholarly contributions include over 50 peer-reviewed publications in leading journals such as Environmental Science & Technology, Water Research, Chemical Engineering Journal, Journal of Membrane Science, and AIChE Journal, garnering an h-index of 25 with approximately 3,000 citations (Google Scholar). Dr. Zhou actively engages in professional service as: Member of the International Water Association (IWA); Young Editorial Board Member of Environmental Science and Ecotechnology; Deputy Director, Water Environment Engineering Committee, Chongqing Environmental Science Society; Committee Member, Young Professionals Committee, China Urban Water Supply and Drainage Association.

Dr. Chencheng Le, Nanyang Technological University, Singapore

Presentation title: Environmental analytical science for carbon analysis

Le Chencheng is a lecturer at the Asian School of the Environment (ASE) and currently serves as the Assistant Chair (Student Life). He specializes in the interdisciplinary collaborative core course Sustainability – Society, Economy and Environment, a university-wide module that engages over 6,000 students each academic year. Prior to ASE, he was a research fellow at the Nanyang Environment & Water Research Institute (NEWRI), Nanyang Technological University (NTU), contributing to Singapore's national water and environmental initiatives. He holds a Ph.D. in environmental engineering from NTU, where he graduated as valedictorian, and a Bachelor of Science (Honours) degree in chemistry from the National University of Singapore.

Chencheng's principal research interest is in the chemistry domain, focusing on environmental analytical science. His fundamental research works have included elucidating the molecular mechanisms of biodegradation, metabolization and biotransformation in diverse biotic and abiotic matrices. His applied work ranges from sustainable large-scale centralized wastewater treatment systems to industrial-scale decentralized resource recovery operations in line with the circular economy principles. He also explores interdisciplinary collaborative learning pedagogy, integrating diverse academic perspectives to enhance education in sustainability.

Dr. Guo Jiayi (Jessie), Agency for Science, Technology and Research (A*STAR), Singapore

Presentation title: Brush Polymer Functionalized Biomass Textile and Its Potential Capacity for Direct Air Capture of CO_2

Dr. Guo Jiayi graduated with PhD in Chemistry from Nanyang Technological University, Singapore, and now works as a senior scientist at Agency for Science, Technology and Research (A*STAR) Singapore. Dr. Guo's research interests is design and synthesis of functional polymers for applications in biomedical and environmental fields, such as soft matters for tissue repair, CO_2 absorbent and energy storage. Dr Guo published more than 20 papers in international peer reviewed journals and technical inventions. She has rich experience in research projects leading and partnership with world-renowned companies such as Siemens, Coca-Cola, and Mitsui Chemicals. One of medical products developed by her as the lead scientist is ongoing the clinical trial in Singapore General Hospital for the commercialization in the coming future soon. Recently Dr Guo is developing functionalized biomass-based textile for CO_2 capture as the circular resource in textile industry.

Dr. Euntae Yang, Gyeongsang National University

Presentation title: Development of 2D Nanomaterial-Based Mixed Matrix Membranes for Carbon Capture

Dr. Euntae Yang is an Associate Professor in the Department of Marine Environmental Engineering at the College of Marine Science, Gyeongsang National University. He received his B.S. in Environmental Engineering from Inha University and completed his M.S. and Ph.D. in Environmental Engineering at the Gwangju Institute of Science and Technology (GIST). He also served as a research fellow at the Singapore Membrane Technology Centre. His primary research interests include membrane technology, bioelectrochemical systems, water treatment, and the development of novel gas separation membranes, including those for carbon capture. Dr. Yang has conducted a number of national and regional research projects in areas such as water treatment membrane development, green hydrogen production, and carbon neutrality. He has published extensively in domestic and international journals and holds patents related to advanced membrane materials and electrochemical technologies.

Prof. Sicong Tian, China Agricultural University

Presentation title: Oxygen vacancy-enhanced thermochemical reforming reactions for CO_2 conversion

Dr. Sicong Tian is a professor at College of Engineering, China Agricultural University. He got his Ph.D. in the discipline of Environmental Science and Engineering at Tsinghua University in 2016. He worked as a postdoctoral research fellow at Macquarie University and The University of Queensland in Australia from 2017 to 2021. Dr Tian's research interests include thermochemical reforming of biomass for H_2 production, CO_2 capture and in-situ utilization in bioenergy conversion, and photo-thermo catalytic conversion of multi-source biowaste. So far, Dr Tian has published 50+ articles in the internationally renowned academic journals such as *Nature Communications*, *Science Advances*, and *Energy & Environmental Science*, and was awarded the Year 2017 Prize in Chemistry by THE DIMITRIS N. CHORAFAS FOUNDATION.

Dr. Tae-Hyun Bae, KAIST, South Korea

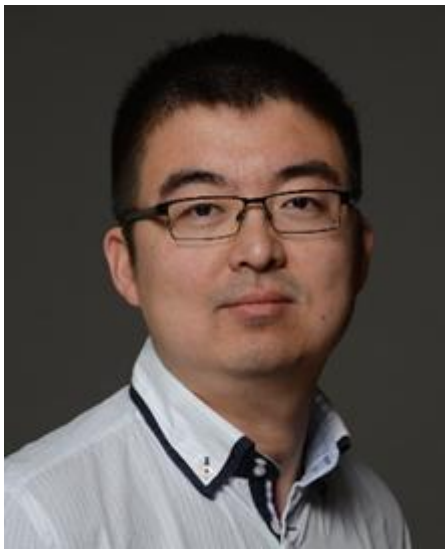
Presentation title: Engineered Porous Polymers for Advanced CO2 Separation

Dr. Tae-Hyun Bae is an Associate Professor at the KAIST CBE Department (joined in May 2019). Tae-Hyun Bae received his Ph.D. in Chemical Engineering at Georgia Institute of Technology in 2010. Following a postdoctoral experience at the University of California, Berkeley, he had worked at Nanyang Technological University, Singapore, from 2013 to 2019 as an Assistant Professor of Chemical Engineering. While he was staying in NTU, he also served as the cluster leader at the Singapore Membrane Technology Centre as well as the assistant chair of research at School of Chemical and Biomedical Engineering. Dr. Bae has extensive research experience in nanoporous materials and membrane technology used in various chemical and environmental engineering processes. He is now serving as an editor of *Journal of Membrane Science* and has published about 130 research papers that have been cited more than 18000 times (Google Scholar).

Dr Xiangkun Cao, MIT

Presentation title: From centralization to distributed systems

Dr. Xiangkun (Elvis) Cao is currently a Carbon Dioxide Removal Specialist at DNV, recently being named one of MIT Technology Review's 35 Innovators Under 35 (MIT TR35 – Global) for his impact in Climate and Sustainability. He is also a Senior Schmidt Science Fellow (SSF), a lifelong fellowship by Schmidt Sciences in partnership with the Rhodes Trust. During his SSF placement, Elvis pursued his research vision of integrated carbon capture and utilization at MIT. He received his Ph.D. from Cornell University in 2021, focusing on optofluidics-enabled CO2 conversion. Dr. Cao secured grant funding as the PI/Co-PI from the Commission for Environmental Cooperation and the Carbontech Development Initiative by NYSERDA, among others. Dr. Cao has been named an Activate Fellow, an MIT Climate & Sustainability Consortium Impact Fellow, a Carbon Removal Justice Fellow, and a German Chancellor Fellow by the Humboldt Foundation. Cao has received Forbes 30 Under 30 in Energy for North America, CAS Future Leader in Chemistry, World Energy Council's Future Energy Leader, Lindau Nobel Laureate Meetings Young Scientist, ME Rising Stars in by UC Berkeley, and MSE Rising Stars by CMU, Stanford, and MIT.



Dr Xi Yu, University of Southampton

Presentation title: Computational fluid dynamics modelling of a chemical looping system for CO2 utilisation

Dr. Xi Yu is a Lecturer in Chemical Engineering at the University of Southampton and a Principal Investigator in the Digital and Data-Driven Methods group. He earned his Bachelor's degree in Chemical Engineering from Tianjin University and his Ph.D. from the University of Sheffield. His expertise spans low-carbon fuels, granulation and tableting, computational fluid dynamics, and chemical looping. With over 30 journal publications, he has played a leading role in projects funded by the Royal Society, AstraZeneca, Leverhulme Trust, EPSRC and EU Horizon 2020. He has also supervised four Ph.D. students and ten MSc students.

Professor Guoping Hu, Ganjiang Innovation Academy, Chinese Academy of Sciences

Presentation title: Strongly polarized small-pore zeolites for the capture of CO2 from dilute sources

Prof Guoping Hu, Ganjiang Innovation Academy, Chinese Academy of Sciences. Dr. Hu obtained his PhD from the University of Melbourne in Australiain 2018, thereafter did postdoc research at the University of Melbourne and the University of Western Australia. He recently moved to the Ganjiang Innovation Academy at the Chinese Academy of Sciences as a professor. His research focuses on chemical separation technologies such as pressure swing adsorption for CO2 and CH4 capture. He holds more than 10 patents and has published over 60 papers and conference proceedings, including articles in Nature, Nature Commun. He has also delivered over 30 talks at international conferences and serves as a member at the International Adsorption Society Education Committee.

Dr Hyungwoong Ahn, University of Edinburgh

Presentation title: Industrial decarbonisation through PSA-SPUR technology: the innovative adsorption process for CO2 capture

Dr Hyungwoong Ahn is a Senior Lecturer in Chemical Engineering at the University of Edinburgh in the UK and also an Adjunct Professor of Chemical Engineering at Yonsei University in Korea. He specialises in adsorption process engineering, focusing on the separation of various gas mixtures, including air drying, CO2 capture and H2 purification. His research revolves primarily around the development and optimisation of innovative adsorption processes, such as Pressure Swing Adsorption (PSA) and Temperature Swing Adsorption (TSA), through Equilibrium Theory analysis, numerical simulation and experimental demonstrations. Dr Ahn has also made significant contributions to advancing various CO2 capture technologies, including fluidised bed systems utilising calcium oxides and absorption processes with physical/chemical solvents as well as PSA/TSA technologies. He has led numerous research and consultancy projects in this area of research, supported by funding from various organisations such as the UK's EPSRC and Department for Business, Energy & Industrial Strategy (BEIS), Korean Energy Technology Evaluation and Planning (KETEP), the Scottish Funding Council (SFC), and others.

He has been recognised as a Brain Pool fellow by the Korean Federation of Science and Technology (KOFST), and served as a technical assessor for the IEA Greenhouse Gas R&D Programme (IEAGHG) and National Grid. Dr Ahn's works have garnered several accolades for his university, including being a finalist for the Energy Award at the IChemE Global Awards and winning the Honeywell UniSim Design Challenge competition. One of his notable inventions is the cutting-edge PSA-SPUR technology for gas separation, which is designed to separate the most strongly adsorbing component from a gas mixture with very high product purity and recovery. Leveraging the patented technology, Dr Ahn is collaborating with a UK SME on various projects funded by the UK funding agencies, such as Connected Places Catapult and Ofgem. These projects are aimed at developing and demonstrating the PSA-SPUR technology at the company's site, highlighting its applicability in real-world settings.

Simultaneously, Dr Ahn is working with a global shipbuilding company on industry-funded projects that aim to commercialise the PSA-SPUR technology for CO2 capture on ships by 2026, showcasing the versatility of the adsorption process for industrial decarbonisation across different sectors.

Dr Inês Graça, University of Aberdeen

Presentation title: Innovative pathways for CO_2 conversion into fuels and chemicals: Enabling CO_2 transfer hydrogenation over zeolite catalysts

Dr Inês Graça is a Lecturer in Chemical Engineering in the School of Engineering, at the University of Aberdeen. She holds an MEng in Chemical Engineering from Instituto Superior Técnico (Portugal) and a PhD in Chemical Engineering from Instituto Superior Técnico (Portugal) and the University of Poitiers (France). Since 2007, she has been working in the field of Catalysis and Reaction Engineering. Her research work focuses on the design and optimisation of multi-functional, nanostructured, heterogeneous catalysts, in particular metal-promoted zeolites and hierarchical zeolites, their characterisation by different analytical techniques and development of sustainable processes for waste conversion. Her primary areas of expertise include carbon dioxide capture and utilisation, and biomass and plastic waste catalytic valorisation into value-added products. She worked for many years on the development of zeolite catalysts for the classical carbon dioxide hydrogenation to methane, but more recently she is focused on the transfer hydrogenation of carbon dioxide using renewable liquid organic hydrogen donors, as an emergent way to use carbon dioxide as a C_1 building block. Inês is an early-career board member of the Carbon Capture Science & Technology journal. She has participated in various European, UK and industrial projects in these areas, and currently has a h-index of 30.

Professor Qiwei Yang, Zhejiang University

Presentation title: Construction of Ultramicroporous Crystalline Materials for CO_2 Separation

Qiwei Yang is a Researcher and PhD supervisor in the College of Chemical & Biological Engineering, Zhejiang University. He received his B.S. and Ph.D. degrees from Zhejiang University, and was ever a visiting scholar at MIT. He was selected as a Young Scholar of the “Changjiang Scholars Award Program” of the Ministry of Education, and is the Secretary-General of the Molecular Recognition Separation Committee of the Chemical Industry and Engineering Society of China. His researches mainly focus on chemical separation engineering and thermal plasma technology. He was awarded the Second Prize of National Technology Invention and the Hou Debang Chemical Science and Technology Youth Award.

KEYNOTE SPEAKERS

Prof Mijndert van der Spek, Heriot Watt University

Presentation title: Going net-zero with CCS and CDR

Mijndert trained as an energy systems engineer and policy analyst at Delft University of Technology where he completed his MSc in 2009. After that, he joined Royal Dutch Shell in the Netherlands, working first in the supply chain optimization team of Shell Chemicals Europe and after as process technologist at the polyols plant of Shell Pernis Refinery. He pursued his PhD studies at the Copernicus Institute of Sustainable Development, where his research focused on techno-economic and environmental analysis of CCS and CCU technologies. Subsequently, he worked as postdoctoral researcher at the Separation Processes Laboratory of ETH Zürich, on CCS process design as well as CCUS system analysis. Mijndert's research focuses on developing the methods and tools to assess climate change mitigation technologies, in particular CO2 capture and direct air capture. Besides his work on process and system modelling, techno-economic, and life cycle analysis, Mijndert's team focuses on understanding and describing the mechanisms for water-CO2 co-adsorption onto solid adsorbents, given the criticality of humidity in CO2 capture. They combine advanced measurement methods with deriving representative equations and feed these into process models to understand the effect of humidity on adsorption cycle performance.

INVITED SPEAKERS

- Chao He, Tampere University
- Chen Yun, Nanjing Normal University
- Ding Wei, Guangdong Technion - Israel Institute of Technology
- Jiang Yizhang, Guangdong Technion - Israel Institute of Technology
- Liu Jianbo, Nanyang Technological University, Singapore
- Qian Tingting, Shandong Normal University
- Shen Nan, Nanjing Normal University
- Tan Ling, Guangdong Technion - Israel Institute of Technology
- Wang Houfeng, Fujian Agriculture And Forestry University

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