- 21-23 July 2023-

# INTERNATIONAL CONFERENCE ON CARBON CAPTURE SCIENCE & TECHNOLOGY 2023

— Online —

CCST 2023 CONFERENCE

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# ZOOM PLATFORM

## CCST 2023:

**Conference Theme: CCST Plenary + Editors' Panel**

Enter Zoom Meeting:

https://us06web.zoom.us/j/82590371552?pwd=QU1wQlMzampEVFo2RXVadjYrUjV3dz09

Conference number: 825 9037 1552

Password: 381272

**Conference Theme: CCST Session A**

Enter Zoom Meeting:

https://us06web.zoom.us/j/88180387027?pwd=NWdrejFQa0ZvemZTQ2hJZU9tVTFpdz09

Conference number: 881 8038 7027

Password: 963897

**Conference Theme: CCST Session B**

Enter Zoom Meeting:

https://us06web.zoom.us/j/81190998962?pwd=UjdJWXhTOXNGa2lqL0RvTnFveU1aQT09

Conference number: 811 9099 8962

Password: 339052

**Conference Theme: CCST Session C**

Enter Zoom Meeting:

https://us06web.zoom.us/j/83005698730?pwd=LzhJT29YL0d0Wml2NVJsV2Fac3JzZz09

Conference number: 830 0569 8730

Password: 543989

# KOUSHARE PLATFORM

## CCST 2023:

**Conference Theme: CCST Plenary + Editors' Panel**

Link of koushare:

https://www.koushare.com/lives/room/976172

**Conference Theme: CCST Session A**

Link of koushare:

https://www.koushare.com/lives/room/085070

**Conference Theme: CCST Session B**

Link of koushare:

https://www.koushare.com/lives/room/041997

**Conference Theme: CCST Session C**

Link of koushare:

https://www.koushare.com/lives/room/030362

# SCHEDULE

CCST 2023 CONFERENCE

| Day One (21nd July 2023) | | | |
|---|---|---|---|
| China Time | | | |
| 8:30-8:50 | Open Ceremony & Awards | | |
| 8:50-9:30 | PL-1<br>Challenges of CCUS for carbon neutrality<br>Prof. Jinyue Yan<br>(The Hong Polytechnic University) | | |
| 9:30-10:10 | PL-2<br>Accurate descriptions of molecule-surface interactions in electrocatalytic CO2 reduction on the copper surfaces<br>Prof. Xin Xu<br>(Fudan University) | | |
| 10:10-10:20 | Breaks | | |
| | Parallel Session A | Parallel Session B | Parallel Session C |
| | Chairs: | Chairs | Chairs |
| 10:20-10:45 | KA-1 | KB-1 | KC-1 |
| 10:45:11:00 | OA-1 | OB-1 | OC-1 |
| 11:00-11:15 | OA-2 | OB-2 | OC-2 |
| 11:15-11:30 | OA-3 | OB-3 | OC-3 |
| 11:30-11:45 | OA-4 | OB-4 | OC-4 |
| 11:45-12:00 | OA-5 | OB-5 | OC-5 |
| 12:00-14:00 | Lunch | | |
| 14:00-14:40 | PL-3<br>Advances and challenges in CO2 capture and conversion<br>Prof. Webley Paul<br>(Monash University) | | |
| | Parallel Session A | Parallel Session B | Parallel Session C |
| | Chairs: | Chairs: | Chairs: |
| 14:40-15:05 | KA-2 | KB-2 | KC-2 |
| 15:05-15:30 | KA-3 | KB-3 | KC-3 |
| 15:30-15:45 | OA-6 | OB-6 | OC-6 |
| 15:45-16:00 | OA-7 | OB-7 | OC-7 |
| 16:00-16:10 | Breaks | | |
| 16:10-16:25 | OA-8 | OB-8 | OC-8 |
| 16:25-16:40 | OA-9 | OB-9 | OC-9 |
| 16:40-16:55 | OA-10 | OB-10 | OC-10 |
| 16:55-17:10 | OA-11 | OB-11 | OC-11 |
| 17:10-17:25 | OA-12 | OB-12 | OC-12 |
| 17:25-17:40 | OA-13 | OB-13 | OC-13 |
| 17:40-17:55 | OA-14 | OB-14 | OC-14 |
| 17:55-18:10 | OA-15 | OB-15 | OC-15 |
| 18:10-20:00 | Dinner | | |
| 20:00-21:00 | Editors' Panel | | |

# SCHEDULE

CCST 2023 CONFERENCE

| Day Two (22nd July 2023) | | | |
|---|---|---|---|
| China Time | | | |
| 8:30-9:10 | PL-4<br>Basic Research on Photocatalytic Conversion of Greenhouse Gases<br>Prof. Jinlong Zhang<br>(East China University of Science and Technology) | | |
| | Parallel Session A | Parallel Session B | Parallel Session C |
| | Chairs: | Chairs | Chairs |
| 9:10-9:35 | Award Session | KB-4 | KC-4 |
| 9:35-10:00 | | KB-5 | KC-5 |
| 10:00-10:15 | | OB-16 | OC-16 |
| 10:15-10:25 | | Breaks | |
| 10:25-10:40 | | OB-17 | OC-17 |
| 10:40-10:55 | | OB-18 | OC-18 |
| 10:55-11:10 | | OB-19 | OC-19 |
| 11:10-11:25 | | OB-20 | OC-20 |
| 11:25-11:40 | | OB-21 | OC-21 |
| 11:40-13:30 | Lunch | | |
| 13:30-14:10 | PL-5<br>Carbon-Based Photo-Thermal Materials for Solar-Distillation, Soft Robot, Tumor Diagnotherapy<br>Prof. Yen Wei<br>(Tsinghua University) | | |
| 14:10-14:50 | PL-6<br>Lessons learnt from the large scale implementation of carbon capture in power plants<br>Dr Dong Xu<br>(China Energy Investment Corporation (China Energy)) | | |
| | Parallel Session A | Parallel Session B | Parallel Session C |
| | Chairs: | Chairs: | Chairs: |
| 14:50-15:15 | KA-4 | KB-6 | KC-6 |
| 15:15-15:40 | KA-5 | KB-7 | KC-7 |
| 15:40-15:50 | Breaks | | |
| 15:50-16:05 | OA-16 | OB-22 | OC-22 |
| 16:05-16:20 | OA-17 | OB-23 | OC-23 |
| 16:20-16:35 | OA-18 | OB-24 | OC-24 |
| 16:35-16:50 | OA-19 | OB-25 | OC-25 |
| 16:50-17:05 | OA-20 | OB-26 | OC-26 |
| 17:05-17:20 | OA-21 | OB-27 | OC-27 |
| 17:20-17:35 | OA-22 | OB-28 | OC-28 |

# SCHEDULE

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| Day Three (23nd July 2023) | | | |
|---|---|---|---|
| China Time | | | |
| 8:30-9:10 | PL-7<br>Study of CO2 Chemical absorption and Industry application<br>Prof. Mengxiang Fang<br>(Zhejiang University) | | |
| 9:10-9:50 | PL-8<br>Insights into the microstructure evolution and CO2 adsorption of activated carbon derived from spent coffee grounds and sewage sludge<br>Prof. Yanjun Hu<br>(Zhejiang University of Technology) | | |
| | Parallel Session A | Parallel Session B | Parallel Session C |
| | Chairs: | Chairs | Chairs |
| 9:50-10:15 | KA-6 | KB-8 | KC-8 |
| 10:15-10:30 | OA-23 | OB-29 | OC-29 |
| 10:30-10:40 | Breaks | | |
| 10:40-10:55 | OA-24 | OB-30 | OC-30 |
| 10:55-11:10 | OA-25 | OB-31 | OC-31 |
| 11:10-11:25 | OA-26 | KB-11 | OC-32 |
| 11:25-11:40 | OA-27 | | OC-33 |
| 11:40-11:55 | OA-28 | OB-34 | OC-34 |
| 11:55-12:10 | OA-29 | OB-35 | OC-35 |
| 12:10-13:30 | Lunch | | |
| | Parallel Session A | Parallel Session B | Parallel Session C |
| | Chairs: | Chairs: | Chairs: |
| 13:30-13:55 | KA-7 | KB-9 | KC-9 |
| 13:55-14:10 | OA-30 | OB-36 | OC-36 |
| 14:10-14:25 | OA-31 | OB-37 | OC-37 |
| 14:25-14:40 | OA-32 | OB-38 | OC-38 |
| 14:40-14:55 | OA-33 | OB-39 | OC-39 |
| 14:55-15:20 | KA-8 | KB-10 | KC-10 |
| 15:20-15:30 | Breaks | | |
| 15:30-16:10 | PL-9<br>Custodians of Carbon: Creating a new circular carbon economy<br>Prof. Peter Styring<br>(University of Sheffield) | | |
| 16:10-16:50 | PL-10<br>CO2 capture and integration with reverse water gas shift reaction for syngas production using dual functional materials<br>Dr Chunfei Wu<br>(Queen's University Belfast) | | |
| 16:50-17:20 | Closing Ceremony and Awards | | |

# DAY 1

CCST 2023 CONFERENCE

## Day One – Parallel Session A

### Topic: capture with solid sorbents

### China Time: 10:20-18:10

(Link of meeting room) (Link of koushare)

| Carbon capture with solid sorbents<br>Chair: Cong Luo, Shuai Deng | | | |
|---|---|---|---|
| China Time | | Speaker | Title |
| 10:20-10:45 | KA-1 | Yunfei Gao<br>(East China University of Science and Technology) | Flue gas CO2 capture and in-situ conversion using phase-transition redox sorbent |
| 10:45:11:00 | OA-1 | Mayra Guadalupe, Gonzalez-Ramirez<br>(Carnegie Mellon University) | Modeling and Structural Optimization of Adsorption-Based Carbon Capture Systems |
| 11:00-11:15 | OA-2 | Magdalena Strojny<br>(AGH University of Science and Technology) | Preliminary analysis of combining amine scrubbing and calcium-looping CO2 capture in cement plant. |
| 11:15-11:30 | OA-3 | Chenghao Liu<br>(Ganjiang Innovation Academy, Chinese Academy of Sciences) | Low silica X zeolite synthesized from low-grade coal gangue via a two-step alkali fusion method for CO2 capture |
| 11:30-11:45 | OA-4 | Zhifu Liu<br>(Ganjiang Innovation academy, Chinese academy of Science) | Carbon materials for CO2 capture – A review from the perspective of pore structure and functionalisation |
| 11:45-12:00 | OA-5 | Pengjie Kong<br>(School of Energy and Mechanical Engineering, Nanjing Normal University) | Insight into the deactivation mechanism of CaO-based CO2 sorbent under in-situ coal combustion |
| 12:00-14:00 | Lunch | | |
| Chair: Guoping Hu (Parallel Session A, B, C) | | | |
| 14:00-14:40 | PL-3 | Prof. Webley Paul<br>(Monash University) | Advances and challenges in CO2 capture and conversion |
| Carbon capture with solid sorbents<br>Chair: Chunfeng Song, Lisa Mingzhe Sun | | | |

# DAY 1

CCST 2023 CONFERENCE

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|---|---|---|---|
| 14:40-15:05 | KA-2 | Yujie Ban (Dalian Institute of Chemical Physics, Chinese Academy of Sciences) | Molecular Assembly on Metal-Organic Frameworks for CO2 Capture |
| 15:05-15:30 | KA-3 | Asim Khan (COMSATS University Islamabad) | Application of Metal Organic Frameworks based Mixed Matrix Membranes for CO2 Capture |
| 15:30-15:45 | OA-6 | Lishu Shao (Central South University of Forestry and Technology) | Synthesis, structure, and carbon dioxide capture of nitrogen-containing porous organic polymers and carbon materials |
| 15:45-16:00 | OA-7 | Kaiwen Ma (School of Energy and Mechanical Engineering, Nanjing Normal University) | Mesoporous core-shell structured CaO-based pellets with enhanced cyclic CO2 capture performance |
| 16:00-16:10 | Breaks | | |
| 16:10-16:25 | OA-8 | Mukondeleli K. Muluvhu (University of Pretoria) | Adsorption Breakthrough Study of CO2/CH4 Separation in a Vacuum Pressure Swing Adsorption using Water-based Aluminum Fumarate Metal Organic Framework (MOF) |
| 16:25-16:40 | OA-9 | Michael Daramola (University of Pretoria) | Application of Response Surface Methodology (RSM) to the Synthesis of Chitosan Applicable in Post-Combustion CO2 Capture |
| 16:40-16:55 | OA-10 | Fangming Yang (University of Nottingham) | Conversion of mixed plastic waste into porous carbons for efficient carbon capture |
| 16:55-17:10 | OA-11 | Emmanuel Dan (University of Aberdeen) | Melamine-Doped PET-Derived Adsorbents for Post-Combustion CO2 Capture |
| 17:10-17:25 | OA-12 | Shervan Babamohammadi (Brunel University London) | Optimization of Sorption Enhanced Steam Methane Reforming (SE-SMR) Process through Design of Experiment (DoE) for Hydrogen Production with in-situ Carbon Capture |
| 17:25-17:40 | OA-13 | Xiaotong Zhao (Queens University of Belfast) | Ni0.05/CaO0.95 dual-functional material for integrated carbon capture and utilisation: effects of oxygen and steam in the CO2 source |
| 17:40-17:55 | OA-14 | Pablo Comendador Morales (University of the Basque Country (UPV/EHU)) | CaO-based sorbents screening according to operational aspects of biomass fast pyrolysis with in line sorption enhanced steam reforming |

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|---|---|---|---|
| 17:55-18:10 | OA-15 | Mike Gorbounov (Brunel University London) | CO2 Adsorbent Scale-up: from Powder to Pellet |

## Day One – Parallel Session B

### Topic: capture with liquid sorbents & Carbon capture with membranes

### China Time: 10:20-18:10

(Link of meeting room) (Link of koushare)

| Carbon capture with liquid solvents<br>Chairs: Rui Zhang, Zhien Zhang | | | |
|---|---|---|---|
| China Time | | Speaker | Title |
| 10:20-10:45 | KB-1 | Colin Scholes (The University of Melbourne) | Membrane gas-solvent contactors for efficient carbon dioxide capture |
| 10:45:11:00 | OB-1 | Jie Cheng (East China University of Science and Technology) | Capturing CO2 by Ionic Liquids and Deep Eutectic Solvents: A Comparative Study Based on Multi-level Absorbent Screening |
| 11:00-11:15 | OB-2 | Jiawei Ruan (East China University of Science and Technology) | Efficient CO2 absorption coordinated by molecules and ions of DBN and 1,2,4-triazole formed deep eutectic solvents |
| 11:15-11:30 | OB-3 | Withdraw | |
| 11:30-11:45 | OB-4 | Cuiting Yuan (Liaoning Shihua University) | CO2 capture enhanced by nanofluids in a membrane contactor: a comprehensive modeling study |
| 11:45-12:00 | OB-5 | Ge Gao (Huazhong University of Science and Technology) | New insights into the structure-activity relationship for CO2 capture by tertiary amines from the experimental and quantum chemical calculation perspectives |
| 12:00-14:00 | Lunch | | |
| Chair: Guoping Hu (Parallel Session A, B, C) | | | |

# DAY 1

CCST 2023 CONFERENCE

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|---|---|---|---|
| 14:00-14:40 | PL-3 | Prof. Webley Paul (Monash University) | Advances and challenges in CO2 capture and conversion |
| Carbon capture with membranes<br>Chairs: Yatao Zhang, Xuezhong He | | | |
| 14:40-15:05 | KB-2 | Yi Liu (Dalian University of Technology) | Multi-scale structure optimization of molecular sieve membranes towards superior separtion performances |
| 15:05-15:30 | KB-3 | Withdraw | |
| 15:30-15:45 | OB-6 | Leong Sing Soh (Xiamen University Malaysia) | Green fabrication of polyimide membranes for enhanced sustainable gas separation |
| 15:45-16:00 | OB-7 | Yongchao Sun (Dalian University of Technology) | Ester-crosslinked polymers of intrinsic microporosity membranes with enhanced plasticization resistance for CO2 separation |
| 16:00-16:10 | Breaks | | |
| 16:10-16:25 | OB-8 | Feihan Yu (Northeast Forestry University) | The Control of Activity and Selectivity of CO2 Electroreduction by Cu Overlayers through Elastic Strain |
| 16:25-16:40 | OB-9 | Chen Wang (Dalian University of Technology) | Innovative prepare Ti-MOF membranes using Ti-oxo cluster sources for enhanced CO2/N2 separation performance |
| 16:40-16:55 | OB-10 | Yue Chen (Nanjing Tech University) | Design of cross-linked poly (ethylene oxide) molecules as selective layer of thin film composite membrane for high-performance CO2 capture |
| 16:55-17:10 | OB-11 | Xue Li (China University of Petroleum-Beijing) | Theoretical study of a novel C9N7 slit materials for CO2 adsorption and selectivity over N2 and CH4 |
| 17:10-17:25 | OB-12 | Zilong Liu (Beijing Key Laboratory of Optical Detection Technology for Oil and Gas, Basic Research Center for Energy Interdisciplinary, College of Science, China | Superior selective CO2 adsorption and separation porous carbon nitride nanosheets by charge and strain engineering |

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|---|---|---|---|
| | | University of Petroleum-Beijing) | |
| 17:25-17:40 | OB-13 | Boyu li (Tongji University) | Grafted Polymer Nanoparticles with Unsaturated Sites Promote Mixed-Matrix Membranes for highly CO2 Separation |
| 17:40-17:55 | OB-14 | Nana Wang (Nanjing Tech University) | Fluoride-free synthesis of zirconia supported Si-CHA zeolite membrane for efficient CO2 capture |
| 17:55-18:10 | OB-15 | Di Shi (China University of Petroleum-Beijing) | Highly selective C2H2 purification from CO2 mixture with co-regulated g-C9N7 nanosheets |

## Day One – Parallel Session C

### Topic: Biomass and carbon materials

### China Time: 10:20-18:10

(Link of meeting room) (Link of koushare)

| Biomass and carbon materials<br>Chairs: Daxin Liang, Zhicheng Luo | | | |
|---|---|---|---|
| China Time | | Speaker | Title |
| 10:20-10:45 | KC-1 | Guozhao Ji (Dalian University of Technology) | Decomposition kinetics and product distribution of a very fast pyrolysis of algal biomass |
| 10:45:11:00 | OC-1 | Hua Yang (Nanjing Normal University) | Effect of ash on oxygen-carrier-aided oxy-fuel combustion of biomass in fluidized bed |
| 11:00-11:15 | OC-2 | Bowang Zhao (Shanghai University of Engineering and Technology) | High energy-power density Zn-ion hybrid supercapacitors with N/P co-doped graphene cathode |
| 11:15-11:30 | OC-3 | Siming Chen (China University of Mining and Technology) | Single-step integrated technology for enhanced CO2 biofixation and efficient lipid extraction in microalgal system including a water-immiscible solvent |

# DAY 1

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|---|---|---|---|
| 11:30-11:45 | OC-4 | Xudun Shen (Shanghai University Of Engineering Science) | Phosphorus-bridged ternary metal alloy encapsulated in fewlayered nitrogen-doped graphene for highly efficient electrocatalytic hydrogen evolution |
| 11:45-12:00 | OC-5 | Mengran Zhao (Shanghai University of Engineering Science) | CoMn phosphide encapsulated in nitrogen-doped graphene for electrocatalytic hydrogen evolution over a broad pH range |
| 12:00-14:00 | Lunch | | |
| Chair: Guoping Hu (Parallel Session A, B, C) | | | |
| 14:00-14:40 | PL-3 | Prof. Webley Paul (Monash University) | Advances and challenges in CO2 capture and conversion |
| Biomass and carbon materials<br>Chairs: Xin Jin, Dingding Yao | | | |
| 14:40-15:05 | KC-2 | Lina Liu (Nankai University) | Plasma-catalytic CO2 reforming of toluene as a model tar surrogate over hydrotalcite-derived NiFe/(Mg, Al)Ox catalysts |
| 15:05-15:30 | KC-3 | Peter Clough (Cranfield University) | CO2 capture and beyond |
| 15:30-15:45 | OC-6 | Longnian Tang (Shanghai University of Engineering Science) | An electrochemical biosensor of Sn@C derived from ZnSn(OH)6 for sensitive determination of acetaminophen |
| 15:45-16:00 | OC-7 | Shiyu Zhang (Tsinghua university) | CO rich syngas production from catalytic CO2 gasification-reforming of biomass components on Ni/CeO2 |
| 16:00-16:10 | Breaks | | |
| 16:10-16:25 | OC-8 | Mabafokeng I. Masitha (University of Pretoria) | Valorization of waste cannabis biomass: Reduction of Carbon and Sulphur emissions through petroleum distillates desulphurization applications |
| 16:25-16:40 | OC-9 | Lusani Mulaudzi (University of Pretoria) | Sequential Pretreatment of Wood Waste for Enhanced Hydrogen Production from Biomass: An Indirect Decarbonisation Strategy |

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|---|---|---|---|
| 16:40-16:55 | OC-10 | Oluwagbenga Tobi Adesina (University of Pretoria) | Decarbonisation via production of biomass briquette from Waste Eichhornia crassipes: Empirical modelling and parametric optimization of the combustion rate |
| 16:55-17:10 | OC-11 | ZiHao Liu (Huazhong University of Science and Technology) | The effect of in-suit lignin stabilization during organic solvent pretreatment on lignin pyrolysis properties. |
| 17:10-17:25 | OC-12 | Shijie Yu (Tsinghua University) | Decoupled temperature and pressure hydrothermal conversion of biomass |
| 17:25-17:40 | OC-13 | Shijie Wu (Huazhong Agricultural University) | Valorization of plastic waste by staged chemical looping gasification with modified Fe-based oxygen carriers |
| 17:40-17:55 | OC-14 | Godknows Dziva (Tianjin University) | Reactor modeling and process simulation of biomass-to-hydrogen via moving bed sorption-enhanced reforming |
| 17:55-18:10 | OC-15 | Withdraw | |

# DAY 2

CCST 2023 CONFERENCE

## Day Two – Parallel Session A

### Topic: Award Session & capture with solid sorbents

### China Time: 9:10-17:35

(Link of meeting room) (Link of koushare)

| Award Session | | | |
|---|---|---|---|
| Chairs: Yikai Xu, Shouliang Yi | | | |
| China Time | | Speaker | Title |
| 9:10-9:40 | AW-1 | Katherine Hornbostel (University of Pittsburgh) | Novel Approaches to Direct Air & Ocean Capture |
| 9:40-10:10 | AW-2 | Zhien Zhang (Ohio State University) | Carbon Capture by Membrane Gas Absorption |
| 10:10-10:40 | AW-3 | Chunfeng Song (Tianjin University) | Cryogenic CO2 capture and potential application for low-carbon future |
| 10:40-10:50 | Breaks | | |
| 10:50-11:20 | AW-4 | Huanhao Chen (Nanjing Tech University) | Non thermal plasma catalysis: Catalyst and reactor design |
| 11:20-11:50 | AW-5 | Changlei Qin (Chongqing University) | CO2 Sorbents from Spent Li-Ion Batteries and Application in ICCU-Methanation |
| 11:50-12:20 | AW-6 | Siming Chen (China University of Mining and Technology) | Single-step integrated technology for enhanced CO2 biofixation and efficient lipid extraction in microalgal system including a water-immiscible solvent |
| 12:20-13:30 | Lunch | | |
| Chair: Daxin Liang (Parallel Session A, B, C) | | | |
| 13:30-14:10 | PL-5 | Prof. Yen Wei (Tsinghua University) | Carbon-Based Photo-Thermal Materials for Solar-Distillation, Soft Robot, Tumor Diagnotherapy |
| 14:10-14:50 | PL-6 | Dr Dong Xu (China Energy Investment Corporation (China Energy)) | Lessons learnt from the large scale implementation of carbon capture in power plants |

# DAY 2

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| Carbon capture with solid sorbents<br>Chairs: Ningbo Gao, Guozhao Ji | | | |
|---|---|---|---|
| 14:50-15:15 | KA-4 | Bo Jin<br>(Hunan University) | Ca-Ni-Fe bifunctional materials for integrated CO2 capture and conversion |
| 15:15-15:40 | KA-5 | Mingzhe (Lisa) Sun<br>(Surface Measurement Systems) | Porous materials for carbon capture |
| 15:40-15:50 | Breaks | | |
| 15:50-16:05 | OA-16 | Tong Luo<br>(Huazhong University of Science and Technology) | Parametric study on the technical routes of the sol-gel combustion synthesis for nano calcium-based CO2 sorbents preparation |
| 16:05-16:20 | OA-17 | Yuxuan Zhang<br>(Nanjing Normal University) | Hydrophobic interface-assisted synthesis of Al-supported, CaO-based sorbent pellets for high-temperature CO2 capture |
| 16:20-16:35 | OA-18 | Yuan Zhu<br>(Queen's University Belfast) | Achieving zero CO2 emissions from integrated biomass gasification with CO2 capture and utilisation (IGCCU) |
| 16:35-16:50 | OA-19 | Yuanyuan Wang<br>(Queen's University Belfast) | Integrated carbon capture and utilization using marble at simulated flue gas condition with oxygen and water |
| 16:50-17:05 | OA-20 | Paul Iacomi<br>(Surface Measurement Systems) | Advanced screening of materials for CO2 capture: accurate measurements and realistic conditions |
| 17:05-17:20 | OA-21 | Jinsong Shi<br>(Jiangxi Academy of Sciences) | Controlled synthesis of porous carbons with specially designed structures for CO2 capture at different pressures |
| 17:20-17:35 | OA-22 | Biao Meng<br>(Nanjing Tech University) | Molecular-Level Regulation of CO2 Capture by Confining Ionic Liquid Cations within Cu-BTC Metal-Organic Frameworks |

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# Day Two – Parallel Session B

## Topic: Carbon capture, utilization, and storage in industry & Carbon dioxide removal

## China Time: 9:10-17:35

(Link of meeting room) (Link of koushare)

| Carbon capture, utilization, and storage in industry<br>Chairs: Ming Gao, Zhuonan Song | | | |
|---|---|---|---|
| China Time | | Speaker | Title |
| 9:10-9:35 | KB-4 | Yingcheng Li, Leyu Cui (Sinopec Shanghai Research Institute of Petrochemical Technology Co. Ltd.) | scCO2 enhanced oil recovery |
| 9:35-10:00 | KB-5 | Long Jiang (Zhejiang University) | Heat pump assisted sorption carbon capture |
| 10:00-10:15 | OB-16 | Yunlong Zhu (Harbin Engineering University) | Research on onboard carbon capture performance of TEPA+MDEA mixed solvent based on catalytic desorption |
| 10:15-10:25 | Breaks | | |
| 10:25-10:40 | OB-17 | Shijian Lu (China University of Mining and Technology) | Research and design experience of CO2 capture and purification project |
| 10:40-10:55 | OB-18 | Linhan Dong (Harbin Institute of Technology) | Novel ammonia carbon capture product selective reduction system with pulsed electrical enhancement |
| 10:55-11:10 | OB-19 | LIU Kefeng (Petrochemical Research Institute, PetroChina) | Progress in Carbon Dioxide Capture Technology for Refining and Chemical Enterprises in PetroChina |
| 11:10-11:25 | OB-20 | Yao Zhao (SINOPEC) | The design study of large packing absorption tower of CO2 in smoke |
| 11:25-11:40 | OB-21 | Zhen Chen; Zhoulan Huang (Tsinghua University) | Comprehensive evaluation of amine loss and material balance using water-lean solvent for CO2 capture on a pilot-scale plant |

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| | | | |
|---|---|---|---|
| 11:40-13:30 | Lunch | | |
| Chair: Daxin Liang (Parallel Session A, B, C) | | | |
| 13:30-14:10 | PL-5 | Prof. Yen Wei (Tsinghua University) | Carbon-Based Photo-Thermal Materials for Solar-Distillation, Soft Robot, Tumor Diagnotherapy |
| 14:10-14:50 | PL-6 | Dr Dong Xu (China Energy Investment Corporation (China Energy)) | Lessons learnt from the large scale implementation of carbon capture in power plants |
| Carbion dioxide removal<br>Chairs: Feng Yan, Xuancan Zhu | | | |
| 14:50-15:15 | KB-6 | Kathryn Mumford (The University of Melbourne) | Progress in direct air capture systems |
| 15:15-15:40 | KB-7 | Eni Oko (Newcastle University) | Ammonia as a suitable hydrogen carrier |
| 15:40-15:50 | Breaks | | |
| 15:50-16:05 | OB-22 | Wang Ding (Xi'an Jiaotong University) | Economic Evaluation of Direct Air Capture Technology |
| 16:05-16:20 | OB-23 | Ying Ji (Zhejiang university) | Synthesis and characterization of ionic liquid-modified molecular sieves for direct air capture |
| 16:20-16:35 | OB-24 | Huiying Sang (Huazhong University of Science and Technology) | Devolatilization Characteristics and transformation of Inorganic Species During the Pyrolysis of Biomass Pellets |
| 16:35-16:50 | OB-25 | Xiefei Zhu (Sun Yat-sen University) | Valorization of slow pyrolysis vapor from biomass waste: A comparative study on pyrolysis characteristics, kinetics, evolved gas evaluation, adsorption effects |
| 16:50-17:05 | OB-26 | Haoyu Xiao (Huazhong University of Science and Technology) | Plasma-catalytic pyrolysis of polypropylene for hydrogen and carbon nanotubes: Understanding the influence of plasma on volatiles |

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|---|---|---|---|
| 17:05-17:20 | OB-27 | Renyu Xie (Zhejiang University) | Understanding the energy consumption advantage of moisture-swing sorption: a thermodynamic analysis |
| 17:20-17:35 | OB-28 | Yuqi Zhou (Xi'an Jiaotong University) | Direct CO2 capture from air using char from pyrolysis of digestate solid |

## Day Two – Parallel Session C

### Topic: Process, AI, and LCA

### & Carbon capture, utilization, and storage in industry

### China Time: 9:10-17:35

(Link of meeting room) (Link of koushare)

| Process, AI, and LCA<br>Chairs: Haiqing Lin, Xiangkun (Elvis) Cao | | | |
|---|---|---|---|
| China Time | | Speaker | Title |
| 9:10-9:35 | KC-4 | Shijian Lu (China University of Mining and Technology) | Low-energy-consuming CO2 capture absorbents and catalysts |
| 9:35-10:00 | KC-5 | Long Han (Zhejiang Universit of Technology) | Energy and Exergy analyses of biomass IGCC power plant using calcium looping gasification with in-situ CO2 capture and negative carbon emission |
| 10:00-10:15 | OC-16 | Meng Wang (University of Pittsburgh) | An Innovative Bionanoreactor Approach for Enhanced CO2 Mineralization |
| 10:15-10:25 | Breaks | | |
| 10:25-10:40 | OC-17 | Janika LAHT (Tallinn University of Technology) | Life Cycle Assessment of oil shale production with applied carbon capture and storage |

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|---|---|---|---|
| 10:40-10:55 | OC-18 | Seang Uyin HONG (Xiamen University Malaysia) | Integrating life cycle assessment andtechno-economic analysis to fabricate sustainable membranes for greener CO2 separation |
| 10:55-11:10 | OC-19 | Sheng Chen (Zhejiang University) | Performance simulation on gas-solid two-phase reaction flow in a fixed bed for carbon dioxide adsorption |
| 11:10-11:25 | OC-20 | Wang Yanjuan (North China Electric Power University) | Performance analysis of supercritical CO2 solar tower receiver with high non-uniform heat flux |
| 11:25-11:40 | OC-21 | Wei Liu (Zhejiang University) | Performance optimization of heat pump assisted carbon capture system based on artificial neural network |
| 11:40-13:30 | Lunch | | |
| Chair: Daxin Liang (Parallel Session A, B, C) | | | |
| 13:30-14:10 | PL-5 | Prof. Yen Wei (Tsinghua University) | Carbon-Based Photo-Thermal Materials for Solar-Distillation, Soft Robot, Tumor Diagnotherapy |
| 14:10-14:50 | PL-6 | Dr Dong Xu (China Energy Investment Corporation (China Energy)) | Lessons learnt from the large scale implementation of carbon capture in power plants |
| Process, AI, and LCA<br>Chairs: Zhen Song, Ziyi Li | | | |
| 14:50-15:15 | KC-6 | Shuang Li (Tsinghua University) | Pre-combustion CO2 capture and separation by elevated temperature pressure swing adsorption |
| 15:15-15:40 | KC-7 | Qingqing Mei (Zhejiang University) | Precise Conversion of Waste Lignin into Valuable Chemicals |
| 15:40-15:50 | Breaks | | |
| 15:50-16:05 | OC-22 | Musamba Banza (Vaal University of Technology) | Synthesis and characterization of sorbents generated from blast furnace slag (BFS) for CO2 capture: Optimization and prediction utilizing Centrale Design in Response surface methodology (RSM) and Artificial neural networks (ANN). |

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|---|---|---|---|
| 16:05-16:20 | OC-23 | Major Mabuza (University of Johannesburg) | EFFECTS OF LONG-TERM FLUE GAS EXPOSURE ON CHEMICAL STRUCTURAL PROPERTIES OF SOUTH AFRICAN COALS: PERSPECTIVE ON ADVANCED ANALYTICAL TECHNIQUES |
| 16:20-16:35 | OC-24 | Jacob Kurian (CHRIST) | Optimal Designing of Solar Battery Powered Public Charging Stations for Kerala's EV Policy 2022 |
| 16:35-16:50 | OC-25 | Billy Davies (Brunel University London) | Exergy Analysis of Blue Hydrogen Production |
| 16:50-17:05 | OC-26 | Yangdi Zhou (Huazhong University of Science and Technology) | Potentials and Critical Paths of CO2 Emissions Reduction in a Chinese Typical Industrial City of Wuhan |
| 17:05-17:20 | OC-27 | Jinyuan Yong (Zhejiang University) | Process Modelling and Optimization for Carbon Capture from Humid Flue Gases Using a Diamine-Appended Metal-Organic Framework |
| 17:20-17:35 | OC-28 | Joni Jupesta (United Nations University) | CCU in the Methanol production; sustainability analysis for Japan |

# DAY 3

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## Day Three – Parallel Session A

### Topic: Carbon Neutral for Construction Materials (CCCM)

### China Time: 9:50-15:30

(Link of meeting room) (Link of koushare)

| Carbon Neutral for Construction Materials (CCCM)<br>Chairs: Xiaoyong Wang, Yanguang Chen | | | |
|---|---|---|---|
| China Time | | Speaker | Title |
| 9:50-10:15 | KA-6 | Lei Wang<br>(Zhejiang University) | Combined use of biochar and CO2 curing for production of carbon-negative composites |
| 10:15-10:30 | OA-23 | Xu Yang<br>(Zhejiang Ocean University) | Dual CO2 capture and storage by carbonization curing of biochar-modified cement-based composites |
| 10:30-10:40 | Breaks | | |
| 10:40-10:55 | OA-24 | Yunqiu Xue<br>(Yunnan University) | Properties and environmental evaluation of treatment approach and substitution content for reclaimed concrete slurry waste used as a substitute for cementitious materials |
| 10:55-11:10 | OA-25 | Liu Cen<br>(Northeast Forestry University) | Study on the effect of basalt fibers on self-healing ability of concrete based on microbial induced calcium carbonate precipitation. |
| 11:10-11:25 | OA-26 | Yiting Zhang<br>(Wuhan University) | The effect of CNT on the mechanical properties of alkali-activated slag geopolymer |
| 11:25-11:40 | OA-27 | Weichuang Zhang<br>(Kunming University of Science and Technology) | Enhancing carbonation curing effect of belite-rich cement by weakly reactive admixture |
| 11:40-11:55 | OA-28 | Weijie Fan<br>(NingboTech University) | Improvement of Sustainability of Crack Concrete by Two-way Electromigration Rehabilitation |
| 11:55-12:10 | OA-29 | Wenrui Wang<br>(School of Civil Engineering, Chang'an University) | Comparative study on the durability of ultra-high toughness cementitious composites and mortar under salt attacks |
| 12:10-13:30 | Lunch | | |

| Carbon Neutral for Construction Materials (CCCM)<br>Chairs: Runsheng Lin, Li Gao | | | |
|---|---|---|---|
| 13:30-13:55 | KA-7 | Lei Xing<br>(University of Surrey) | Gas-liquid-solid triple-phase contactors for CO2 capture via enhanced weathering |
| 13:55-14:10 | OA-30 | Mei-yu Xuan<br>(Kangwon National University) | Carbonation treatment of eggshell powder concrete improves strength, durability, and sustainability |
| 14:10-14:25 | OA-31 | HAN YI<br>(Kangwon National University) | Preparation of nanomaterials to improve concrete engineering performance by capturing and storing CO2 from alkaline waste materials |
| 14:25-14:40 | OA-32 | Wei Du<br>(Wuhan Textile University) | The effect of microcapsules on the self-repairing performance of LC3 mortar |
| 14:40-14:55 | OA-33 | Jizhou Wu<br>(China testing holding group Jingcheng Testing) | Carbon capture, utilization and storage technology promotes carbon emission reduction in cement industry |
| 14:55-15:20 | KA-8 | Waheed Afzal<br>(University of Aberdeen) | Mineral CCUS: Lowering carbon footprint of Portland cement with mineral carbonates |
| 15:20-15:30 | Breaks | | |

## Day Three – Parallel Session B

### Topic: CO2 utilization and storage

### China Time: 9:50-15:30

(Link of meeting room) (Link of koushare)

| CO2 utilization and storage<br>Chairs: Lina Liu, Cui Quan | | | |
|---|---|---|---|
| China Time | | Speaker | Title |
| 9:50-10:15 | KB-8 | Hao Zhang<br>(Zhejiang University) | Plasma-assisted CO2 conversion: Unlocking the efficiency |

# DAY 3

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|---|---|---|---|
| 10:15-10:30 | OB-29 | Yingju Yang (Huazhong University of Science and Technology) | Design and screening of chalcogenide-based electrocatalysts for CO2-to-CO conversion |
| 10:30-10:40 | Breaks | | |
| 10:40-10:55 | OB-30 | Guo Dawei (Harbin Institute of Technology) | Synergistic mechanism of Cu-TiO2/biochar adsorption-photocatalytic reduction of CO2 |
| 10:55-11:10 | OB-31 | Xinyu Zhi (State Key Laboratory of Coal Combustion, Huazhong University of Science and Technology) | Investigation of the performance of CeO2-coated nickel ferrite to enhance the high-temperature hydrogenation of CO2 to CO |
| 11:10-11:25 | OB-32 | Xuan Bie (Tsinghua University) | Revealing the effect of NH3 on Cu/ZnO/Al2O3 catalyst for reverse water gas shift reaction |
| 11:25-11:40 | KB-11 | Yan Liu (Institute of Geology, Chinese Academy of Geological Sciences) | Artificially enhanced Tibetan geological carbon sink: A cheap end to rapidly escalating atmospheric CO2 concentrations |
| 11:40-11:55 | | | |
| 11:55-12:10 | OB-35 | Yonglian Lu (China University of Petroleum) | Ag@Cu2O Tandem Catalyst with Tunable Shell Thickness for Electrochemical CO2 reduction towards C2+ valuables |
| 12:10-13:30 | Lunch | | |
| CO2 utilization and storage<br>Chairs: Xinying Liu, Shuzhuang Sun | | | |
| 13:30-13:55 | KB-9 | Hongman Sun (China University of Petroleum (East China) ) | Studies of Copper-based Crystalline Materials in Carbon Dioxide Electrocatalytic Reduction |
| 13:55-14:10 | OB-36 | Ziyan Yang (Hebei University of Technology) | Fabrication of MSW incineration bottom ash-derived Ni-based catalyst with superior stability for dry reforming of methane |
| 14:10-14:25 | OB-37 | Jinhui Li (Wuhan Textile University) | Preparation and Microstructure Control Mechanism of Impact-Abrasion Resistance Ultra High Performance Concrete |

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|---|---|---|---|
| 14:25-14:40 | OB-38 | Yingrui Zhang (Queen's university belfast) | The potential application of surface-accessible plasmonic Pickering emulsions in CO2 conversion by photocatalytic |
| 14:40-14:55 | OB-39 | Dingshan Cao (Huazhong University of Science and Technology) | Development of La2NiO4 perovskite oxides as catalysts with high carbon resistance for dry reforming of methane |
| 14:55-15:20 | KB-10 | Panagiotis Kechagiopoulos (University of Aberdeen) | Non-thermal Plama catalysis |
| 15:20-15:30 | Breaks | | |

## Day Three – Parallel Session C

### Topic: Integrated carbon capture and utilization (ICCU) & Other carbon capture-related studies

### China Time: 9:50-15:30

(Link of meeting room) (Link of koushare)

| Integrated carbon capture and utilization (ICCU)<br>Chairs: Bo Jin, Yongqing Xu | | | |
|---|---|---|---|
| China Time | | Speaker | Title |
| 9:50-10:15 | KC-8 | Nannan Sun (Shanghai Advanced Research Institute, Chinese Academy of Sciences) | Continuous decarbonization of flue gas by integrated carbon capture and conversion to methane |
| 10:15-10:30 | OC-29 | Huang Pu (Nanjing Normal University) | Integrating calcium-looping and reverse-water-gas-shift reaction for CO2 capture and conversion: screening of optimum catalyst |
| 10:30-10:40 | Breaks | | |

# DAY 3

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|---|---|---|---|
| 10:40-10:55 | OC-30 | Yan Huang (Key Laboratory of Clean Energy and Carbon Neutrality of Zhejiang Province) | Performance investigation on an integrated system CO2 capture and utilizaiton for vessel methanol conversion |
| 10:55-11:10 | OC-31 | Zheyi Sun (East China University of Science and Technology) | The proximity effect of adsorbents and catalysts on the integrated CO2 capture and methanation |
| 11:10-11:25 | OC-32 | Wei Lifei (Tianjin University) | Alkali metal salts promote CaO in medium temperature CO2 capture and methanation conversion |
| 11:25-11:40 | OC-33 | Yongqing Xu (Tsinghua University) | Integrated CO2 capture and utilization with CuxMgyCaO for high-purity CO production |
| 11:40-11:55 | OC-34 | Bin Shao (East China university of Science and Technology) | Synergistic promotions between CO2 capture and in-situ conversion on Ni-CaO dual functional materials |
| 11:55-12:10 | OC-35 | Shuzhuang Sun (Queens University Belfast) | Integrated CO2 capture from H2O and O2 containing flue gas and methane dry reforming with different Ni-loaded Ni/CaO dual functional materials |
| 12:10-13:30 | Lunch | | |
| Other carbon capture-related studies<br>Chairs: Yeshui Zhang, Salman Masoudi Soltani | | | |
| 13:30-13:55 | KC-9 | Lingzhi Wang (East China University of Science and Technology) | Understanding the C-H activation mechanism of photocatalytic non-oxidative methane coupling |
| 13:55-14:10 | OC-36 | Du Wenjing (Shanghai University of Engineering Science) | Carbon-Decorated Na3V2(PO4)3 as Ultralong Lifespan Cathodes for High-Energy-Density Symmetric Sodium-Ion Batteries |
| 14:10-14:25 | OC-37 | Fu Rao (Ganjiang Innovation Academy, Chinese Academy of Sciences) | Preparation of high performance binder-free Y molecular sieve and its application in capturing CO2 |
| 14:25-14:40 | OC-38 | Shizhang Wang (Harbin Institute of Technology) | Plasma/Nano-catalyst Synergistic Induction of CH4 Cracking for Hydrogen Production |

# DAY 3

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|---|---|---|---|
| 14:40-14:55 | OC-39 | Mais Baqain (Tallinn university of technology (Taltech)) | SO2 Emissions from Oxyfuel Combustion of Ca-rich fuel in a 60 kWth Circulating Fluidized Bed |
| 14:55-15:20 | KC-10 | Chuang Wen (University of Exeter) | A new CO2 separation concept using phase change behaviour in supersonic flows |
| 15:20-15:30 | Breaks | | |

# Plenary Speaker

## *PL-1* Prof. Jinyue Yan, Hong Kong PolyU

### Title: Challenges of CCUS for carbon neutrality

Prof. Yan is an academician of the European Academy of Sciences and Arts and the Chair Professor at the Hong Kong Polytechnic University. His research interests include renewable energy, advanced energy systems, climate change mitigation technologies, and related environment and policy. Prof. Yan has published 400+ papers, including articles in Science, Nature Energy, Nature Climate & Nature Communications, and holds 10+ patents. He has supervised nearly 200 post-docs and 50 PhDs.

As PI, Prof. Yan has received external grants from research foundations and industry in several EU projects and other international and national projects, totaling more than 200 MSEK (20+ MEuro) in the past 10 years. He has led the research platform Future Energy Profile with funding of approximately 10 MEuro from the Swedish Knowledge Foundation and industrial partners.

Prof. Yan received his PhD from the Royal Institute of Technology (KTH) in 1991 and was appointed as Chair Professor and Head of the Energy Department at Luleå University of Technology, Sweden, in 2001. He has also served as Chair Professor at Mälardalen University and KTH, Sweden, and Director of Future Energy Profile. He is the founding editor-in-chief of Advances in Applied Energy (Elsevier) and Nexus (Cell) and the Advisory Editor-in-Chief of Applied Energy (Elsevier). He is also the founder of several international and interdisciplinary R&D platforms, such as the International Conferences on Applied Energy (ICAE), UNiLAB, iCET, EnerarXiv, and EP.

Prof. Yan has received numerous awards, including the Global Human Settlements Award of Green Technology (2014) supported by UNDP, finalist for the SWFF (Securing Water for Food: A Grand Challenge for Development) award by USAID, Government of Sweden, and the Netherlands (2015), the Energy Islands' Award by the European Union (2017), Research2Business Top100 (2020) by the Swedish Royal Academy of Engineering Sciences (IVA), and CoverPeople in Famgang (Swedish magazine, select 6 annually) (2021).

## *PL-2* Prof. Xin Xu, Fudan University

### Title: Accurate descriptions of molecule-surface interactions in electrocatalytic $CO_2$ reduction on the copper surfaces

Professor Xin Xu received his doctoral degree in theoretical chemistry from Xiamen University, China, in 1991. After a postdoctoral stay at Fujian Institute of Research on the Structure of Matter, Academia Sinica, he was appointed as an associated professor in 1993 and was promoted to a full professor in 1995 in the Department of Chemistry, Xiamen University, where he became the Lu-Jia-Xi Chair professor in 2006. He moved to Fudan University in Shanghai as a distinguished chair professor in 2010. Xin Xu was awarded the Ten-Outstanding Young Chemists of 1995, issued by Chinese Chemical Society. He received reward fundings from Fok Ying Tung Foundation (Hong Kong) in 1998, from State Education Commission for Outstanding Young Professors in Chinese University in 2000, and from National Natural Science Foundation for Outstanding Young Scientists in 2006. He was appointed as a Ming-Jiang Scholar of Fujian province in 2006, and a Chang-Jiang Chair professor in 2012. He has published more than 300 peer-reviewed papers, and have received >17000 citations with an H-index of 60. He has been invited to give over 200 lectures. He serves on the editorial board of several international journals, including as an Associate Editor for JACS Au published by the American Chemical Society. His main research area is Density Functional Theory (DFT) and its applications including in $CO_2$ conversion and utilization.

## *PL-3* Prof. Webley Paul, Monash University

### Title: Advances and challenges in $CO_2$ capture and conversion

Prof Paul Webley is a Professor in the Department of Chemical and Biological Engineering at Monash University, Director of the Woodside Monash Energy Partnership (WMEP) and Director of the ARC Hub for Carbon Utilisation and Recycling. He received his MScEng and PhD degrees in chemical engineering from MIT. He has over 30 years combined industry and academic experience in the development and management of clean energy technologies, especially carbon capture technologies. The underlying theme of Webley's research is technology for environmental and energy applications including: $CO_2$ capture and utilization systems for the industrial and energy sectors, hydrogen generation, storage and utilization technologies, design of energy efficient thermodynamic systems, and negative emissions technologies.

## *PL-4* Prof. Jinlong Zhang, East China University of Science and Technology

### Title: Basic Research on Photocatalytic Conversion of Greenhouse Gases

Prof. Dr. Jinlong Zhang studied at East China University of Science and Technology, where he received a PhD in 1993. In 1996 he received the Award of the JSPS and then studied in Osaka Prefecture University, Japan, as a postdoctoral. He became a full professor in 2000. He was selected as the Member of Academia Europaea and Distinguished Professor of Huixian in ECUST in 2019. He has published over then 550 original papers in "Nat. Comm.; Chem. Rev.; J. Am. Chem. Soc.; Angew Chem Int Ed et al, which were cited more than 35000 times (H-index: 105), serves on the editor of Research on Chemical Intermediates and the editorial boards of several international journals, for example, "Applied Catalysis B: Environmental", and "Photographic Science and Photochemistry". His research interests include photocatalysis, environmental science and materials science.

## *PL-5* Prof. Yen Wei, Tsinghua University

### Title: Carbon-Based Photo-Thermal Materials for Solar-Distillation, Soft Robot, Tumor Diagnotherapy

Dr. Yen Wei is Chair Professor of Chemistry at Tsinghua University. He received his undergraduate diploma (1979) and MS (1981) at Peking U., and PhD at City U. of New York (1986). After postdoctoral work at MIT, he joined Drexel U. in 1987 as Assistant Prof., where he became DuPont Associate Prof. with tenure in 1991, Full Prof. in 1995 and Herman B. Wagner Prof. of Chemistry in 2004. He has co-authored 1279 scientific articles with 58900 SCI citations and H-index of 119. He joined Tsinghua full-time in 2009 as a national highest level talent. His current research is focused on polymers and nano-materials for biomedicine, energy, cellulose, environment and 3D-printing technologies. He was listed as a highest cited scientist every year from 2014 to 2022.

## *PL-6* Dr Dong Xu, China Energy Investment Corporation (China Energy)

### Title: Lessons learnt from the large scale implementation of carbon capture in power plants

Dr. Dong XU, Director of Carbon Neutralization Research Center of the New Energy Institute, China Energy. He is member of the APEC Sustainable Energy Center Expert Committee and observer of the United Nations Climate Technology Center and Network Advisory Committee (CTNEC). Dr. XU is one of the 100 members of the Future Energy Leadership Plan of the World Energy Council. He also worked in the secondment programme of the IEA Carbon Capture, Utilization and Storage (CCUS) Unit between 2019-2020. His research focuses on development and demonstration of technologies along the CCUS industrial chain. He takes the lead in a number of key national and provincial R&D projects on carbon capture and utilization as resource and energy source. Dr. XU overseas the successful on-going demonstration of China Energy's 150 kt/a $CO_2$ capture project in Jinjie Power Plant, currently the largest coal-fired power plant carbon capture project in China. In the meantime, he is also leading China Energy's 500 kt/a $CO_2$ capture demonstration project in Taizhou Power Plant in east China. Dr. XU has applied for over 30 patents and published more than 40 research papers.

## *PL-7* Prof. Mengxiang Fang, Zhejiang University

### Title: Study of $CO_2$ Chemical absorption and Industry application

Prof. Mengxiang Fang got his PhD degree on Engineering Thermolphysics from Zhejiang University in 1991. After graduated, he worked at Institute for Thermal Power Engineering of Zhejiang University and was promoted to the professor in 1998. His research is coal and biomass combustion, pyrolysis and gasification, $CO_2$ chemical absorption and oxy-fuel combustion. He has already been responsible to finished more than 40 projects including National Natural Science Foundation Project, National Key Basic Research Project (973), National High Technology Research and Development Project(863), EU project, etc. He got more than 20 patents and presented more than 100 papers in Journal and conference.

## *PL-8* Prof. Yanjun Hu, Zhejiang University of Technology

### Title: Insights into the microstructure evolution and $CO_2$ adsorption of activated carbon derived from spent coffee grounds and sewage sludge

Yanjun Hu is a Professor at Institute of Energy and Power Engineering, Zhejiang University of Technology, China. She has mainly focused on the thermo-chemical conversion technology of organic solid waste. Specific research interests include heavy metals and organic pollutants control in the processes of pyrolysis/gasification/incineration, co-pyrolysis mechanism of multi-source organic solid waste, high-value utilization of pyrolysis char and so on. As the first or corresponding author, she has published over 40 SCl indexed papers, 1 book. As the first investor, she has more than 40 patents in the field of treatment and management of organic solid waste. She takes charge of more than 30 key projects as the project leader. She has won 5 technology awards, and has received the First-Class Prize of Science and Technology Award of China Federation of Commerce as the first awardee in 2019.

## *PL-9* Prof. Peter Styring, University of Sheffield

### Title: Custodians of Carbon: Creating a new circular carbon economy

Peter Styring is Professor of Chemical Engineering & Chemistry and Associate Fellow in the Understanding of Politics at the University of Sheffield, UK. He is a Fellow of both the Royal Society of Chemistry and the Institution of Chemical Engineers. His research focuses on carbon dioxide (and carbon) utilisation within a circular economy. This covers the whole system from carbon capture, catalysis, social impact, life cycle and Techno-economic analysis, policy development, and process engineering from pilot demonstrators through to the commercialisation of systems.

## *PL-10* Dr Chunfei Wu, Queen's University Belfast

### Title: $CO_2$ capture and integration with reverse water gas shift reaction for syngas production using dual functional materials

Dr Chunfei Wu is a Reader at the School of Chemistry and Chemical Engineering. He has worked in the areas of converting renewable and waste resources to energy, fuel, and chemicals through catalytic thermochemical routes for 20 years. He is the PI of a EU RISE international exchange programme in relation to biomass gasification and carbon capture and utilisation (Ref; EU823745, €864,400) (2019-2022), coordinating 15 research groups. Dr Wu has also been involved in several EPSRC, Innovate UK, Royal Society and other EU projects. For example, he is the Co-I in EP/R000670/1 using microwave for bio-oil upgrading; Co-I in Innovate UK (Ref: 29478) for advanced battery thermal control and thermal using thermal phase change materials; Host academic for a Royal Society K.C. Wong International Fellowship (Ref: NIF\R1\191817). He has published >220 peer-reviewed journal papers with >10,000 citations (H index of 62, Google Scholar). He is the Managing Editor of Biomass and Bioenergy, and he is a Charted Scientist and a Member of Royal Society of Chemistry. He is also the Founding Editor-in-Chief of Carbon Capture Science & Technology, a journal published by Elsevier. Dr Wu is also the Chair of International Association for Carbon Capture.

# Keynote Speaker

*KA-1* Yunfei Gao, East China University of Science and Technology

*KA-2* Yujie Ban, Dalian Institute of Chemical Physics, Chinese Academy of Sciences

*KA-3* Asim Khan, COMSATS University Islamabad

*KA-4* Bo Jin, Hunan University

*KA-5* Mingzhe (Lisa) Sun, Surface Measurement Systems

*KA-6* Lei Wang, Zhejiang University

*KA-7* Lei Xing, University of Surrey

*KA-8* Waheed Afzal, University of Aberdeen

*KB-1* Colin Scholes, The University of Melbourne

*KB-2* Yi Liu, Dalian University of Technology

*KB-4* Kathryn Mumford, The University of Melbourne

*KB-5* Long Jiang, Zhejiang University

*KB-6* Yingcheng Li, Sinopec Shanghai Research Institute of Petrochemical Technology Co. Ltd.

*KB-7* Eni Oko, Newcastle University

*KB-8* Hao Zhang, Zhejiang University

*KB-9* Hongman Sun, China University of Petroleum (East China)

*KB-10* Panagiotis Kechagiopoulos, University of Aberdeen

*KC-1* Guozhao Ji, Dalian University of Technology

*KC-2* Lina Liu, Nankai University

*KC-3* Qingqing Mei, Zhejiang University

*KC-4* Shuang Li, Tsinghua University

*KC-5* Long Han, Zhejiang Universit of Technology

*KC-6* Shijian Lu, China University of Mining and Technology

*KC-7* Peter Clough, Cranfield University

# SPEAKERS

*KC-8* **Nannan Sun, Shanghai Advanced Research Institute, Chinese Academy of Sciences**

*KC-9* **Lingzhi Wang, East China University of Science and Technology**

*KC-10* **Chuang Wen, University of Exeter**

# Invited CCST Award Speaker

*AW-1* Katherine Hornbostel, University of Pittsburgh

*AW-2* Zhien Zhang, Ohio State University

*AW-3* Chunfeng Song, Tianjin University

*AW-4* Huanhao Chen, Nanjing Tech University

*AW-5* Changlei Qin, Chongqing University

*AW-6* Siming Chen, China University of Mining and Technology

# SPEAKERS

## CCST2023 Editor's Session – 21st July 2023

8 pm- 9 pm (China Time); 1 pm – 2 pm (UK Time)

**Zooms link:**

https://us06web.zoom.us/j/82590371552?pwd=QU1wQlMzampEVFo2RXVadjYrUjV3dz09

**Meeting ID: 825 9037 1552**

**Passcode: 381272**

**Workshop programme**

**8 pm (China time); 1:00 pm (UK time) – Workshop introduction**, Dr Chunfei Wu, Queen's University Belfast

**8:05 pm (China time); 1:05 pm (UK time) – Introduction of panel members**

Professor Yong Wang – Editor in Chief, Applied Catalysis B: Environmental, Washington State University

Professor Jerry Heng – Editor in Chief, Chemical Engineering Research and Design, Imperial College London

Dr Shouliang Yi – Editor, Separation Purification Technology; Executive Editor-in-Chief, Results in Engineering, The University of Pittsburgh

Dr Ziliang Wang – Editor, Green Energy and Resources, Shandong University

Dr Haoran Zhang – Subject Editor, Advances in Applied Energy, Peking University

**8:15 pm (China time); 1:15 pm (UK time) – Panel discussion about predetermined questions**

**8:45 pm (China time); 1:45 pm (UK time) – Panel discussion about questions from the audience**

# CCST2023 supporting organisations

清華大學
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