SDER 2025

第二届可持续发展与能源资源国际学术会议

2025 2nd International Conference on Sustainable Development and Energy Resources

Conference Manual

● 2025年8月1-3日 ● 中国·深圳

主办单位：南方科技大学碳中和能源研究院

承办单位：哈尔滨工业大学（深圳）绿色低碳能源创新技术研究所、AEIC学术交流中心

协办单位：香港中文大学（深圳）城市地下空间及能源研究院、南开大学光伏材料与电池全国重点实验室、中国科学院广州能源研究所、香港理工大学、中山大学

支持单位：深圳产学研合作促进会

日程安排 Program

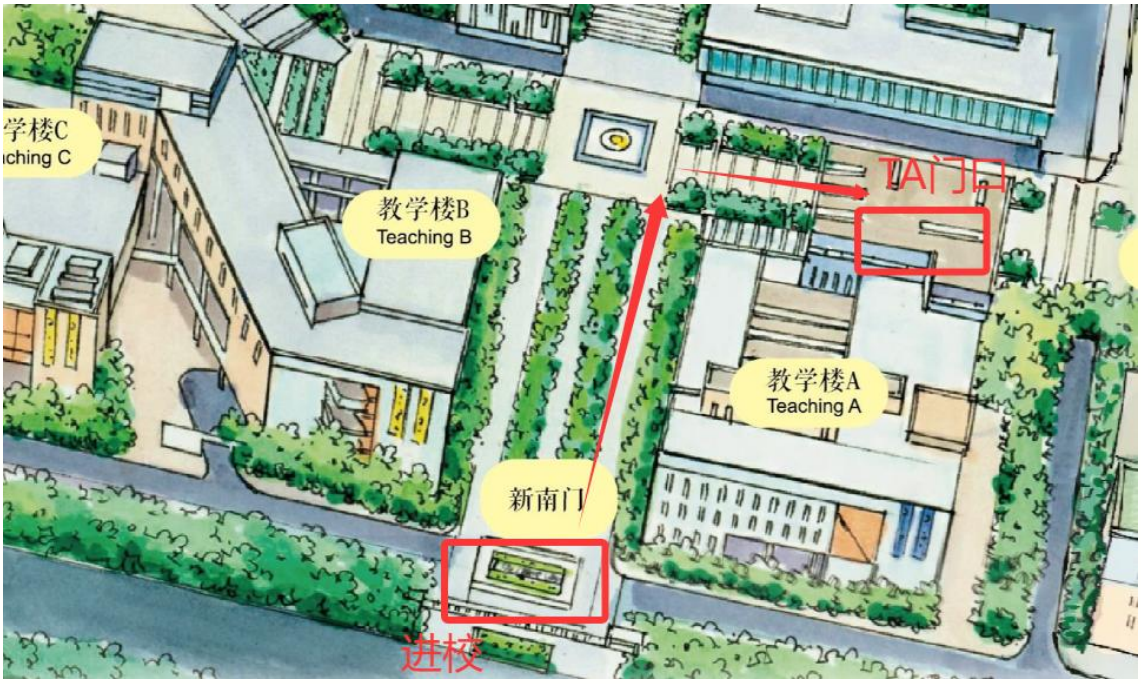
Day 1- Aug. 1, 2025		
13:00-18:00	签到	Registration
Day 2- Aug. 2, 2025		
08:00-09:00	签到	Registration
09:00-09:20	会议开幕式	Opening Ceremony
09:20-11:40	主旨报告	Keynote Speeches
11:40-13:10	午餐	Lunch
13:10-14:00	乘坐大巴前往香港中文大学（深圳）	Take the bus to The Chinese University of Hong Kong, Shenzhen
14:00-17:30	专题会场	Thematic Sessions
18:00-19:00	乘坐大巴返回酒店	Take the bus back to the hotel
19:00-20:00	晚餐	Dinner
Day 3- Aug. 3, 2025		
09:00-20:00	自由返程	Return Trip

照片直播 Live Photo

扫描查看会议照片
Scan the QR Code for Live Photos

场地指引 Venue Guide

主会场：尚锦国际酒店（深圳龙城广场店）

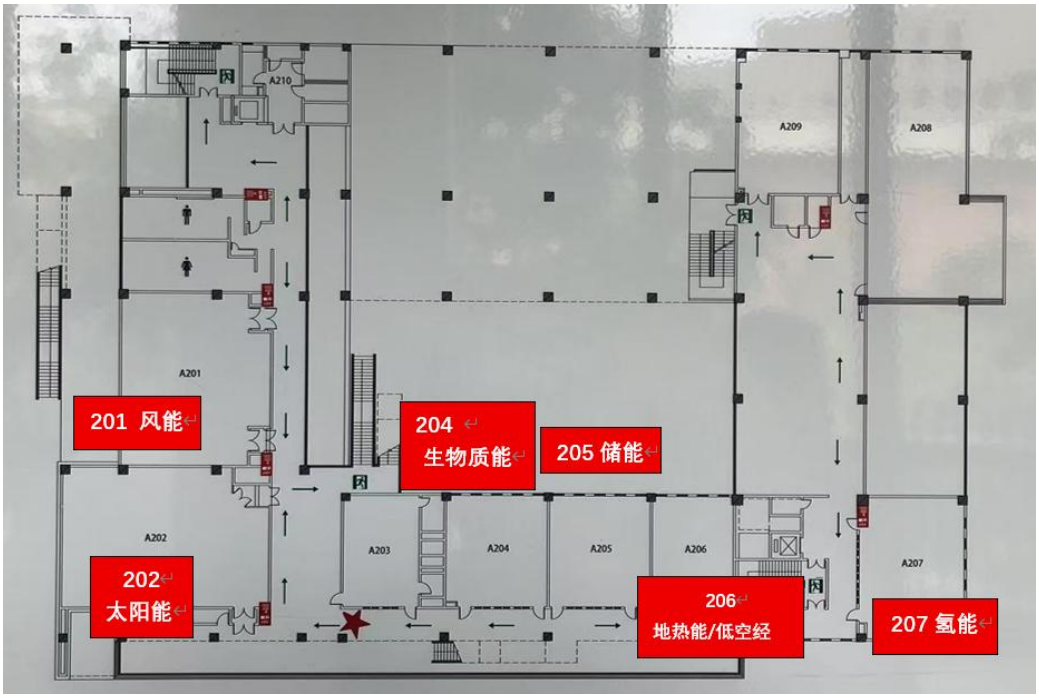


专题会场：香港中文大学（深圳）Teaching A 2楼

酒店地址

1. 尚锦国际酒店（深圳龙城广场店）：深圳龙岗区龙城大道93号
2. 深圳中海凯骊酒店：深圳龙岗区大运路168号
3. 深圳大与酒店（龙岗横岗地铁站店）：深圳龙岗区横岗新园路88号大与文体度假中心A栋

场地指引 Venue Guide



专题会场安排 Teaching A 2楼

各专题会场安排	
TA 201	创新风能技术与可持续发展前沿
TA 202	高效太阳能利用与多场景应用
TA 204	生物质能转化及绿色能源体系
TA 205	储能技术创新与能源系统优化
TA 206	低空经济赋能绿色能源与产业创新 地热能开发与综合利用新进展
TA 207	氢能生产、存储与应用的未来愿景

目录 Contents

会议介绍 Introduction

为应对全球变化与能源转型的挑战，推动可持续发展与能源资源领域的创新研究与实践，第二届可持续发展与能源资源国际学术会议（SDER 2025）于2025年8月1-3日在中国深圳隆重召开。本次会议旨在为全球学者、企业代表及政策制定者提供一个高水平的交流平台，共同探讨能源资源领域的前沿技术与可持续发展路径。

会议下设风能、太阳能、生物质能、储能、地热、氢能、低空经济七个专题分会场，涵盖能源转型与低碳技术的核心议题。会议将邀请国内外知名专家学者、企业领袖及政策制定者，通过主题报告、专题研讨、技术展示、海报展示等形式，分享最新研究成果、行业实践与政策经验，推动产学研深度融合，助力全球碳中和目标的实现。

深圳作为中国改革开放的前沿阵地和科技创新高地，将为本次会议注入活力与创新精神。我们诚邀全球各界人士齐聚深圳，共话可持续发展与能源资源的未来，携手推动绿色低碳转型，共创美好未来。

会议介绍 Introduction

In order to address the challenges of global change and energy transition, and to promote innovative research and practice in the field of sustainable development and energy resources, the 2025 2nd International Conference on Sustainable Development and Energy Resources (SDER 2025) will be grandly held on August 1-3, 2025 in Shenzhen, China. The conference aims to provide a high-level communication platform for global scholars, business representatives and policy makers to discuss the cutting-edge technologies and paths to sustainable development in the field of energy resources.

The conference will include seven thematic sessions on wind energy, solar energy, biomass energy, energy storage, geothermal energy, hydrogen energy, and low-altitude economy, covering the core issues of energy transition and low-carbon technologies. The conference will invite renowned experts, scholars, business leaders and policy makers from home and abroad to share the latest research results, industry practices and policy experiences through keynote speeches, symposiums, technology demonstrations, poster presentations, etc., to promote the in-depth fusion of industry, academia and research and to help realize the goal of global carbon neutrality.

Shenzhen, as the frontier of China's reform and opening up and a highland of scientific and technological innovation, will inject vitality and innovative spirit into this conference. We sincerely invite people from all walks of life around the world to gather in Shenzhen to talk about the future of sustainable development and energy resources, and to join hands to promote green and low-carbon transformation and create a better future.

组织单位 Organizations

主办单位 Host

南方科技大学碳中和能源研究院

Energy Institute for Carbon Neutrality, Southern University of Science and Technology

承办单位 Organizers

哈尔滨工业大学（深圳）绿色低碳能源创新技术研究所

Institute of Green-Low Carbon Energy Innovative Technology, Harbin Institute of Technology, Shenzhen

AEIC学术交流中心

AEIC Academic Exchange Information Center

协办单位 Co-organizers

香港中文大学（深圳）城市地下空间及能源研究院

Institute of Urban Underground Space and Energy Studies (IUSE) at The Chinese University of Hong Kong, Shenzhen

南开大学光伏材料与电池全国重点实验室

State Key Laboratory of Photovoltaic Materials and Cells, Nankai University

中国科学院广州能源研究所

Guangzhou Institute of Energy Conversion, Chinese Academy of Sciences

香港理工大学

The Hong Kong Polytechnic University

中山大学

Sun Yat-sen University

支持单位 Supporter

深圳产学研合作促进会

Shenzhen Industry-University-Research Institute Collaboration Association

会议组委会 Committees

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会议议程(8月2日） Agenda of Aug. 2

尚锦国际酒店2楼锦绣厅 2F - Hotel

开幕式 Opening Ceremony		
09:00-09:05	开场白	Opening Remarks
09:05-09:15	致辞	Opening Address
09:15-09:20	合影	Group Photo
主旨报告 Keynote Speeches		
09:20-09:50	赵天寿，讲席教授，南方科技大学 题目：流体电池实现长时储能	Prof. Tianshou Zhao, Southern University of Science and Technology Title: Flow Cells for Long-Duration Energy Storage
09:50-10:20	张明明，教授，哈尔滨工业大学（深圳） 题目：AI赋能风能利用技术研究与应用	Prof. Mingming Zhang, Harbin Institute of Technology, Shenzhen Title: Research and Application of AI Empowered Wind Energy Utilization Technology
10:20-10:40	茶歇	Tea Break
10:40-11:10	Bernd R. Noack，教授，深圳大学 题目：用于阵风安全低空经济飞行的空气动力学技术与人工智能	Prof. Bernd R. Noack, Shenzhen University Title: Aerodynamic technologies and artificial intelligence for a gust-safe low-altitude economy
11:10-11:40	黄振，研究员，中国科学院广州能源研究所 题目：有机固废化学链气化	Researcher Zhen Huang, Guangzhou Institute of Energy Conversion, Chinese Academy of Sciences Title: Chemical Looping Gasification of Organic Solid Waste
11:40-13:10	午餐	Lunch

会议议程(8月2日） Agenda of Aug. 2

TA 201：创新风能技术与可持续发展前沿 TA 201: Innovative Wind Technology and the Frontier of Sustainable Development 召集人：张明明　李晔		
特邀报告 Special Invited Presentation		
14:00-14:25	胡伟飞，研究员、长聘副教授，浙江大学 题目：AI赋能的大型风电装备设计制造运维全生命周期研究	Researcher, Assoc. Prof. Weifei Hu, Zhejiang University Title: Research on Whole Life Cycle of Large-Scale Wind Turbines Driven by AI
14:25-14:50	王燕，教授，兰州理工大学 题目：叶尖速比对风力机尾迹蜿蜒的影响	Prof. Yan Wang, Lanzhou University of Technology Title: The Influence of Tip Speed Ratio on Wind Turbine Wake Meandering
14:50-15:15	周奇，教授，汕头大学 题目：风力机圆形塔筒的二维非线性涡激力数学建模研究	Prof. Qi Zhou, Shantou University Title: Mathematical Modeling of Two-Dimensional Nonlinear Vortex-Induced Forces on Cylindrical Wind Turbine Towers
15:15-15:40	沈昕，副教授，上海交通大学 题目：非线性影响下超大型风力机叶片气弹失稳特性研究	Assoc. Prof. Xin Shen, Shanghai Jiaotong University Title: Aeroelastic Instability Characteristics of Ultra-large Wind Turbine Blades Under the Influence of Nonlinearity
15:40-15:50	茶歇	Tea Break
邀请报告 Invited Presentation		
15:50-16:05	史洁，副教授，济南大学 题目：基于改进的动态时间规整数据填补和深度学习结合的短期风电功率预测模型	Assoc. Prof. Jie Shi, University of Jinan Title: A short-term wind power prediction model based on improved dynamic time warping data filling and deep learning
16:05-16:20	杨尚慧，副研究员，四川大学 题目：基于超短时风速预测和动态尾流的风电场自适应实时控制	Associate Researcher, Shanghui Yang, Sichuan University Title: Adaptive Real-Time Wind Farm Control Based on Ultra-Short-Term Wind Prediction and Wake Dynamics
16:20-16:35	漆良文，讲师，汕头大学 题目：基于叶尖位移的风电机组疲劳载荷及净空协同控制	Lecturer, Liangwen Qi, Shantou University Title: Coordinated Control of Fatigue Loads and Blade-tower Clearance Based on Blade-tip Displacement in Wind Turbines
16:35-16:50	孙海莹，副教授，华南理工大学 题目：纵摇运动下浮式海上风机的气动性能与尾流特性	Assoc. Prof. Haiying Sun, South China University of Technology Title: Aerodynamic performance and wake characteristics of floating offshore wind turbine under pitch motion

会议议程(8月2日） Agenda of Aug. 2

TA 201：创新风能技术与可持续发展前沿 TA 201: Innovative Wind Technology and the Frontier of Sustainable Development 召集人：张明明　李晔		
口头报告 Oral Presentation		
16:50-17:00	陈雅男，天津大学 题目：中国与欧洲海上风能资源特征及最优单峰风速模型分析	Yanan Chen, Tianjin University Title: Comparative analysis of offshore wind resources and optimal wind speed distribution models in China and Europe
17:00-17:10	尹佳敏，扬州大学 题目：适用于风力机可压缩与不可压缩流动计算的新叶素动量理论	Jiamin Yin, Yangzhou University Title: A New Blade Element Momentum Theory for Both Compressible and Incompressible Wind Turbine Flow Computations
17:10-17:20	江宇航，扬州大学 题目：多机型下风电场布局和电缆拓扑的协同优化	Yuhang Jiang, Yangzhou University Title: Co-optimization of wind farm layout and cable topology for multiple wind turbine types
17:20-17:30	杨坤，香港大学 题目：布局优化对入流依赖的敏感性：以Lillgrund风电场为例	Kun Yang, The University of Hong Kong Title: Inflow-Dependent Sensitivity of Layout Optimization Performance: A Case Study of the Lillgrund Wind Farm
17:30-17:40	王速，上海交通大学 题目：多工况下风力机超长柔性叶片气弹失稳的能量相关机理研究	Su Wang, Shanghai Jiaotong University Title: Study on Energy-related Mechanisms of Aeroelastic Instability of Ultra-long Flexible Wind Turbine Blades Under Various Working Conditions
17:40-17:50	谢彬，华南理工大学 题目：IEA 22 MW浮式风力机在平台运动与波浪影响下的气动与尾流特性计算分析	Bin Xie, South China University of Technology Title: Computational Analysis of Platform Motion and Wave Effects on the Aerodynamics and Wake of the IEA 22 MW Floating Wind Turbine
17:50-18:00	王海强，华北电力大学（保定） 题目：基于混合时序模式的多特征因素下风速行为预测方法研究	Haiqiang Wang, North China Electric Power University (Baoding) Title: Research on Wind Speed Behavior Prediction Method Based on Mixed Time Series Mode under Multiple Feature Factors
18:00-18:10	董欣辉，香港大学 风力涡轮机和 UMaine VolturnUS-S 半潜式平台的耦合气动-流体动力学分析	Xinhui Dong, The University of Hong Kong Title: A Coupled Aerodynamic-Hydrodynamic analysis of IEA 15 MW Wind Turbine and UMaine VolturnUS-S semi-submersible platform/ IEA 15 MW

会议议程(8月2日） Agenda of Aug. 2

TA 202：高效太阳能利用与多场景应用 TA 202: Efficient Solar Energy Utilization and Multi-scene Application 召集人：赵颖 秦彩燕		
特邀报告 Special Invited Presentation		
14:00-14:25	韩灿，助理教授，中山大学 题目：面向太瓦级光伏产能需求的透明电极开发	Asst. Prof. Can Han, Sun Yat-sen University Title: Development of Transparent Electrodes for Terawatt-Scale Photovoltaic Capacity Demand
14:25-14:50	许盛之，教授级高工，南开大学光伏材料与电池全国重点实验室 题目：人工智能与光伏技术的深度融合：数据基石、领域大模型与未来智能生态	Professor-level Senior Engineer, Shengzhi Xu, State Key Laboratory of Photovoltaic Materials and Cells, Nankai University Title: The Deep Integration of AI and Photovoltaic Technologies: Data Foundations, Domain-Specific Large Language Models, and Future Intelligent Ecosystems
14:50-15:15	杨月，教授，哈尔滨工业大学（深圳） 题目：基于太阳辐射光谱分频利用提升能量转换性能	Prof. Yue Yang, Harbin Institute of Technology, Shenzhen Title: Spectral utilization of solar radiation to improve energy conversion performance
15:15-15:30	茶歇	Tea Break
邀请报告 Invited Presentation		
15:30-15:45	吴绍航，副教授，暨南大学 题目：柔性钙钛矿光伏产业化技术及应用	Assoc. Prof. Shaohang Wu, Jinan University Title: Industrialization technology and application of flexible perovskite photovoltaics
15:45-16:00	李航，副教授，南开大学、清华大学 题目：真空蒸镀高性能钙钛矿太阳能电池	Assoc. Prof. Hang Li. Nankai University, Tsinghua University Title: Vacuum thermal evaporation for efficient perovskite solar cells
16:00-16:15	陈梅洁，副教授，中南大学 题目：基于空天能量的热辐射调控与利用	Assoc. Prof. Meijie Chen, Central South University Title: Thermal radiation control and utilization based on outer space energy
16:15-16:30	曲万军，副教授，东莞理工学院 题目：太阳能驱动分布式能源系统碳捕集与封存的热力学研究	Assoc. Prof. Wanjun Qu, Dongguan Universtiy of Technology Title: Thermodynamic Study on Solar-Powered Carbon Capture and Sequestration in Distributed Energy Systems
口头报告 Oral Presentation		
16:30-16:40	何青辰，暨南大学 题目：基于空间限域与动态配位协同效应实现结晶调控——应用于27.9%效率全钙钛矿叠层太阳能电池	Qingchen He, Jinan University Title: Steric Confinement and Dynamic Coordination Synergy for Crystallization Control in 27.9%-Efficient All Perovskite Tandem Solar Cell

会议议程(8月2日） Agenda of Aug. 2

TA 202：高效太阳能利用与多场景应用 TA 202: Efficient Solar Energy Utilization and Multi-scene Application 召集人：赵颖 秦彩燕		
口头报告 Oral Presentation		
16:40-16:50	江波，南方科技大学 题目：无反溶剂高效制备与低熔点合金刮涂电极用于钙钛矿太阳能电池的设计与制备	Bo Jiang, Southern University of Science and Technolog Title: Anti-Solvent-Free and Efficient Fabrication of Blade-Coated Low-Melting-Point Alloy Electrodes for Perovskite Solar Cells: Design and Fabrication
16:50-17:00	陈占朝，哈尔滨工业大学（深圳） 题目：纳米颗粒团聚光学特性及光热转换机制研究	Zhanchao Chen, Harbin Institute of Technology, Shenzhen Title: Study on the optical properties and photothermal conversion mechanism of nanoparticle agglomerates
17:00-17:10	达嘉颖，中南大学 题目：碳/镍基相变复合材料在热电应用中的太阳能热储能性能研究	Jiaying Da, Central South University Title: Solar-thermal energy storage characteristics of carbon/nickel-based phase change composites for thermoelectric utilization
17:10-17:20	林驰，中山大学 题目：TOPCon太阳电池金属化提效探索	Chi Lin, Sun Yat-sen University Title: Metallization for Efficiency Improvement of TOPCon Solar Cells
17:20-17:30	谯攀攀，哈尔滨工业大学（深圳） 题目：基于底部入射的动态直接吸收式太阳能集热器性能提升及参数优化研究	Panpan Jiao, Harbin Institute of Technology, Shenzhen Title: Study on Performance Improvement and Parameter Optimization of Dynamic Direct Absorption Solar Collector Based on Bottom Heating Strategy
17:30-17:40	王奕阳，中南大学 题目：液态有机氢载体蒸发特性的模拟研究	Yiyang Wang, Central South University Title: Simulation on Evaporation Characteristics of Liquid Organic Hydrogen Carriers

会议议程(8月2日） Agenda of Aug. 2

TA 204：生物质能转化及绿色能源体系 TA 204: Transformation of Biomass Energy and Green Energy System 召集人：黄振		
特邀报告 Special Invited Presentation		
14:00-14:25	冯昱恒，副教授，同济大学 题目：城镇污水污泥热解炭化机制研究	Assoc. Prof. Yuheng Feng, Tongji University Title: Study on the Carbonization Mechanism of Municipal Sewage Sludge
14:25-14:50	魏国强，副研究员，华南农业大学 题目：有机固废化学链制氢	Associate Researcher, Guoqiang Wei, South China Agricultural University Title: Hydrogen production from organic solid waste chemical looping
14:50-15:15	张军，副研究员，中国科学院广州能源研究所 题目：生物质催化热解制取轻质芳烃	Associate Researcher, Jun Zhang, Guangzhou Institute of Energy Conversion, Chinese Academy of Sciences Title: Catalytic Pyrolysis of Biomass into Light Aromatics
15:15-15:40	舒日洋，副教授，广东工业大学 题目：木质素热化学催化解聚和加氢脱氧制备烃类燃料	Assoc. Prof. Riyang Shu, Guangdong University of Technology Title: Lignin thermochemical catalytic depolymerization and hydrodeoxygenation conversion for the production of hydrocarbon fuels
15:40-16:05	胡志锋，副教授，华南农业大学 题目：生物质热解与化学链气化分步转化制生物炭和高品质合成气	Assoc. Prof. Zhifeng Hu, South China Agricultural University Title: Step conversion of biomass pyrolysis and chemical looping gasification to produce biochar and high-quality syngas
16:05-16:15	茶歇	Tea Break
口头报告 Oral Presentation		
16:15-16:25	肖雯，华南理工大学 题目：冰模板辅助松木屑S/N/O共掺杂制备大比表面积多孔炭用于超级电容器	Wen Xiao, South China University of Technology Title: Ice template-assisted co-doping of pine sawdust with S/N/O to prepare high specific surface area porous carbon for supercapacitors
16:25-16:35	郑雄威，中国科学院广州能源研究所 题目：使用铁酸铜和铁酸镍作为氧载体对厨余垃圾的化学气化循环特性的评估	Xiongwei Zheng, Guangzhou Institute of Energy Conversion, Chinese Academy of Sciences Title: Evaluation of Chemical Gasification Cyclic Characteristics of Kitchen Waste Using Copper Ferrite and Nickel Ferrite as Oxygen Carriers
16:35-16:45	陈可，集美大学 题目：燃用生物质燃料环己醇对柴油机性能影响	Ke Chen, Jimei University Title: Effect of Burning Biomass Fuel Cyclohexanol on Diesel Engine Performance
16:45-16:55	陈卓瑶，华南理工大学 题目：杨木与磷酸三聚氰胺共热解制备鱼鳞状N、O、P共掺杂多孔炭	Zhuoyao Chen, South China University of Technology Title: Preparation of fish-scale N, O, P co-doped porous carbon by co-pyrolysis of poplar wood with melamine phosphate

会议议程(8月2日） Agenda of Aug. 2

TA 204：生物质能转化及绿色能源体系 TA 204: Transformation of Biomass Energy and Green Energy System 召集人：黄振		
口头报告 Oral Presentation		
16:55-17:05	姚炜珊，华南农业大学 题目：基于链式反应的垃圾填埋气梯级制氢基础研究	Weishan Yao, South China Agricultural University Title: Basic research on cascade production of hydrogen from landfill gas chemical looping
17:05-17:15	孙宗盛，中国矿业大学 题目：低阶煤蒸汽闪蒸干燥脱水特性研究及其提质应用	Zongsheng Sun, China University of Mining & Technology Title: Study on coarse-grained coal water removal characteristics via steam flash drying for low-rank coal upgrading
17:15-17:25	刘煜晨，集美大学 题目：EGR率对环己醇-柴油双燃料发动机的影响	Yuchen Liu, Jimei University Title: Effect of EGR Rate on Cyclohexanol-diesel Dual-fuel Engines
17:25-17:35	李宗阳，中国科学院广州能源研究所 题目：不同生命周期评估方法下薄膜光伏组件环境评估差异调查	Zongyang Li, Guangzhou Institute of Energy Conversion, Chinese Academy of Sciences Title: Investigation on Environmental Assessment Variability of Thin-Film PV Modules Across Different LCA Approaches

会议议程(8月2日） Agenda of Aug. 2

TA 205：储能技术创新与能源系统优化 TA 205: Innovative Wind Technology and the Frontier of Sustainable Development 召集人：李文甲　魏磊		
特邀报告		
14:00-14:25	李一举，副研究员，南方科技大学 题目：面向高比能锂电池溶剂与反溶剂分子设计	Associate Researcher, Yiju Li, Southern University of Science and Technology Title: Molecular Design of Solvents and Antisolvents for High-Energy-Density Lithium Batteries
14:25-14:50	周学龙，副教授，深圳大学 题目：液流电池电极材料的多物理场行为及其设计策略	Assoc. Prof. Xuelong Zhou, Shenzhen University Title: Multiphysics Behavior and Design Strategies of Flow Battery Electrodes
14:50-15:15	方娟，副教授，北京科技大学 题目：光与热协同驱动燃料转化	Assoc. Prof. Juan Fang, University of Science and Technology Beijing Title: Fuel Conversion via Synergistic Photo-Thermal Activation
15:15-15:40	马非，副教授，天津大学 题目：固体氧化物燃料电池系统余热梯级利用与动态特性研究	Assoc. Prof. Fei Ma, Tianjin University Title: Study on Cascade Utilization of Waste Heat and Dynamic Characteristics in Solid Oxide Fuel Cell Systems
15:40-15:50	茶歇	Tea Break
15:50-16:15	王建勇，副教授，中山大学 题目：强浮升力影响下的水平超临界CO_2流动传热研究	Assoc. Prof. Jianyong Wang, Sun Yat-sen University Title: Study on buoyancy-affected heat transfer of horizontal supercritical CO_2 flows
16:15-16:40	邱昌煜，助理研究员，中国科学院广州能源研究所 题目：从综合视角分析金属资源与电池技术的协同演化及作用机制	Assistant Researcher, Changyu Qiu, Guangzhou Institute of Energy Conversion, Chinese Academy of Science Title: Analyzing the co-evolution and synergistic mechanisms of metal resources and battery technology from an integrated perspective
口头报告 Oral Presentation		
16:40-17:00	任嘉友，香港科技大学，南方科技大学 题目：大面积钒液流电池性能优化	Jiayou Ren , The Hong Kong University of Science and Technology, Southern University of Science and Technology Title: Optimization of Performance of Large-Scale Vanadium Flow Batteries
17:00-17:10	郭君伟，中国矿业大学 题目：超临界CO_2流体萃取技术在高碱煤加工提质领域的应用	Junwei Guo, China University of Mining and Technology Title: Application of supercritical CO_2 fluid extraction technology in the processing and upgrading of high-alkali coal
17:10-17:20	魏金鹏，东北电力大学 题目：电力系统灵活性充裕度评估与灵活性资源配置	Jinpeng Wei, Northeast Electric Power University Title: Assessment of Flexibility Adequacy in Power Systems and Flexibility Resource Allocation

会议议程(8月2日） Agenda of Aug. 2

TA 205：储能技术创新与能源系统优化 TA 205: Innovative Wind Technology and the Frontier of Sustainable Development 召集人：李文甲　魏磊		
口头报告 Oral Presentation		
17:20-17:30	许思涵，南京师范大学 题目：聚光光伏协同热再生电池的数据中心高效清洁供能系统设计及优化	Sihan Xu, Nanjing Normal University Title: Design and optimization of high-efficiency clean energy supply system for data centers based on concentrated photovoltaics and synergistic thermally regenerative batteries
17:30-17:40	张浩，中国科学院广州能源研究所、 题目：从综合视角分析金属资源与电池技术的协同演化及作用机制	Hao Zhang, Guangzhou Institute of Energy Conversion, Chinese Academy of Sciences Title: Analyzing the co-evolution and synergistic mechanisms of metal resources and battery technology from an integrated perspective
17:40-17:50	许晓倩，南方科技大学 题目：多元素协同位点选择性掺杂策略构筑超稳定P2型钠离子电池正极材料	Xiaoqian Xu, Southern University of Science and Technology Title: Achieving Long-Term Cyclability in Sodium-Ion Batteries: Site-Selective Doping to Inhibit Irreversible Phase Transitions in P2-Type Cathodes
17:50-18:00	代诚欣，黑龙江科技大学 题目：化学结构与微孔隙耦合影响下煤中CO_2/CH_4吸附分子模拟	Chengxin Dai, Heilongjiang University of Science and Technology Title: Molecular simulation of CO_2/CH_4 adsorption in coal under the coupling effect of chemical structure and micropores

会议议程(8月2日） Agenda of Aug. 2

TA 206 低空经济赋能绿色能源与产业创新 Low-Altitude Economy Empowers Green Energy and Industrial Innovation 召集人：卢镇波 张炳夫 地热能开发与综合利用新进展 New Progress in Development and Comprehensive Utilization of Geothermal Energy 召集人：纪冬旭		
特邀报告 Special Invited Presentation		
14:00-14:25	卢镇波，教授， 中山大学 题目：低空飞行器创新路径与关键技术研究	Prof. Zhenbo Lu, Sun Yat-sen University Title: Key Technologies Research and Innovation Pathways for Low-Altitude Aircraft
14:25-14:50	温新，教授，上海交通大学 题目：基于数据驱动和振荡射流的气动矢量控制研究	Prof. Xin Wen, Shanghai Jiao Tong University Title: Development of Thrust Vector Control Based on Data Driven methods and Sweeping Jets
14:50-15:15	张炳夫，副教授，哈尔滨工业大学（深圳） 题目：运载工具人工智能气动减阻节能流动控制方法研究	Assoc. Prof. Bingfu Zhang, Harbin Institute of Technology, Shenzhen Title: Artificial intelligence flow control for aerodynamic drag reduction and power saving of a vehicle model
15:15-15:30	茶歇	Tea Break
口头报告 Oral Presentation		
15:30-15:45	朱奋田，西南交通大学 题目：隧道运行场景下高速磁浮列车气动载荷特性	Fentian Zhu, Southwest Jiaotong University Title: Aerodynamic load characteristics of high-speed maglev trains in tunnel operation scenarios
15:45-16:00	袁雪，中国科学技术大学 题目：碳排放者指定的市场反应:绿色创新和溢出的证据	Xue Yuan, University of Science and Technology of China Title: Market Reactions to Carbon Emitter Designation: Evidence on Green Innovation and Spillovers
16:00-16:15	何驰骋，中南大学 题目：中深地热利用的同轴管式换热器：数值分析与布置优化	Chicheng He, Central South University Title: Coaxial tube heat exchangers for medium-deep geothermal utilization: numerical analysis and layout optimization

会议议程(8月2日） Agenda of Aug. 2

TA 207：氢能生产、存储与应用的未来愿景 TA 207: Future Vision of Hydrogen Energy Production, Storage and Application 召集人：徐心海 安亮		
特邀报告 Special Invited Presentation		
14:00-14:25	陈曦，教授，湖南理工学院 题目：基于分级燃烧的氨氢燃料低氮排放数值模拟研究	Prof. Xi Chen, Hunan Institute of Science and Technology Title: Numerical study of Low-NOx emission of ammonia-hydrogen flames in a staged combustor
14:25-14:50	杨扬，教授，重庆大学 题目：TPMS结构在制氢技术方面的研究	Prof. Yang Yang, Chongqing University Title: Study of Triply Periodic Minimal Surface (TPMS) Structure in Hydrogen Production Technology
14:50-15:15	潘哲飞，教授，重庆大学 题目：阴离子交换膜直接氨燃料电池	Prof. Zhefei Pan, Chongqing University Title: Building an Ammonia Fuel Cell with an Anion Exchange Membrane
15:15-15:40	高展，教授，西安交通大学 题目：基于碳氢燃料的固体氧化物电池 $SrTi_{1-x}Fe_xO_3$（STF）阳极研究	Prof. Zhan Gao, Xi'an Jiaotong University Title: Study on $SrTi_{1-x}Fe_xO_3$ (STF) Anodes for Solid Oxide Cells Based on Hydrocarbon Fuels
15:40-16:05	闫晓晖，副教授，上海交通大学 题目：PEM电解水制氢气泡动力学与电极设计研究	Assoc. Prof. Xiaohui Yan, Shanghai Jiao Tong University Title: Bubble evolution and transport in PEM water electrolyzer
16:05-16:20	茶歇	Tea Break
邀请报告 Invited Presentation		
16:20-16:35	潘泽华，副教授，哈尔滨工业大学（深圳） 题目：基于热力学建模的固体氧化物燃料电池系统优化	Assoc. Prof. Zehua Pan, Harbin Institute of Technology, Shenzhen Title: Optimization of Solid Oxide Fuel Cell Systems Based on Thermodynamic Modeling
16:35-16:50	蒋博，副教授，大连理工大学 题目：热化学制氢中热质传递与化学反应协同理论研究	Assoc. Prof. Bo Jiang, Dalian University of Technology Title: Theoretical Study on Synergistic Heat Mass Transfer and Chemical Reactions in Thermochemical Hydrogen Production
16:50-17:05	秦彦周，副研究员，天津大学 题目：PEM燃料电池水传输直接可视化测量与水分布信息定量分析	Associate Researcher, Yanzhou Qin, Tianjin University Title: Direct Experimental Visualization of Water Transport and Quantitative Analysis of Water Distribution in PEM Fuel Cell
17:05-17:20	郑伟波，助理教授，同济大学 题目：质子交换膜燃料电池催化层多物理场耦合疲劳/衰减机制研究	Asst. Prof. Weibo Zheng, Tongji University Title: Investigating Physical and Chemical Degradation Mechanisms due to Multi-Physics Coupling in the Catalyst Layer of Proton Exchange Membrane Fuel Cells

会议议程(8月2日） Agenda of Aug. 2

TA 207：氢能生产、存储与应用的未来愿景 TA 207: Future Vision of Hydrogen Energy Production, Storage and Application 召集人：徐心海 安亮		
邀请报告 Invited Presentation		
17:20-17:35	范聪敏，讲师，成都理工大学 题目：Ni_3S_2 基催化剂的制备及电催化析氧/析氢性能研究	Lecturer, Congmin Fan, Chengdu University of Technology Title: Preparation of Ni_3S_2-based catalysts and research of their electrocatalytic performance for oxygen/hydrogen evolution reactions
口头报告		
17:35-17:45	魏光辉，中南大学 题目：基于仿生结构的燃料电池流道设计及性能分析	Guanghui Wei, Central South University Title: Design and performance analysis of fuel cell flow channels based on biomimetic structures

主旨报告 Keynote Speeches

赵天寿 讲席教授

南方科技大学

Prof. Tianshou Zhao
Southern University of Science and Technology

赵天寿教授，南方科技大学碳中和能源研究院院长、机械与能源工程系讲席教授。他于2021年加入南方科技大学，此前任香港科技大学工程及环境学冠名讲座教授。

赵教授是中国科学院院士、美国机械工程师学会会士（ASME Fellow）、英国皇家化学会会士（RSC Fellow）、中国化学会会士。曾获国家自然科学奖、何梁何利基金科学与技术进步奖、裘槎优秀科研者奖等多项荣誉，多次入选科睿唯安（Clarivate Analytics）/汤森路透（Thomson Reuters）「高被引科学家」。现任《International Journal of Heat and Mass Transfer》主编。

赵教授长期致力于热质传递理论和电池储能技术的研究。针对国家“双碳”戦略实施对储能技术的重大需求，围绕燃料电池、液流电池、金属空气电池等流体电池储能装置中能量传递与转换关键科学问题，建立了电池储能系统中热质传递和电化学能量转换的耦合理论，提出了热、质、电子及离子协同传输方法，突破了高功率流体电池设计的关键技术。

报告题目：流体电池实现长时储能

摘要：流体电池是一种以可流动物质（如氢气、甲醇、氨、液态电解质等）為能量载体实现容量与功率解耦的电池，具有时长灵活、扩容方便、本征安全、选址灵活等优势，有望成為推动可再生能源广泛部署的颠覆性技术。本讲座将重点探讨，如何通过交叉学科研究方法突破流体电池共性科学问题和技术挑戦，推动技术规模化应用。

主旨报告 Keynote Speeches

Prof. Tianshou Zhao
Southern University of Science and Technology

Biography: Prof. Tianshou Zhao is Director of Energy Institute for Carbon Neutrality, Chair Professor of Mechanical & Energy Engineering, Southern University of Science & Technology (SUSTech). Before joining SUSTech in 2021, he held the named professorship of Engineering and Environment at The Hong Kong University of Science and Technology.
Prof. Zhao is an elected academician of the Chinese Academy of Sciences, Fellow of the American Society Mechanical Engineers, Fellow of the Royal Society of Chemistry, Fellow of the Chinese Society of Chemistry, and a Highly Cited Researcher by Clarivate/Thomson Reuters, and Editor-in-Chief of International Journal of Heat and Mass Transfer.
He has made seminal contributions in the areas of fuel cells, advanced batteries, multi-scale multiphase heat and mass transport with electrochemical reactions, and computational modeling. Prof. Zhao received the State Natural Science Award, the Ho Leung Ho Lee Prize for Scientific and Technological Progress, the Croucher Senior Fellowship award, and among others.

Title: Flow Cells for Long-Duration Energy Storage

Abstract: Flow cells are those in which a flowable storage medium (e.g.: hydrogen, methanol, ammonia, liquid electrolytes, etc.) allows decoupling power and energy. This talk will show that flow cells are scable, safe, and particularly flexiable in storage duration and site selections. Therefore, flow cells will become game-changing technologies to facilitate the widespread deployment of renewables. In particular, we will show that common scientific issues and practical challenges pertaining to flow cell technologies can be addressed by an interdisciplinary approach combining electrochemistry and engineering thermophyiscs.

主旨报告 Keynote Speeches

张明明 教授
哈尔滨工业大学（深圳）

Prof. Mingming Zhang
Harbin Institute of Technology, Shenzhen

作为万人领军人才、国家优青、中国科学院百人计划、深圳市“孔雀计划”A类人才，科技部国家科技重点专项专家组专家、中国可再生能源学会风能专委会副主任、IEEE PES新能源技术分委会副主席、《Renewable Energy》副主编，围绕大型风电叶片流动控制与创新设计、高可靠风电机组设计及智慧风电场等开展应用基础研究。主持科技部863、重点研发计划、国际合作项目，基金委优青基金、重点基金、面上基金项目，中国科学院“百人计划”、先导专项课题等。发表国内外学术论文210余篇，其中SCI收录近60余篇；国内外学术邀请报告40余次；申请或授权发明专利近50项。获AIAA青年学者科技荣誉奖，百人计划终期评估优秀奖，国家能源科技进步二等奖，中国科学院科技贡献二等奖，中国能源创新一等奖，北京市科学技术二等奖，中国电力科技进步二等奖，吴仲华优秀青年学者奖等奖励10余项。

报告题目：AI赋能风能利用技术研究与应用

摘要：随着第四次工业革命的来临，人工智能与人类之间的认知伙伴关系确立，以人工智能技术为依托，结合数字孪生、大数据、云计算、5G、物联网等先进技术的深度融合，通过对风电机组及关键部件、风电场的统一监测和管理，实现对工况环境、设备状态、故障预警等方面可靠数据治理和最优协同管控，具有开放性、学习性、成长性、异构性和交互性的特点，对风电行业将带来更大价值提升，同时解决行业痛点、降本增效。为此，本报告将与各位领导专家分享相关方面的成果和经验，着重介绍智能化风功率预报，大型及超大型风电机组与关键部件智能化设计与控制，智慧风电场预报、设计、场群控制及运维以及相关智慧能源管理等方面基础理论与技术研发、应用。

主旨报告 Keynote Speeches

Prof. Mingming Zhang
Harbin Institute of Technology, Shenzhen

Biography: As a leading talent of ten thousand people, a national outstanding youth, a member of the Chinese Academy of Sciences' Hundred Talents Program, and a Class A talent of the Shenzhen "Peacock Plan", an expert in the National Key Science and Technology Special Expert Group of the Ministry of Science and Technology, deputy director of the Wind Energy Special Committee of the China Renewable Energy Society, vice chairman of the IEEE PES New Energy Technology Subcommittee, and deputy editor in chief of "Renewable Energy", we conduct applied basic research on flow control and innovative design of large wind turbine blades, design of highly reliable wind turbines, and smart wind farms. Hosted the Ministry of Science and Technology's 863 Program, Key R&D Program, International Cooperation Projects, National Natural Science Foundation's Excellent Youth Fund, Key Fund, General Fund Projects, Chinese Academy of Sciences' "Hundred Talents Program", Leading Special Projects, etc. Published over 210 academic papers both domestically and internationally, including nearly 60 SCI indexed papers; More than 40 academic invitation reports at home and abroad; Close to 50 invention patents have been applied for or authorized. Received more than 10 awards, including the AIAA Young Scholar Science and Technology Honor Award, the Outstanding Award for the Final Evaluation of the Hundred Talents Program, the Second Prize for National Energy Science and Technology Progress, the Second Prize for Science and Technology Contribution of the Chinese Academy of Sciences, the First Prize for China Energy Innovation, the Second Prize for Science and Technology in Beijing, the Second Prize for China Electric Power Science and Technology Progress, and the Wu Zhonghua Outstanding Young Scholar Award.

Title: Research and Application of AI Empowered Wind Energy Utilization Technology

Abstract: With the advent of the Fourth Industrial Revolution, the cognitive partnership between artificial intelligence and humans has been established. Based on artificial intelligence technology, advanced technologies such as digital twins, big data, cloud computing, 5G, and the Internet of Things are deeply integrated. Through unified monitoring and management of wind turbines, key components, and wind farms, reliable data governance and optimal collaborative control of working conditions, equipment status, fault warning, and other aspects are achieved. It has the characteristics of openness, learning, growth, heterogeneity, and interactivity, which will bring greater value enhancement to the wind power industry, while solving industry pain points, reducing costs, and increasing efficiency. To this end, this report will share relevant achievements and experiences with leaders and experts, focusing on the research and application of basic theories and technologies in intelligent wind power forecasting, intelligent design and control of large and ultra large wind turbines and key components, intelligent wind farm forecasting, design, site group control and operation, and related intelligent energy management.

主旨报告 Keynote Speeches

Bernd R. Noack 教授

深圳大学

Prof. Bernd R. Noack
Shenzhen University

Bernd R. Noack，深圳大学特聘教授，担任广东省垂直起降飞行器制造创新中心首席科学家，粤港澳大湾区低空经济研究院院长，柏林工业大学讲座教授，同时担任哈尔滨工业大学、深圳技术大学和马德里卡洛斯三世大学的兼职/访问/名誉教授。Noack教授在深圳领导着一个不断壮大的团队，拥有五个实验室，专注于低空经济中的空气动力学和控制问题。三十多年来，Noack教授在欧洲和美国的领先机构，如马克斯·普朗克学会、德国航天中心、联合技术研究中心、柏林工业大学和法国国家科学研究中心等，致力于交通工具工程湍流控制的研究。Noack 教授发表了350余篇经同行评审的学术论文，包括2项国际专利、1项中国实用新型专利、6本专著以及170余篇国际期刊论文。他的工作获得了多项国内外奖项，如成为美国物理学会会士，获得首届ANR流体力学领域卓越主席职位，并且是2005年度冯·米塞斯奖的唯一得主。Mendeley/斯坦福将他列为高被引科学家，Research.com 评选他为中国及全球顶尖机械与航天工程科学家。

报告题目：用于阵风安全低空经济飞行的空气动力学技术与人工智能

摘要：快速发展的低空经济正在将人类转变为空中社会：无人机和空中出租车使得在人口密集的城市中，能够突破交通拥堵，实现空中运输和出行，同时覆盖偏远的农村地区，带来前所未有的便利。然而，平稳的风速和阵风挑战着城市环境中空中出租车和配送无人机的安全运行。这些风力会导致无人机意外偏移，可能引发碰撞和事故。因此，我们从多个方面应对多旋翼无人机及类似设计的空中出租车的这一安全挑战。首先，我们开发了一种适用于低速和高速运行的空气动力学无人机模型，该模型用于评估和优化在风中巡航性能及飞行控制。其次，在我们的空中城市实验室（Aerial City Lab）中，利用自主研发的风扇阵列风力发生器（FAWG），包含40 × 40个可独立控制的风扇（吉尼斯世界纪录 2025），模拟城市风环境。基于此，我们开创了适用于稀疏优化传感器的流场预测方法。最后，针对阵风条件下的起飞、降落和巡航，我们优化了飞行控制系统，采用了空气动力学模型和基于人工智能的学习方法，并预估改进流场条件。
本讲座主要工作来源于Noack教授团队，特别是刘宇同、刘艳婷、王天宇、姜竹涛、李逸清、侯昶、Yutong Liang、Muhammad Babansoro Sanusi、Matheesha Pathiraja及Guy Cornejo Maceda（哈尔滨工业大学/马德里康普顿斯大学）。同时也与以下教授团队合作：何晓舟（哈尔滨工业大学）、张宏伟（哈尔滨工业大学）、胡钢（哈尔滨工业大学）、Franz Raps（深圳技术大学）、杨军（电子科技大学）、高楠（大连航华科技有限公司）、Yang Yang（深圳市无人机行业协会）、杨延年（华南理工大学）、Dmitry Kolomenskiy（斯科尔科沃科学技术研究院）、Andrea Ianiro（马德里康普顿斯大学）和Stefano Discetti（马德里康普顿斯大学）。

主旨报告 Keynote Speeches

Prof. Bernd R. Noack
Shenzhen University

Biography: Bernd R. Noack is Distinguished Professor at Shenzhen University, Chief Scientist at the Guangdong Province VTOL Manufacturing Innovation Center, Director at the Guangdong-Hong Kong-Macao Greater Bay Aera Low Altitude Economy Research Institute Professor, Chair at TU Berlin and Adjunct/Visiting/Honorary Professor at Harbin Institute of Technology, Shenzhen Technology University and University Carlos III of Madrid and. In Shenzhen, he heads a growing team with five laboratories for the aerodynamics and control problems of the low-altitude economy. For over three decades, he has worked on engineering turbulence control for transport vehicles in leading European and the US institutions, including the Max-Plank Society, German Aerospace Center (DLR), United Technologies Research Center (UTRC), TU Berlin and the French National Center for Scientific Research (CNRS). Prof. Noack has written over 350 refereed publications, including 2 international patents, 1 China Utility Model Patent, 6 books and over 170 journal articles. His work has been awarded with dozens of national and international awards. For instance, he became Fellow of the American Physical Society, got the first senior ANR Chair of Excellence in Fluid Mechanics, and was the only winner of the annual von Mises award 2005. Mendeley/Stanford lists him as highly cited scientist and Research.com rates him as Top Mechanical and Aerospace Engineering Scientist in China and worldwide.

Title: Aerodynamic technologies and artificial intelligence for a gust-safe low-altitude economy

Abstract: The rapidly evolving low-altitude economy transforms mankind into an aerial society: Drones and air taxis allow unprecedented transport and mobility over traffic jams in congested metropolises and to remote rural destinations. Yet, steady winds and wind gusts challenge the safety of air taxi and delivery drone operation in urban environments. These winds lead to unintended displacements and may result potential collisions and accidents. We address this safety challenge for multicopter drones and similarly designed air taxis on several fronts. First, an aerodynamic drone model is developed for low and high-speed operation. This plant serves for the assessment and optimization of cruise performance and flight control under wind. Second, the urban wind conditions are emulated in our Aerial City Lab simulations and experiments with a self-build fan array wind generator (FAWG) with 40 × 40 individually controllable fans (Guinness World Record 2025). Thus, flow prediction methodologies are developed for sparse optimized sensors. Finally, the
flight control is optimized for take-off, landing and cruise under gusty wind conditions. The control design employs the aerodynamic model, artificial intelligence based learning and is further improved by estimated flow conditions. This lecture is based on work of Prof. Noack's team, in particular Yutong Liu, (SZUAYanting Liu,
Tianyu Wang, Zhutao Jiang, Yiqing Li, Chang Hou, Yutong Liang, Muhammad Babansoro Sanusi, Matheesha Pathiraja and Guy Cornejo Maceda (HIT/UC3M) in collaboration with the teams of Profs. Xiaozhou He (HIT), Hongwei Zhang (HIT), Gang Hu (HIT), Franz Raps (SZTU), Jun Yang (UESTC), Nan Gao (HangHua), Yang Yang VIA), Yannian Yang (SCUT), Dmitry Kolomenskiy (Skoltech), Andrea Ianiro (UC3M) and Stefano Discetti (UC3M).

主旨报告 Keynote Speeches

黄振 研究员

中国科学院广州能源研究所

Researcher Zhen Huang
Guangzhou Institute of Energy Conversion,
Chinese Academy of Sciences

黄振，工学博士，中国科学院广州能源研究所研究员、博士生导师，国家能源生物燃料研发中心副主任，国家WR计划青年拔尖人才，国家重点研发计划“循环经济关键技术与装备”项目负责人，中国科学院特聘骨干研究员，广东省杰青。主要研究方向为含碳燃料化学链气化/重整/制氢。发表SCI期刊论文150余篇，SCI他引6000余次，H因子45，入选全球前2%顶尖科学家“终身科学影响力榜单”，授权发明专利12件（PCT 2件）；荣获广东省青年科技创新奖、广东省自然科学奖一等奖、河南省自然科学奖二等奖，入选中国科学院青年创新促进会、中国可再生能源学会优秀青年科技人才；承担国家重点研发计划项目、国家自然科学基金、广东省自然科学基金重点基金、中国科学院洁净能源创新研究院合作基金等项目十余项；是Carbon Energy、Green Carbon等多个SCI/EI期刊（青年/客座）编委，担任中国化工学会工程热化学专业委员会委员、城乡矿山产学研联盟秘书长、广东省工程热物理学会副秘书长、第八届全国青年燃烧学术会议执行主席、第一届中国化学链会议秘书长。

报告题目：有机固废化学链气化

摘要：有机固废能源化与资源化利用是推动我国绿色低碳高质量发展、实现“双碳”目标的重要途径。热化学转化技术是有机固废实现“减量化、资源化、无害化”处理与处置的重要手段，其中，气化技术是一种二次污染相对小、能耗低以及可实现综合利用的有机固废处置技术，特别是对有机固废的分散式处理与处置显得更为有意义。针对有机固废常规气化产生的合成气品质低(高焦油、低H_2/CO比)、二次污染物含量高，无法直接作为合成高附加值液体燃料/化学品的原料等瓶颈，本报告创新性地提出了化学链气化技术方案。主要汇报内容包括：1）：以大宗天然铁矿石或工业含铁废渣为载氧体基体，基于燃料中能量/污染元素赋存特性，定向引入外源活性组分强化Fe基载氧体反应活性，开发出主动匹配燃料特性的高性能复合载氧体；2）基于过渡金属强化的Fe基复合载氧体，在国际上率先提出了农林有机固废(N/S/Cl等污染元素含量低)化学链气化制备高品质合成气新方法，获得了低焦油、H_2/CO比在1~3范围内可控的合成气；3）基于碱(土)金属强化的Fe基复合载氧体，探索出工业/城镇有机固废(N/S/Cl等污染元素含量高)化学链转化制备清洁合成气新思路，实现合成气中焦油含量降低90%、氮/硫/氯污染物一体化脱除率大于95%。

主旨报告 Keynote Speeches

Researcher Zhen Huang
Guangzhou Institute of Energy Conversion, Chinese Academy of Sciences

Biography: Zhen Huang, Ph.D. in Engineering, serves as a researcher and doctoral supervisor at the Guangzhou Institute of Energy Conversion, Chinese Academy of Sciences (CAS). Dr. Huang acts as the Deputy Director of the National Energy Biofuel Research Center, a National Excellent Young Talent under the WR Program. a project leader of the National Key R&D Program's "Key Technologies and Equipment for Circular Economy," a Distinguished Key Scientist of the CAS, and a recipient of the Guangdong Provincial Distinguished Young Scholar award. Dr. Huang focuses on chemical looping gasification, reforming, and hydrogen production of carbon-containing fuels. Furthermore, he has published over 150 SCI journal papers, with more than 6,000 citations and an H-index of 45. He is listed among the World's Top 2% Scientists. He holds 12 authorized invention patents (including 2 PCT patents). He also won many awards, including the Guangdong Youth Science and Technology Innovation Award, the First-Class Guangdong Natural Science Award, and the Second-Class Henan Natural Science Award. He is a member of the CAS Youth Innovation Promotion Association and was recognized as an Outstanding Young Scientific Talent by the Chinese Renewable Energy Society. Dr. Huang has undertaken more than ten projects including the National Key R&D Program, National Natural Science Foundation of China, Guangdong Provincial Natural Science Foundation Key Fund, and cooperation funds from the Institute of Clean Energy Innovation, Chinese Academy of Sciences. Moreover, he serves as a guest editorial board member for numerous SCI/EI journals such as Carbon Energy and Green Carbon. He is also a member of the Engineering Thermochemistry Committee of the Chemical industry and Engineering Society of China, Secretary-General of the Urban and Rural Mining Industry-University-Research Alliance, Deputy Secretary-General of the Guangdong Engineering Thermophysics Society, Executive Chair of the 8th National Youth Combustion Academic Conference, and Secretary-General of the 1st China Chemical Looping Conference.

Title: Chemical Looping Gasification of Organic Solid Waste

Abstract: The energy recovery and resource utilization of organic solid waste are important pathways to promote China's green, low-carbon, and high-quality development and to achieve the "dual carbon" goals. Thermochemical conversion technologies are key methods for realizing the "reduction, resource recovery, and harmless treatment" of organic solid waste. Among them, gasification technology is a relatively low secondary pollution, energy-efficient, and comprehensive utilization technology for the disposal of organic solid waste, which is especially meaningful for decentralized treatment and disposal of such waste. To address the bottlenecks of conventional gasification of organic solid waste—namely, low-quality syngas (characterized by high tar content and low H_2/CO ratio) and high levels of secondary pollutants, which prevent its direct use as a feedstock for synthesizing high-value liquid fuels or chemicals—this report innovatively proposes a chemical looping gasification (CLG) technology solution. The main reported contents include:1) Using bulk natural iron ore or industrial iron-containing waste residue as the oxygen carrier matrix, and based on the energy and pollutant element distribution characteristics in the fuel, exogenous active components are directionally introduced to enhance the reactivity of the Fe-based oxygen carrier, thereby developing a high-performance composite oxygen carrier that actively matches the fuel characteristics;2) Based on transition metal-enhanced Fe-based composite oxygen carriers, a new chemical looping gasification method for producing high-quality syngas from agricultural and forestry organic solid wastes (which have low content of pollutants such as N, S, and Cl) is pioneered internationally, resulting in syngas with low tar content and a controllable H_2/CO ratio ranging from 1 to 3;3) Based on alkali (earth) metal-enhanced Fe-based composite oxygen carriers, a novel chemical looping conversion approach is explored for industrial and municipal organic solid wastes (with high levels of N, S, Cl pollutants) to produce clean syngas, achieving a 90% reduction in tar content and an integrated removal rate of nitrogen, sulfur, and chlorine pollutants exceeding 95%.

海报展示 Poster Presentations

1. Honglin Chen, Southern University of Science and Technology
Title: A high redox potential phenothiazine-based catholyte for aqueous organic redox flow batteries

2. Xianying Li, Xi'an Mingde Institute of Technology
Title: Energy saving and Personalized Thermal Comfort Control Based on Reinforcement Learning and Decision Tree

3. Hanyi Lin, Guangzhou Institute of Energy Conversion, Chinese Academy of Sciences
Title: Optimization deployment and evaluation of demand-driven offshore wind power electrolysis hydrogen supply chain

4. Guangyu Liu, Nanning Power Supply Bureau, Guangxi Power Grid Corporation
Title: Continuous Active Balancing for Sodium-Ion Batteries: HiNA 50kW/10okWh Case Study

5. Zhengwei Xu, Shenzhen Zhongdian Power Technology Co., Ltd.
Title: Multi-Objective Reactive Power Optimization Method for the Distribution Grid with Distributed Generator

笔记页 Notes

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