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MATERIALS FOR GREEN FUTURE

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Report Scope

Focus on but are not limited to the following areas

- Artificial Synapses Devices
- Batteries
- Electrocatalysis/Photocatalysis/Photoelectrocatalysis
- Energy Storage and Conversion
- Flexible/Wearable Materials and Devices
- Microwave Absorption and EMI materials
- Nanobiomedicine, Technology, Engineering
- Nanosensors
- Perovskite Materials and Devices, Solar Cells
- Synthesis, Characterization, Manipulation, Modeling of Nano/Microscaled Materials & Structures
- Sustainable Energy and Environment

Article type

Research articles, Reviews, Communications, Commentaries, Perspectives, Highlights, etc

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SPRINGER NATURE

INSTRUCTIONS FOR SPEAKERS

1. **Plenary Talks:** Plenary speakers will be allotted 30 minutes to present their results, followed by a 5 minutes discussion period.
2. **Keynote Talks:** Keynote speakers will be allotted 20 minutes to present their results, followed by a 5 minutes discussion period.
3. **Invited Talks:** Invited speakers will be allotted 17 minutes to present their results, followed by a 3-minute discussion period.
4. **Oral Talks:** Oral speakers will be allotted 12 minutes to present their results, followed by a 3-minute discussion period.
5. Please do not exceed the allotted time slot.
6. Speakers should have their presentations saved on a USB memory stick.
7. It is suggested to email a copy of the presentations to us as back up.
8. Please prepare the presentation in PPT files, PDF is not recommended.
9. **Basic AV setup will be provided:** laser pointer, cordless mike, desktop mike, sound system.
10. Laptops equipped with Windows 10, Office 2010 Pro English (Word, Powerpoint, Excel) and Adobe Reader are provided.
11. If your presentation files contain movies, please make sure that they are well formatted and connected to the main files. You may check your slides during the breaks.
12. Projectors are equipped with standard VGA connection ports. Mac users should bring their own adapter cord.
13. Please re-check this program prior to the conference to confirm if any changes have been made to your session.
14. Conference volunteers will move the mic during Q&A. Audience with questions may raise hand to receive the mic.

INSTRUCTIONS FOR POSTER

1. Maximum poster size is A0.
2. Push pins for attaching the poster to the board will be provided.
3. Poster presenters will be directed to the designated board at the start of the poster session.
4. Author must be present to provide details and answer questions during the selected poster session times.

CONFERENCE CHAIRS

LIANGZHI KOU

Associate Professor

Faculty of Engineering, School of Mech Medical & Process Engineering, Queensland University of Technology Australia

A/Prof. Liangzhi Kou received his Ph.D. in 2011 from Nanjing University of Aeronautics and Astronautics. He was an Alexander von Humboldt Fellow at University of Bremen during 2012–2014, and ARC-DECRA fellow during 2015-2018, winner of Friedrich Wilhelm Bessel Research Award (2025). He has been a Lecturer at Queensland University of Technology since 2015 and promoted to senior lecturer in 2018 and Associate Professor in 2021. His research mainly focuses on computational discovery and design of novel 2D materials for energy applications and electronics devices. Until now, he has published over 190 papers with h-index of 59, including Nature Communications, JACS, Nano Letters, ACS Nano, Adv. Sci, Adv. Func. Mater., which have been cited over 13,000 times.

ZIQI SUN

Professor

Faculty of Science
School of Chemistry & Physics
Queensland University of Technology
Australia

Prof. Ziqi Sun, Fellow of the Higher Education Academy and Fellow of the Royal Chemical Society, is currently a full professor, ARC Future Fellow, and ARC Industry Mid-Career Fellow at the Queensland University of Technology (QUT), Australia. His research interest includes rational design of multiscale-ordered metal oxide nanomaterials and bio-inspired inorganic smart nanomaterials for sustainable energy and environmental technologies, such as rechargeable batteries, oil-water separations, and catalysis. Ziqi received his PhD degree on advanced structural ceramics from Institute of Metal Research, Chinese Academy of Sciences in 2009. After one-year experience as NIMS postdoctoral fellowship (Japan) on solid oxide fuel cells, he joined University of Wollongong (UOW), Australia in 2010 and moved to QUT as a faculty member in 2015. Ziqi has published over 200 refereed articles in field-leading journals, such as Nature Nanotechnology, Nature Communications, Journal of the American Chemical Society, Advanced Materials, etc. Ziqi serves as the Editor-in-Chief of Sustainable Materials and Technologies (IF = 9.6), Principal Editor of Journal of Materials Research (MRS), and Handling Editor of Physics Open.

PLENARY SPEAKERS

DONGYUAN ZHAO

Professor

Academician of Chinese Academy of Sciences, Professor, Laboratory of Advanced Materials, Department of Chemistry, Fudan University, P.R. China

Professor Dongyuan Zhao was born in Northeastern of China, he received B.S. (1984), M.S. (1987) and PhD (1990) from Jilin University. He was a post-doctoral fellow in University of Houston (1995–96), University of California at Santa Barbara (1996–98). Now he is a Professor (Cheung Kong and Hao-Qing Professorship) in the Department of Chemistry at Fudan University. He was a member of Chinese Academy of Sciences and The World Academy of Science (TWAS). He has received many awards such as ACS Nano Award (2021); 1st Grade Award of Natural Science; Nano Research Award (2020); Khwarizmi International Award (KIA) (2019); JCIS Darsh Wasan Award (2018); Chemistry Contribution Award, China Chemical Society (2018); TWAS Lenovo Science Prize (2016); CRN Rao Award from India Chemical Research Society (2013); Muetterties Memory Award (2012); The Ho Leung Ho Lee Award (2009), TWAS Prize (2008); IMMS Award (2008); DuPond Award (2005). He is now appointed as senior Editor of ACS Central Science. He published more than 800 peer-review papers and is listed as one of highly cited researchers ISI in both Chemistry and Materials Science fields (Total citation ~ 145,000, h index 184). His research interests mainly include designed synthesis, assembly, structure and application of ordered mesoporous materials.

HUI-MING CHENG

Professor

Academician of Chinese Academy of Sciences, Director, Advanced Carbon Research Division & Institute of Technology for Carbon Neutrality, Shenzhen Institute of Advanced Technology, P.R. China

Prof. Hui-Ming Cheng graduated from Hunan University, China in 1984 and received his Ph. D in 1992 from Institute of Metal Research, Chinese Academy of Sciences (IMR CAS). He is the founding director of the Institute of Technology for Carbon Neutrality, Shenzhen Institutes of Advanced Technology, CAS since 2021, and concurrently the director of the Advanced Carbon Research Division of Shenyang National Laboratory for Materials Science, Institute of Metal Research, CAS since 2001. He is a member of CAS and a fellow of TWAS. He used to work at Kyushu Research Center of AIST and Nagasaki University, Japan from 1990 to 1993, and MIT, USA from 1997 to 1998. He was an honorary professor at the University of Queensland and a Vice Chancellor's Fellow at the University of Surrey. His research activities mainly focus on energy materials and devices, carbon nanotubes, graphene, and other 2D materials. He has published over 1000 papers with an h-index of 178, and is a Highly Cited Researcher in two fields of materials science, and chemistry. He has given over 240 plenary/keynote/invited lectures at various conferences, and won 4 State Natural Science Award of China (2nd class in 2006, 2017, 2020 and 2024), Charles E. Pettinos Award from American Carbon Society, Felcht Award from SGL, Germany, and ACS Nano Lecture Award, etc. He has also spun off several high-tech companies. He used to be an Editor of Carbon from 2000 to 2015, Editor-in-Chief of New Carbon Materials from 1998 to 2015, Associate Editor of Science China Materials from 2014 to 2022, and is the founding Editor-in-Chief of Energy Storage Materials since 2014.

WANLIN GUO

Professor

Academician of Chinese Academy of Sciences, Professor of Mechanics, Nanjing University of Aeronautics and Astronautics P.R. China

Dr. Wanlin Guo Academician of Chinese Academy of Sciences, chair Professor in mechanics and nanoscience, founder and director of the Key Laboratory of Intelligent Nano Materials and Devices of Ministry of Education and the Institute of Nanoscience of Nanjing University of Aeronautics and Astronautics. He received the National Science Foundation of China for Distinguished Young Scholars in 1996 and the honor of Cheung Kong Scholars in 1999. He obtained the National Nature Science Prize of China in 2012 and the Ho Leung Ho Lee Foundation Mathematical Mechanics Prize in 2019. He has published 400+ refereed papers in journals such as Nature Nanotech, Nature Comm., Phys. Rev. Lett., Nano Lett., J. Am. Chem. Soc., Adv. Mater., J. Mech. Phys. Solids et al. His current research focuses on 1) three dimensional fatigue fracture and damage tolerance and durability design of structures at high temperature; 2) intelligent nano materials and devices, multiscale physical mechanics, novel conception and technology for efficient energy conversion; 3) Hydrovoltaics and brain-like intelligence.

HUIJUN ZHAO

Professor

Fellow of the Australian Academy of Sciences and Fellow of Australian Academy of Technological Sciences and Engineering Professor and Director of Griffith University Australia

Prof. Huijun Zhao is the Funding Director of the Centre for Catalysis and Clean Energy at Griffith University, the elected Fellow of Australian Academy of Science (FAA) and Australian Academy of Technological Sciences & Engineering (FTSE), the Fellow of Royal Society of Chemistry (FRSC) and the Fellow of the Royal Australian Chemical Institute (FRACI). He has extensive expertise in functional materials, energy conversion and storage, catalysis and sensing technologies. He has published over 550 refereed journal papers and gained 68 international patents within 8 world-wide patent families. One of his current research pursuits is to explore new ways to unlock the catalytic capabilities of nonprecious materials as high performance catalysts for important catalysis reactions.

HUA ZHANG

Professor

Herman Hu Chair Professor of Nanomaterials, Department of Chemistry City University of Hong Kong, China

Prof. Hua Zhang, a Chair Professor at City University of Hong Kong, is a leading figure in nanomaterials research. His work revolves around phase engineering of nanomaterials and controlled epitaxial growth of heterostructures. With over 500 papers and numerous patents, he's made significant contributions to the field. Prof. Zhang's research spans various applications, including catalysis, clean energy, electronics, sensors, and water remediation. He has received prestigious awards, including being elected as a Foreign Fellow of the European Academy of Sciences and an Academician of the Asia Pacific Academy of Materials. His expertise has led to editorial roles in esteemed journals, showcasing his influence in the scientific community.

DMITRI GOLBERG

Professor

Fellow of the Australian Academy of Sciences, Professor, and Co-Director of the Centre for Materials Science, Queensland University of Technology (QUT) Australia

Professor Dmitri Golberg received his PhD in Russia and conducted research at the Bardin Research Institute in Moscow before joining the National Institute for Materials Science (NIMS) in Tsukuba, Japan in 1995. He is currently an Australian Laureate Fellow and Professor at Queensland University of Technology (QUT). A pioneer in boron nitride nanotubes research, he has made groundbreaking contributions to nanomaterials science through advanced electron microscopy techniques. Professor Golberg has published over 750 peer-reviewed papers with more than 62,000 citations and holds 130+ international patents. His honors include being a Highly Cited Researcher (2014-2022), recipient of the Seto Prize (2016), NIMS President Award (2017), and Tsukuba Prize (2005). His research focuses on synthesis and applications of nanotubes, nanowires, and 2D materials for energy technologies.

XIAODONG CHEN

Professor

President's Chair and Professor in Materials Science and Engineering Deputy Director Institute for Digital Molecular Analytics and Science (IDMxS); Director, Innovative Centre for Flexible Devices (iFlex) Nanyang Technological University (NTU) Singapore

Professor Xiaodong Chen is a Distinguished University Professor and President's Chair in Materials Science & Engineering at NTU Singapore. A pioneer in nanotechnology, his work on flexible electronics, biointerfaces, and plant-based robotics has advanced wearable health tech and sustainable solutions. He directs NTU's Innovative Centre for Flexible Devices (iFlex) and serves as Deputy Director of IDMxS.

Educated at Fuzhou University (BSc), Chinese Academy of Sciences (MSc), and University of Münster (PhD), he later conducted postdoctoral research at Northwestern University. An elected member of Leopoldina (2024) and Singapore National Academy of Science (2022), he edits ACS Nano and has received the Bessel Research Award (2019) and NRF Investigatorship (2016). His research bridges nanomaterials with medical and energy applications.

DAY-0 APRIL 28, 2025

17:00-21:00	**WELCOME RECEPTION**

DAY-1 APRIL 29, 2025

08:00-09:00	Registration and Arrival Coffee
09:00-09:15	**Welcoming Speech: Conference Chairs** **Liangzhi Kou,** Queensland University of Technology, Australia **Ziqi Sun,** Queensland University of Technology, Australia
	Session Chairs: Dmitri Golberg, Queensland University of Technology, Australia **Ziqi Sun, Queensland University of Technology, Australia**
	PLENARY TALKS
09:15-09:50	**Title:** Supra-Assembly of Functional Mesoporous Materials for the Energy Applications **Dongyuan Zhao,** Fudan University, China
09:50-10:25	**Title:** Repairing and Up Cycling of Cathode Materials from Spent Lithium ion Batteries **Hui-Ming Cheng,** Shenzhen Institute of Advanced Technology, China
10:25-10:45	**COFFEE BREAK**
10:45-11:20	**Title:** Energizing Intelligence **Wanlin Guo,** Nanjing University of Aeronautics and Astronautics, China
11:20-11:55	**Title:** Green Electrochemical Transformation of Carbon Dioxide: Challenges and Solutions **Huijun Zhao,** Griffith University, Australia
11:55-12:30	**Title:** Phase Engineering of Nanomaterials **Hua Zhang,** City University of Hong Kong, China
12:30-13:30	**LUNCH BREAK**
13:30-14:05	**Title:** In situ TEM: State-of-the-Art Tool for "Green" Materials Property Explorations **Dmitri Golberg,** Queensland University of Technology, Australia
	Session Chair: Ning Wang, Hainan University, China **JiangBiao, Shanghai institute of Organic Chemistry, CAS, China**
	KEYNOTE TALKS
14:05-14:30	**Title:** Battery Innovation Empowered by Lithium Bond and Artificial Intelligence **Qiang Zhang,** Tsinghua University, China
14:30-15:00	**COFFEE BREAK**
15:00-15:25	**Title:** Molecular Design and Device Engineering for High Performance Organic Solar Cells **Hongzheng Chen,** Zhejiang University, China
15:25-15:50	**Title:** From Clinics to Crops : How Nanoengineered Diagnostics Are Reshaping Global Health and Food Security **Muhammad J. A. Shiddiky,** Charles Sturt University, Australia

15:50-16:15	**Title:** TBA **Hanying Li,** Zhejiang University, China
16:15-16:40	**Title:** Ultra Thin Materials for Next-Generation Electronics and Optoelectronics **Sumeet Walia,** RMIT University, Australia
16:40-17:05	**Title:** TBA **Ning Wang,** Hainan University, China
17:05-17:30	**Title:** Design of Advanced Electrode Materials for Na-ion Battery **Yan Yu,** University of Science and Technology of China, China
17:30-17:55	**Title:** Chainmail Catalysis: From Fundamentals to Applications **Dehui Deng,** Dalian Institute of Chemical Physics, CAS, China
	INVITED TALK
17:55-18:15	**Title:** Reduction of Dysprosium Oxide by Microwave Plasma **Satoshi Fujii, N. I. T.,** Okinawa College, Japan
19:00 ONWARDS	**CONFERENCE BANQUET**

DAY-2 APRIL 30, 2025

08:30-09:00 **REGISTRATION AND ARRIVAL COFFEE**

ROOM-A

PLENARY TALK

09:00-09:35 **Title:** Extreme Electrochemical Energy Storage
Xiaodong Chen, Nanyang Technological University, Singapore

Materials for Energy Conversion and Storage

Session Chair: Yandong Ma, Shandong University, China
Yi Du, Beihang University, China

KEYNOTE TALKS

09:35-10:00 **Title:** The Redox Aspects of Lithium-Ion Batteries
Hubert Girault, Ecole Polytechnique Fédérale de Lausanne, Switzerland

10:00-10:25 **Title:** Mass Production of 2D Electrocatalysts for Industrial Relevant High-Current-Density Water Electrolysis
Bilu Liu, Tsinghua University, China

10:25-10:50 **Title:** Photocatalytic Water Splitting and CO2 Reduction
Akihiko Kudo, Tokyo University of Science, Japan

10:50-11:10 **COFFEE BREAK**

11:10-11:35 **Title:** In Situ Electropolymerizing toward Polymer Nanofilms of Cobalt Porphyrin and Phthalocyanine for Electrochemical CO_2 Reduction
Xunjin Zhu, The Hong Kong Polytechnic University, Hong Kong

11:35-12:00 **Title:** Atomically Dispersed Electrocatalysts in Porous Architecture for Fuel cells, Water Electrolysis and Li-S batteries
Jinwoo Lee, KAIST, Republic of Korea

12:00-12:25 **Title:** 2D Frustrated Materials with Exotic Electronic Structures
Yi Du, Beihang University, China

12:25-13:30 **LUNCH BREAK**

Session Chair: Jiahua Zhu, Nanjing Tech University, China
Chengwang Niu, Shandong University, China

13:30-13:55 **Title:** Multifunctional Nanocomposites for Clean Energy Applications, including Fuel Cells, Thermoelectrics and Water Splitting
Daniel Chua, National University of Singapore, Singapore

13:55-14:20 **Title:** Innovating layered Cathode Materials Through the Mechanistic Understanding of its Disorders
Yong-Mook Kang, Korea University, Republic of Korea

14:20-14:45 **Title:** Transforming Energy Industry by Configuring Meta-Organics Functionalities
Mohini Sain, University of Toronto, Canada

14:45-15:10 **Title:** Optimizing Charge Transport in Hematite Through Morphology Engineering
Ji-Hyun Jang, Ulsan National Institute of Science and Technology, Republic of Korea

15:10-15:30	**COFFEE BREAK**
15:30-15:55	**Title:** Characterization of Lithiation Ion Batteries with Advanced Electron Microscopy **Dong Su,** Institute of Physics, CAS, China
15:55-16:20	**Title:** Unlocking the Power of UV: Tailoring Optical and Structural Properties of Perovskite Materials **Ze Xiang Shen,** Nanyang Technological University, Singapore
16:20-16:45	**Title:** Electronic and Magnonic Chern Insulators in Two-Dimensional Ferromagnets **Chengwang Niu,** Shandong University, China
16:45-17:10	**Title:** Extracting Charge Carrier Mobility in Organic Solar Cells through Space-Charge-Limited Current Measurements **Hang Yin,** Shandong University, China
	INVITED TALKS
17:10-17:30	**Title:** $La_{0.5-x}Sc_xSr_{0.5}MnO_{3-\delta}$ Cathodes for Proton-Conducting Solid Oxide Fuel Cells: Taking Advantage of the Secondary Phase **Hailu Dai,** Yancheng Institute Of Technology, China
17:30-17:50	**Title:** Enhancing Perovskite Solar Cell Efficiency through Interfacial Passivation and Field Design **Jun Hong Noh,** Korea University, Republic of Korea
18:00-18:40	**POSTER PRESENTATIONS**

ROOM-B DAY 2, APRIL 30, 2025

Session Chair: Bingzi Zhang, Science China Press
Huan Wang, Journal of Advanced Functional Materials

	INVITED EDITORS
09:35-10:00	**Title:** TBA **Yaoqing Zhang,** Springer Nature
10:00-10:25	**Title:** TBA **Bingzi Zhang,** Science China Press
10:25-10:50	**Title:** The Physical Science Portfolio in Cell Press **Qiuming Ma,** Cell Press
10:50-11:10	**COFFEE BREAK**
11:10-11:35	**Title:** Publishing in Wiley Physical Sciences Journals How to Maximize Your Success **Huan Wang,** AFM, Wiley
11:35-12:00	**Title:** TBA **Jie Yang,** Engineering Structure
12:00-12:25	**Title:** Publishing in Wiley Advanced & Small Family Journals **Xi Wen,** Small Methods wiley
12:25-13:30	**LUNCH BREAK**

MATERIALS SCIENCE AND ENGINEERING

Session Chair: Bilu Liu, Tsinghua University, China
Chang Liu, Jilin University, China

KEYNOTE TALKS

13:55-14:20 **Title:** Doping Inorganic Crystals for Photonic Applications
Feng Wang, City University of Hong Kong, Hong Kong

14:20-14:45 **Title:** Photo-Thermal and Photo-Electric Catalytic Micro/Nanodevices for Green Synthesis and Water Remediation
Borja Sepulveda, Institute of Microelectronics of Barcelona, Spain

14:45-15:10 **Title:** Electric Field Enhanced Energy Devices
Mengyu Yan, Wuhan University of Technology, China

15:10-15:30 **COFFEE BREAK**

15:30-15:55 **Title:** Non-Cationic Bionanomaterials for Delivery to Challenging Diseased Sites
Jonathan Choi, The Chinese University of Hong Kong, Hong Kong

INVITED TALKS

15:55-16:15 **Title:** Structural and Property Evolution of Superhard Materials Under Nonhydrostatic Strains
Chang Liu, Jilin University, China

16:15-16:35 **Title:** Theoretical Design of Low-Dimensional Ferroic Materials
Lei Zhang, Shandong University, China

16:35-16:55 **Title:** Layered Semiconductors for Electronic and Optoelectronic Applications
Sudha Mokkapati, Monash University, Australia

16:55-17:15 **Title:** TBA
Ruijie Ma, The Hong Kong Polytechnic University, China

ORAL TALKS

17:15-17:30 **Title:** Dynamic phase locking in Parity Time Symmetric Thermal Systems
Pei-Chao Cao, Beihang University, China

17:30-17:45 **Title:** Electronic Flat Band in Distorted Colouring Triangle Lattice
Yaqi Li, Beihang University, China

18:00- 18:40 **POSTER PRESENTATIONS**

ROOM-C DAY 2, APRIL 30, 2025

SUSTAINABLE MATERIALS AND ENVIRONMENT

Session Chair: Muhammad J. A. Shiddiky, Charles Sturt University, Australia
Hyung-Ho Park, Yonsei University, Republic of Korea

KEYNOTE TALKS

09:35-10:00 **Title:** Bacterial Cellulose: A Green Alternative for Food Packaging Innovations
To Ngai, The Chinese University of Hong Kong, Hong Kong

10:00-10:25 **Title:** Microwave-Assisted CO_2 Capture with Ultra-low Energy Duty
Jiahua Zhu, Nanjing Tech University, China

10:25-10:50 **Title:** Introduction of Aerogel Nanomaterials as Green Energy Materials
Hyung-Ho Park, Yonsei University, Republic of Korea

10:50-11:10 **COFFEE BREAK**

INVITED TALKS

11:10-11:30 **Title:** Rational Catalyst Design for CO2 Electrochemical Reduction Reaction
Ziyun Wang, University of Auckland, New Zealand

11:30-11:50 **Title:** 2D Materials for Gold Recycling and Its Reuse Exploration
Yang Su, Tsinghua University, China

11:50-12:10 **Title:** Eco-Friendly Light-Activated Catalyst for Breaking Down Synthetic Dyes: Using AI to Predict Results
Nurhidayatullaili Muhd Julkapli, University of Malaya, Malaysia

12:10-12:30 **Title:** Study of Hole Transport layer for Highly Efficient Sn-Pb Perovskite Solar Cells
Dong Hoe Kim, Korea University, Republic of Korea

12:30-13:30 **LUNCH BREAK**

NANOMATERIAL AND NANOCATALYSIS FOR GREEN ENERGY

Session Chair: Ziyun Wang, University of Auckland, New Zealand
Wei Wei, Shandong University, China

KEYNOTE TALK

13:30-13:55 **Title:** Transfer The Green Material Technology from China to ASEAN
JiangBiao, Shanghai institute of Organic Chemistry, CAS, China

13:55-14:20 **Title:** Controlled Synthesis and Application of High-Performance Photothermal Management Materials
Rufan Zhang, Tsinghua University, China

14:20-14:45 **Title:** Graphene Origami-Enabled Mechanical Metamaterials for Green Future
Jie Yang, RMIT University, Australia

14:45-15:10 **Title:** Interface- and Defect-Engineering of 2D Nanostructured Energy-Functional Materials
Seong Ju Hwang, Yonsei University, Republic of Korea

15:10-15:30 **COFFEE BREAK**

15:30-15:55	**Title:** Interlayer Magnetoelectric Coupling in Van Der Waals Structures **Wei Wei,** Shandong University, China
15:55-16:20	**Title:** Advanced Atomic Catalysts Design For Energy Systems **Bolong Huang,** City University of Hong Kong, Hong Kong
	INVITED TALKS
16:20-16:40	**Title:** Theoretical Exploration of Topological Magnetism in 2D Materials **Yandong Ma,** Shandong University, China
16:40-17:00	**Title:** The Design of Multifunctional Piezoelectric Catalysts **Kai Wang,** The University of Queensland, Australia
17:00-17:20	**Title:** Defect Engineering in 2D Nanosheet-Based Materials for Electrocatalytic Applications **Xiaoyan Jin,** University of Seoul, Republic of Korea
17:20-17:40	**Title:** Highly selective Artificial Ion Channel Materials and Their Energy Applications **Jun Gao,** Qingdao Institute of Bioenergy and Bioprocess Technology, CAS, China
18:00-18:40	**POSTER PRESENTATIONS**

ROOM-D DAY 2, APRIL 30, 2025

NSR SPOTLIGHT SYMPOSIUM

Session Chair: Hongjin Fan, Nanyang Technological University, Singapore
Dongliang Chao, Fudan University, China

KEYNOTE TALKS

09:35-10:00	**Title:** Multimodal Electrolyte Architecting for Durable Aqueous Batteries **Hongjin Fan,** Nanyang Technological University, Singapore
10:00-10:25	**Title:** Materials and Systems for Solar Water Splitting to Produce Hydrogen **Fuxiang Zhang,** Dalian Institute of Chemical Physics, China
10:25-10:50	**Title:** The Role of Electrocatalytic Materials in Metal||Sulfur Batteries **Chao Ye,** University of Adelaide, Australia
10:50-11:10	**COFFEE BREAK**
11:10-11:35	**Title:** Next Aqueous Battery: A View of Redox Couples **Dongliang Chao,** Fudan University, China
11:35-12:00	**Title:** Cellulose Nanofiber-Based Separators for Durable Zn Ion Batteries **Jiaqian Qin,** Chulalongkorn University, Thailand
12:00-12:25	**Title:** Micro-Nano Artificial Structures and Acoustic Metasurface Devices **Xuefeng Zhu,** Huazhong University of Science and Technology, China
12:25-13:30	**LUNCH BREAK**

Session Chair: Hao Wang, Institute of Metal Research, CAS, China
Fuxiang Zhang, Dalian Institute of Chemical Physics, China

13:30-13:55	**Title:** The Puzzle of Magnetization Improved Water Oxidation and its Relation to Electron Spin **Zhichuan Xu,** Nanyang Technological University, Singapore

13:55-14:20	**Title:** Tailoring the Movements of Charger Carriers in Electrochemical Energy Storage Systems **Yuping Wu,** Southeast University, China
14:20-14:45	**Title:** Electrocatalysts for Anion Exchange Membrane Fuel Cells **Jinsong Hu,** Institute of Chemistry, CAS, China
14:45-15:10	**Title:** Interfacial Electrochemistry of CO_2 Reduction **Liming Zhang,** Fudan University, China
15:10-15:30	**COFFEE BREAK**
15:30-15:55	**Title:** Phosphorus Based Anode Materials for Fast-Charge Li-ion Batteries **Hengxing Ji,** University of Science and Technology of China, China
15:55-16:20	**Title:** Z-Scheme Heterojunctions for Photocatalytic Overall Water Splitting **Shaohua Shen,** Xi'an Jiaotong University, China
16:20-16:45	**Title:** Electrocatalytic Hydrogen Oxidation: a New Challenge in Alkaline Fuel Cells **Wenchao Sheng,** Tongji University, China
16:45-17:05	**Title:** Construction of Multi-Chambered Mesoporous Nanoreactors **Yuzhu Ma,** Inner Mongolia University, China
	INVITED TALKS
17:05-17:25	**Title:** Homologous Metal Materials for High-Current-Density Water Electrolysis **Qiangmin Yu,** Tsinghua University, China
18:00-18:40	**POSTER PRESENTATIONS**
GM01	**Title:** Upconversion Nanomaterial Integrated and Polydopamine Functionalized β-SiC Nanosystem for Efficient Green Hydrogen Production under Visible Light **Amit Kumar Verma,** Rajiv Gandhi Institute of Petroleum Technology, India
GM02	**Title:** Stress-Induced Self-Assembly of Hierarchically Twisted Stripe Arrays **Zhenghao Zhang,** Fudan University, China
GM03	**Title:** Development of Material Information Management System **Jinahua Yao,** Shanghai Institute of Organic Chemistry, CAS, China
GM04	**Title:** Efficient and Bright Broadband Electroluminescence Based on Environment-Friendly Metal Halide Nanoclusters **Dingshuo Zhang,** Zhejiang University, China
GM05	**Title:** Tandem Chemistry with Janus Mesopores Accelerator for Efficient Aqueous Batteries **Xinxin Song,** Fudan University, China
GM06	**Title:** Light-Driven Metal Exsolution-Redissolution of High-Entropy Oxide Enabling High-Performance Dry Reforming of Methane **Tingting Kong,** Anhui Normal University, China
GM07	**Title:** Machine Learning-Enabled Study of Thermoelectric Conversion Mechanism at Solid-Liquid Interfaces Driven by Thermo-osmosis **Xin Wang,** Anhui Normal University, China

GM08 **Title:** Biomimetic Phthalocyanine-Based Covalent Organic Frameworks with Tunable Pendant Groups for Electrocatalytic CO_2 Reduction
Yan Yue, Anhui Normal University, China

GM09 **Title:** Constructing Pd/PdO Heterointerface for Light-Driven Methane Conversion into Value-Added Product
Wenqing Zhang, Anhui Normal University, China

DAY-3 MAY 01, 2025

08:30-09:00 **REGISTRATION AND ARRIVAL COFFEE**

ROOM-A

COMPUTATIONAL MATERIALS SCIENCE

Session Chair: Xiaoming Zhang, Hebei University of Technology, China
Jun Yin, Nanjing University of Aeronautics and Astronautics, China

KEYNOTE TALKS

09:00-09:25 **Title:** Formation of Novel Helium-Containing Compounds at High Pressure
Yinwei Li, Jiangsu Normal University, China

09:25-09:50 **Title:** Theoretical Prediction of Topological Electronic Materials and Their Applications as Catalysts
Xiaoming Zhang, Hebei University of Technology, China

09:50-10:15 **Title:** Single-Atom-Site Catalysts for CO_2 Reduction: Mechanisms and Descriptors
Chongyi Ling, Southeast University, China

10:15-10:40 **Title:** Ferroelectric Photocatalysts: Theoretical Prediction and Experimental Validation
Li Chang Yin, Institute of Metal Research, CAS, China

10:40-11:00 **COFFEE BREAK**

INVITED TALKS

11:00-11:20 **Title:** Kinetic Photovoltage from Moving Boundaries of Electrical Double Layer and its Modulation
Jidong Li, Nanjing University of Aeronautics and Astronautics, China

11:20-11:40 **Title:** Intelligent Design and Manufacturing of Digital Materials Fabricated via Additive Manufacturing
Yunlong Tang, Monash University, Australia

11:40-12:00 **Title:** Computational Exploration of Ultrafast Laser-Induced Demagnetization in 2D Magnetic Materials
Yalong Jiao, Hebei Normal University, China

12:00-12:20 **Title:** Electric Field Control of Electronic and Magnetic Topology Based on Magnetoelectric Coupling
Junting Zhang, China University of Mining and Technology, China

12:20-13:30 **LUNCH BREAK**

Session Chair: Xiangmei Duan, Ningbo University, China
Xiuwen Zhou, Queensland University of Technology, Australia

13:30-13:50 **Title:** First-Principles Investigation of Two-Dimensional Unconventional Magnetism
Cheng Tang, Shanghai University, China

13:50-14:10 **Title:** Simulating Electrocatalysis with Constant Potential Molecular Dynamics
Xunhua Zhao, Southeast University, China

14:10-14:30 **Title:** Exploration of C-N Coupling for Electrocatalytic Urea Synthesis
Junxian Liu, Queensland University of Technology, Australia

14:30-14:50 **Title:** Enhancing the Hydrogen Evolution Reaction Performance of Solution-Corroded NiMo Alloys via Plasma Modification
Joshua Zheyan Soo, Monash University Malaysia, Malaysia

14:50-15:10	**Title:** Rational Design of light-Emitting Materials in OLEDs **Xiuwen Zhou,** Queensland University of Technology, Australia
15:10-15:30	**COFFEE BREAK**

MATERIALS FOR ENERGY CONVERSION AND STORAGE

Session Chair: Yinwei Li, Jiangsu Normal University, China

INVITED TALKS

15:30-15:50	**Title:** Water Structure and Ion Sieving at the Nanoscale Solid-Liquid Interface **Minmin Xue,** Nanjing University of Aeronautics and Astronautics, China
15:50-16:10	**Title:** Potassium Pillars in Layered Oxides for Sustainable Sodium-Ion Batteries **Jose L. Tirado,** Universidad de Cordoba, Spain
16:10-16:30	**Title:** Atomic-Level Surface and Interface Regulation of Nanocatalysts for Water Electrolysis **Jingjie Ge,** The Hong Kong Polytechnic University, Hong Kong
16:30-16:50	**Title:** $PdSe_2$: A Promising Candidate for Photocatalytic Application With Unique Pentagonal lattice Structure **Chen Long,** Anyang Normal University, China
18:00 ONWARDS	**COCKTAILS**

ROOM-B DAY 3, MAY 01, 2025

THEORETICAL SIMULATIONS ON CATALYTIC REACTION, HYDROGEN AND BIOCHEMICAL PRODUCTION

Session Chair: Guoping Gao, Xi'an Jiaotong University, China
Li Shuzhou, Nanyang Technological University, Singapore

KEYNOTE TALKS

09:00-09:25	**Title:** Electroreduction Reaction Mechanism of Metal-Nitrogen-Carbon Catalysts Through Numerical Simulations **Li Shuzhou ,** Nanyang Technological University, Singapore
09:25-09:50	**Title:** Development of High-Strength Aluminium Alloy for Additive Manufacturing **Yuman Zhu,** Monash University, Australia
09:50-10:15	**Title:** The Origin of the Ion Transport, Charge Transfer and Energy Exchange in the Electrochemical Interface **Guoping Gao,** Xi'an Jiaotong University, China
10:15-10:40	**Title:** Prediction of CO_2 Reduction Reaction Intermediates and Products on Transition Metal-Doped γ-GeSe Monolayers: A Combined DFT and Machine Learning Approach **Xiangmei Duan,** Ningbo University, China
10:40-11:10	**COFFEE BREAK**

INVITED TALKS

11:10-11:30	**Title:** The Development in LASP Software and its Applications in Material Simulation **Cheng Shang,** Fudan University, China

11:30-11:50	**Title:** Diverse Active Oxygen Species Accelerate Easy Capture-Oxidation of Formaldehyde in Mullite $YMnFeO_5$ Catalyst **Shan Gao,** Ningbo University, China
11:50-12:10	**Title:** Machine learning-Assisted Micromechanics Models for Mechanical Metamaterials **Shaoyu Zhao,** RMIT University, Australia
	ORAL TALKS
12:10-12:25	**Title:** TBA **Yanru Yin,** Huazhong University of Science and Technology, China
12:25-13:30	**LUNCH BREAK**
	AI AND MACHINE LEARNING FOR MATERIALS DESIGN
	Session Chair: Yalong Jiao, Hebei Normal University, China
	KEYNOTE TALKS
13:30-13:55	**Title:** Artificial Intelligence Assisted Design of High Performance Titanium Alloys **Hao Wang,** Institute of Metal Research, CAS, China
13:55-14:20	**Title:** Construction and Application of a Digital Platform for Material Design **Jinahua Yao,** Shanghai Institute of Organic Chemistry, CAS, China
	INVITED TALK
14:20-14:40	**Title:** TBA **Ji Liang,** Tianjin University, China
14:40-15:00	**Title:** Effect of Surface Acid-Base Properties of Metal Oxides on Graphene Growth via Low-Temperature Acetylene CVD **Mengxuan Zhang,** Tohoku University, Japan
15:00-15:30	**COFFEE BREAK**
	MATERIALS MODELLING, CHARACTERIZATION AND METALLURGY
	Session Chair: Jian Liu, Inner Mongolia University, China
	INVITED TALK
15:30-15:50	**Title:** Advancing Power Transformer Manufacturing Through Innovative Copper Blue Laser Welding **António Pereira,** University of Aveiro, Portugal
15:50-16:20	**Title:** Atomic-Scale Engineering of 2D Material Edges for Enhanced Electrocatalytic Performance **Ya Ping Hsieh,** Institute of Atomic and Molecular Sciences, Academia Sinica, Taiwan
	ORAL TALKS
16:20-16:35	**Title:** Weldability of Copper Pipes for Heat Pumps: A Comparative Analysis **Nélia Silva,** University of Aveiro, Portugal
16:35-16:50	**Title:** Enhanced Hydrogen Evolution Reaction in Alkaline Media via Ruthenium-Chromium Atomic Pairs Modified Ruthenium Nanoparticles **Parisa Eskandari,** University of New South Wales , Australia
18:00 ONWARDS	**COCKTAILS**

ROOM-C DAY 3, MAY 01, 2025

NANOMATERIALS, NANOTECHNOLOGY AND MATERIALS CHEMISTRY

Session Chair: To Ngai, The Chinese University of Hong Kong, Hong Kong
Zhuhua Zhang, Nanjing University of Aeronautics and Astronautics, China

KEYNOTE TALKS

09:00-09:25 **Title:** High Active and Stable Carbon Catalysts for Thermal Catalytic Reaction-Acetylene Hydrochlorination, Active Sites Beyond Heteroatom Doping
Ying Li, Zhejiang University of Technology, China

09:25-09:50 **Title:** Rich Structures and Functionalities at Interfaces of 2D Materials
Zhuhua Zhang, Nanjing University of Aeronautics and Astronautics, China

09:50-10:15 **Title:** Mechanical-Electric Coupling at Solid-Liquid Interfaces
Jun Yin, Nanjing University of Aeronautics and Astronautics, China

10:15-10:40 **Title:** Hierarchical Mesoporous Supraparticles: Precise Synthesis and Applications
Zaiwang Zhao, Inner Mongolia University, China

10:40-11:10 **COFFEE BREAK**

INVITED TALKS

11:10-11:30 **Title:** Synthesis and Catalytic Properties of Metal Nanomaterials with Unconventional Crystal Phases
Ye Chen, The Chinese University of Hong Kong, Hong Kong

11:30-11:50 **Title:** Van der Waals Interactions in 2D Materials
Xiaofei Liu, Nanjing University of Aeronautics and Astronautics, China

11:50-12:10 **Title:** Skyrmions in Room-Temperature 2D Magnet Fe_3GaTe_2
Yan Shi, Beihang University, China

12:10-12:30 **Title:** High Performance Composite Membrane for Vanadium Redox Flow Batteries
Jiaye Ye, Queensland University of Technology, Australia

12:30-13:30 **LUNCH BREAK**

POLYMERS, CERAMICS AND COMPOSITE MATERIALS

Session Chair: Hubert Girault, Ecole Polytechnique Fédérale de Lausanne, Switzerland
Wai Kian Tan, Toyohashi University of Technology, Japan

KEYNOTE TALKS

13:30-13:55 **Title:** Three-dimensional Graphene Frameworks Synthesized via Zipping Reactions for Durable Electrode Applications
Hirotomo Nishihara, Tohoku University, Japan

13:55-14:20 **Title:** Graded Porous Ceramics Fabrication Using Electrostatically Integrated Composite Granules
Wai Kian Tan, Toyohashi University of Technology, Japan

14:20-14:45 **Title:** TBA
Winita Punyodom, Chiang Mai University, Thailand

INVITED TALKS

14:45-15:10 **Title:** High-Entropy Fluorite Oxides: Tailoring Thermal and Mechanical Properties for Advanced Applications
Jun Zhou, Institute of Materials Research and Engineering, Singapore

15:10-15:30 **COFFEE BREAK**

ELECTRONIC MATERIALS

Session Chair: Ye Chen, The Chinese University of Hong Kong, Hong Kong
Dongchen Qi, Queensland University of Technology, Australia

KEYNOTE TALKS

15:30-15:55 **Title:** Synthesis of Large-Scale 2D Organic Framework/Graphene Heterostructure with Observing Dirac and Flat Bands
Minghu Pan, Shaanxi Normal University, China

15:55-16:20 **Title:** Engineering Diamond Surfaces for Quantum Diamondtronics
Dongchen Qi, Queensland University of Technology, Australia

16:20-16:45 **Title:** Universal Hole Threshold in Ferroelectric Phase Stabilization and Electric Polarization Effects on Transport Properties
Tengfei Cao, Northwestern Polytechnical University, China

16:45-17:10 **Title:** Computational Design of 2D Materials and Devices for Electronic, Spintronic and Altermagnetic Device Applications
Yee Sin Ang, Singapore University of Technology and Design, Singapore

18:00 ONWARDS **COCKTAILS**

ROOM-D DAY 3, MAY 01, 2025

NSR SPOTLIGHT SYMPOSIUM

Session Chair: Zhong Shuai Wu, Dalian Institute of Chemical Physics, CAS, China
Qiaowei Li, Fudan University, China

KEYNOTE TALKS

09:00-09:25 **Title:** 2D Materials for Micro-Electrochemical Energy Storage Devices
Zhong Shuai Wu, Dalian Institute of Chemical Physics, CAS, China

09:25-09:50 **Title:** Strictly Periodic Multicomponent Metal-Organic Frameworks
Qiaowei Li, Fudan University, China

09:50-10:15 **Title:** Repairing and Upcycling of Electrode Materials from Spent Lithium Ion Batteries
Guangmin Zhou, Tsinghua University, China

10:15-10:40 **Title:** TBA
Jianping Yang, Donghua University, China

10:40-11:10 **COFFEE BREAK**

11:10-11:35	**Title:** Precise Construction of Porous Carbon Materials for Energy Conversion **Jian Liu,** Inner Mongolia University, China
11:35-12:00	**Title:** Advanced lithium-Sulfur Batteries Enabled With New Electrolytes **Quanquan Pang,** Peking University, China
12:00-12:25	**Title:** TBA **Qingsheng Wu,** Tongji University, China
12:25-13:30	**LUNCH BREAK**
	Session Chair: Jiang Zhou, Central South University, China **Guangmin Zhou, Tsinghua University, China**
13:30-13:55	**Title:** TBA **Liqiang Mai,** Wuhan University of Technology, China
13:55-14:20	**Title:** Monomicellar Assembly to Synthesize Mesoporous Materials **Wei Li,** Fudan University, China
14:20-14:45	**Title:** TBA **Lei Bi,** South China University, China
14:45-15:10	**Title:** Biomedical Aggregate Materials and Devices **Zheng Zhao,** The Chinese University of Hong Kong, Hong Kong
15:10-15:30	**COFFEE BREAK**
15:30-15:55	**Title:** Material Designs for High-Performance Aqueous Zinc Batteries **Jiang Zhou,** Central South University, China
	INVITED TALKS
15:55-16:15	**Title:** Surface Coordination Chemistry on Graphdiyne for Electrocatalysis **Lele Duan,** Westlake Institute for Advanced Study, China
16:15-16:35	**Title:** Strategies Toward High-Energy-Density Lithium-Sulfur Batteries with Extended Cycle Life **Tao Wang,** Southeast University, China
	ORAL TALKS
16:35-16:50	**Title:** Aqueous-S vs Organic-S Battery: Volmer-Step Involved Sulfur Reaction **Tengsheng Zhang,** Fudan University, China
16:50-17:05	**Title:** Benchmarking Corrosion with Anionic Polarity Index for Stable and Fast Aqueous Batteries Even in Low-Concentration Electrolyte **Xia Wang,** Fudan University, China
18:00 ONWARDS	**COCKTAILS**

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