

Hui PAN (潘暉)

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Dr. Hui Pan is a professor and the associate director in the Institute of Applied Physics and Materials Engineering at the University of Macau. He got his PhD degree in Physics from the National University of Singapore in 2006. From 2006 to 2013, he worked at National University of Singapore as a Research Fellow, Oak Ridge National Laboratory (USA) as a Postdoctoral Fellow, and Institute of High-Performance Computing (Singapore) as a Senior Scientist, respectively. He joined the University of Macau as an assistant professor in 2013. Dr. Pan was promoted to associate professor in 2017 and full professor in 2020. In his research, a combined computational and experimental method is used to design and fabricate novel nanomaterials for applications in green energy and environments (such as electro-/photo-catalysis, water splitting, CO₂/NO₃ reduction, and fuel cells), electronic/quantum devices, and spintronics. He has published ~ 300 papers in international peer-reviewed journals. The total citation is ~ 18,500 (google scholar). Additionally, he is the author of 5 book chapters and the inventor of 4 USA and 10 China patents. His present h-index is 74 (google scholar). (updated in Nov. 2024).

Education

- Ph.D. in Physics, National University of Singapore, Singapore (2006)
- Bachelor in Electronic Materials and Devices, Xidian University, Xi'an, China (1997)

Professional Experience

- Associate Director of the Institute of Applied Physics and Materials Engineering, University of Macau, Macau (05/2022 – Present)
- Professor, University of Macau, Macau (08/2020 – Present)
- Founding Head of Department of Physics and Chemistry, Faculty of Science and Technology, University of Macau, Macau (08/2018 – 06/2022)
- Associate Professor, University of Macau, Macau (08/2017 – 08/2020)
- Assistant Professor, University of Macau, Macau (08/2013 – 08/2017)
- Senior Scientist I, Institute of High Performance Computing, Singapore (03/2013 – 08/20213)
- Scientist II, Institute of High Performance Computing, Singapore (04/2012 – 03/2013)
- Scientist I, Institute of High Performance Computing, Singapore (05/2009 – 03/2012)
- Postdoctoral Fellow, Oak Ridge National Laboratory, USA (04/2008 – 04/2009)
- Research Fellow, National University of Singapore, Singapore (01/2006 – 03/2008)

Teaching

B.Sc. Courses

1. Solid State Physics

PhD Courses

1. Advanced Instrumentation for Materials Characterization

Research

Research Interests

- Energy harvesting and storage (photocatalysis, electrocatalysis, CO₂/NO₃ reduction, Water Splitting, hydrogen production)
- Spintronics
- Nanodevices (ReRAM and PRAM)
- Fabrication and first-principles design of materials
- Condensed Matter Physics

Research Grants

Grants from Macau/Shenzhen Government:

- Science and Technology Development Fund from Macao SAR (FDCT/0050/2023/RIB2) (from 01/2024 to 01/2027) (on-going)
- Science and Technology Development Fund from Macao SAR (FDCT/0023/2023/AFJ) (from 12/2023 to 12/2026) (on-going)
- Science and Technology Development Fund from Macao SAR (FDCT- 0111/2022/A2) (from 12/2022 to 12/2025) (on-going)
- Shenzhen-Hong Kong-Macao Science and Technology Research Programme (Type C) (SGDX20210823103803017) (from 04/2022 to 04/2024)
- Science and Technology Development Fund from Macao SAR (FDCT- 0028/2021/APD) (from 04/2022 to 03/2024)
- Science and Technology Development Fund from Macao SAR (FDCT- 0081/2019/AMJ) (from 01/2021 to 12/2023)
- Science and Technology Development Fund from Macao SAR (FDCT- 0154/2019/A3) (from 05/2020 to 05/2023)
- Science and Technology Development Fund from Macao SAR (FDCT- 0102/2019/A2) (from 08/2019 to 07/2022)
- Science and Technology Development Fund from Macao SAR (FDCT- 0035/2019/AGJ) (from 01/2020 to 12/2021)
- Science and Technology Development Fund from Macao SAR (FDCT- 110/2014/SB) (from 11/2015 to 10/2018)
- Science and Technology Development Fund from Macao SAR (FDCT-132/2014/A3) (from 06/2015 to 05/2018)
- Science and Technology Development Fund from Macao SAR (FDCT-062/2014/A) (from 01/2015 to 12/2017)
- Science and Technology Development Fund from Macao SAR (FDCT-076/2013/A) (from 01/2014 to 12/2014)

Grants from University of Macau:

- Multi-year research grant at University of Macau (MYRG-GRG2023-00010-IAPME) (from 01/2024 to 12/2025) (on-going)

- Multi-year research grant at University of Macau (MYRG2022-00026-IAPME) (from 01/2023 to 12/2024) (on-going)
- Multi-year research grant at University of Macau (MYRG2018-00003-IAPME) (from 01/2019 to 12/2021)
- Multi-year research grant at University of Macau (MYRG2017-00027-FST) (from 01/2018 to 12/2020)
- Multi-year research grant at University of Macau (MYRG2015-00017-FST) (from 04/2015 to 09/2018)
- Start-up research grant at University of Macau (SRG2013-00033-FST) (from 10/2013 to 09/2015)
- Multi-year research grant at University of Macau (MYRG2014-000159-FST) (from 05/2014 to 04/2017)

Research Laboratory

Catalysis and Energy Materials Laboratory: N23-2005/6

Current Members

PhD, Master and UG Students

Mr. Wendi Zhang (PhD student, 08/2024 ~ present)
 Mr. Chengcheng Zhong (PhD student, 08/2024 ~ present)
 Ms. Xiaoling Lai (PhD student, 08/2024 ~ present)
 Ms. Ziwen Feng (PhD student, 08/2024 ~ present)
 Ms. Juanjuan Wang (PhD student, 08/2024 ~ present)
 Mr. Jianke Tao (PhD student, 08/2023 ~ present)
 Ms. Hongling Liu (PhD student, 08/2023 ~ present)
 Ms. Jiao Yang (PhD student, 08/2023 ~ present)
 Ms. Junge Yang (PhD student, 08/2023 ~ present)
 Mr. Yiqian Chen (Undergraduate, 10/2022 ~ present)
 Mr. Chunfa Liu (PhD student, 08/2022 ~ present)
 Mr. Shuyang Peng (PhD student, 08/2022 ~ present)
 Mr. Yutong Li (PhD student, 08/2022 ~ present)
 Mr. Zichao Yu (PhD student, 08/2022 ~ present)
 Mr. Zhongheng Li (PhD student, 08/2021 ~ present)
 Mr. Yanhong Liu (Master student, 08/2023 ~ present)
 Mr. Wuri Bao (Master student, 08/2024 ~ present)
 Mr. Xingyou Li (Master student, 08/2024 ~ present)
 Mr. Yuzhe Shen (Master student, 08/2024 ~ present)
 Mr. Jiachen Li (Undergraduate, 10/2021 ~ present)
 Mr. Iek Him Chen (Undergraduate, 10/2022 ~ present)
 Ms. Lihong Yin (PhD student, 08/2021 ~ present)
 Ms. Ka Ka Ng (Undergraduate, 06/2024 ~ present)
 Ms. Si Ham Li (Undergraduate, 06/2024 ~ present)
 Mr. Li-Hung Yao (Undergraduate, 08/2024 ~ present)
 Mr. Yueyang Wu (Undergraduate, 05/2024 ~ present)

Research Staff:

Mr. Lun LI
Mr. Youpeng CHAO
Dr. Di LIU
Dr. Jinxian FENG
Dr. Yuxuan XIAO

Former Members**PhD Graduates**

Dr. Yuanju Qu, Roger (PhD study from 08/2014 ~ 08/2017)
Dr. Ziqian Ma, Mason (PhD study from 08/2014 ~ 04/2018)
Dr. Mengmeng Shao (PhD study from 08/2016 ~ 06/2019)
Dr. Wenzhou Chen (PhD study from 08/2016 ~ 06/2019)
Dr. Xiongwei Zhong (PhD study from 08/2016 ~ 10/2019)
Dr. Lujie Cao (PhD study from 01/2016 ~ 01/2020)
Dr. Mingyang Yang (PhD study from 01/2016 ~ 01/2020)
Dr. Qing Zhu (PhD study from 08/2017 ~ 07/2020)
Dr. Yangfan Shao (PhD study from 08/2016 ~ 07/2020)
Dr. Rui Tong (PhD study from 08/2017 ~ 08/2020)
Dr. Dong Liu (PhD study from 01/2019 ~ 08/2021)
Dr. Youchao Kong (PhD study from 08/2018 ~ 08/2021)
Dr. Zhiqin Ying (PhD study from 08/2018 ~ 10/2021)
Dr. Chon Chio Leong, Roy (PhD study from 08/2014 ~ 12/2021)
Dr. Xinyu Du (PhD study from 08/2019 ~ 06/2022)
Dr. Haoqiang Ai (PhD study from 08/2019 ~ 06/2022)
Dr. Jiazhong Geng (PhD study from 08/2019 ~ 06/2022)
Dr. Feifei Li (PhD study from 08/2019 ~ 06/2022)
Dr. Mingpeng Chen (PhD study from 08/2019 ~ 06/2022)
Dr. Kin Long Ao (PhD study from 08/ 2017 ~ 10/2022)
Dr. Di Liu (PhD study 08/2020 ~ 07/2023)
Dr. Jinxian Feng (PhD study 08/2020 ~ 07/2023)
Dr. Bowen Li (PhD study 08/2019 ~ 07/2023)
Dr. Pengfei Zhou (PhD study 08/2019 ~ 07/2023)
Dr. Haoyun Bai (PhD study, 08/2020 ~ 07/2024)
Dr. Lulu Qiao (PhD study, 08/2021 ~ 08/2024)

Undergraduates

Mr. Shijie Wen, Jack (graduated in 2016)
Mr. Yifeng Xie (graduated in 2018)
Mr. Jialin Li (graduated in 2018)
Mr. Ye Ke (graduated in 2018)
Mr. Jer Shiuh Phoooh (graduated in 2019)
Ms. Ziqin Dai, Helen (graduated in 2019)
Mr. Shengjie Ding (graduated in 2020)
Mr. Yunxiao Liu (graduated in 2023)
Mr. Xuanwei Dai (graduated in 2024)

Research Staff

Mr. Di Liu (currently Postdoctoral fellow in my Group)
Dr. Zhen Li (@Shandong Normal University, Shandong, China)

Dr. Chi Fong Wong (@City Univerisyt of Macau, Macao SAR)
Dr. Tianwei He (@ Fritz Haber Institute of the Max Plank Society Berlin, Germany)
Dr. Pengcheng Zhao (@Northeast Petroleum University)
Dr. Chao Peng (@WuYi University, Jiangmen, Guangdong, China)
Mr. Ke-Yu An (currently PhD student in my Group)
Dr. Zhongbing Pan (@ Lingbo University, Lingbo, Zhejiang, China)
Dr. Xuejian Du (@Shandong Normal University, Shandong, China)
Dr. Roger Yuanju QU (@Linkoping University, Sweden)
Mr. Wenhao Gu (@Nanjing University of Information Science & Technology)
Dr. Qingchun ZHANG (@Southwest University of Science and Technology)
Mr. Chunfa LIU (currently PhD student in my Group)
Dr. Yuyun CHEN (@ Guangxi Nationality University)
Dr. Siying SHEN
Dr. Songbo CHEN (@ Shenzhen University)
Dr. Yuling ZHOU (@ Shenzhen University)
Dr. Yuzhe LIU (@ Shenzhen University)
Dr. Shangpeng LI (@ Shenzhen University)
Dr. Lianyi SHAO (@ Guangdong University of Technology)
Dr. Xingshuai LYV (@ Ocean University of China)
Dr. Katherine Weng I CHIO

Links

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<https://orcid.org/0000-0002-6515-4970>
<https://www.scopus.com/authid/detail.uri?authorId=57192713115>

Patent List:

1. **Hui Pan** and Lun Li, Preparation method and application of a high entropy electrocatalyst, submitted.
2. **Hui Pan**, Chunfa Liu, Hongchao Liu, and Shuangpeng Wang, A facile method for the preparation of low-cost, efficient and stable transition metal-based OER electrocatalysts, submitted.
3. **Hui Pan** and Jinxing Feng, Low-cost and high-performance electrocatalyst based on surface Sn incorporation brass for CO₂-to-formate electrochemical reduction, 24/10/2023, **China Patent Application No. "202311383783.1"**.
4. **Hui Pan**, Chunfa Liu, and Hongchao Liu, Bi-functional and low-cost electrocatalyst for high-efficient and stable full-water-splitting: FeCoCrCuOx@CF, 11/05/2023, **China Patent Application No. "202310523696.5"**.
5. **Hui Pan**, Shuyang Peng, and Kin Ho Lo, Low Cost, High Efficiency and Stability Industrial Si-based Photoelectrochemical Materials for Water Splitting, 11/07/2023, **China Patent Application No. "202311350080.9"**.
6. **Hui Pan**, Rucheng Wu, and Di Liu, A simple way to make Si-based photoelectrode with active layer for Solar-driven water splitting with high Saturation Photocurrent. 31/10/2022, **China Patent Application No. "202211344350.0"**.
7. **Hui Pan**, Di Liu, Shuangpeng Wang, Lulu Qiao, and Kar-Wei Ng, Low-cost electrocatalyst for high-efficient and stable nitrate reduction reaction. 28/07/2022, **China Patent Application No. "202210554712.2"**.
8. **Hui Pan**, Pengfei Zhou, Shuangpeng Wang, and Kar-Wei Ng, Bi-functional and low-cost electrocatalyst for high-efficient and stable full-water-splitting: stainless steel treated by simple anodization in saline. 16/06/2021, **China Patent Application No. "202110856193.0"**.
9. **Hui Pan**, Dong Liu and Guichuang Xing, "Bi-functional and low-cost electrocatalyst for high-efficient and stable full-water-splitting: Cr-doped NiS_x", 13/12/2022, **Granted, China Patent No. "ZL201910758027. X"**.
10. **Hui Pan** and Mengmeng Shao, "MoS₂/Mo₂C/CdS: a super-efficient photocatalyst for hydrogen evolution", 30/08/2020, **Granted, China Patent No. "ZL201811323293.1"**.
11. **Hui Pan** and Xiongwei Zhong, "Carbon-Coated N-rich C₃N₄ as an anode material for Lithium Battery", 12/02/2018, **Granted, China Patent No. ZL 201810148357.2**.
12. **Hui Pan** and Yuanju Qu, "TiS₂: an excellent cathodic electrocatalyst for hydrogen production in electrolysis of water", 26/09/2017, **Granted. China Patent No. ZL 201710917164.4**.
13. Soo Jin Chua, Hailong Zhou, Jianyi Lin, **Hui Pan**, "Method of ZnO Film Grown on the Epitaxial Lateral Overgrowth GaN Template", 04/25/2006, **US Provisional Patent Application No. 60/794,775**.
14. **Hui Pan**, Jianyi Lin, Yuan Ping Feng, "Supercapacitor from Carbon Tubes-in-Tube Nanostructures", 03/01/2006, **US Provisional Patent Application No. 60/777,547**.
15. **Hui Pan**, Jianyi Lin, Yuan Ping Feng, "Synthesis of Mg doped ZnO Nanowires and Their Applications to Optical Devices and Hydrogen Storage", 07/13/2005, **US Provisional Patent Application No. 60/698,476**.
16. **Hui Pan**, Jianyi Lin, Jun Ding, Yuan Ping Feng, "Single Crystal Growth of Magnetic Nanowires", 11/02/2004, **US Provisional Patent Application No. 60/607,111**.

Published/Accepted journal papers (*Corresponding Author):

1. Hongling Liu, Di Liu, Zhichao Yu, Haoyun Bai, and **Hui Pan***, Electrochemical reduction of CO₂ on pure and doped Cu₂O (111). *J. Col. Inter. Sci.* (2025).
2. Chunfa Liu, Haoyun Bai, Jinxian Feng, Keyu An, Lun Li, Zhichao Yu, Lulu Qiao, Di Liu, Shuyang Peng, Hongchao Liu*, and **Hui Pan***, Electrodeposited Ternary Metal (Oxy)hydroxide Achieves Highly Efficient Alkaline Water Electrolysis over 1000 hours under Industrial Conditions. *Carbon Energy*, *accepted* (2024).
3. Wenhao Gu, Jinxian Feng, Xingshuai Lv, Weng Fai Ip, and **Hui Pan***, Highly enhanced photocatalytic performance for CO₂ reduction on NH₂-MIL-125(Ti): The impact of (Cu, Mn) co-incorporation. *Separation and Purification Technology* 359, 130323 (2025).
4. Shuyang Peng, Di Liu, Haoyun Bai, Chunfa Liu, Jinxian Feng, Keyu An, Lulu Qiao, Kin Ho Lo*, and **Hui Pan***, Progress on Si-based photoelectrodes for industrial production of green hydrogen by solar-driven water splitting. *EcoEnergy* (2024).
5. Jiangke Tao, Di Liu, Zhichao Yu, and **Hui Pan***, Enhanced reduction of CO to C₂ products on MoS₂ nanoribbon by edge engineering. *J. Mater. Chem. A* 12, 32154-32163 (2024).
6. Jinxian Feng, Xuesen Wang, and **Hui Pan***, In-situ reconstruction of catalyst in electrocatalysis. *Adv. Mater.* 36, 2411688 (2024).
7. Lun Li, Lulu Qiao, Di Liu, Zhichao Yu, Keyu An, Jiao Yang, Chunfa Liu, Youpeng Cao, and **Hui Pan***, High-Valence Metals Accelerate the Reaction Kinetics for Boosting Water Oxidation. *Small* (2024).
8. Yixin Chen, Jun Meng, Miao Xu, Lulu Qiao, Di Liu, Yuchao Kong, Xiaosai Hu, Qingju Liu, Mingpeng Chen, Siliu Lyu*, Rui Tong*, and **Hui Pan***, Adaptive Active Site Turning for Superior OER and UOR on Ir-Ni₃N Catalyst. *Adv. Fun. Mater.* (2024).
9. Lulu Qiao, Anquan Zhu, Di Liu*, Keyu An, Jinxian Feng, Chunfa Liu, Kar Wei Ng*, and **Hui Pan***, In Situ Reconstructed Cu/ β -Co(OH)₂ Tandem Catalyst for Enhanced Nitrate Electroreduction to Ammonia in Ampere-Level. *Adv. Energy Mater.* 14, 2402805 (2024). (*Front Cover*)
10. Jiao Yang, Keyu An, Zhichao Yu, Lulu Qiao, Youpeng Cao, Yajuan Zhuang, Chunfa Liu, Lun Li, Lishan Peng* and Hui Pan*, Effect of Cation and Anion Vacancies in Ruthenium Oxide on the Activity and Stability of Acidic Oxygen Evolution. *ACS Catal.* 14, 17739-17747 (2024).
11. Jinxian Feng, Chunfa Liu, Lulu Qiao, Keyu An, Sen Lin, Weng Fai Ip, and **Hui Pan***, Electrolyte-Assisted Structure Reconstruction Optimization of Sn-Zn Hybrid Oxide Boosts the Electrochemical CO₂-to-HCOO⁻ Conversion. *Adv. Sci.* 11, 2407019 (2024).
12. Junge Yang, Jinxian Feng, Youpeng Cao, Yuxuan Xiao, Lulu Qiao, Keyu An, Jiao Yang, Jing Peng*, **Hui Pan***, and Hui-Ming Cheng*, Highly Dispersed Ru-Pt Heterogeneous Nanoparticles on Reduced Graphene Oxide for Efficient pH-Universal Hydrogen Evolution. *Adv. Fun. Mater.* 34, 2411081 (2024).
13. Hong Lin, Zhiliang Guo, Qingchun Zhang*, Qin Yang, Meng Wang, Yuanyuan Chen, Shiyang Shen, Xijun Wei, Lixian Song, Yingze Song*, and Hui Pan*, Coupled Ni-Co Dual-Atom Catalyst for Guiding Sulfur and Lithium Evolutions in Lithium-Sulfur Batteries. *Small* 14, 2404983 (2024).
14. Shuyang Peng, Di Liu, Zhiqin Ying, Keyu An, Chunfa Liu, Jinxian Feng, Haoyun Bai, Kin Ho Lo*, and **Hui Pan***, Industrial-Si-based photoanode for highly efficient and stable water splitting. *J. Col. Inter. Sci.* 671, 434-440 (2024).
15. Dong Liu*, Yaohai Cai, Xin Wang, Yuling Zhuo, **Hui Pan***, and Zhenbo Wang*, Innovations in Electrocatalysts, Hybrid Anodic Oxidation, Electrolyzers for Enhanced Direct Seawater Electrolysis. *Energy Environ. Sci.* 17, 6897-6942 (2024).

16. Mingpeng Chen*, Huachuan Sun, Qingjie Lu, Dequan Li, Di Liu, Tong Zhou, Baoye Zi, Hongshun Zheng, Bin Xiao, Tianwei He, Jianhong Zhao, Yumin Zhang, Jin Zhang, Feng Liu, Hao Cui, **Hui Pan***, and Qingju Liu*, Shining light on atomic vacancies in electrocatalysts for boosted water splitting. *Chem. Eng. J* **497**, 154235 (2024).
17. Shanpeng Li, Yuling Zhuo, Dong Liu*, **Hui Pan***, and Zhenbo Wang*, Anchoring highly surface-exposed Pt single atoms on Ni₃S₂/Co₉S₈ with abundant S vacancies triggers d-orbital electron rearrangements for boosted seawater hydrogen evolution. *Appl. Catal. B* **355**, 124188 (2024).
18. Keyu An, Zhichao Yu, Haoyun Bai, Di Liu, Lulu Qiao, Xingshuai Lv, Lianyi Shao, Jinxian Feng, Youpeng Cao, Lun Li, Zhaorui Wen, Shi Chen, Zhongbin Pan, Shuangpeng Wang*, and **Hui Pan***, Oxygen vacancy redistribution and ferroelectric polarization relaxation on epitaxial perovskite films during an electrocatalytic process. *J. Mater. Chem. A* **12**, 9672-9680 (2024).
19. Di Liu, Shuyang Peng, Lulu Qiao, Haoyun Bai, Keyu An, Chunfa Liu, Mingpeng Chen, Kin Ho Lo, Kar Wei Ng, Shengjie Peng, Shuangpeng Wang*, Weng Fai Ip*, and **Hui Pan***, Rational Design of Cocatalyst for Highly Improved Ammonia Production from Photoelectrochemical Nitrate Reduction. *Appl. Catal. B*, **351**, 123980 (2024).
20. Songbo Chen, Yuling Zhuo, Xin Wang, Shanpeng Li, Jianxi Lu, Dong Liu*, **Hui Pan***, and Zhenbo Wang*, Advances of layered double hydroxide electrocatalysts for high-current-density alkaline water/seawater splitting. *Coordination Chem. Rev.* **510**, 215832 (2024).
21. Haoyun Bai, Weng Fai Ip, Wenlin Feng, and **Hui Pan***, Effect of ferroelectric polarization on oxygen evolution reaction: a theoretical study of M₁IrSn₂S₆ (M= Bi, Mn, and Sb). *J. Mater. Chem. A* **12**, 7724-7731 (2024).
22. Yutong Li, Haoyun Bai, Zhichao Yu, Chi Tat Kwok*, and **Hui Pan***, Multiferroicity in 2D MSX₂ (M= Nb and Zr; X= Cl, Br, and I). *J. Mater. Chem. C* **12**, 6131-6139 (2024).
23. Haiyang Liu, Xiaolu Liu, Chengqun Xu*, Dongyu Wang, Dezhi Li, Jingyao Huang, Shengquan Wu, Zhichun Wang, and **Hui Pan***, Molecular engineering of polymeric carbon nitride for photocatalytic hydrogen production with ultrahigh apparent quantum efficiency. *J. Mater. Chem. A* **12**, 9200 - 9211 (2024).
24. Mengmeng Shao*, Yangfan Shao, and **Hui Pan***, Progress on enhancing the charge separation efficiency of carbon nitride for robust photocatalytic H₂ production. *Phys. Chem. Chem. Phys.* **26**, 11243-11262 (2024).
25. Lebin Cai, Haoyun Bai, Cheng-wei Kao, Kang Jiang, **Hui Pan**, Ying-Rui Lu*, and Yongwen Tan*, Platinum–Ruthenium Dual-Atomic Sites Dispersed in Nanoporous Ni_{0.85}Se Enabling Ampere-Level Current Density Hydrogen Production. *Small* **20**, 2311178 (2024).
26. Zhichao Yu, Haoyun Bai, Bowen Li, Lun Li, and **Hui Pan***, Two-Dimensional Asymmetric Multiferroics: Unique Way toward Strong Magnetoelectric Coupling and Multistate Memory. *J. Phys. Chem. Lett.* **15**, 1795-1801 (2024).
27. Haoyun Bai, Zhichao Yu, Jinxian Feng, Di Liu, Weiqi Li, and **Hui Pan***, Co₃X₈ (X= Cl and Br): multiple phases and magnetic properties in Kagome lattice. *Nanoscale* **16**, 1362-1370 (2024).
28. Shuyang Peng, Di Liu, Keyu An, Zhiqin Ying, Mingpeng Chen, Jinxian Feng, Kin Ho Lo*, and **Hui Pan***, n-Si/SiO_x/CoO_x-Mo Photoanode for Efficient Photoelectrochemical Water Oxidation. *Small* **20**, 2304376 (2024).
29. Jinxian Feng, Lulu Qiao, Chunfa Liu, Pengfei Zhou, Wenlin Feng, and **Hui Pan***, Triggering efficient reconstructions of Co/Fe dual-metal incorporated Ni hydroxide by phosphate additives for electrochemical hydrogen and oxygen evolutions. *J. Col. Inter. Sci.* **657**, 705-715 (2024).
30. Lulu Qiao, Di Liu, Anquan Zhu, Jinxian Feng, Pengfei Zhou, Chunfa Liu, Kar Wei Ng*, and **Hui Pan***, Nickel-facilitated In-situ Surface Reconstruction on Spinel Co₃O₄ for Enhanced Electrochemical Nitrate Reduction to Ammonia. *Appl. Catal. B* **340**, 123219 (2024).
31. Chunfa Liu, Jinxian Feng, Pengfei Zhou, Dong Liu, Lulu Qiao, Di Liu, Youpeng Cao, Shi-Chen Su, Hongchao Liu*, and **Hui Pan***, Multi-metal interaction boosts reconstructed

- FeCoCrCuO_x@CF toward efficient alkaline water electrolysis under large current density. *Chem. Eng. J.* **476**, 146710 (2023).
32. Haoyun Bai, Di Liu, and **Hui Pan***, LaOMS₂ (M= Ti, V, and Cr): novel crystal spin valves without contact. *Mater. Horizon* **10**, 5126-5132 (2023).
 33. Qingchun Zhang, Di Liu, Yaping Zhang, Zhiliang Guo*, Minpeng Chen, Yuyun Chen, Bo Jin, Yingze Song*, and **Hui Pan***, Insight into coupled Ni-Co dual-metal atom catalysts for efficient synergistic electrochemical CO₂ reduction. *J. Energy Chem* **87**, 509-517 (2023).
 34. Zhichao Yu, Bowen Li, Haoyun Bai, and **Hui Pan***, Two-dimensional Janus perovskite oxynitrides as active photocatalysts for overall water splitting with ferroelectric modulation. *J. Chem. Mater. A* **11**, 19074-19082 (2023).
 35. Xingshuai Lv, Junxian Liu, Liangzhi Kou*, Kar Wei Ng*, Shuangpeng Wang*, Thomas Frauenheim*, and **Hui Pan***, Three-Dimensional Dual-Site Catalysts for Industrial Ammonia Synthesis at Dramatically Decreased Temperatures and Pressures. *ACS Catal.* **13**, 13561-13568 (2023).
 36. Lihong Yin, Zhiqiang Li, Jinxian Feng, Pengfei Zhou, Lulu Qiao, Di Liu, Zhibin Yi, Weng Fai Ip*, Guangfu Luo*, and **Hui Pan***, Facile and Stable CuInO₂ Nanoparticles for Efficient Electrochemical CO₂ Reduction. *ACS Appl. Mater. Inter.* **15**, 47135-47144 (2023).
 37. Yuling Zhuo, Dong Liu*, Lulu Qiao, Songbo Chen, Jianxi Lu, Weng Fai Ip*, **Hui Pan***, and Zhenbo Wang*, Ultrafast Room-Temperature Synthesis of Large-Scale, Low-Cost, and Highly Active Ni—Fe Based Electrodes toward Industrialized Seawater Oxidation. *Adv. Energy Mater.* **13**, 2301921 (2023).
 38. Shiyong Shen, Haoqiang Ai, Yandong Ma, Haoyun Bai, Xuejian Du, Feifei Li, and **Hui Pan***, In-Plane Ferroelectric Monolayer TiNbX₄O and Its Application in Bulk Photovoltaic Effect. *Appl. Phys. Lett.* **123**, 052901 (2023).
 39. Songbo Chen, Dong Liu*, Pengfei Zhou, Lulu Qiao, Keyu An, Yuling Zhuo, Jianxi Lu, Qizhen Liu, Weng Fai Ip*, Zhenbo Wang*, and **Hui Pan***, Multi-metal electrocatalyst with crystalline/amorphous structure for enhanced alkaline water/seawater hydrogen evolution. *J. Colloid Inter. Sci.* **650**, 807-815 (2023).
 40. Hongjiao Huang, Aoming Huang, Di Liu, Wentao Han, Chun-Han Kuo, Han-Yi Chen, Linlin Li, **Hui Pan**, and Shengjie Peng*, Tailoring oxygen reduction reaction kinetics on perovskite oxides via oxygen vacancies for low-temperature and knittable zinc–air batteries. *Adv. Mater.* **35**, 2303109 (2023).
 41. Di Liu, Lulu Qiao, Shuyang Peng, Haoyun Bai, Chunfa Liu, Weng Fai Ip, Kin Ho Lo, Hongchao Liu, Kar Wei Ng, Shuangpeng Wang*, Xiaozhan Yang, and **Hui Pan***, Recent advances in electrocatalysts for efficient nitrate reduction to ammonia. *Adv. Funct. Mater.* **33**, 2303480 (2023).
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Book Chapters:

1. **Hui Pan**, Nanotubes for Energy Storage, “**Nanofabrication and its Application in Renewable Energy**”, edited by G. Zhang and N. Manjooran, The Royal Society of Chemistry 2014, pp. 120-197. (invited review)
2. **Hui Pan**, Progress on the Theoretical Study of Two-Dimensional MoS₂ Monolayer and Nanoribbon, “**MoS₂ – Materials, Physics, and Devices**”, edited by Z. M. Wang, Springer 2014, pp. 1-35. (invited review)
3. Yuan Ping Feng, **Hui Pan**, Rongqin Wu, Lei Shen, Jun Ding, Jiabao Yi, Yihong Wu, Ferromagnetism in Semiconductors Doped with Non-Magnetic Elements, “**Spintronics: Materials, Applications and Devices**”, edited by G. C. Lombardi and G. E. Bianchi, 2009, pp. 59-78. (invited review)
4. Jianyi Lin, **Hui Pan**, Yuan Ping Feng, Hydrogen Storage by Nanostructured Materials, “**Encyclopedia of Nanoscience and Nanotechnology**”, edited by Dr. H. S. Nalwa, American scientific Publisher, California 2011, pp. 225-253. (invited review)
5. Yuan Ping Feng, **Hui Pan**, Rongqin Wu, Guowen Peng, Jianyi Lin, *Ab Initio* study of Functionalized Nanotubes, “**Hard Nanomaterials**”, edited by Dr. H. S. Nalwa, 2006. (invited review)

International Conference/Workshop Talk List:

1. **Hui Pan**, Electrochemical Production of Green Hydrogen: from lab to industry. **Keynote talk**, the 4th international Conference on Advanced Materials and Clean Energy, Feb. 17, 2023.
2. **Hui Pan**, Electrocatalysts for Green Hydrogen Production: Design, Synthesis, and Industrial Fabrication, **Keynote talk**, The Asian Consortium on Computational Materials Science – Global Research Center (ACCMS-GRC), Webinar, Dec. 08, 2022.
3. **Hui Pan**, Electrocatalysts: from Design, Fabrication to Industrial Production. **Invited talk**, International Conference of Green Energy and Catalysts, Huizhou, Nov. 19, 2022.
4. **Hui Pan**, Design of 2D materials for Nanodevices. **Invited talk**, 2022 International Conference on Low-Dimensional Semiconductor Materials and Device Physics, Chongqing, Nov. 19, 2022.
5. **Hui Pan**, Electrocatalysts: from Design, Fabrication to Industrial Production. **Invited talk**, 1st International Symposium on Advanced Functional Materials, Hangzhou, Nov. 14, 2022.
6. **Hui Pan**, Electrolysis of Water: Design, Fabrication to Industrial Production of Electrocatalysts. **Invited talk**, Zhejiang Technological University, Oct. 11, 2022.
7. **Hui Pan**, Water Electrolysis - Design, Fabrication to Industrial Production of Electrocatalysts. **Invited talk**, China South Normal University, Sep. 15, 2022.
8. **Hui Pan**, Electrolysis of Water: Design, Fabrication and Industrial Production of Electrocatalysts. **Invited talk**, Donghua University, Aug. 02, 2022.
9. **Hui Pan**, Design and Fabrication of Metal compounds for Electrolysis of Water, **Keynote talk**, 2022 International Conference on Energy Technology and Thermodynamic System (ETTS 2022). Jun. 24, 2022.
10. **Hui Pan**, Multi-metal compounds for Water Splitting, **Invited talk**, 闽澳学术论坛. May 19, 2022.
11. **Hui Pan**, Design and Fabrication of Materials for Multiple Applications – A view from “Solid State Physics”, **Invited talk**, Chongqing University, Mar. 24, 2022.
12. **Hui Pan**, Design and Fabrication of Electrocatalysts for Water Oxidization, **Keynote talk**, 2022 International Symposium on Green Energy Development Technology (GEDT 2022). Jan. 14, 2022.
13. **Hui Pan**, Design of Materials for Multi-functional Applications – A view from “Solid State Physics”, **Invited talk**, 5th Forum of Materials Genome Engineering (ForMGE), Zhengzhou, China, Dec. 15th -17th, 2021.
14. **Hui Pan**, Design of Materials for Multi-functional Applications, **Keynote talk**, 2021 5th International Conference on Sensors, Materials and Manufacturing (ICSMM 2021), 2021 5th International Conference on Advanced Manufacturing and Materials (ICAMM2021), and 2021 10th International Conference on Chemical Science and Engineering (ICCSE 2021), Nov. 19-21, 2021.
15. **Hui Pan**, Surface Reconstruction and Phase Transition of Electrocatalysts in OER, **Invited talk**, 1st International Conference on Energy Materials (ICEM) 2021, Nov. 5-8, 2021.
16. **Hui Pan**, Design of Catalysts for N₂-Reduction, **Invited talk**, Materials for Humanity (MH 21), Singapore, Jul. 6~9, 2021.
17. **Hui Pan**, P/N-Functionalized MXenes for Electrocatalysis, **Keynote talk**, IUMRS-ICA2020 & MRS-Thailand, Feb. 23-26, 2021.
18. **Hui Pan**, Enhanced Anchoring of Single-atom catalysts on N-functionalized MXenes for CO₂ reduction, **Invited talk**, The 3rd International Conference on MXenes, Ningbo, China, Oct. 11-14, 2020.
19. **Hui Pan**, Design and Fabrication of Nanomaterials for Energy Harvesting, **Keynote talk**, The 5th International Conference on Advances in Materials, Mechatronics and Civil Engineering (ICAMMCE 2020), Suzhou, China, Mar. 20-22, 2020.
20. **Hui Pan**, Design of Multi-functional 2D Materials, **Invited talk**, International Symposium on Condensed Matter Physics, Guangdong University, Nov. 09-10, 2019.

21. **Hui Pan**, Design of 2D Materials for Energy Harvesting, **Invited talk**, 粤港澳高校联盟 2019 年青年学者分论坛——基于超算先进材料应用研究, 中山大学国家超级计算广州中心, 2019/10/31.
22. **Hui Pan**, Design of Novel 2D Materials, **Invited talk**, the 10th International Conference of the Asian Consortium of Computational Materials Science (ACCMS-10), Hong Kong, Jul. 22-26, 2019.
23. **Hui Pan**, Design of co-catalysts for enhanced photocatalytic hydrogen production, **Invited talk**, The International Conference on Materials for Advanced Technologies (ICMAT) 2019, Singapore, Jun. 22~28, 2019.
24. **Hui Pan**, Design of 2D materials for multi-functional applications, **Invited talk**, The International Conference on Materials for Advanced Technologies (ICMAT) 2019, Singapore, Jun. 22~28, 2019.
25. **Hui Pan**, 2D Materials Design for Versatile Applications, **Invited talk**, the University of Electronic Science and Technology of China, Chengdu, China, June 14, 2019.
26. **Hui Pan**, Multifunctional applications of two-dimensional materials, **Invited talk**, Chongqing University, Chongqing, China, June 12, 2019.
27. **Hui Pan**, 2D Materials: From spintronics to catalysts, **Invited talk**, Chongqing University, Chongqing, China, June 11, 2019.
28. **Hui Pan**, Design of Pentagonal Monolayers for diverse applications, **Invited talk**, the 2nd International Conference on MXenes for Energy Applications, Beijing, China, May 10~12, 2019.
29. **Hui Pan**, Design of 2D materials for hydrogen production, **Invited Talk**, The 10th Singapore International Conference on Chemistry (SICC10), National University of Singapore, Singapore, Dec. 16-19, 2018.
30. **Hui Pan**, 2D materials as Electro-/Photo-catalysts, **Invited Talk**, The 8th Young Scholars Symposium on Nano & New Energy Technology (NNET 2018), Jinan University, Guangzhou, China, Sep. 26-29, 2018.
31. **Hui Pan**, Design of 2D monolayers as catalysts for energy harvesting, **Invited talk**, the Conference of the Asian Consortium on Computational Materials Science Theme Meeting (ACCMS-TM 2018), Ha Noi, Vietnam, Sep 6~9, 2018.
32. **Hui Pan**, Design and Fabrication of Catalysts for Water-Splitting, **Invited talk**, the 8th international conference on Advanced Functional Materials & Devices (AFMD), Catholic University of Leuven, Belgium, August 17~19, 2018.
33. **Hui Pan**, Hydrogen production from water, **Keynote talk**, the International Conference on Mechanical, Electric and Industrial Engineering (MEIE2018), Hangzhou, China, May 27~28, 2018.
34. **Hui Pan**, MXenes: Novel Catalysts for Hydrogen Production, **Invited talk**, the 1st International Conference on MXenes for Energy Applications, Changchun, China, May 25~26, 2018.
35. **Hui Pan**, Design and Fabrication of electrocatalysts for hydrogen production, **Invited Talk**, the South University of Science and Technology of China, Shenzhen on March 15-17, 2018.
36. **Hui Pan**, Materials Design for Solar-Driven Water Splitting, **Invited talk**, The 18th International Union of Materials Research Societies International Conference in Asia (IUMRS-ICA 2017), Taipei, Taiwan, Nov. 06~09, 2017.
37. **Hui Pan**, 2D Monolayers: Promising Materials for Versatile Applications, **Invited talk**, Huazhong University of Science and Technology, Wuhan, China, Aug. 03~06, 2017.
38. **Hui Pan**, Electronic, Magnetic, and Chemical Properties of 2D TMDs and MXenes, **Invited talk**, The 9th Joint Meeting of Chinese Physicists Worldwide (OCPA9), Beijing, China, Jul. 17~20, 2017.
39. **Hui Pan**, Electronic, Magnetic, and Chemical Properties of 2D Metal Nitrides and Phosphides, **Invited talk**, The International Conference on Materials for Advanced Technologies (ICMAT) 2017, Singapore, Jun. 18~23, 2017.

40. **Hui Pan**, Materials design for hydrogen production from water, **Plenary talk**, the 10th international conference on computational physics, Macao, Jan. 16~20, 2017.
41. **Hui Pan**, Multi-functional applications of 2D monolayers, **Invited Talk**, Zhejiang University of Technology, Hangzhou, on Oct. 10, 2016.
42. **Hui Pan**, Multi-functional applications of 2D monolayers, **Invited Talk**, Zhejiang University, Hangzhou, on Oct. 08, 2016.
43. **Hui Pan**, Materials design for solar energy harvesting, **Talk given**, South University of Science and Technology of China, Shenzhen on Aug. 08, 2016.
44. **Hui Pan**, Physical and Chemical Properties of Metal-dichalcogenides Monolayers, **Invited Talk**, The 2016 International Conference on Electronic Materials (ICEM2016), Jul. 4-8, 2016.
45. **Hui Pan**, Unique Electronic, Magnetic, and Chemical Properties of Metal-dichalcogenides Monolayers, **Talk given at the University of New South Wales, Sydney, Australia, on Jun. 17, 2016.**
46. **Hui Pan**, Electronic, Magnetic, and Chemical Properties of Metal-dichalcogenides Monolayers, **Talk given at the Institute of High Performance Computing, Singapore, on Feb. 12, 2016.**
47. **Hui Pan**, Waved Graphenes --- Unusual Physical and Chemical Properties, **Invited Talk, International Workshop on Functional Materials 2015 (Macau).**
48. **Hui Pan**, Unusual Mechanical, Electronic, Magnetic, and Chemical Properties of Waved Graphene. **The 4th Global Conference on Materials Science and Engineering Aug 3-6, 2015, Macau**
49. **Hui Pan**, Magnetic and Electronic Evolutions of Metal Dichalcogenide Monolayers Tuned by Hydrogenation and Strain. **The International Conference on Materials for Advanced Technologies 2015 (ICMAT2015), Singapore.**
50. **Hui Pan**, TiO₂-based photocatalyst for hydrogen production: dopant and defect, **Invited Talk, 2015 EMN East Meeting (Energy Material Nanotechnology), Apr. 20-23, Beijing (China).**
51. **Hui Pan**, Electronic, Magnetic, and Catalytic properties of Transition Metal Dichalcogenide Monolayers, **Invited Talk, International Workshop on Functional Materials 2014 (Macau).**
52. **Hui Pan**, Physical and Chemical Properties of 2D Metal Dichalcogenides, **Invited Talk, 2014 UM and HKU Joint Workshop on Science and Technology Innovation, 2014 (Macau).**
53. **Hui Pan**, Design and Fabrication of TiO₂-based Photocatalyst for Hydrogen Production, **Invited Talk, Workshop on Functional Ceramics, University of Macau, 2013 (Macau SAR, China)**
54. **Hui Pan**, MoS₂ Nanoribbons: Effects of Edge and Strain on its Magnetic and Electronic Properties, **the 12th Asia-Pacific Physics Conference of AAPPS (APPC12) 2013 (Japan).**
55. **Hui Pan**, Design of GaN-Based Photocatalyst for Hydrogen Production: ZnO-Codoped GaN Nanotubes, **the 7th International Conference on Materials for Advanced Technology (ICMAT) 2013 (Singapore).**
56. **Hui Pan**, Edge-dependent Structural, Electronic, and Magnetic Properties of MoS₂ Nanoribbons, **The International Union of Materials Research Society – International Conference in Asia (IUMRS-ICA) 2012 (Korea).**
57. **Hui Pan**, GaN/ZnO superlattice nanowires as photocatalyst for water-splitting: first-principles study on electronic and magnetic properties, **MRS Spring Meeting 2012 (USA).**
58. **Hui Pan**, Effects of defects and (H, N)-codoping on the photocatalytic ability of TiO₂: a first-principles study, **MRS Spring Meeting 2011 (USA).**
59. **Hui Pan** and Yong-Wei Zhang, ab initio study on the photocatalytic and magnetic properties of graphitic carbon nitride nanotubes, **MRS Spring Meeting 2011 (USA).**
60. **Hui Pan**, Xiaofeng Qiu, Wenguan Zhu, Wei Wang, M. Parans Paranthaman, Gyula Eres, Zhenyu Zhang, Baohua Gu, Defect-Induced Bandgap Narrowing in TiO₂ and Photochemical Water Splitting in Visible Light, **MRS Fall Meeting 2008 (USA).**
61. **Hui Pan**, Yuanping Feng, Jianyi Lin, Tungsten Carbide Nanotube for Hydrogen Adsorption: First-Principles Calculation, **AsiaNano 2008 (Singapore).**

62. Yuan Ping Feng, **Hui Pan**, Jiabao Yi, Rongqin Wu, Lei Shen, Jun Ding, Jianyi Lin, Dilute Magnetic Semiconductors Without Magnetic Elements: First-Principles Prediction and Experimental Demonstration, *International Conference on Electronic Materials, IUMRS-ICEM 2008 (Australia)*.
63. **Hui Pan**, J Yi, J Y Lin, Y P Feng, J Ding, L H Van, J H Yin, Room Temperature Ferromagnetism in Carbon-Doped ZnO, *MRS Spring Meeting 2007 (USA)*.
64. **Hui Pan**, Yuanping Feng, Jianyi Lin, Magnetic Properties of OH-functionalized Carbon Nanotubes, *the 4th International Conference on Materials for Advanced Technologies (ICMAT) 2007 (Singapore)*.
65. **Hui Pan**, Rongqin Wu, Lei Shen, Jiabao Yi, Junhua Yang, Jianyi Lin, Yuan Ping Feng, Jun Ding, L H Van, J H Yin, Room Temperature Ferromagnetism in Carbon-Doped ZnO, *The 4th Conference of the Asian Consortium on Computational Materials Science 2007 (Korea)*.
66. **Hui Pan**, Jianyi Lin, Weizhe Chen, Han Sun, Yuanping Feng, Wei Ji, Optical Limiting and Hydrogen Storage Characterization of Cu, Cu₂O and CuO Nanostructures, *International Congress on Nanotechnology 2005 (USA)*.
67. **Hui Pan**, Zhenhua Ni, Han Sun, Cheekoh Poh, Zhexiang Shen, Yuanping Feng, Jianyi Lin, Optical and Raman Characterization of ZnO Nanowires, *The 3rd International Conference on Materials for Advanced Technologies (ICMAT) 2005 (Singapore)*.
68. **Hui Pan**, Quanxi Cao, Liyin Tong, Micro-defect in CZ-Si Crystal: its Control and Elimination, *The 8th International Conference on Electronic Materials 2002 (China)*

Professional Affiliations

Member of Physical Society of Macau (PSM, Macau)
 Member of Materials Research Society-Singapore (MRS-S)

Professional Services

- Member of Local Organizing Committee for the 10th Biennial International Conference of The Asian Consortium on Computational Materials Science (ACCMS-10), hosted by City University of Hong Kong for July 22 – 26, 2019.
- Member of International Advisory Committee in the 10th International Conference of Computational Physics (ICCP11). Hangzhou, China, Jun. 24-28, 2019.
- Session chair in the 10th International Conference on Materials for Advanced Technologies (ICMAT). Singapore, Jun. 23 - 28 2019.
- Session chair in the 2nd international conference on MXenes, Beijing, China, May 10-12, 2019.
- The Secretary of the 10th International Conference of Computational Physics (Macao, 2017)
- Chair of the symposium on “Computational Study on Nanosctructures” in the 10th international Conference on Computational Physics.
- Member of the Local Organizing Committee in the International Workshop on Solid-State Lighting of LED and Laser Diode, Macau 2016

Professional Review Services

Journals

Dr. Pan has served as a regular reviewer for more than 40 international SCI journals, such as Chemistry of Materials, ACS Nano, Physical Review B, Journal of Physical Chemistry, ACS Applied Materials &

Interface, New Journal of Physics, Journal of Power Sources, Energy & Environmental Science, and Applied Catalyst B: Environmental.