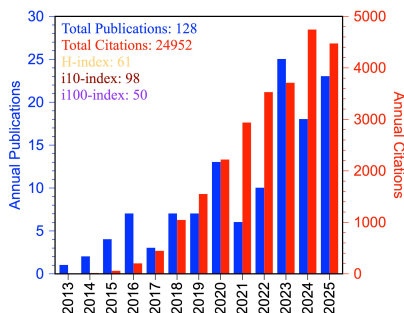


CURRICULUM VITAE

Sung-Fu Hung

Department of Applied Chemistry
National Yang Ming Chiao Tung University
1001 University Road, Hsinchu 300, Taiwan
Phone: +886-3-5712121 #31946
Email: sungfuhung@nycu.edu.tw
ORCID: [0000-0002-7423-2723](https://orcid.org/0000-0002-7423-2723)
Publication articles: [128](#); total citation: [24952](#)
H index: [61](#) ; i10 index: [98](#) ; i100 index: [51](#)
2024 World's Top 2% Scientists: [rank 38536](#)



RESEARCH INTERESTS

1. Synthesis of nanostructural materials for (photo-)electrocatalysts
2. Oxygen evolution reaction (OER), hydrogen evolution reaction (HER), oxygen reduction reaction (ORR), and CO₂ reduction reaction (CO₂RR)
3. Flow systems for scalable water and CO₂ electrolysis
4. Development of *in-situ* techniques for (photo-)electrocatalysts: hard/soft X-ray absorption spectroscopy (XAS), high-energy-resolution fluorescence-detection X-ray absorption spectroscopy (HERFD-XAS), X-ray diffraction (XRD), Raman spectroscopy

EDUCATION

National Taiwan University Sept. 2014 - Jun. 2018
Ph.D in Chemistry (Advisor: Prof. Hao Ming Chen)
Thesis: *Development of High-efficient Electrocatalysts and Photoelectrocatalysts and Their In-/ex-situ Analysis*

National Tsing-Hua University Sept. 2008 - Aug. 2010
Master of Science in Materials Science and Engineering (Advisor: Prof. Chih-Huang Lai)
Thesis: *The Study on Cadmium Sulfide Buffer Layer Prepared by Chemical Bath Deposition on CIGS Solar Cell Application*

National Tsing-Hua University Sept. 2004 - Aug. 2008
Bachelor of Science in Materials Science and Engineering (Major) and Chemistry (Minor)

WORK EXPERIENCE

Associate Professor, National Yang Ming Chiao Tung University Aug 2025 - present

Joint Associate Professor, Kaohsiung Medical University Aug 2025 - present

Assistant Professor, National Yang Ming Chiao Tung University Feb 2021 - Jul 2025

Assistant Professor, National Chiao Tung University Aug 2020 - Jan 2021

Postdoctoral Research Fellow, University of Toronto May 2019 - May 2020
Advisor: Prof. Ted Sargent

Postdoctoral Research Fellow, National Taiwan University Sept. 2018 - May 2019
Advisor: Prof. Hao Ming Chen

Research Associate, Nanyang Technological University Feb. 2014 - Sept. 2014
Advisor: Prof. Bin Liu

Research Assistant, National Taiwan University Sept. 2013 - Feb. 2014
Advisor: Prof. Hao Ming Chen

Research Assistant, Academia Sinica Sept. 2010 - Aug. 2012
Advisor: Prof. Jiann-T'suen Lin and Prof. Shu-Hua Chien

HONORS

World's Top 2% Scientists, 2021-2024. (Rank: 38536 for 2024; 53503 for 2023; 89062 for 2022; 93456 for 2021)

23. Asia-Pacific Sustainability Action Awards (APSAA), Copper Award, 2025.

22. Taiwan Sustainability Action Awards (TSAA), Copper Award, 2025.

21. Yushan Young Scholar II, 2025.

20. NSTC 2030 International Outstanding Young Scholar, 2025.

19. Highly Cited Researcher of Chemistry (Clarivate), 2024.

18. Occupational safety and health affair managers, 2024.

17. ChemNanoMat Early Career Researchers, 2024.

16. Highly Cited Researcher of Cross-Field (Clarivate), 2023.

15. Journal of Materials Chemistry A Emerging Investigators, 2023.

14. Green Chemistry Application and Innovation Award, 2023.

13. NSTC 2030 Emerging Young Fellow, 2021.

12. Fellow of the Higher Education Academy (FHEA), UK, 2021.

11. Yushan Young Scholar, 2020.

10. IUPAC-Solvay International Award for Young Chemists, 2019. (5 winners per year international, the first winner in Taiwan)

9. Lam Research Award, 2018.

8. The Best Thesis Award in Song-Pei Wu Applied Chemistry, Chemical Society Located in Taipei, 2018.

7. Yen Thesis Award, PhD, National Taiwan University, 2018.

6. Award of ScinoPharm Taiwan, 2018.

5. Dean's Award, College of Science, National Taiwan University, 2018.

4. CTCI Scholarship Award for Excellence in Research, 2017.

3. Scholarship for doctoral candidate of National Synchrotron Radiation Research Center, 2017.

2. Scholarship for doctoral candidate of National Synchrotron Radiation Research Center, 2016.

1. Excellent teaching assistant award, National Taiwan University, 2016.

GRANTS

10. Ministry of Science and Technology Grant: 2030 Cross-Generation Young Scholars Program - International Outstanding Young Scholar, 2025-2029 (NSTC 114-2628-M-A49-005)

9. Yushan Young Scholar II Program, 2025-2030 (MOE 114-YSFMS-0010-003-P2)

8. Featured Areas Research Center Program within the framework of the Higher Education Sprout Project from the Ministry of Education, Taiwan, 2023-2027

7. Ministry of Science and Technology Grant: 2030 Cross-Generation Young Scholars Program - Emerging Young Scholar, 2021-2025 (NSTC 113-2628-M-A49-008; NSTC 112-2628-M-A49-001; NSTC 111-2628-M-A49-007; MOST 110-2628-M-A49-002)

6. Yushan Young Scholar Program, 2020-2025

5. ITRI - Industry-Academia Cooperative Project, 2021-2025

4. Junior Faculty Basic Cultivating Support Program, 2024

3. Ministry of Science and Technology Grant: Junior Researcher Program (MOST 110-2113-M-009-007-MY2), 2020-2022

2. Junior Faculty Research Enhancement Project (109W205), 2020

1. Taiwan Postdoctoral Research Abroad Program (MOST 108-2917-I-564-016), 2019-2020

PUBLICATIONS (Published Articles: 128; Revision: 4; Total Citation: 24952)

128. Kuan, C.-H.; Jiang, X.; Zhou, Q.; Wen, X.; **Hung, S.-F.**; Chen, H.-L.; Shih, Y.-S.; Narra, S.; Chiou, J.-W.; Lin, J.-M.; Hou, Y.; E. W.-G. Diau* Overcoming the Stability Issue for Hydrophobic Hole Transporting Layers Utilized in Tin-Lead Perovskite and Tandem Solar Cells. *Adv. Func. Mater.* **2025**, *accepted*.
127. Li, S.; Zhao, S.; **Hung, S.-F.**; Deng, L.; Wang, L.; Shi, F.; Dong, A.; Zhang, Y.; Chen, T.-Y.; Hu, F.; Li, L.; Ramakrishna, S.; Wu, Y.; Peng, S. Oxophilic Sites Mediated Dynamic Oxygen Replenishment to Stabilize Lattice Oxygen Catalysis in Acidic Water Oxidation. *J. Am. Chem. Soc.* **2025**, *accepted*. [[link](#)]
126. Lu, Y.-H.;† Shen, Y.-J.;† Tsai, H.-J.; Lee, Y.-H.; Huang, Y.-Y.; Lin, Z.-Y.; Huang, W.-Y.; Lee, T.-J.; Chen G.-L.; Hiraoka, N.; Ishii, H.; Liu, H.-J.; Hsu, S.-H.; Chang, C.-C.; Xu, A.;* **Hung, S.-F.*** Unveiling the Synergies of Sulfur-Containing Single-Atom Catalysts via Model Thiophene-Decorated Nickel Porphyrins for Tandem CO₂ Reduction Reaction. *Nature Synth.* **2025**, *accepted*.
125. Wu, Q.; Ji, S.; Chen, J.; Tan, X.-Q.; Ong, W.-J.; Du, R.; Wang, P.; Wang, H.; Qiu, Y. Q.; Yan, K. Y.; Zhao, Y. Z.; Zhao, W.-W.; Peng, K.-S.; Chen, Y.-Y.; **Hung, S.-F.*** Zhou, L.; Wang, X.; Qiu, G.;* Chen, G.* Realizing the practical application of CO₂ electroreduction for urban wastewater denitrification. *Nature Water.* **2025**, *accepted*.
124. Xu, T.; Shi, J.; Peng, K.-S.; Hsu, Y.-H.; Liu, Y.-C.; Wang, S.; Zhang, H.; Wang, Y.; Zhang, G.; **Hung, S.-F.**; Liu, K.;* Wang, X. Organic Surface Passivation on Rh@CeO₂ Cocatalysts for Photocatalytic Overall Water Splitting. *Angew. Chem. Int. Ed.* **2025**, e202513029. [[link](#)]
123. Peng, K.-S.; Shen, Y.-J.; Chang, Y.-C.; Liu, Y.-C.; Chou, C.-H.; Chang, Y.-C.; Li, M.-H.; Lu, Y.-R.; Hsu, S.-H.; **Hung, S.-F.*** Effect of Electrolyte Cations on the Selectivity of Electrochemical CO₂ Reduction in a Flow Cell System. *J. Chin. Chem. Soc.* **2025**, *accepted*. [[link](#)]
122. Xu, X.; Su, B.; Wang, S.; Xing, W.; **Hung, S.-F.**; Pan, Z.; Fang, Y.; Zhang, G.; Zhang, H.; Wang, X. CO₂ Photoreduction by H₂O: Cooperative Catalysis of Palladium Species on Poly(triazine imide) Crystals. *Angew. Chem. Int. Ed.* **2025**, e202512386. [[link](#)]
121. Wei, F.; Zhao, J.; Liu, Y.-C.; Hsu, Y.-H.; **Hung, S.-F.**; Fu, J.; Liu, K.; Lin, W.; Yum, Z.; Tan, L.; Lu, X. F.; Feng, C.; Zhang, H.;*Wang, S.* Photocatalytic ethylene production over defective NiO through lattice oxygen participation. *Nature Commun.* **2025**, *16*, 6586. [[link](#)]
120. Zhao, T.; Cai, G.; Zhai, X.; Wang, S.; Yang, X.; Peng, K.-S.; Chen, M.-C.; **Hung, S.-F.**; Kong, X.; Li, M.; Tang, W.; Zhou, L.;* Hua, W.* Impact of Surface Li-containing Rock-salt Phase on Electrochemical Performance of Li- and Mn-rich Cathodes. *J. Power Sources* **2025**, *649*, 237445. [[link](#)]
119. Yang, Q.; Wang, X.; Zhang, J.; Mao, Y.; Xi, S.; Liu, Y.-C.; Hsu, Y.-H.; Zhang, L.; Dolmanan, S. B.; Wang, M.; Wang, B.; Zang, Y.; Zhang, M.; Leow, W. R.; **Hung, S.-F.**; Wang, Z.;* Lum, Y.* Dopant-induced switch in rate-determining step enables high current ethylene electrosynthesis at <2 V full-cell voltage. *Nature Synth.* **2025**, *accepted*. [[link](#)]
118. Wang, M.; Luo, C.; Mi, Z.; Chang, Y.-C.; Chueh, Y.-T.; Luo, P.; Zhang, M.; Zhang, J.; Yang, R.; Yang, Q.; Wang, S.; Chen, S.; Jia, J.; Leow, W. R.; Aabdin, Z.; **Hung, S.-F.**; Lum, Y.* Triple-Phase Boundaries Enable Selective Urea Production from Simulated Flue Gas in a Zero-Gap Electrolyzer. *Angew. Chem. Int. Ed.* **2025**, *64*, e202505987. [[link](#)]
117. Su, B.; Wang, S.; Xing, W.; Liu, K.; **Hung, S.-F.**; Chen, X.; Fang, Y.; Zhang, G.; Zhang, H.; Wang, X.* Synergistic Ru Species on Poly(heptazine imide) Enabling Efficient Photocatalytic CO₂ reduction with H₂O Beyond 800 nm. *Angew. Chem. Int. Ed.* **2025**, *64*, e202505453. [[link](#)]
116. Li, J.; Zhao, J.; Wang, S.;* Peng, K.-S.; Su, B.; Liu, K.; **Hung, S.-F.**; Huang, M.; Zhang, G.; Zhang, H.; Wang, X.* Activating Lattice Oxygen in Perovskite Ferrite for Efficient and Stable Photothermal Dry Reforming of Methane. *J. Am. Chem. Soc.* **2025**, *147*, 14705-14714. [[link](#)]

115. Wang, L, **Hung, S.-F.**; Zhao, S.; Wang, Y.; Bi, S.; Li, S.; Ma, J.-J.; Zhang, C.; Zhang, Y.; Li, L.;* Chen, T.-Y.; Chen, H.-Y.; Hu, F.;* Wu, Y.; Peng, S.* Modulating the Covalency of Ru-O Bonds by Dynamic Reconstruction for Efficient Acidic Oxygen Evolution. *Nature Commun.* **2025**, *16*, 3502. [[link](#)]
114. Kibria, Md G.; Kumar, P.; Zhang, H.; Yohannes, A.; Wang, J.; Zeraati, A. S.; Roy, S.; Wang, X.; Kannimuthu, K.; Askar, A.; Miller, K. A.; Ling, K.; Adnan, M.; **Hung, S.-F.**; Ma, J.-J.; Huang, W.-H.; Trivedi, D.; Molina, M.; Zhao, H.; Martí, A.; Leontowich, A.; Shimizu, G.; Sinton, D.; Adachi, M.; Wu, Y.; Ajayan, P.; Siahrostami, S.; Hu, J. Isolated Iridium Oxide Sites on Modified Carbon Nitride for Photoreforming of Plastic Derivatives. *Nature Commun.* **2025**, *16*, 2862. [[link](#)]
113. Wang, Q.;† **Hung, S.-F.**;† Huang, X.; Tao, H. B.;* Yang, H. B.; Zhang, L.; Zhang, J.; Liu, Y.; Chen, J.; Xu, Y.; Su, C.;* Chen, J. G.;* Liu, B.* Breaking the Linear-scaling Limit in Multi-electron-transfer Catalysis through Intermediate Spillover. *Nature Catal.* **2025**, *8*, 378-388. (†These authors equally contribute to this work) [[link](#)]
112. Zhao, S.; **Hung, S.-F.**; Wang, Y.; Li, S.; Yang, J.; Zeng, W.-J.; Zhang, Y.; Chang, H.-H.; Chen, H.-Y.; Hu, F.; Li, L.; Peng, S.* Dynamic Deprotonation Enhancement Triggered by Accelerated Electrochemical Delithiation Reconstruction during Acidic Water Oxidation. *J. Am. Chem. Soc.* **2025**, *147*, 7993-8003. [[link](#)]
111. Chen, M.; Tan, S. X.; Cheng, S.; Chen, Y.-Y.; Hsu, Y.-H.; **Hung, S.-F.**; Zhang, L.; Gao, J. Revisiting the Ruthenium Oxide-based Water Oxidation Catalysts in Acidic Media: from Amorphous to Crystalline. *Nano Energy* **2025**, *137*, 110800. [[link](#)]
110. Shen, Y.-J.; Hsu, Y.-H.; Chang, Y.-C.; Ma, J.-J.; Peng, K.-S.; Lu, Y.-R.; Hsu, S.-H.; **Hung, S.-F.*** Microenvironment Matters: Copper-Carbon Composites Enable Highly Efficient Carbon Dioxide Reduction Reaction to C2 Products. *ACS Appl. Mater. Interface* **2025**, *17*, 9378-9390. [[link](#)]
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109. Zhao, T.; Zhang, J.; Wang, K.; Xiao, Y.; Wang, Q.; Li, L.; Tseng, J.; Chen, M.-C.; Ma, J.-J.; Lu, Y.-R.; Hirofumi, I.; Shao, Y.-C.; Zhao, X.; **Hung, S.-F.**; Su, Y.; Mu, X.; Hua, W. Exploring the Mechanism of Surface Cationic Vacancy Induced High Activity of Metastable Lattice Oxygen in Li-and Mn-rich Cathode Materials. *Angew. Chem. Int. Ed.* **2025**, *64*, e202419664. (**Inside Front Cover**) [[link](#)]
108. Wang, M.; Li, Y.; Jia, J.; Ghosh, T.; Luo, P.; Shen, Y.-J.; Wang, S.; Zhang, J.; Xi, S.; Mi, Z.; Zhang, M.; Leow, W. R.; Johannessen, B.; Aabdin, Z.; **Hung, S.-F.**; Zhang, J.;* Lum, Y.* Tuning Catalyst-support Interactions Enable Steering of Electrochemical CO₂ Reduction Pathways. *Sci. Adv.* **2025**, *11*, eado5000. [[link](#)]
107. Fan, L.; Li, F.; Liu, T.; Huang, J. E.; Miao, R. K.; Yan, Y.; Feng, S.; Tai, C.-W.; **Hung, S.-F.**; Tsai, H.-J.; Chen, M.-C.; Bai, Y.; Kim, D.; Park, S.; Papangelakis, P.; Wu, C.; Zeraati, A. S.; Dorakhan, R.; Sun, L.;* Sinton, D.;* Sargent, E. H.* Atomic-level Cu Active Sites Enable CO₂ Reduction to Multi-carbon Products in Strong Acid. *Nature Synth.* **2025**, *4*, 262-270. [[link](#)]
106. Hsiao, Y.-C.; Wu, C.-Y.; Lee, C.-H.; Huang, W.-Y.; Thang, H. V.; Chi, C.-C.; Zeng, W.-J.; Gao, J.-Q.; Lin, C.-Y.; Lin, J.-T.; Gardner, A. M.; Jang, H.; Juang, R.-H.; Liu, Y.-H.; Mekhemer, I. M. A.; Lu, M.-Y.; Lu, Y.-R.; Chou, H.-H.; Kuo, C.-H.; Zhou, S.; Hsu, L.-C.;* Chen, H.-Y. T.; Cowan, A. J.;* **Hung, S.-F.*** Yeh, J.-W.;* Yang, T.-H.* A Library of Seed@High-Entropy-Alloy Core-shell Nanocrystals With Controlled Facets for Catalysis. *Adv. Mater.* **2025**, *37*, 2411464. [[link](#)]
105. Liu, F.; Deng, J. Su, B.; Peng, K.-S.; Liu, K.;* Lin, X.; **Hung, S.-F.,*** Chen, X.; Lu, X. F.; Fang, Y.; Zhang, G.; Wang, S.* Poly(triazine imide) Crystals for Efficient CO₂ Photoreduction: Surface Pyridine Nitrogen Dominates the Performance. *ACS Catal.* **2025**, *15*, 1018-1026. [[link](#)]

104. Zhang, J.; Zhai, X.; Zhao, T.; Yang, X.; Wang, Q.; Chen, Z.; Chen, M.-C.; Ma, J.-J.; Lu, Y.-R.; **Hung, S.-F.**; Hua, W.* What Impact Does Ammonia Have on the Microstructure of the Precursor and the Electrochemical Performance of Ni-Rich Layered Oxides? *J. Mater. Chem. A* **2025**, *13*, 1181-1190. [[link](#)]
103. Deng, L.; Chen, H.; **Hung, S.-F.**; Zhang, Y.; Yu, H.; Chen, H.-Y. Li, L.; Peng, S.* Lewis Acid-Mediated Interfacial Water Supply for Sustainable Proton Exchange Membrane Water Electrolysis. *J. Am. Chem. Soc.* **2024**, *146*, 35438-35448. [[link](#)]
102. Wang, S.; Li, F.; Zhao, J.; Zeng, Y.; Li, Y.; Lin, Z.-Y.; Lee, T.-J.; Liu, S.; Ren, X.; Wang, W.; Chen, Y.; **Hung, S.-F.**; Lu, Y.-R.; Cui, Y.; Yang, X.; Li, X.*; Huang, Y.*; Liu, B.* Manipulating C-C Coupling Pathway in Electrochemical CO₂ Reduction for Selective Ethylene and Ethanol Production over Single-Atom Alloy Catalyst. *Nature Commun.* **2024**, *15*, 10247. [[link](#)]
101. Zhang, J.; Li, F.; Liu, W.; Wang, Q.; Li, X.; **Hung, S.-F.*** Yang, H.*; Liu, B.* Modulating Spin of Atomic Manganese Center for High-Performance Oxygen Reduction Reaction. *Angew. Chem. Int. Ed.* **2024**, *63*, e202412245. [[link](#)]
100. Hao, Y.; **Hung, S.-F.**; Wang, L.; Deng, L.; Zeng, W.-J.; Zhang, C.; Lin, Z.-Y.; Kuo, C.-H.; Wang, Y.; Zhang, Y.; Chen, H.-Y.; Hu, F.; Li, L.; Peng, S.* Designing Neighboring-Site Activation of Single Atom via Tunnel Ions for Boosting Acidic Oxygen Evolution. *Nature Commun.* **2024**, *15*, 8015. [[link](#)]
99. Xu, Z.;[†] Lu, R.;[†] Lin, Z.-Y.;[†] Wu, W.; Tsai, H.-J.; Lu, Q.; Li, Y. C.; **Hung, S.-F.*** Song, C.; Yu, J. C.; Wang, Z.*; Wang, Y.* Electroreduction of CO₂ to Methane with Triazole Molecular Catalysts. *Nature Energy* **2024**, *9*, 1397-1406. ([†]These authors equally contribute to this work) [[link](#)]
 ➤ Highlighted as a **News & Views** in *Nature Energy*.
98. Deng, L.; **Hung, S.-F.**; Liu, S.; Zhao, S.; Lin, Z.-Y.; Zhang, C.; Zhang, Y.; Wang, A.-Y.; Chen, H.-Y.; Peng, J.; Ma, R.; Jiao, L.; Hu, F.; Li, L.; Peng, S.* Accelerated Proton Transfer in Asymmetric Active Units for Sustainable Acidic Oxygen Evolution Reaction. *J. Am. Chem. Soc.* **2024**, *146*, 23146-23157. [[link](#)]
97. Yang, B.; Liu, K.; Ma, Y.; Ma, J.-J.; Chen, Y.-Y.; Huang, M.; Yang, C.; Hou, Y.; **Hung, S.-F.**; Yu, J. C.; Zhang, J.*; Wang, X.* Incorporation of Pd Single-atom Sites in Perovskite with an Excellent Selectivity toward Photocatalytic Semihydrogenation of Alkynes. *Angew. Chem. Int. Ed.* **2024**, *63*, e202410394. [[link](#)]
96. Ma, J.-J.;[†] Chueh, Y.-T.;[†] Chen, Y.-Y.; Hsu, Y.-H.; Liu, Y.-C.; Peng, K.-S.; Hu, C.-W.; Lu, Y.-R.; Shao, Y.-C.; Hsu, S.-H.; **Hung, S.-F.*** Robust Iron-Doped Nickel Phosphides in Membrane-Electrode Assembly for Industrial Water Electrolysis. *Electrochim. Acta* **2024**, *500*, 144744. ([†]These authors equally contribute to this work) [[link](#)]
95. Wu, C.-Y.; Hsiao, Y.-C.; Chen, Y.; Lin, K.-H.; Lee, T.-J.; Chi, C.-C.; Lin, J.-T.; Hsu, L.-C.; Tsai, H.-J.; Gao, J.-Q.; Chang, C.-W.; Kao, I.-T.; Wu, C.-Y.; Lu, Y.-R.; Pao, C.-W.; **Hung, S.-F.**; Lu, M.-Y.; Zhou, S.; Yang, T.-H.* A Catalyst Family of High-Entropy-Alloy Atomic Layers with Square Atomic Arrangements Comprising Iron- and Platinum-Group Metals. *Sci. Adv.* **2024**, *10*, adl3693. [[link](#)]
94. Chen, Y.; Sun, M.; Wu, M.; Zhu, C.; Li, H.; Lin, Z.-Y.; Li, H.; Xu, H.; Li, D.; Chen, X.; **Hung, S.-F.**; Dong, J.; Liu, B.* Demidenko, O.; Huang, B.*; Li, Y.* Enhancing Oxygen Reduction Activity via Tailoring Micro-Strain in PdMo Nanoalloy through Repetitive Hydrogen Absorption-Release. *ACS Catal.* **2024**, *14*, 9354-9363. [[link](#)]
93. Zeng, W.-J.;[†] Ma, J.-J.;[†] Huang, W.-Y.; Lee, T.-J.; Lin, Z.-Y.; Peng, K.-S.; Hiraoka, N.; Liao, Y.-F.; Lu, Y.-R.; Hu, C.-W.*; Hsu, S.-H.*; **Hung, S.-F.*** Leveraging Bifunctional Phosphide-based Catalysts in a Membrane-Electrode-Assembly to Achieve Industrial Hydrogen

Production. *Mater. Today Sustain.* **2024**, 27, 100820. (†These authors equally contribute to this work) [[link](#)]

92. Lin, Z.-Y.; Chang, Y.-C.; Chen, Y.-Y.; Hsu, Y.-H.; Peng, K.-S.; **Hung, S.-F.*** Operando Studies for CO₂/CO Reduction in Flow-Based Devices. *ChemNanoMat* **2024**, 10, e202400070. (Special collection: *Early Career Researcher 2023*) [[link](#)]
91. Wang, X.; Lu, R.; Pan, B.; Yang, C.; Zhuansun, M.; Li, J.; Xu, Y.; **Hung, S.-F.**; Zheng, G.; Li, Y.; Wang, Z.; Wang, Y.* Enhanced Carbon-Carbon Coupling at Interfaces with Abrupt Coordination Number Changes. *ChemSusChem* **2024**, 17, e202400150. [[link](#)]
90. Zhao, S.; **Hung, S.-F.**; Deng, L.; Zeng, W.-J.; Xiao, T.; Li, S.; Kuo, C.-H.; Chen, H.-Y.; Hu, F.; Peng, S.* Constructing regulable supports via non-stoichiometric engineering to stabilize ruthenium nanoparticles for enhanced pH-universal water splitting. *Nature Commun.* **2024**, 15, 2728. [[link](#)]
89. Duan, X.; Sha, Q.; Li, P.; Li, T.; Yang, G.; Liu, W.; Yu, E.; Zhou, D.; Fang, J.; Chen, W.; Chen Y.; Zheng, L.; Liao, J.; Wang, Z.; Li, Y.; Yang, H.; Zhang, G.; Zhuang, Z.; **Hung, S.-F.**; Jing, C.; Luo, J.; Bai, L.; Dong, J.; Xiao, H.; Liu, W.; Kuang, Y.* Liu, B.* Sun, X.* Dynamic Chloride ion Adsorption on Single Iridium Atom Boosts Seawater Oxidation Catalysis. *Nature Commun.* **2024**, 15, 1973. [[link](#)]
88. Lin, T.-Y.*; Hsieh, C.-F.; Kanai, A.; Yashiro, T.; Zeng, W.-J.; Ma, J.-J.; **Hung, S.-F.**; Sugiyama, M. Radiation Resistant Chalcopyrite CIGS Solar Cells: Proton Damage Shielding with Cs Treatment and Defect Healing via Heat-light Soaking. *J. Mater. Chem. A* **2024**, 12, 7536-7548. (**Cover**) [[link](#)]
87. Hao, Y.; **Hung, S.-F.**; Tian, C.; Wang, L.; Chen, Y.-Y.; Zhao, S.; Peng, K.-S.; Zhang, C.; Zhang, Y.; Kuo, C.-H.; Chen, H.-Y.; Peng, S.* Polarized Ultrathin BN Induced Dynamic Electron Interactions for Enhancing Acidic Oxygen Evolution. *Angew. Chem. Int. Ed.* **2024**, 63, e202402018. [[link](#)]
86. Chi, M.;† Zhao, J.;†, Ke, J.;† Liu, Y.; Wang, R.; Wang C.; **Hung, S.-F.**; Lee, T.-J.; Geng, Z.*; Zeng, J.* Bipyridine-confined Silver Single-atom Catalysts Facilitate In-plane C-O Coupling for Propylene Electrooxidation. *Nano Lett.* **2024**, 24, 1801-1807. [[link](#)]
85. Miao, R. K.; Wang, N.; **Hung, S.-F.**; Huang, W.-Y.; Zhang, J.; Zhao, Y.; Ou, P.; Wang, S.; Edwards J. P.; Tian, C.; Han, J.; Xu, Y.; Fan, M.; Huang, J. E.; Xiao, Y. C.; Ip, A. H.; Liang, H.; Sargent, E. H.*; Sinton, D.* Electrified Cement Production via Anion-mediated Electrochemical Calcium Extraction. *ACS Energy Lett.* **2023**, 8, 4694-4701. [[link](#)]
84. Hao, Y.; **Hung, S.-F.**; Zeng, W.-J.; Wang, Y.; Zhang, C.; Kuo, C.-H.; Wang, L.; Zhao, S.; Zhang, Y.; Chen, H.-Y.; Peng, S.* Switching the Oxygen Evolution Mechanism on Atomically Dispersed Ru for Enhanced Acidic Reaction Kinetics. *J. Am. Chem. Soc.* **2023**, 145, 23659-23669. [[link](#)]
83. Jia, J.-F.; Hao, T. T.; Chen, P.-H.; Wu, F.-Y.; **Hung, S.-F.*** Suen, N.-T.* Direct Electrosynthesis of Metal Nanoparticle on Ti₃C₂T_x-Mxene during Hydrogen Evolution. *Inorg. Chem.* **2023**, 62, 19230-19237. (**Cover**) [[link](#)]
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81. Yang, X.; Wang, S.; Li, H.; Peng, J.; Zeng, W.-J.; Tsai, H.-J.; **Hung, S.-F.**; Indris, S.; Li, F.; Hua, W.* Boosting the Ultra-stable High-Na-Content P2-Type Layered Cathode Materials with Zero Strain Cation Storage via a Lithium Dual-Site Substitution Approach. *ACS Nano* **2023**, 17, 18616-18628. [[link](#)]

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21. **Hung, S.-F.**;† Chen, Z.-Z.;† Chang, C.-C.; Hsu, C.-S.; Tsai, M.-K.; Kang, C.-C.; Chen, H. M. Dual-Hole Excitons Activated Photoelectrolysis in Neutral Solution. *Small* **2018**, *14*, 1704047. (†These authors equally contribute to this work, **Frontispiece**) [[link](#)]
20. Yang, H.; **Hung, S.-F.**; Liu, S.; Yuan, K.; Miao, S.; Zhang, L.; Huang, X.; Wang, H.-Y.; Cai, W.; Chen, R.; Gao, J.; Yang, X.; Chen, W.; Huang, Y.;* Chen, H. M.; Li, C.; Zhang, T.;* Liu, B.* Atomically Dispersed, Low valent Ni(I) as the Active Site for Electrochemical CO₂ Reduction. *Nature Energy* **2018**, *3*, 140-147. [[link](#)]
19. Ma, L.; **Hung, S.-F.**; Zhang, L.; Cai, W.; Yang, H. B.; Chen, H. M.; Liu, B.* High Spin State Promotes Water Oxidation Catalysis at Neutral pH in Spinel Cobalt Oxide. *Ind. Eng. Chem. Res.* **2018**, *57*, 1441-1445. [[link](#)]
18. **Hung, S.-F.**;† Hsu, Y.-Y.;† Chang, C.-J.; Hsu, C.-S.; Suen, N.-T.; Chan, T.-S.; Chen, H. M. Unraveling Geometrical Site Confinement in Iron-Doped Electrocatalysts toward Oxygen Evolution Reaction. *Adv. Energy Mater.* **2018**, *8*, 1701686. (**Back Cover**) [[link](#)]
 ➤ Highlighted as a **research news** in National Synchrotron Radiation Research Center.
17. Ma, Q.;† Hu, C.;† Liu, K.; **Hung, S.-F.**; Ou, D.; Chen, H. M.; Fu, G.; Zheng, N. Identifying the Electrocatalytic Sites of Nickel Disulfide in Alkaline Hydrogen Evolution Reaction. *Nano Energy* **2017**, *41*, 148-153. (†These authors equally contribute to this work) [[link](#)]
16. Hu, C.;† Ma, Q.;† **Hung, S.-F.**; Chen, Z.; Ren, B.; Chen, H. M.;* Fu, G.;* Zheng, N.* In Situ Electrochemical Production of Ultrathin Nickel Nanosheets for Efficient Hydrogen Evolution Electrocatalysis. *Chem* **2017**, *3*, 122-133. (†These authors equally contribute to this work) [[link](#)]
15. Suen, N.-T.; **Hung, S.-F.**; Quan, Q.; Zhang, N.; Xu, Y.-J.;* Chen, H. M.* Electrocatalysis for the Oxygen Evolution Reaction: Recent Development and Future Perspectives. *Chem. Soc. Rev.* **2017**, *46*, 337-365. (**Front Cover**) [[link](#)]
14. Wang, H.-Y.; **Hung, S.-F.**; Hsu, Y.-Y.; Zhang, L.; Miao, J.; Chan, T.-S.; Xiong, Q.; Liu, B.* In-Situ Spectroscopic Identification of μ -OO Bridging on Spinel Co₃O₄ Water Oxidation Electrocatalyst. *J. Phys. Chem. Lett.* **2016**, *7*, 4847-4853. [[link](#)]
13. Gao, J.; Jia, C.; Zhang, L.; Wang, H.;* Yang, Y.; **Hung, S.-F.**; Hsu, Y.-Y.; Liu, B.* Tuning Chemical Bonding of MnO₂ through Transition-Metal Doping for Enhanced CO Oxidation. *J. Catal.* **2016**, *341*, 82-90. [[link](#)]

12. **Hung, S.-F.**; Tung, C.-W.; Chan, T.-S.;* Chen, H. M.* In-Situ Morphological Transformation and Investigation of Electrocatalytic Properties of Cobalt Oxide Nanostructures toward Oxygen Evolution. *CrystEngComm* **2016**, *18*, 6008. [[link](#)]
11. Yang, H. B.; Miao, J.; **Hung, S. F.**; Chen, J.; Tao, H. B.; Wang, X.; Zhang, L.; Chen, R.; Gao, J.; Chen, H. M.; Dai, L.;* Liu, B.* Identification of Catalytic Sites for Oxygen Reduction and Oxygen Evolution in N-Doped Graphene Materials: Development of Highly Efficient Metal-Free Bifunctional Electrocatalyst. *Science Adv.* **2016**, *2*, e1501122. [[link](#)]
10. **Hung, S.-F.**;[†] Xiao, F.-X.;[†] Hsu, Y.-Y.; Suen, N.-T., Yang, H. B.; Chen, H. M.;* Liu, B.* Iridium Oxide-Assisted Plasmon-Induced Hot Carriers: Improvement on Kinetics and Thermodynamics of Hot Carriers. *Adv. Energy Mater.* **2016**, *6*, 1501339. (†These authors equally contribute to this work, **Back Cover**) [[link](#)]
 ➤ Highlighted in *MaterialsViewsChina* and *NSRRC 2016 Newsletter*.
9. Wang, H.-Y.; **Hung, S.-F.**; Chen, H.-Y.; Chan, T.-S.; Chen, H. M.;* Liu, B.* In Operando Identification of Geometrical-Site-Dependent Water Oxidation Activity of Spinel Co₃O₄. *J. Am. Chem. Soc.* **2016**, *138*, 36–39. [[link](#)]
8. **Hung, S.-F.**;[†] Yu, Y.-C.;[†] Suen, N.-T.; Tzeng, G.-Q.; Tung, C.-W.; Hsu, Y.-Y.; Hsu, C.-S.; Chang, C.-K.; Chan, T.-S.; Sheu, H.-S.; Lee, J.-F.; Chen, H. M.* The Synergistic Effect of a Well-Defined Au@Pt Core-Shell Nanostructure Toward Photocatalytic Hydrogen Generation: Interface Engineering to Improve the Schottky Barrier and Hydrogen-Evolved Kinetics. *Chem. Commun.* **2016**, *52*, 1567-1570. (†These authors equally contribute to this work, **Inside Cover**) [[link](#)]
 ➤ Highlighted as a **research news** in National Synchrotron Radiation Research Center.
7. Xiao, F.-X.; Zeng, Z.; Hsu, S.-H.; **Hung, S.-F.**; Chen, H. M.;* Liu, B.* Light-Induced in Situ Transformation of Metal Clusters to Metal Nanocrystals for Photocatalysis. *ACS Appl. Mater. Interfaces* **2015**, *7*, 28105–28109. [[link](#)]
6. Hsu, Y.-Y.; Suen, N.-T.; Chang, C.-C.; **Hung, S.-F.**; Chen, C.-L.;* Chan, T.-S.;* Dong, C.-L.; Chan, C.-C.; Chen, S.-Y.; Chen, H. M.* Heterojunction of Zinc Blende/Wurtzite in Zn_{1-x}Cd_xS Solid Solution for Efficient Solar Hydrogen Generation: X-Ray Absorption/Diffraction Approaches. *ACS Appl. Mater. Interfaces* **2015**, *7*, 22558–22569. [[link](#)]
5. Xiao, F.-X.; **Hung, S.-F.**; Tao, H. B.; Miao, J.; Yang, H. B.; Liu, B.* Spatially Branched Hierarchical ZnO Nanorod-TiO₂ nanotube Array Heterostructures for Versatile Photocatalytic and Photoelectrocatalytic Applications: Towards Intimate Integration of 1D–1D Hybrid Nanostructures. *Nanoscale* **2015**, *6*, 14950–14961. [[link](#)]
4. Xiao, F.-X.; Miao, J.; Tao, H. B.; **Hung, S.-F.**; Wang, H.-Y.; Yang, H. B.; Chen, J.; Chen, R.; Liu, B.* One-Dimensional Hybrid Nanostructures for Heterogeneous Photocatalysis and Photoelectrocatalysis. *Small* **2015**, *11*, 2115–2131. [[link](#)]
3. Yang, H. B.; Miao, J.; **Hung, S.-F.**; Huo, F.; Chen, H. M.;* Liu, B.* Stable Quantum Dot Photoelectrolysis Cell for Unassisted Visible Light Solar Water Splitting. *ACS Nano* **2014**, *8*, 10403–10413. [[link](#)]
2. Xiao, F.-X.; **Hung, S.-F.**; Miao, J.; Wang, H.-Y.; Yang, H.; Liu, B.* Metal-Cluster-Decorated TiO₂ Nanotube Arrays: a Composite Heterostructure Toward Versatile Photocatalytic and Photoelectrochemical Applications. *Small* **2014**, *11*, 554–567. [[link](#)]
1. Hsu, S.-H.; **Hung, S.-F.**; Chien, S.-H.* CdS Sensitized Vertically Aligned Single Crystal TiO₂ Nanorods on Transparent Conducting Glass with Improved Solar Cell Efficiency and Stability Using ZnS Passivation Layer. *J. Power Sources* **2013**, *233*, 236–243. [[link](#)]

ACADEMIC ACTIVITIES

Committees & Organizers & Reviewers

◆ Organizer/Chair:

5. Session-Electrocatalysis, 10th Asia-Pacific Congress on Catalysis (APCAT-10), Singapore, 2025.
4. Session-Single-Atom Catalysts, Taipei International Conference on Catalysis, Hsinchu, Taiwan, 2025.
3. Session-Electrochemical Driven Conversion, International Conference on Green Electrochemical Technologies, Hsinchu, Taiwan, 2023
2. Session-Material Science, 8th National Tsing Hua University/Keio University Symposium of Advanced Chemistry, 2022
1. Symposium - Photocatalysis and Photosynthesis, Material Research Society-Taiwan International Conference (MRSTIC), 2021

◆ Review Editor Board - *Frontiers in Catalysis*, *Frontiers*, 2021

◆ Guest Editor - Special Issue "Nanomaterials for Electrochemical Energy Conversion" *Nanomaterials*, MDPI, 2021.

◆ Peer Reviewer:

2025: *ACS Appl. Mater. Interface* (2: 20250630; 20250725); *ACS Appl. Energy Mater.* (20250304); *Adv. Func. Mater.* (2: 20250707; 20250822); ***Angew. Chem. Int. Ed.* (2: 20250604; 20250730)**; *Appl. Catal. B* (20250901); *Chem Catal.* (2: 20250503; 20250904), *ChemElectroChem* (20250406); *Chem. Eng. J.* (20250903); *ChemSusChem* (20250405); *Electrochemical. acta* (20250805); ***J. Am. Chem. Soc.* (2: 20250203; 20250823)**; *J. Electroanal. Chem.* (20250122); *J. Environ. Chem. Eng.* (20250502); *Nanoscale* (20250220); *Nanoscale Horiz.* (3: 20250124, 20250427; 20250816); ***Nature Commun.* (20250526)**; *RSC Advances* (20250112)

2024: *ACS Appl. Mater. Interface* (20241122); *ACS Omega* (20240320); ***Adv. Mater.* (2: 20240714, 20241024)**; ***Angew. Chem. Int. Ed.* (20241116)**; *ChemCatChem* (2: 20240418, 20240724); *Chem Eur. J.* (20240906); *Chem. Sci.* (20240426); *Electrochim. Acta* (20240715); *Inorg. Chem.* (20240125); *Inter. J. Hydrog. Energy* (20240309); *iScience* (20240219); *J. Colloid Interface Sci* (20240924); *J. Electroanal. Chem.* (20241213). *Nano Energy* (20240616); *Nanoscale Horiz.* (2: 20240725, 20240929); *New J. Chem.* (20240819); *Small* (20240916); *Sci. China Chem.* (20240106).

2023: *ACS Appl. Nano Mater.* (20231115); ***Angew. Chem. Int. Ed.* (20230507)**; *Catal. Sci. Technol.* (20230407); *Catal. Commun.* (20231214). ***J. Am. Chem. Soc.* (20240905)**; *Mater. Today Sustain.* (20220726).

2022: *AIMS Mater. Sci.* (20220217); *Catal. Sci. Technol.* (2: 20220305, 20220806); *Catalysts* (20220725); *Energies* (20220918); *J. Catal.* (2: 20220315, 20220821); *J. Chin. Chem. Soc.* (20220420); *J. Solid State Electrochem.* (2: 20220123, 20221104); *Nanomaterials* (20221003); *Nanoscale Horiz.* (4: 20220201, 20220722, 20221017, 20221217); ***Nature* (20220828)**; ***Nature Catal.* (20221109)**; *New J. Chem.* (3: 20220217, 20220513, 20221011); *Symmetry* (20221107).

2021: *Nanoscale Horiz.* (20211125).

2020: *Catal. Sci. Technol.* (2: 20200822, 20201224); *Inorg. Chem. Commun.* (20200822).

◆ Thesis award referee - Annual Meeting of Chemical Society Located in Taipei, Taipei, Taiwan, 2022

◆ Oral contest referee:

2. Taipei International Conference on Catalysis, Hsinchu, Taiwan, 2025.

1. International Conference on Green Electrochemical Technologies, Hsinchu, Taiwan, 2023.

◆ Poster referee:

2. Chemistry National Meeting, , New Taipei, Taiwan, 2024
1. 68th Annual Meeting of Taiwan Institute of Chemical Engineering, Kaohsiung, Taiwan, 2022

Cooperators

1. Prof. **Edward Sargent** (*Department of Chemistry, Northwestern University, United State America*)
2. Prof. **David Sinton** (*Department of Mechanical and Industrial Engineering, University of Toronto, Canada*)
3. Prof. **Bin Liu** (*Department of Materials Science and Engineering, City University of Hong Kong, Hong Kong*)
4. Prof. **Fengwang Li** (*School of Chemical Biochemical Engineering, The University of Sydney, Australia*)
5. Prof. **Aoni Xu** (*School of Chemical Biochemical Engineering, The University of Sydney, Australia*)
6. Prof. **Ziyun Wang** (*School of Chemical Science, University of Auckland, New Zealand*)
7. Prof. **Dae-Hyun Nam** (*Department of Materials Science and Engineering, Korea University, Korea*)
8. Prof. **Mercedes Taylor** (*Department of Chemistry & Biochemistry, University of Maryland, United State America*)
9. Prof. **Yanwei Lum** (*Department of Chemical Biochemical Engineering, National University of Singapore, Singapore*)
10. Prof. **Wanru Leow** (*School of Chemistry, Chemical Engineering and Biotechnology, National Nanyang University, Singapore*)
11. Prof. **Ying Wang** (*Department of Chemistry, The Chinese University of Hong Kong, Hong Kong*)
12. Prof. **Xue Wang** (*School of Energy and Environment, City University of Hong, KongHong Kong*)
13. Prof. **Miao Zhong** (*College of Engineering and Applied Science, Nanjing University, China*)
14. Prof. **Shengjie Peng** (*College of Materials Science and Technology, Nanjing University of Aeronautics and Astronautics, China*)
15. Prof. **Yueming Zhai** (*The Institute for Advanced Studies, Wuhan University, China*)
16. Prof. **Nian-Tzu Suen** (*College of Chemistry and Chemical Engineering, Yangzhou University, China*)
17. Prof. **Weibo Hua** (*School of Chemical Engineering and Technology, Xi'an Jiaotong University, China*)
18. Prof. **Kunlong Liu** (*College of Chemistry, Fuzhou University, China*)
19. Prof. **Sibo Wang** (*College of Chemistry, Fuzhou University, China*)
20. Prof. **Yongjie Wang** (*School of Integrated Circuit, Harbin Institute of Technology, China*)
21. Prof. **Xuning Li** (*Dalian Institute of Chemical Physics, Chinese Academy of Sciences, China*)
22. Prof. **Chun-Chih Chang** (*Department of Chemical and Materials Engineering, Chinese Culture University*)
23. Dr. **Jiajian Gao** (*Institute of Sustainability for Chemicals, Energy, and Environment, A*STAR*)
24. Dr. **Ying-Rui Lu** (*National Synchrotron Radiation Research Center*)
25. Dr. **Chih-Wei Hu** (*National Synchrotron Radiation Research Center*)
26. Dr. **Yen-Fa Liao** (*National Synchrotron Radiation Research Center*)

Oral presentation & Invited talk (**Red** means English presentation)

55. **Invited talk** - NYCU-Kumamoto University Symposium, Kumamoto, Japan, 2025.

54. **Invited talk** - NYCU-Kyushu University Symposium, Fukuoka, Japan, 2025.
53. **Invited talk** - 2nd International Symposium on Advanced Renewables Generation, Electrocatalysis & Nanotechnology, Singapore, 2025.
52. **Invited talk** - 2030 Cross-Generation Young Scholars Symposium, Taipei, Taiwan, 2025
51. **Invited talk** - 10th Asia-Pacific Congress on Catalysis (APCAT-10), Singapore, 2025.
50. **Invited talk** - 7th International Conference on Chemical Engineering, Food and Bio Technology, Ho Chi Minh City, Vietnam, 2025.
- *Excellent oral presentation Award*
49. **Invited talk** - Chemistry National Meeting, Taichung, Taiwan, 2025.
48. **Invited talk** - 2nd International Symposium on Carbon Materials, New Taipei, Taiwan, 2025.
47. **Invited talk** - Department of Chemical and Biomolecular Engineering, National University of Singapore, Singapore, 2024.
46. **Invited talk** - 2024 Singapore International Chemistry Conference, Singapore, 2024.
45. **Invited talk** - 2024 RIES-CEFMS Symposium, Hsinchu, Taiwan, 2024.
44. **Invited talk** - NYCU-Gakushuin Student Symposium, Hsinchu, Taiwan, 2024.
43. **Invited talk** - PRiME 2024, Hawaii, USA, 2024.
42. **Invited talk** - Institute of Environmental Engineering, National Sun Yat-sen University, Kaohsiung, Taiwan, 2024.
41. **Invited talk** - Department of Chemistry, Fuzhou University, Fujian, China, 2024.
40. **Invited talk** - Institute of Chemistry, Academia Sinica, Taipei, Taiwan, 2024.
39. **Invited talk** - Chemistry National Meeting, New Taipei, Taiwan, 2024.
38. **Invited talk** - 1st International Symposium of Advanced Research in Green Energy and Nanotechnology, Hong Kong, 2024.
37. **Invited talk** - TW-TH Bilateral Catalysis Symposium, Bangkok, Thailand, 2023.
36. **Invited talk** - Department of Medicinal and Applied Chemistry, Kaohsiung Medical University, Kaohsiung, Taiwan, 2023.
35. **Invited talk** - International Conference on Green Electrochemical Technologies, Taipei, Taiwan, 2023.
34. **Invited talk** - Department of Chemistry, National Changhua University of Education, Changhua, Taiwan, 2023.
33. 18th National Conference on Hydrogen Energy and Fuel Cells, Hualien, Taiwan, 2023.
32. **Invited talk** - Taiwan-Japan Symposium on Reaction Control, Hsinchu, Taiwan, 2023.
31. **Invited talk** - Green Chemistry Workshop, Tainan, Taiwan, 2023.
30. **Invited talk** - Taiwan International Conference on Catalysts, Tainan, Taiwan, 2023.
29. **Invited talk** - Annual Meeting of Chemical Society Located in Taipei, Kaohsiung, Taiwan, 2023.
28. **Invited talk** - International Conference on Green Electrochemical Technologies, Hsinchu, Taiwan, 2022
27. **Invited talk** - Taiwan International Conference on Catalysts, Taipei, Taiwan, 2022
26. **Invited talk** - Annual Meeting of Chemical Society Located in Taipei, Taipei, Taiwan, 2022
25. **Invited talk** - Institute of Analytical and Environmental Sciences, National Tsing Hua University, Hsinchu, Taiwan, 2022.
24. **Invited talk** - Fall Meeting of Analytical Chemistry, Pingtung, Taiwan, 2022
23. **Invited talk** - 68th Annual Meeting of Taiwan Institute of Chemical Engineering, Kaohsiung, Taiwan, 2022
22. **Invited talk** - Hsinchu-branch Meeting of Chemical Society Located in Taipei, Hsinchu, Taiwan, 2021
21. **Invited talk** - XAS Journal Club from Europe and Asia-Oceania, 2021.

20. **Invited talk** - Department of Engineering and System Science, National Tsing Hua University, Hsinchu, Taiwan, 2021.
19. **Invited talk** - Department of Chemical Engineering, National Tsing Hua University, Hsinchu, Taiwan, 2021.
18. **Invited talk** - Department of Material Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan, 2021.
17. **Invited talk** - Annual Meeting of Chemical Society Located in Taipei, Taoyuan, Taiwan, 2021
16. **Invited talk** - Department of Chemical Engineering, National Cheng Kung University, Tainan, Taiwan, 2021.
15. **Invited talk** - Department of Chemistry, National Tsing Hua University, Hsinchu, Taiwan, 2020.
14. **Invited talk** - Center for Condensed Matter Sciences, National Taiwan University, Taipei, Taiwan, 2020.
13. **Invited talk** - Department of Material Science and Engineering, National Tsing Hua University, Hsinchu, Taiwan, 2020.
12. **Invited talk** - Annual Meeting of Catalysis Society of Taiwan, Taipei, Taiwan, 2020.
11. **Invited talk** - Department of Material Science and Engineering, Fuzhou University, Fujian, China, 2019.
10. **Invited talk** - Department of Electrical and Computer Engineering, Toronto University, Canada, 2018.
9. 24th User's Meeting & Workshops, National Synchrotron Radiation Research Center, Hsinchu, Taiwan, 2018.
 ➤ *Award of Recognition in student oral presentation in material science*
8. Symposium for Peking University-National Taiwan University, Taipei, Taiwan, 2018.
7. **HERCULES** (Higher European Research Course for Users of Large Experimental Systems) **European School**, 25 Feb - 30 Mar, Grenoble, France, 2018.
6. 23rd User's Meeting & Workshops, National Synchrotron Radiation Research Center, Hsinchu, Taiwan, 2017.
 ➤ *Award of Recognition in student oral presentation in material science*
5. Symposium for Peking University-National Taiwan University, Peking, China, 2017.
4. **253rd ACS National Meetings & Expositions, San Francisco, USA, 2017.**
3. **Invited talk** - National Synchrotron Radiation Research Center, Hsinchu, Taiwan, 2017.
2. 22nd User's Meeting & Workshops, National Synchrotron Radiation Research Center, Hsinchu, Taiwan, 2016.
 ➤ *Award of Outstanding Research in student oral presentation in material science*
1. 3th Annual Junior Chemist Meeting on Frontier Molecular Science, Yilan, Taiwan, 2016.

Poster presentation

11. 31th User's Meeting & Workshops, National Synchrotron Radiation Research Center, Hsinchu, Taiwan, 2025
10. 28th User's Meeting & Workshops, National Synchrotron Radiation Research Center, Hsinchu, Taiwan, 2022
9. 26th User's Meeting & Workshops, National Synchrotron Radiation Research Center, Hsinchu, Taiwan, 2020
8. 25th User's Meeting & Workshops, National Synchrotron Radiation Research Center, Hsinchu, Taiwan, 2019
7. IUPAC 2019, Paris, France, 2019
6. Annual Meeting of Chemical Society Located in Taipei, Kaohsiung, Taiwan, 2018

➤ **Outstanding Poster Award & IUPAC Poster Prize**

5. MRS Fall Meeting, Boston, USA, 2018
4. 12th International Symposium for Chinese Inorganic Chemists, Taipei, Taiwan, 2018
3. Graduate Student Poster Competition, National Taiwan University, 2018
- **Outstanding Poster Award of NTU Chemistry, PhD**
2. 3rd ACS Taiwan Chapter Graduate Student Conference, Taipei, Taiwan, 2018
1. 10th Exchange Symposium for Kanagawa University-National Taiwan University, Taipei, Taiwan, 2015

EDUCATIONAL ACTIVITIES

Teaching courses

11. **Inorganic Chemistry Research Techniques** (2025) - No assigned textbook.
10. **Inorganic Chemistry** (2024) - Textbook: "Inorganic Chemistry" Gary L. Moessler, Paul J. Foscher, Donald A. Tarr, Pearson, 2023.
9. **General Chemistry** (2024) - Textbook: "University Chemistry" Brian B. Laird, McGraw Hill, 2009.
8. **Inorganic Chemistry Research Techniques** (2024) - No assigned textbook.
7. **General Chemistry** (2023) - Textbook: "University Chemistry" Brian B. Laird, McGraw Hill, 2009.
6. **Inorganic Chemistry Research Techniques** (2023) - No assigned textbook.
5. **General Chemistry** (2022) - Textbook: "University Chemistry" Brian B. Laird, McGraw Hill, 2009.
4. **Inorganic Chemistry Research Techniques** (2022) - No assigned textbook.
3. **General Chemistry** (2021) - Textbook: "University Chemistry" Brian B. Laird, McGraw Hill, 2009.
2. **Inorganic Chemistry Research Techniques** (2021) - No assigned textbook.
1. **General Chemistry** (2020) - Textbook: "University Chemistry" Brian B. Laird, McGraw Hill, 2009.

Graduate Students (record 121)

24. **Yu-Jhih Shen** (PhD):

➤ Publications:

- (1) **Shen, Y.-J.;** Hsu, Y.-H.; Chang, Y.-C.; Ma, J.-J.; Peng, K.-S.; Lu, Y.-R.; Hsu, S.-H.; Hung, S.-F.* Microenvironment Matters: Copper-Carbon Composites Enable Highly Efficient Carbon Dioxide Reduction Reaction to C₂ Products. *ACS Appl. Mater. Interface* **2025**, *17*, 9378-9390.
- (2) Wang, M.; Li, Y.; Jia, J.; Ghosh, T.; Luo, P.; **Shen, Y.-J.;** Wang, S.; Zhang, J.; Xi, S.; Mi, Z.; Zhang, M.; Leow, W. R.; Johannessen, B.; Aabdin, Z.; Hung, S.-F.; Zhang, J.*; Lum, Y.* Tuning catalyst-support interactions enable steering of electrochemical CO₂ reduction pathways. *Sci. Adv.* **2025**, *11*, eado5000.

23. **Kang-Shun Peng** (PhD):

- *Gold Award at the 4th College Green Chemistry Creative Competition*, 2025.
- *Excellent Award in the student Oral Competition at International Conference on Green Electrochemical Technologies*, 2024
- *Lam Research Outstanding Science Award*, 2023.
- *Honorable Mention at Net Zero Tech International Contest at Taiwan*, 2023.
- Publications:

- (1) Zhao, T.; Cai, G.; Zhai, X.; Wang, S.; Yang, X.; **Peng, K.-S.**; Chen, M.-C.; Hung, S.-F.; Kong, X.; Li, M.; Tang, W.; Zhou, L.;* Hua, W.* Impact of Surface Li-containing Rock-salt Phase on Electrochemical Performance of Li- and Mn-rich Cathodes. *J. Power Sources* **2025**, 649, 237445.
- (2) Li, J.; Zhao, J.; Wang, S.;* **Peng, K.-S.**; Su, B.; Liu, K.; Hung, S.-F.; Huang, M.; Zhang, G.; Zhang, H.; Wang, X.* Activating Lattice Oxygen in Perovskite Ferrite for Efficient and Stable Photothermal Dry Reforming of Methane. *J. Am. Chem. Soc.* **2025**, 147, 14705-14714.
- (3) Shen, Y.-J.; Hsu, Y.-H.; Chang, Y.-C.; Ma, J.-J.; **Peng, K.-S.**; Lu, Y.-R.; Hsu, S.-H.; Hung, S.-F.* Microenvironment Matters: Copper-Carbon Composites Enable Highly Efficient Carbon Dioxide Reduction Reaction to C2 Products. *ACS Appl. Mater. Interface* **2025**, 17, 9378-9390.
- (4) Liu, F.; Deng, J. Su, B.; **Peng, K.-S.**; Liu, K.;* Lin, X.; Hung, S.-F.,* Chen, X.; Lu, X. F.; Fang, Y.; Zhang, G.; Wang, S.* Poly(triazine imide) Crystals for Efficient CO2 Photoreduction: Surface Pyridine Nitrogen Dominates the Performance. *ACS Catal.* **2025**, 15, 1018-1026.
- (5) Ma, J.-J.; Chueh, Y.-T.; Chen, Y.-Y.; Hsu, Y.-H.; Liu, Y.-C.; **Peng, K.-S.**; Hu, C.-W.; Lu, Y.-R.; Shao, Y.-C.; Hsu, S.-H.; Hung, S.-F.* Robust Iron-Doped Nickel Phosphides in Membrane-Electrode Assembly for Industrial Water Electrolysis. *Electrochim. Acta* **2024**, 500, 144744.
- (6) Zeng, W.-J.;† Ma, J.-J.;† Huang, W.-Y.; Lee, T.-J.; Lin, Z.-Y.; **Peng, K.-S.**; Hiraoka, N.; Liao, Y.-F.; Lu, Y.-R.; Hu, C.-W.;* Hsu, S.-H.;* Hung, S.-F.* Leveraging Bifunctional Phosphide-based Catalysts in a Membrane-Electrode-Assembly to Achieve Industrial Hydrogen Production. *Mater. Today Sustain.* **2024**, 27, 100820. (†These authors equally contribute to this work)
- (7) Lin, Z.-Y.; Chang, Y.-C.; Chen, Y.-Y.; Hsu, Y.-H.; **Peng, K.-S.**; Hung, S.-F.* Operando Studies for CO₂/CO Reduction in Flow-Based Devices. *ChemNanoMat* **2024**, 10, e202400070. (Special collection: *Early Career Researcher 2023*)
- (8) Hao, Y.; Hung, S.-F.; Tian, C.; Wang, L.; Chen, Y.-Y.; Zhao, S.; **Peng, K.-S.**; Zhang, C.; Zhang, Y.; Kuo, C.-H.; Chen, H.-Y.; Peng, S.* Polarized Ultrathin BN Induced Dynamic Electron Interactions for Enhancing Acidic Oxygen Evolution. *Angew. Chem. Int. Ed.* **2024**, e202402018.
- (9) Wu, F.-Y.; Tsai, H.-J.; Lee, T.-J.; Lin, Z.-Y.; **Peng, K.-S.**; Chen, P.-H.; Hiraoka, N.; Liao, Y.-F.; Hu, C.-W.; Hsu, S.-H.; Lu, Y.-R.;* Hung, S.-F.* Copper-Barium-Decorated-Carbon-Nanotube Composite for Electrocatalytic CO₂ Reduction to C2 Products. *J. Mater. Chem. A* **2023**, 11, 13217-13222. (Themed collection: *Journal of Materials Chemistry A Emerging Investigators*)

22. **Yu-Cheng Liu** (PhD):

21. **Shuo-Peng Lin** (Master 2027):

➤ *Judges' Award of Wah Lee Materials Competition* in the Materials Research Society, Taiwan, 2024.

20. **Chi Kang** (Master 2027):

➤ *IUPAC Poster Prize*, 2025.

➤ *CTCI Foundation Chemistry Award for Outstanding College Students*, 2025

➤ *Excellent Poster Prize* at the 2025 Chemistry National Meeting.

➤ *Judges' Award of Wah Lee Materials Competition* in the Materials Research Society, Taiwan, 2024.

➤ *Excellent Poster Gold Award* at the International Electron Devices & Materials Symposium, 2024.

19. **Ming-Hsuan Li** (Master 2026):

➤ *College Student Research Scholarship, 2023.*

18. **Ya-Ching Chang** (Master 2026):

17. **Ching-Hsuan Chou** (Master 2026):

16. **Yu-Chia Chang** (Master 2025):

➤ *The Phi Tau Phi Scholastic Honorary Member, 2025*

➤ *Merck Young Scientist - Outstanding Poster Award, 2025.*

➤ *Lam Research Outstanding Science Award, 2024.*

➤ Publications:

(1) Wang, M.; Luo, C.; Mi, Z.; **Chang, Y.-C.**; Chueh, Y.-T.; Luo, P.; Zhang, M.; Zhang, J.; Yang, R.; Yang, Q.; Wang, S.; Chen, S.; Jia, J.; Leow, W. R.; Aabdin, Z.; Hung, S.-F.; Lum, Y.* Triple-Phase Boundaries Enable Selective Urea Production from Simulated Flue Gas in a Zero-Gap Electrolyzer. *Angew. Chem. Int. Ed.* **2025**, 64, e202505987.

(2) Shen, Y.-J.; Hsu, Y.-H.; **Chang, Y.-C.**; Ma, J.-J.; Peng, K.-S.; Lu, Y.-R.; Hsu, S.-H.; Hung, S.-F.* Microenvironment Matters: Copper-Carbon Composites Enable Highly Efficient Carbon Dioxide Reduction Reaction to C₂ Products. *ACS Appl. Mater. Interface* **2025**, 17, 9378-9390.

(3) Lin, Z.-Y.; **Chang, Y.-C.**; Chen, Y.-Y.; Hsu, Y.-H.; Peng, K.-S.; Hung, S.-F.* Operando Studies for CO₂/CO Reduction in Flow-Based Devices. *ChemNanoMat* **2024**, 10, e202400070. (Special collection: *Early Career Researcher 2023*)

15. **Yung-Hsi Hsu** (Master 2025): Silver -Modified Hollow-Shelled Cu₂O Nanoparticles Enable Ampere-Level Electrocatalytic CO₂RR to C₂⁺ Products

➤ *Gold Award at the 4th College Green Chemistry Creative Competition, 2025.*

➤ *Excellent Poster Prize* at the 2025 Chemistry National Meeting.

➤ Publications:

(1) Wei, F.; Zhao, J.; Liu, Y.-C.; **Hsu, Y.-H.**; Hung, S.-F.; Fu, J.; Liu, K.; Lin, W.; Yum, Z.; Tan, L.; Lu, X. F.; Feng, C.; Zhang, H.;*Wang, S.* Photocatalytic ethylene production over defective NiO through lattice oxygen participation, *Nature Commun.* **2025**, 16, 6586.

(2) Yang, Q.; Wang, X.; Zhang, J.; Mao, Y.; Xi, S.; Liu, Y.-C.; **Hsu, Y.-H.**; Zhang, L.; Dolmanan, S. B.; Wang, M.; Wang, B.; Zang, Y.; Zhang, M.; Leow, W. R.; Hung, S.-F.; Wang, Z.;* Lum, Y.* Dopant-induced switch in rate-determining step enables high current ethylene electrosynthesis at <2 V full-cell voltage. *Nature Synth.* **2025**, *accepted*.

(3) Chen, M.; Tan, S. X.; Cheng, S.; Chen, Y.-Y.; **Hsu, Y.-H.**; Hung, S.-F.; Zhang, L.; Gao, J. Revisiting the Ruthenium Oxide-based Water Oxidation Catalysts in Acidic Media: from Amorphous to Crystalline. *Nano Energy* **2025**, 137, 110800.

(4) Shen, Y.-J.; **Hsu, Y.-H.**; Chang, Y.-C.; Ma, J.-J.; Peng, K.-S.; Lu, Y.-R.; Hsu, S.-H.; Hung, S.-F.* Microenvironment Matters: Copper-Carbon Composites Enable Highly Efficient Carbon Dioxide Reduction Reaction to C₂ Products. *ACS Appl. Mater. Interface* **2025**, 17, 9378-9390.

(5) Ma, J.-J.; Chueh, Y.-T.; Chen, Y.-Y.; **Hsu, Y.-H.**; Liu, Y.-C.; Peng, K.-S.; Hu, C.-W.; Lu, Y.-R.; Shao, Y.-C.; Hsu, S.-H.; Hung, S.-F.* Robust Iron-Doped Nickel Phosphides in Membrane-Electrode Assembly for Industrial Water Electrolysis. *Electrochim. Acta* **2024**, 500, 144744.

- (6) Lin, Z.-Y.; Chang, Y.-C.; Chen, Y.-Y.; **Hsu, Y.-H.**; Peng, K.-S.; Hung, S.-F.* Operando Studies for CO₂/CO Reduction in Flow-Based Devices. *ChemNanoMat* **2024**, *10*, e202400070. (Special collection: *Early Career Researcher 2023*)
14. **Yu-Ting Chueh** (Master 2025): Ce Decorated Carboxylic Acid-Based Iron Nickel Metal-Organic Framework Electrocatalysts for Alkaline Water Electrolysis in Membrane Electrode Assembly.
- *Honorable Mention for Thesis, Department of Applied Chemistry, National Yang Ming Chiao Tung University, 2025.*
 - Publications:
 - (1) Wang, M.; Luo, C.; Mi, Z.; Chang, Y.-C.; **Chueh, Y.-T.**; Luo, P.; Zhang, M.; Zhang, J.; Yang, R.; Yang, Q.; Wang, S.; Chen, S.; Jia, J.; Leow, W. R.; Aabdin, Z.; Hung, S.-F.; Lum, Y.* Triple-Phase Boundaries Enable Selective Urea Production from Simulated Flue Gas in a Zero-Gap Electrolyzer. *Angew. Chem. Int. Ed.* **2025**, *64*, e202505987.
 - (2) Ma, J.-J.; **Chueh, Y.-T.**; Chen, Y.-Y.; Hsu, Y.-H.; Liu, Y.-C.; Peng, K.-S.; Hu, C.-W.; Lu, Y.-R.; Shao, Y.-C.; Hsu, S.-H.; Hung, S.-F.* Robust Iron-Doped Nickel Phosphides in Membrane-Electrode Assembly for Industrial Water Electrolysis. *Electrochim. Acta* **2024**, *500*, 144744.
13. **Yu-Chun Liu** (Master 2025): Tandem Catalysis System Utilizing Three-Dimensional Covalent Organic Frameworks Molecule on Copper Nanowire for Enhanced Electrocatalytic CO₂ Reduction to C₂ Products.
- *Gold Award at the 4th College Green Chemistry Creative Competition, 2025.*
 - *Best Award in the student Poster Competition at International Conference on Green Electrochemical Technologies, 2024.*
 - Publications:
 - (1) Wei, F.; Zhao, J.; **Liu, Y.-C.**; Hsu, Y.-H.; Hung, S.-F.; Fu, J.; Liu, K.; Lin, W.; Yum, Z.; Tan, L.; Lu, X. F.; Feng, C.; Zhang, H.;*Wang, S.* Photocatalytic ethylene production over defective NiO through lattice oxygen participation, *Nature Commun.* **2025**, *16*, 6586.
 - (2) Yang, Q.; Wang, X.; Zhang, J.; Mao, Y.; Xi, S.; **Liu, Y.-C.**; Hsu, Y.-H.; Zhang, L.; Dolmanan, S. B.; Wang, M.; Wang, B.; Zang, Y.; Zhang, M.; Leow, W. R.; Hung, S.-F.; Wang, Z.* Lum, Y.* Dopant-induced switch in rate-determining step enables high current ethylene electrosynthesis at <2 V full-cell voltage. *Nature Synth.* **2025**, *accepted*.
 - (3) Ma, J.-J.; Chueh, Y.-T.; Chen, Y.-Y.; Hsu, Y.-H.; **Liu, Y.-C.**; Peng, K.-S.; Hu, C.-W.; Lu, Y.-R.; Shao, Y.-C.; Hsu, S.-H.; Hung, S.-F.* Robust Iron-Doped Nickel Phosphides in Membrane-Electrode Assembly for Industrial Water Electrolysis. *Electrochim. Acta* **2024**, *500*, 144744.
12. **Jian-Jie Ma** (Master 2024): Chemical-Vapor-Deposition Enhanced Chromium doping in Iron-Cobalt Oxide for Efficient Alkaline Seawater Electrolysis in Membrane Electrode Assemblies.
- *Honorable Mention in Chao-Ting Chang Inorganic Chemistry, Chemical Society Located in Taipei, 2025.*
 - *Excellent Poster Prize at the 2024 Chemistry National Meeting.*
 - *Honorable Mention for poster competition in electrochemical driven conversion at International Conference on Green Electrochemical Technologies, 2023.*
 - *Honorable Mention at Net Zero Tech International Contest at Taiwan, 2023.*
 - Publications:
 - (1) Wang, L, Hung, S.-F.; Zhao, S.; Wang, Y.; Bi, S.; Li, S.; **Ma, J.-J.**; Zhang, C.; Zhang, Y.; Li, L.; Chen, T.-Y.; Chen, H.-Y.; Wu, Y.; Peng, S. Modulating the covalency of Ru-

O bonds by dynamic reconstruction for efficient acidic oxygen evolution. *Nature Commun.* **2025**, *16*, 3502..

- (2) Kibria, Md G.; Kumar, P.; Zhang, H.; Yohannes, A.; Wang, J.; Zeraati, A. S.; Roy, S.; Wang, X.; Kannimuthu, K.; Askar, A.; Miller, K. A.; Ling, K.; Adnan, M.; Hung, S.-F.; **Ma, J.-J.**; Huang, W.-H.; Trivedi, D.; Molina, M.; Zhao, H.; Martí, A.; Leontowich, A.; Shimizu, G.; Sinton, D.; Adachi, M.; Wu, Y.; Ajayan, P.; Siahrostami, S.; Hu, J. Isolated iridium oxide sites on modified carbon nitride for photoreforming of plastic derivatives. *Nature Commun.* **2025**, *16*, 2862.
 - (3) Shen, Y.-J.; Hsu, Y.-H.; Chang, Y.-C.; **Ma, J.-J.**; Peng, K.-S.; Lu, Y.-R.; Hsu, S.-H.; Hung, S.-F.* Microenvironment Matters: Copper-Carbon Composites Enable Highly Efficient Carbon Dioxide Reduction Reaction to C2 Products. *ACS Appl. Mater. Interface* **2025**, *17*, 9378-9390.
 - (4) Zhao, T.; Zhang, J.; Wang, K.; Xiao, Y.; Wang, Q.; Li, L.; Tseng, J.; Chen, M.-C.; **Ma, J.-J.**; Lu, Y.-R.; Hirofumi, I.; Shao, Y.-C.; Zhao, X.; Hung, S.-F.; Su, Y.; Mu, X.; Hua, W. Exploring the mechanism of surface cationic vacancy induced high activity of metastable lattice oxygen in Li-and Mn-rich cathode materials. *Angew. Chem. Int. Ed.* **2025**, *64*, e202419664.
 - (5) Zhang, J.; Zhai, X.; Zhao, T.; Yang, X.; Wang, Q.; Chen, Z.; Chen, M.-C.; **Ma, J.-J.**; Lu, Y.-R.; Hung, S.-F.; Hua, W.* What impact does ammonia have on the microstructure of the precursor and the electrochemical performance of Ni-rich layered oxides? *J. Mater. Chem. A* **2025**, *13*, 1181-1190.
 - (6) Yang, B.; Liu, K.; Ma, Y.; **Ma, J.-J.**; Chen, Y.-Y.; Huang, M.; Yang, C.; Hou, Y.; Hung, S.-F.; Yu, J. C.; Zhang, J.; Wang, X. Incorporation of Pd Single-atom Sites in Perovskite with an Excellent Selectivity toward Photocatalytic Semihydrogenation of Alkynes. *Angew. Chem. Int. Ed.* **2024**, *63*, e202410394.
 - (7) **Ma, J.-J.**; Chueh, Y.-T.; Chen, Y.-Y.; Hsu, Y.-H.; Liu, Y.-C.; Peng, K.-S.; Hu, C.-W.; Lu, Y.-R.; Shao, Y.-C.; Hsu, S.-H.; Hung, S.-F.* Robust Iron-Doped Nickel Phosphides in Membrane-Electrode Assembly for Industrial Water Electrolysis. *Electrochim. Acta* **2024**, *500*, 144744.
 - (8) Zeng, W.-J.;[†] **Ma, J.-J.**;[†] Huang, W.-Y.; Lee, T.-J.; Lin, Z.-Y.; Peng, K.-S.; Hiraoka, N.; Liao, Y.-F.; Lu, Y.-R.; Hu, C.-W.;* Hsu, S.-H.;* Hung, S.-F.* Leveraging Bifunctional Phosphide-based Catalysts in a Membrane-Electrode-Assembly to Achieve Industrial Hydrogen Production. *Mater. Today Sustain.* **2023**, *27*, 100820. ([†]These authors equally contribute to this work)
 - (9) Lin, T.-Y.;* Hsieh, C.-F.; Kanai, A.; Yashiro, T.; Zeng, W.-J.; **Ma, J.-J.**; Hung, S.-F.; Sugiyama, M. Radiation Resistant Chalcopyrite CIGS Solar Cells: Proton Damage Shielding with Cs Treatment and Defect Healing via Heat-light Soaking. *J. Mater. Chem. A* **2024**, *12*, 7536-7548. (**Cover**)
11. **Yi-Yu Chen** (Master 2024): Pulsed Electrochemical Flow System Using Cu₂O Nanowires for CO₂ Reduction to Enhance Ethanol Production.
- Honorable Mention at Net Zero Tech International Contest at Taiwan, 2023.
 - Publications:
 - (1) Chen, M.; Tan, S. X.; Cheng, S.; **Chen, Y.-Y.**; Hsu, Y.-H.; Hung, S.-F.; Zhang, L.; Gao, J. Revisiting the Ruthenium Oxide-based Water Oxidation Catalysts in Acidic Media: from Amorphous to Crystalline. *Nano Energy* **2025**, *137*, 110800.
 - (2) Yang, B.; Liu, K.; Ma, Y.; Ma, J.-J.; **Chen, Y.-Y.**; Huang, M.; Yang, C.; Hou, Y.; Hung, S.-F.; Yu, J. C.; Zhang, J.; Wang, X. Incorporation of Pd Single-atom Sites in Perovskite

with an Excellent Selectivity toward Photocatalytic Semihydrogenation of Alkynes. *Angew. Chem. Int. Ed.* **2024**, 63, e202410394.

- (3) Ma, J.-J.; Chueh, Y.-T.; **Chen, Y.-Y.**; Hsu, Y.-H.; Liu, Y.-C.; Peng, K.-S.; Hu, C.-W.; Lu, Y.-R.; Shao, Y.-C.; Hsu, S.-H.; Hung, S.-F.* Robust Iron-Doped Nickel Phosphides in Membrane-Electrode Assembly for Industrial Water Electrolysis. *Electrochim. Acta* **2024**, 500, 144744.
- (4) Lin, Z.-Y.; Chang, Y.-C.; **Chen, Y.-Y.**; Hsu, Y.-H.; Peng, K.-S.; Hung, S.-F.* Operando Studies for CO₂/CO Reduction in Flow-Based Devices. *ChemNanoMat* **2024**, 10, e202400070. (Special collection: *Early Career Researcher 2023*)
- (5) Hao, Y.; Hung, S.-F.; Tian, C.; Wang, L.; **Chen, Y.-Y.**; Zhao, S.; Peng, K.-S.; Zhang, C.; Zhang, Y.; Kuo, C.-H.; Chen, H.-Y.; Peng, S.* Polarized Ultrathin BN Induced Dynamic Electron Interactions for Enhancing Acidic Oxygen Evolution. *Angew. Chem. Int. Ed.* **2024**, e202402018.

10. **Meng-Cheng Chen** (Master 2024): Self-Assembling of Neatly-Arranged Nickel Single-Atom Catalysts on Carbon Nanofiber for Industrial CO₂-to-CO Conversion.

- *Excellent Thesis Award, Department of Applied Chemistry, National Yang Ming Chiao Tung University, 2024*
- *Merck Young Scientist - Outstanding Poster Award, 2024.*
- *Honorable Mention at Net Zero Tech International Contest at Taiwan, 2023.*
- Publications:

- (1) Zhao, T.; Cai, G.; Zhai, X.; Wang, S.; Yang, X.; Peng, K.-S.; **Chen, M.-C.**; Hung, S.-F.; Kong, X.; Li, M.; Tang, W.; Zhou, L.*; Hua, W.* Impact of Surface Li-containing Rock-salt Phase on Electrochemical Performance of Li- and Mn-rich Cathodes. *J. Power Sources* **2025**, 649, 237445.
- (2) Zhao, T.; Zhang, J.; Wang, K.; Xiao, Y.; Wang, Q.; Li, L.; Tseng, J.; **Chen, M.-C.**; Ma, J.-J.; Lu, Y.-R.; Hirofumi, I.; Shao, Y.-C.; Zhao, X.; Hung, S.-F.; Su, Y.; Mu, X.; Hua, W. Exploring the mechanism of surface cationic vacancy induced high activity of metastable lattice oxygen in Li-and Mn-rich cathode materials. *Angew. Chem. Int. Ed.* **2025**, 64, e202419664.
- (3) Fan, L.; Li, F.; Liu, T.; Huang, J. E.; Miao, R. K.; Yan, Y.; Feng, S.; Tai, C.-W.; Hung, S.-F.; Tsai, H.-J.; **Chen, M.-C.**; Bai, Y.; Kim, D.; Park, S.; Papangelakis, P.; Wu, C.; Zeraati, A. S.; Dorakhan, R.; Sun, L.*; Sinton, D.*; Sargent, E. H.* Atomic-level Cu active sites enable CO₂ reduction to multi-carbon products in strong acid. *Nature Synth.* **2025**, 4, 262-270.
- (4) Zhang, J.; Zhai, X.; Zhao, T.; Yang, X.; Wang, Q.; Chen, Z.; **Chen, M.-C.**; Ma, J.-J.; Lu, Y.-R.; Hung, S.-F.; Hua, W.* What impact does ammonia have on the microstructure of the precursor and the electrochemical performance of Ni-rich layered oxides? *J. Mater. Chem. A* **2025**, 13, 1181-1190.
- (5) Wu, Q.;† Du, R.;† Wang, P.; Waterhouse, G. I.N.*; Li, J.; Qiu, Y.; Yan, K.; Zhao, Y.; Zhao, W.-W.; Tsai, H.-J.; **Chen, M.-C.**; Hung, S.-F.*; Wang, X.*; Chen, G.* Nanograin boundary-abundant Cu₂O-Cu Nanocubes with High C₂⁺ Selectivity and Good Stability during Electrochemical CO₂ Reduction at a Current Density of 500 mA/cm². *ACS Nano* **2023**, 17, 12884-12894.

9. **Guan-Lin Chen** (Master 2024): Silver-Modified Cu₂O Nanocavities for Electrocatalytic CO₂ Reduction to C₂⁺Product.

- Publications:

- (1) Wei, Z.; Ding, J.; Duan, X.; **Chen, G.-L.**; Wu, F.-Y.; Zhang, L.; Yang, X.; Zhang, Q.; He, Q.; Chen, Z.; Huang, J.; Hung, S.-F.*; Yang, X.*; Zhai, Y.* Enhancing Selective

Electrochemical CO₂ Reduction by In Situ Constructing Tensile Strained Cu Catalysts. *ACS Catal.* **2023**, *13*, 4711-4718.

- (2) Lee, S.;[†] Park, S. M.;[†] Jung, E. D.;[†] Zhu, T.;[†] Pina, J. M.; Anwar, H.; Wu, F.-Y.; **Chen, G.-L.**; Dong, Y.; Cui, T.; Wei, M.; Bertens, K.; Wang, Y.-K.; Chen, B.; Filleter, T.; Hung, S.-F.; Won, Y.-H.; Kim, K.-H.; Hoogland, S.; Sargent, E. H.* Dipole Engineering Through the Orientation of Interface Molecules for Efficient InP Quantum Dot Light-Emitting Diodes. *J. Am. Chem. Soc.* **2022**, *144*, 20923-20930.
- (3) Hung, S.-F.;* Wu, F.-Y.; Lu, Y.-H.; Lee, T.-J.; Tsai, H.-J.; Chen, P.-H.; Lin, Z.-Y.; **Chen, G.-L.**; Huang, W.-Y.; Zeng, W.-J. Operando X-ray Absorption Spectroscopic Studies of Carbon Dioxide Reduction Reaction in a Modified Flow Cell. *Catal. Sci. Technol.* **2022**, *12*, 2739-2743. (Themed collection: *In situ and operando spectroscopy in catalysis*, **Back cover**)

8. **Hsin-Jung Tsai** (Master 2023): Carbon Nanofiber-supported Nickel Single-Atom Catalyst for the Industrial CO₂-to-CO Conversion.

- *Honorable Mention in Chao-Ting Chang Inorganic Chemistry, Chemical Society Located in Taipei, 2024*
- *Everlight Thesis Award in Green Chemistry, 2024*
- *Graduate Student Thesis Award, Distinguished Honor, Department of Applied Chemistry, National Yang Ming Chiao Tung University, 2023*
- *Gold Award at the 3rd College Green Chemistry Creative Competition, 2023.*
- *IUPAC Poster Prize, 2023.*
- *Excellent Poster Prize at the Annual Meeting of Chemical Society Located in Taipei, 2023.*
- *Gold Award for poster competition in electrochemical driven conversion at International Conference on Green Electrochemical Technologies, 2022*
- *Third place of SDGs Student Research Poster Award at 2022 Conference on Institutional Research and Sustainable Development Goals/University Social Responsibility.*
- *Judges' Award of Wah Lee Materials Competition in the Materials Research Society, Taiwan, 2022.*
- Publications:
 - (1) Fan, L.; Li, F.; Liu, T.; Huang, J. E.; Miao, R. K.; Yan, Y.; Feng, S.; Tai, C.-W.; Hung, S.-F.; **Tsai, H.-J.**; Chen, M.-C.; Bai, Y.; Kim, D.; Park, S.; Papangelakis, P.; Wu, C.; Zeraati, A. S.; Dorakhan, R.; Sun, L.;* Sinton, D.;* Sargent, E. H.* Atomic-level Cu active sites enable CO₂ reduction to multi-carbon products in strong acid. *Nature Synth.* **2025**, *4*, 262-270.
 - (2) Xu, Z.;[†] Lu, R.;[†] Lin, Z.-Y.;[†] Wu, W.; **Tsai, H.-J.**; Lu, Q.; Li, Y. C.; Hung, S.-F.;* Song, C.; Yu, J. C.; Wang, Z.;* Wang, Y.* Electroreduction of CO₂ to Methane with Triazole Molecular Catalysts. *Nature Energy* **2024**, *9*, 1397-1406.
 - (3) Yang, X.; Wang, S.; Li, H.; Peng, J.; Zeng, W.-J.; **Tsai, H.-J.**; Hung, S.-F.; Indris, S.; Li, F.; Hua, W.* Boosting the Ultra-stable High-Na-Content P2-Type Layered Cathode Materials with Zero Strain Cation Storage via a Lithium Dual-Site Substitution Approach. *ACS Nano* **2023**, *17*, 18616-18628.
 - (4) Zhang, Q.;[†] **Tsai, H.-J.**;[†] Li, F.; Ding, J.; He, Q.; Wei, Z.; Liu, Y.; Lin, Z.-Y.; Yang, X.; Chen, Z.; Yang, X.; Tang, Q.;* Yang, H. B.;* Hung, S.-F.;* and Zhai, Y.* Boosting the Proton-coupled Electron Transfer via Fe-P Atomic Pair for Enhanced Electrochemical CO₂ Reduction. *Angew. Chem. Int. Ed.* **2023**, *62*, e202311550.
 - (5) He, Q.; Ding, J.; **Tsai, H.-J.**; Liu, Y.; Wei, M.; Zhang, Q.; Wei, Z.; Chen, Z.; Huang, J.; Hung, S.-F.;* Yang, H.; Zhai, Y.* Boosting Photocatalytic Hydrogen Peroxide

Production by Regulating Electronic Configuration of Single Sb Atoms via Carbon Vacancies in Carbon Nitrides. *J. Colloid Interface Sci.* **2023**, *651*, 18-26.

- (6) Wu, Q.;[†] Du, R.;[†] Wang, P.; Waterhouse, G. I.N.;* Li, J.; Qiu, Y.; Yan, K.; Zhao, Y.; Zhao, W.-W.; **Tsai, H.-J.**; Chen, M.-C.; Hung, S.-F.;* Wang, X.;* Chen, G.* Nanograin boundary-abundant Cu₂O-Cu Nanocubes with High C₂⁺ Selectivity and Good Stability during Electrochemical CO₂ Reduction at a Current Density of 500 mA/cm². *ACS Nano* **2023**, *17*, 12884-12894.
- (7) Wu, F.-Y.; **Tsai, H.-J.**; Lee, T.-J.; Lin, Z.-Y.; Peng, K.-S.; Chen, P.-H.; Hiraoka, N.; Liao, Y.-F.; Hu, C.-W.; Hsu, S.-H.; Lu, Y.-R.;* Hung, S.-F.* Copper-Barium-Decorated-Carbon-Nanotube Composite for Electrocatalytic CO₂ Reduction to C₂ Products. *J. Mater. Chem. A* **2023**, *11*, 13217-13222. (Themed collection: *Journal of Materials Chemistry A Emerging Investigators*)
- (8) Deng, Y.;[†] Zhao, J.;[†] Wang, S.;[†] Chen, R.; **Tsai, H.-J.**; Zeng, W.-J.; Hung, S.-F.; Xu, W.; Wang, J.; Li, X.;* Liu, B.;* Huang, Y.* Operando Spectroscopic Analysis of Axial Oxygen Coordinated Single-Sn-Atom Sites for Electrochemical CO₂ Reduction. *J. Am. Chem. Soc.* **2023**, *145*, 7242-7251. (**Cover**)
- (9) Xu, A.;[†] Hung, S.-F.;[†] Cao, A.;[†] Wang, Z.;[†] Karmodak, N.; Huang, J. E.; Yan, Y.; Rasouli, A. S.; Ozden, A.; Wu, F.-Y.; Lin, Z.-Y.; **Tsai, H.-J.**; Lee, T.-J.; Li, F.; Luo, M.; Wang, Y.; Wang, X.; Abed, J.; Wang, Z.; Nam, D.-H.; Li, C. Y.; Ip, A. H.; Sinton, D.; Dong, C.;* Sargent, E. H.* Stable Cu: Alkali Earth Metal Oxide Interfaces for Electrochemical CO₂ to Alcohols by Selective Hydrogenation. *Nature Catal.* **2022**, *5*, 1081-1088.
- (10) Lu, Y.-H.;[†] **Tsai, H.-J.**;[†] Huang, W.-Y.; Lee, T.-J.; Lin, Z.-Y.; Hsu, S.-H.;* Hung, S.-F.* A Nitrogen-doped Graphene-supported Nickel-single-atom Catalyst in the Flow Cell Meets the Industrial Criteria of Carbon Dioxide Reduction Reaction to Carbon Monoxide. *Front. Catal.* **2022**, *2*, 915971.
- (11) Hung, S.-F.;* Wu, F.-Y.; Lu, Y.-H.; Lee, T.-J.; **Tsai, H.-J.**; Chen, P.-H.; Lin, Z.-Y.; Chen, G.-L.; Huang, W.-Y.; Zeng, W.-J. Operando X-ray Absorption Spectroscopic Studies of Carbon Dioxide Reduction Reaction in a Modified Flow Cell. *Catal. Sci. Technol.* **2022**, *12*, 2739-2743. (Themed collection: *In situ and operando spectroscopy in catalysis*, **Back cover**)

7. **Zih-Yi Lin** (Master 2023): Metal-organic-framework-derived Tubular Copper Electrocatalysts for Efficient CO₂ Electroreduction to C₂⁺ Products.

- *Honorable Poster Prize* at Taipei International Conference on Catalysts, Taiwan, 2023.
- *Gold Award at the 3rd Symposium on Nano-Device Circuits and Technologies*, 2023.
- *Gold Award at the 3rd College Green Chemistry Creative Competition*, 2023.
- *Honorable Mention for poster competition in electrochemical driven conversion* at International Conference on Green Electrochemical Technologies, 2022
- *Third place of SDGs Student Research Poster Award* at 2022 Conference on Institutional Research and Sustainable Development Goals/University Social Responsibility.
- *Judges' Award of Wah Lee Materials Competition* in the Materials Research Society, Taiwan, 2022.
- Publications:
 - (1) Hao, Y.; Hung, S.-F.; Wang, L.; Deng, L.; Zeng, W.-J.; Zhang, C.; **Lin, Z.-Y.**; Kuo, C.-H.; Wang, Y.; Zhang, Y.; Chen, H.-Y.; Hu, F.; Li, L.; Peng, S.* Designing neighboring-site activation of single atom via tunnel ions for boosting acidic oxygen evolution. *Nature Commun.* **2024**, *15*, 8015.

- (2) Xu, Z.;[†] Lu, R.;[†] **Lin, Z.-Y.**;[†] Wu, W.; Tsai, H.-J.; Lu, Q.; Li, Y. C.; Hung, S.-F.;^{*} Song, C.; Yu, J. C.; Wang, Z.;^{*} Wang, Y.* Electroreduction of CO₂ to Methane with Triazole Molecular Catalysts. *Nature Energy* **2024**, 9, 1397-1406.
- (3) Deng, L.; Hung, S.-F.; Liu, S.; Zhao, S.; **Lin, Z.-Y.**; Zhang, C.; Zhang, Y.; Wang, A.-Y.; Chen, H.-Y.; Peng, J.; Ma, R.; Jiao, L.; Hu, F.; Li, L.; Peng, S.* Accelerated Proton Transfer in Asymmetric Active Units for Sustainable Acidic Oxygen Evolution Reaction. *J. Am. Chem. Soc.* **2024**, 146, 23146-23157.
- (4) Zeng, W.-J.;[†] Ma, J.-J.;[†] Huang, W.-Y.; Lee, T.-J.; **Lin, Z.-Y.**; Peng, K.-S.; Hiraoka, N.; Liao, Y.-F.; Lu, Y.-R.; Hu, C.-W.;^{*} Hsu, S.-H.;^{*} Hung, S.-F.* Leveraging Bifunctional Phosphide-based Catalysts in a Membrane-Electrode-Assembly to Achieve Industrial Hydrogen Production. *Mater. Today Sustain.* **2023**, 27, 100820. ([†]These authors equally contribute to this work)
- (5) **Lin, Z.-Y.**; Chang, Y.-C.; Chen, Y.-Y.; Hsu, Y.-H.; Peng, K.-S.; Hung, S.-F.* Operando Studies for CO₂/CO Reduction in Flow- Based Devices. *ChemNanoMat* **2024**, 10, e202400070. (Special collection: *Early Career Researcher 2023*)
- (6) Deng, L.; Hung, S.-F.; Zhao, S.; Zeng, W.-J.; **Lin, Z.-Y.**; Hu, F.; Xie, Y.; Yin, L.; Li, L.; Peng, S.* Unveiling Coordination Transformation for Dynamically Enhanced Hydrogen Evolution Catalysis. *Energy Environ. Sci.* **2023**, 16, 5220-5230.
- (7) Deng, L.; Hung, S.-F.; **Lin, Z.-Y.**; Zhang, Y.; Zhang, C.; Hao, Y.; Liu, S.; Kuo, C.-H.; Chen, H.-Y.; Peng, J.; Wang, J.; Peng, S.* Valence Oscillation of Ru Active Sites for Efficient and Robust Acidic Water Oxidation. *Adv. Mater.* **2023**, 35, 2305939.
- (8) Zhang, Q.;[†] Tsai, H.-J.;[†] Li, F.; Ding, J.; He, Q.; Wei, Z.; Liu, Y.; **Lin, Z.-Y.**; Yang, X.; Chen, Z.; Yang, X.; Tang, Q.;^{*} Yang, H. B.;^{*} Hung, S.-F.;^{*} and Zhai, Y.* Boosting the Proton-coupled Electron Transfer via Fe-P Atomic Pair for Enhanced Electrochemical CO₂ Reduction. *Angew. Chem. Int. Ed.* **2023**, 62, e202311550.
- (9) Hu, F.; Yu, D.; Zeng, W.-J.; **Lin, Z.-Y.**; Han, S.; Sun, Y.; Wang, H.; Ren, J.; Hung, S.-F.;^{*} Li, L.;^{*} Peng, S.* Active Site Tailoring of Metal-Organic Frameworks for Highly Efficient Oxygen Evolution. *Adv. Energy Mater.* **2023**, 13, 2301224.
- (10) Wu, F.-Y.; Tsai, H.-J.; Lee, T.-J.; **Lin, Z.-Y.**; Peng, K.-S.; Chen, P.-H.; Hiraoka, N.; Liao, Y.-F.; Hu, C.-W.; Hsu, S.-H.; Lu, Y.-R.;^{*} Hung, S.-F.* Copper-Barium-Decorated-Carbon-Nanotube Composite for Electrocatalytic CO₂ Reduction to C₂ Products. *J. Mater. Chem. A* **2023**, 11, 13217-13222. (Themed collection: *Journal of Materials Chemistry A Emerging Investigators*)
- (11) Fan, M.;[†] Miao, R. K.;[†] Ou, P.;[†] Xu, Y.;[†] **Lin, Z.-Y.**; Lee, T.-J.; Hung, S.-F.; Xie, K.; Huang, J. E.; Ni, W.; Li, J.; Zhao, Y.; Ozden, A.; O'Brien, C. P.; Chen, Y.; Xiao, Y. C.; Liu, S.; Wicks, J.; Wang, X.; Abed, J.; Shirzadi, E.; Sargent, E. H.;^{*} Sinton, D.* Single-site Decorated Copper Enables Energy- and Carbon-efficient Electroproduction of Synthetic Methane. *Nature Commun.* **2023**, 14, 3314.
- (12) Xu, A.;[†] Hung, S.-F.;[†] Cao, A.;[†] Wang, Z.;[†] Karmodak, N.; Huang, J. E.; Yan, Y.; Rasouli, A. S.; Ozden, A.; Wu, F.-Y.; **Lin, Z.-Y.**; Tsai, H.-J.; Lee, T.-J.; Li, F.; Luo, M.; Wang, Y.; Wang, X.; Abed, J.; Wang, Z.; Nam, D.-H.; Li, C. Y.; Ip, A. H.; Sinton, D.; Dong, C.;^{*} Sargent, E. H.* Stable Cu: Alkali Earth Metal Oxide Interfaces for Electrochemical CO₂ to Alcohols by Selective Hydrogenation. *Nature Catal.* **2022**, 5, 1081-1088.
- (13) Lu, Y.-H.;[†] Tsai, H.-J.;[†] Huang, W.-Y.; Lee, T.-J.; **Lin, Z.-Y.**; Hsu, S.-H.;^{*} Hung, S.-F.* A Nitrogen-doped Graphene-supported Nickel-single-atom Catalyst in the Flow Cell Meets the Industrial Criteria of Carbon Dioxide Reduction Reaction to Carbon Monoxide. *Front. Catal.* **2022**, 2, 915971.

- (14) Hung, S.-F.;* Wu, F.-Y.; Lu, Y.-H.; Lee, T.-J.; Tsai, H.-J.; Chen, P.-H.; Lin, Z.-Y.; Chen, G.-L.; Huang, W.-Y.; Zeng, W.-J. Operando X-ray Absorption Spectroscopic Studies of Carbon Dioxide Reduction Reaction in a Modified Flow Cell. *Catal. Sci. Technol.* **2022**, *12*, 2739-2743. (Themed collection: *In situ and operando spectroscopy in catalysis*, **Back cover**)

6. **Tsung-Ju Lee** (Master 2023): Cerium-modified Cu₂O Nanowire Enables CO₂RR to C₂+ Products with Industrial-scale Current Density.

- *Honorable Poster Prize* at Taipei International Conference on Catalysts, Taiwan, 2023.
- *Gold Award at the 3rd College Green Chemistry Creative Competition*, 2023.
- *Excellent Poster Prize* at the Annual Meeting of Chemical Society Located in Taipei, 2023.
- *Honorable Mention for poster competition in electrochemical driven conversion* at International Conference on Green Electrochemical Technologies, 2022.
- *Third place of SDGs Student Research Poster Award* at 2022 Conference on Institutional Research and Sustainable Development Goals/University Social Responsibility.
- *Judges' Award of Wah Lee Materials Competition* in the Materials Research Society, Taiwan, 2022.
- Publications:

- (1) Zeng, W.-J.;† Ma, J.-J.;† Huang, W.-Y.; **Lee, T.-J.**; Lin, Z.-Y.; Peng, K.-S.; Hiraoka, N.; Liao, Y.-F.; Lu, Y.-R.; Hu, C.-W.;* Hsu, S.-H.;* Hung, S.-F.* Leveraging Bifunctional Phosphide-based Catalysts in a Membrane-Electrode-Assembly to Achieve Industrial Hydrogen Production. *Mater. Today Sustain.* **2023**, *27*, 100820. (†These authors equally contribute to this work)
- (2) Chi, M.;† Zhao, J.;†, Ke, J.;† Liu, Y.; Wang, R.; Wang C.; Hung, S.-F.; **Lee, T.-J.**; Geng, Z.;* Zeng, J.* Bipyridine-confined Silver Single-atom Catalysts Facilitate In-plane C-O Coupling for Propylene Electrooxidation. *Nano Lett.* **2024**, *24*, 1801-1807.
- (3) Wu, F.-Y.; Tsai, H.-J.; **Lee, T.-J.**; Lin, Z.-Y.; Peng, K.-S.; Chen, P.-H.; Hiraoka, N.; Liao, Y.-F.; Hu, C.-W.; Hsu, S.-H.; Lu, Y.-R.;* Hung, S.-F.* Copper-Barium-Decorated-Carbon-Nanotube Composite for Electrocatalytic CO₂ Reduction to C₂ Products. *J. Mater. Chem. A* **2023**, *11*, 13217-13222. (Themed collection: *Journal of Materials Chemistry A Emerging Investigators*) [[link](#)]
- (4) Fan, M.;† Miao, R. K.;† Ou, P.;† Xu, Y.;† Lin, Z.-Y.; **Lee, T.-J.**; Hung, S.-F.; Xie, K.; Huang, J. E.; Ni, W.; Li, J.; Zhao, Y.; Ozden, A.; O'Brien, C. P.; Chen, Y.; Xiao, Y. C.; Liu, S.; Wicks, J.; Wang, X.; Abed, J.; Shirzadi, E.; Sargent, E. H.;* Sinton, D.* Single-site Decorated Copper Enables Energy- and Carbon-efficient Electroproduction of Synthetic Methane. *Nature Commun.* **2023**, *14*, 3314.
- (5) Xu, A.;† Hung, S.-F.;† Cao, A.;† Wang, Z.;† Karmodak, N.; Huang, J. E.; Yan, Y.; Rasouli, A. S.; Ozden, A.; Wu, F.-Y.; Lin, Z.-Y.; Tsai, H.-J.; **Lee, T.-J.**; Li, F.; Luo, M.; Wang, Y.; Wang, X.; Abed, J.; Wang, Z.; Nam, D.-H.; Li, C. Y.; Ip, A. H.; Sinton, D.; Dong, C.;* Sargent, E. H.* Stable Cu: Alkali Earth Metal Oxide Interfaces for Electrochemical CO₂ to Alcohols by Selective Hydrogenation. *Nature Catal.* **2022**, *5*, 1081-1088.
- (6) Lu, Y.-H.;† Tsai, H.-J.;† Huang, W.-Y.; **Lee, T.-J.**; Lin, Z.-Y.; Hsu, S.-H.;* Hung, S.-F.* A Nitrogen-doped Graphene-supported Nickel-single-atom Catalyst in the Flow Cell Meets the Industrial Criteria of Carbon Dioxide Reduction Reaction to Carbon Monoxide. *Front. Catal.* **2022**, *2*, 915971.

5. **Wen-Jing Zeng** (Master 2023): Chemical-Vapor-Deposited Cobalt Boride Boosts the Alkaline Seawater Electrolysis in Membrane Electrode Assemblies.

- *Excellent Poster Prize* at Taipei International Conference on Catalysts, Taiwan, 2023.

- *Merck Young Scientist - Rising Star Award*, 2023.
- *Best Poster Award* at the 3rd Symposium on Nano-Device Circuits and Technologies, 2023.
- *Excellent Poster Prize* at the Annual Meeting of Chemical Society Located in Taipei, 2023.
- *Honorable Mention for poster competition in electrochemical driven conversion* at International Conference on Green Electrochemical Technologies, 2022.
- *Third place of SDGs Student Research Poster Award* at 2022 Conference on Institutional Research and Sustainable Development Goals/University Social Responsibility.
- *Judges' Award of Wah Lee Materials Competition* in the Materials Research Society, Taiwan, 2022.
- Publications:
 - (1) Zhao, S.; Hung, S.-F.; Wang, Y.; Li, S.; Yang, J.; **Zeng, W.-J.**; Zhang, Y.; Chang, H.-H.; Chen, H.-Y.; Hu, F.; Li, L.; Peng, S.* Dynamic Deprotonation Enhancement Triggered by Accelerated Electrochemical Delithiation Reconstruction during Acidic Water Oxidation. *J. Am. Chem. Soc.* **2025**, *147*, 7993-8003.
 - (2) Hsiao, Y.-C.; Wu, C.-Y.; Lee, C.-H.; Huang, W.-Y.; Thang, H. V.; Chi, C.-C.; **Zeng, W.-J.**; Gao, J.-Q.; Lin, C.-Y.; Lin, J.-T.; Gardner, A. M.; Jang, H.; Juang, R.-H.; Liu, Y.-H.; Mekhemer, I. M. A.; Lu, M.-Y.; Lu, Y.-R.; Chou, H.-H.; Kuo, C.-H.; Zhou, S.; Hsu, L.-C.;* Chen, H.-Y. T.; Cowan, A. J.;* Hung, S.-F.;* Yeh, J.-W.;* Yang, T.-H.* A Library of Seed@High-Entropy-Alloy Core-shell Nanocrystals With Controlled Facets for Catalysis. *Adv. Mater.* **2025**, *37*, 2411464.
 - (3) Hao, Y.; Hung, S.-F.; Wang, L.; Deng, L.; **Zeng, W.-J.**; Zhang, C.; Lin, Z.-Y.; Kuo, C.-H.; Wang, Y.; Zhang, Y.; Chen, H.-Y.; Hu, F.; Li, L.; Peng, S.* Designing neighboring-site activation of single atom via tunnel ions for boosting acidic oxygen evolution. *Nature Commun.* **2024**, *15*, 8015.
 - (4) **Zeng, W.-J.**;† Ma, J.-J.;† Huang, W.-Y.; Lee, T.-J.; Lin, Z.-Y.; Peng, K.-S.; Hiraoka, N.; Liao, Y.-F.; Lu, Y.-R.; Hu, C.-W.;* Hsu, S.-H.;* Hung, S.-F.* Leveraging Bifunctional Phosphide-based Catalysts in a Membrane-Electrode-Assembly to Achieve Industrial Hydrogen Production. *Mater. Today Sustain.* **2023**, *27*, 100820. (†These authors equally contribute to this work)
 - (5) Zhao, S.; Hung, S.-F.; Deng, L.; **Zeng, W.-J.**; Xiao, T.; Li, S.; Kuo, C.-H.; Chen, H.-Y.; Hu, F.; Peng, S.* Constructing regulable supports via non-stoichiometric engineering to stabilize ruthenium nanoparticles for enhanced pH-universal water splitting. *Nature Commun.* **2024**, *15*, 2728.
 - (6) Lin, T.-Y.;* Hsieh, C.-F.; Kanai, A.; Yashiro, T.; **Zeng, W.-J.**; Ma, J.-J.; Hung, S.-F.; Sugiyama, M. Radiation Resistant Chalcopyrite CIGS Solar Cells: Proton Damage Shielding with Cs Treatment and Defect Healing via Heat-light Soaking. *J. Mater. Chem. A* **2024**, *12*, 7536-7548. (**Cover**)
 - (7) Hao, Y.; Hung, S.-F.; **Zeng, W.-J.**; Wang, Y.; Zhang, C.; Kuo, C.-H.; Wang, L.; Zhao, S.; Zhang, Y.; Chen, H.-Y.; Peng, S.* Switching the Oxygen Evolution Mechanism on Atomically Dispersed Ru for Enhanced Acidic Reaction Kinetics. *J. Am. Chem. Soc.* **2023**, *145*, 23659-23669.
 - (8) Deng, L.; Hung, S.-F.; Zhao, S.; **Zeng, W.-J.**; Lin, Z.-Y.; Hu, F.; Xie, Y.; Yin, L.; Li, L.; Peng, S.* Unveiling Coordination Transformation for Dynamically Enhanced Hydrogen Evolution Catalysis. *Energy Environ. Sci.* **2023**, *16*, 5220-5230.
 - (9) Yang, X.; Wang, S.; Li, H.; Peng, J.; **Zeng, W.-J.**; Tsai, H.-J.; Hung, S.-F.; Indris, S.; Li, F.; Hua, W.* Boosting the Ultra-stable High-Na-Content P2-Type Layered Cathode Materials with Zero Strain Cation Storage via a Lithium Dual-Site Substitution Approach. *ACS Nano* **2023**, *17*, 18616-18628.

- (10) Hu, F.; Yu, D.; **Zeng, W.-J.**; Lin, Z.-Y.; Han, S.; Sun, Y.; Wang, H.; Ren, J.; Hung, S.-F.;* Li, L.;* Peng, S.* Active Site Tailoring of Metal-Organic Frameworks for Highly Efficient Oxygen Evolution. *Adv. Energy Mater.* **2023**, *13*, 2301224.
 - (11) Ren, X.; Zhao, J.; Li, X.;* Shao, J.; Pan, B.; Salamé, A.; Boutin, E.; Groizard, T.; Wang, S.; Ding, J.; Zhang, X.; Huang, W.-Y.; **Zeng, W.-J.**; Liu, C.; Li, Y.; Hung, S.-F.;* Huang, Y.; Robert, M.;* Liu, B.* *In-Situ* Spectroscopic Probe of the Intrinsic Structure Feature of Single-Atom Center in Electrochemical CO/CO₂ Reduction to Methanol with a Phthalocyanine Cobalt Complex. *Nature Commun.* **2023**, *14*, 3401. (Featured in the Editors' highlight)
 - (12) Deng, Y.;† Zhao, J.;† Wang, S.;† Chen, R.; Tsai, H.-J.; **Zeng, W.-J.**; Hung, S.-F.; Xu, W.; Wang, J.; Li, X.;* Liu, B.;* Huang, Y.* Operando Spectroscopic Analysis of Axial Oxygen Coordinated Single-Sn-Atom Sites for Electrochemical CO₂ Reduction. *J. Am. Chem. Soc.* **2023**, *145*, 7242-7251. (**Cover**)
 - (13) Hung, S.-F.;* Wu, F.-Y.; Lu, Y.-H.; Lee, T.-J.; Tsai, H.-J.; Chen, P.-H.; Lin, Z.-Y.; Chen, G.-L.; Huang, W.-Y.; **Zeng, W.-J.** Operando X-ray Absorption Spectroscopic Studies of Carbon Dioxide Reduction Reaction in a Modified Flow Cell. *Catal. Sci. Technol.* **2022**, *12*, 2739-2743. (Themed collection: *In situ and operando spectroscopy in catalysis*, **Back cover**)
4. **Wen-Yang Huang** (Master 2023): Metal-Organic-Framework-Derived Ce-doped Cobalt Oxides for Efficient Non-Noble-Metal Acidic Oxygen Evolution Reaction in Membrane Electrode Assemblies.
- *Gold Award for poster competition in electrochemical driven conversion* at International Conference on Green Electrochemical Technologies, 2022
 - Publications:
 - (1) Hsiao, Y.-C.; Wu, C.-Y.; Lee, C.-H.; **Huang, W.-Y.**; Thang, H. V.; Chi, C.-C.; Zeng, W.-J.; Gao, J.-Q.; Lin, C.-Y.; Lin, J.-T.; Gardner, A. M.; Jang, H.; Juang, R.-H.; Liu, Y.-H.; Mekhemer, I. M. A.; Lu, M.-Y.; Lu, Y.-R.; Chou, H.-H.; Kuo, C.-H.; Zhou, S.; Hsu, L.-C.;* Chen, H.-Y. T.; Cowan, A. J.;* Hung, S.-F.;* Yeh, J.-W.;* Yang, T.-H.* A Library of Seed@High-Entropy-Alloy Core-shell Nanocrystals With Controlled Facets for Catalysis. *Adv. Mater.* **2025**, *37*, 2411464.
 - (2) Zeng, W.-J.;† Ma, J.-J.;† **Huang, W.-Y.**; Lee, T.-J.; Lin, Z.-Y.; Peng, K.-S.; Hiraoka, N.; Liao, Y.-F.; Lu, Y.-R.; Hu, C.-W.;* Hsu, S.-H.;* Hung, S.-F.* Leveraging Bifunctional Phosphide-based Catalysts in a Membrane-Electrode-Assembly to Achieve Industrial Hydrogen Production. *Mater. Today Sustain.* **2023**, *27*, 100820. (†These authors equally contribute to this work)
 - (3) Miao, R. K.; Wang, N.; Hung, S.-F.; **Huang, W.-Y.**; Zhang, J.; Zhao, Y.; Ou, P.; Wang, S.; Edwards J. P.; Tian, C.; Han, J.; Xu, Y.; Fan, M.; Huang, J. E.; Xiao, Y. C.; Ip, A. H.; Liang, H.; Sargent, E. H.;* Sinton, D.* Electrified Cement Production via Anion-mediated Electrochemical Calcium Extraction. *ACS Energy Lett.* **2023**, *8*, 4694-4701.
 - (4) Ren, X.; Zhao, J.; Li, X.;* Shao, J.; Pan, B.; Salamé, A.; Boutin, E.; Groizard, T.; Wang, S.; Ding, J.; Zhang, X.; **Huang, W.-Y.**; Zeng, W.-J.; Liu, C.; Li, Y.; Hung, S.-F.;* Huang, Y.; Robert, M.;* Liu, B.* *In-Situ* Spectroscopic Probe of the Intrinsic Structure Feature of Single-Atom Center in Electrochemical CO/CO₂ Reduction to Methanol with a Phthalocyanine Cobalt Complex. *Nature Commun.* **2023**, *14*, 3401.
 - (5) Lu, Y.-H.;† Tsai, H.-J.;† **Huang, W.-Y.**; Lee, T.-J.; Lin, Z.-Y.; Hsu, S.-H.;* Hung, S.-F.* A Nitrogen-doped Graphene-supported Nickel-single-atom Catalyst in the Flow Cell

Meets the Industrial Criteria of Carbon Dioxide Reduction Reaction to Carbon Monoxide. *Front. Catal.* **2022**, 2, 915971.

- (6) Hung, S.-F.;* Wu, F.-Y.; Lu, Y.-H.; Lee, T.-J.; Tsai, H.-J.; Chen, P.-H.; Lin, Z.-Y.; Chen, G.-L.; **Huang, W.-Y.**; Zeng, W.-J. Operando X-ray Absorption Spectroscopic Studies of Carbon Dioxide Reduction Reaction in a Modified Flow Cell. *Catal. Sci. Technol.* **2022**, 12, 2739-2743. (Themed collection: *In situ and operando spectroscopy in catalysis*, **Back cover**)

3. **Feng-Yi Wu** (Master 2022): Barium-Copper-Composite-Decorated Carbon Nanotube for Electrocatalytic CO₂ Reduction to C₂ product.

➤ *Award of Recognition for poster competition in material science* at 28th User's Meeting & Workshops, National Synchrotron Radiation Research Center, 2022

➤ *Best Popularity Award* at 28th User's Meeting & Workshops, National Synchrotron Radiation Research Center, 2022

➤ Publications:

- (1) Jia, J.-F.; Hao, T. T.; Chen, P.-H.; **Wu, F.-Y.**; Hung, S.-F.;* Suen, N.-T.* Direct Electrosynthesis of Metal Nanoparticle on Ti₃C₂Tx-Mxene during Hydrogen Evolution. *Inorg. Chem.* **2023**, 62, 19230-19237. (**Cover**)
- (2) **Wu, F.-Y.**; Tsai, H.-J.; Lee, T.-J.; Lin, Z.-Y.; Peng, K.-S.; Chen, P.-H.; Hiraoka, N.; Liao, Y.-F.; Hu, C.-W.; Hsu, S.-H.; Lu, Y.-R.;* Hung, S.-F.* Copper-Barium-Decorated-Carbon-Nanotube Composite for Electrocatalytic CO₂ Reduction to C₂ Products. *J. Mater. Chem. A* **2023**, 11, 13217-13222. (Themed collection: *Journal of Materials Chemistry A Emerging Investigators*)
- (3) Wei, Z.; Ding, J.; Duan, X.; Chen, G.-L.; **Wu, F.-Y.**; Zhang, L.; Yang, X.; Zhang, Q.; He, Q.; Chen, Z.; Huang, J.; Hung, S.-F.;* Yang, X.;* Zhai, Y.* Enhancing Selective Electrochemical CO₂ Reduction by In Situ Constructing Tensile Strained Cu Catalysts. *ACS Catal.* **2023**, 13, 4711-4718.
- (4) Lee, S.;† Park, S. M.;† Jung, E. D.;† Zhu, T.;† Pina, J. M.; Anwar, H.; **Wu, F.-Y.**; Chen, G.-L.; Dong, Y.; Cui, T.; Wei, M.; Bertens, K.; Wang, Y.-K.; Chen, B.; Filleter, T.; Hung, S.-F.; Won, Y.-H.; Kim, K.-H.; Hoogland, S.; Sargent, E. H.* Dipole Engineering Through the Orientation of Interface Molecules for Efficient InP Quantum Dot Light-Emitting Diodes. *J. Am. Chem. Soc.* **2022**, 144, 20923-20930.
- (5) Xu, A.;† Hung, S.-F.;† Cao, A.;† Wang, Z.;† Karmodak, N.; Huang, J. E.; Yan, Y.; Rasouli, A. S.; Ozden, A.; **Wu, F.-Y.**; Lin, Z.-Y.; Tsai, H.-J.; Lee, T.-J.; Li, F.; Luo, M.; Wang, Y.; Wang, X.; Abed, J.; Wang, Z.; Nam, D.-H.; Li, C. Y.; Ip, A. H.; Sinton, D.; Dong, C.;* Sargent, E. H.* Stable Cu: Alkali Earth Metal Oxide Interfaces for Electrochemical CO₂ to Alcohols by Selective Hydrogenation. *Nature Catal.* **2022**, 5, 1081-1088.
- (6) Rasouli, A. S.; Wang, X.; Wick, J.; Dinh, C.-T.; Abed, J.; **Wu, F.-Y.**; Hung, S.-F.; Bertens, K.; Huang, J. E.; Sargent, E. H.* Ga doping disrupts C-C coupling and promotes methane electroproduction on CuAl catalysts. *Chem Catal.* **2022**, 2, 908-916.
- (7) Hung, S.-F.;* **Wu, F.-Y.**; Lu, Y.-H.; Lee, T.-J.; Tsai, H.-J.; Chen, P.-H.; Lin, Z.-Y.; Chen, G.-L.; Huang, W.-Y.; Zeng, W.-J. Operando X-ray Absorption Spectroscopic Studies of Carbon Dioxide Reduction Reaction in a Modified Flow Cell. *Catal. Sci. Technol.* **2022**, 12, 2739-2743. (Themed collection: *In situ and operando spectroscopy in catalysis*, **Back cover**)
- (8) Wang, N.;† Xu, A.;† Ou, P.;† Hung, S.-F.;† Ozden, A.; Lu, Y.-R.; Abed, J.; Wang, Z.; Yan, Y.; Sun, M.; Xia, Y.; Han, M.; Han, J.; Yao, K.; **Wu, F.-Y.**; Chen, P. H.; Vomiero,

- A.; Seifitokaldani, A.; Sun, X.; Sinton, D.; Liu, Y.;* Sargent, E. H.;* Liang, H.* Boride-Derived Oxygen-Evolution Catalysts. *Nature Commun.* **2021**, *12*, 6089.
2. **Pei-Hsuan Chen** (Master 2022): Enclosed Copper Nanoparticles into Carbon Nanotube Enhances CO₂ Reduction to Multi-Carbon Products.
 ➤ Publications:
 - (1) Jia, J.-F.; Hao, T. T.; **Chen, P.-H.**; Wu, F.-Y.; Hung, S.-F.;* Suen, N.-T.* Direct Electrosynthesis of Metal Nanoparticle on Ti₃C₂T_x-Mxene during Hydrogen Evolution. *Inorg. Chem.* **2023**, *62*, 19230-19237. (**Cover**)
 - (2) Wu, F.-Y.; Tsai, H.-J.; Lee, T.-J.; Lin, Z.-Y.; Peng, K.-S.; **Chen, P.-H.**; Hiraoka, N.; Liao, Y.-F.; Hu, C.-W.; Hsu, S.-H.; Lu, Y.-R.;* Hung, S.-F.* Copper-Barium-Decorated-Carbon-Nanotube Composite for Electrocatalytic CO₂ Reduction to C₂ Products. *J. Mater. Chem. A* **2023**, *11*, 13217-13222. (Themed collection: *Journal of Materials Chemistry A Emerging Investigators*)
 - (3) Hung, S.-F.;* Wu, F.-Y.; Lu, Y.-H.; Lee, T.-J.; Tsai, H.-J.; **Chen, P.-H.**; Lin, Z.-Y.; Chen, G.-L.; Huang, W.-Y.; Zeng, W.-J. Operando X-ray Absorption Spectroscopic Studies of Carbon Dioxide Reduction Reaction in a Modified Flow Cell. *Catal. Sci. Technol.* **2022**, *12*, 2739-2743. (Themed collection: *In situ and operando spectroscopy in catalysis*, **Back cover**)
 1. **Yi-Hsuan Lu** (Master 2022): Enhancing Tandem Catalysis via Incorporating Nickel Porphyrin with Thiophene Substituents on Copper for Efficient CO₂ Electroreduction to C₂ Products.
 ➤ *Excellent Thesis Award, Department of Applied Chemistry, National Yang Ming Chiao Tung University, 2022*
 ➤ Publications:
 - (1) **Lu, Y.-H.**;† Tsai, H.-J.;† Huang, W.-Y.; Lee, T.-J.; Lin, Z.-Y.; Hsu, S.-H.;* Hung, S.-F.* A Nitrogen-doped Graphene-supported Nickel-single-atom Catalyst in the Flow Cell Meets the Industrial Criteria of Carbon Dioxide Reduction Reaction to Carbon Monoxide. *Front. Catal.* **2022**, *2*, 915971.
 - (2) Hung, S.-F.;* Wu, F.-Y.; **Lu, Y.-H.**; Lee, T.-J.; Tsai, H.-J.; Chen, P.-H.; Lin, Z.-Y.; Chen, G.-L.; Huang, W.-Y.; Zeng, W.-J. Operando X-ray Absorption Spectroscopic Studies of Carbon Dioxide Reduction Reaction in a Modified Flow Cell. *Catal. Sci. Technol.* **2022**, *12*, 2739-2743. (Themed collection: *In situ and operando spectroscopy in catalysis*, **Back cover**)

Undergraduate Students

11. **Kent-Meng Khor** (Independent Study 2026)
10. **Yu-Ting Wang** (Independent Study 2026)
9. **Bo-Kai Chen** (Independent Study 2025)
8. **Zhen-Yuan Huang** (Independent Study 2025)
7. **Fang-Yu Lin** (Independent Study 2025)
6. **Jing-Ya Wang** (Independent Study 2024): One-Dimensional Nanostructure Tin Dioxide Catalysts to Achieve Industrial CO₂ Reduction to Formic Acid.
 ➤ *Judges' Award of Wah Lee Materials Competition* in the Materials Research Society, Taiwan, 2024.
 ➤ *Excellent Poster Silver Award* at the International Electron Devices & Materials Symposium, 2024.
 ➤ *College Student Research Scholarship*, 2024.

5. **Chi Kang** (Independent Study 2024, being a master student at 2025): Spatial Confinement Effect of SnO₂ Nanospheres Catalysts Enables Ampere-Level CO₂ Reduction to Formic Acid and Artificial Photosynthesis system.
 > *IUPAC Poster Prize, 2025.*
 > *CTCI Foundation Chemistry Award for Outstanding College Students, 2025*
 > *Excellent Poster Prize* at the 2025 Chemistry National Meeting.
 > *Judges' Award of Wah Lee Materials Competition* in the Materials Research Society, Taiwan, 2024.
 > *Excellent Poster Gold Award* at the International Electron Devices & Materials Symposium, 2024.
4. **Shuo-Peng Lin** (Independent Study 2024, being a master student at 2025): 2-Mercaptobenzimidazole Modified hydrophobic Ag Nanowire for Industrial CO₂ Reduction to CO.
 > *Judges' Award of Wah Lee Materials Competition* in the Materials Research Society, Taiwan, 2024.
3. **Ming-Hsuan Li** (2023, being a master student at 2024): Non-Equivalent Iodide Ions Boosting the Bismuth-Based Catalysts to Achieve Industrial CO₂ Reduction to Formic Acid.
 > *College Student Research Scholarship, 2023.*
2. **Yu-Cheng Liu** (Independent Study 2023, being a master student at 2024): Silver-Carbon Nanofiber Composite Catalysts for Industrial Electrocatalytic CO₂ Reduction to CO.
1. **Po-Rui Su** (Independent Study 2023): Study of Anions in the of Bismuth-based Catalyst on Industrial CO₂-to- HCOOH Conversion.

Graduate Defense committees

42. **Maliya Syabriyana** (Ph.D, Advisor: Prof. Chih-Huang Lai, National Tsing Hua University): *Performance Enhancement of Flexible Cu(In, Ga)Se₂ Solar Cell on Mica Substrate, 2025.*
41. **You-Ren Kang** (Master, Advisor: Prof. Kien-Wen Sun, National Yang Ming Chiao Tung University): *Properties of Si-O and Si-F based Composites for Passive Radiative Cooling Via Mid-Infrared Emission in Practical Applications, 2025.*
40. **Yu-Lun Zhu** (Master, Advisor: Prof. Pei-Yuin Keng, National Tsing Hua University): *Harnessing the Structural Synergy of High-Loading Cobalt Pyroborate on Fibrous Silica for Efficient and Recyclable Advanced Oxidation Catalysis, 2025.*
39. **Kai-Rou Wang** (Master, Advisor: Prof. Ming-Chang Lin, National Yang Ming Chiao Tung University): *Photocatalytic Activities of Gold with Cuprous Oxide and Boron-Doped Graphitic Carbon Nitride Co-loaded on Hydrogenated TiO₂ Nanoparticles, 2025.*
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