Feng Jiao, Ph.D.
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Research Interests

The Jiao research group is steadfastly devoted to the development of cutting-edge electrochemical technologies that address pressing global issues in energy storage, chemical manufacturing, and food production. Our focus is centered on three primary objectives:

- Advancing electrochemical systems for carbon utilization by pursuing high-performance CO_2 and CO electrolysis, surpassing the efficiency of conventional fossil-based systems. This is achieved through our expertise in state-of-the-art catalyst design and the engineering of electrode-electrolyte interfaces.
- Developing new strategies that enhance energy efficiency of food production over conventional agriculture, which may reduce environmental impacts, improve food quality, and address the global food security.
- Exploring innovative synthesis methods for nanostructured materials tailored for energy applications, enabling the creation of materials exhibiting unique morphologies and compositions unattainable by current techniques.

Our research focuses on developing clean, cost-effective, and environmentally friendly solutions for energy, chemical, and food production, advancing a healthier and more sustainable future.

Education

Jan. 2004 – Jan. 2008	Ph.D. in Chemistry University of St Andrews, St Andrews, United Kingdom Thesis: Nanomaterials for energy storage and conversion Advisor: Prof. Peter G. Bruce
Sep. 1997 – Jul. 2001	B.S. in Chemistry, Fudan University, Shanghai, China Thesis: Catalytic oxidation of phenol using nanostructured iron oxides Advisor: Prof. Heyong He

Professional Experience

Nov. 2025 – Present	Deputy Director, NSF CURB Engineering Research Center, Washington University in St. Louis, St. Louis, MO, United States
Jun. 2025 – Present	Professor (secondary faculty appointment), School of Public Health, Washington University in St. Louis, St. Louis, MO, United States
Apr. 2025 – Present	Lauren and Lee Fixel Distinguished Professor, Washington University in St. Louis, St. Louis, MO, United States
Aug. 2023 – Present	Professor, Department of Energy, Environmental, and Chemical Engineering, Washington University in St. Louis, St. Louis, MO, United States
Aug. 2023 – Present	Director, Center for Carbon Management, Washington University in St. Louis, St. Louis, MO, United States
Sept. 2021 – Jul. 2023	Professor and Graduate Program Director, Department of Chemical and Biomolecular Engineering, University of Delaware, Newark, DE, United States
Jul. 2020 – Jul. 2023	Director, Center for Catalytic Science & Technology, University of Delaware, Newark, DE, United States
Sept. 2019 – Dec. 2022	Robert Grasselli Development Professor of Chemical and Biomolecular Engineering, University of Delaware, Newark, DE, United States

Sept. 2017 – Sept. 2021	Associate Professor, Department of Chemical and Biomolecular Engineering University of Delaware, Newark, DE, United States
Sept. 2017 – Jun. 2020	Associate Director, Center for Catalytic Science & Technology University of Delaware, Newark, DE, United States
Jun. 2017 – Nov. 2017	Visiting Faculty, SUNCAT Center for Interface Science and Catalysis Stanford University, Stanford, CA, United States (Host: Prof. Jens Norskov)
Aug. 2010 – Sept. 2017	Assistant Professor, Department of Chemical and Biomolecular Engineering, University of Delaware, Newark, DE, United States
Jan. 2008 – Aug. 2010	Postdoctoral Researcher (Supervisor: Dr. Heinz Frei) Lawrence Berkeley National Laboratory, Physical Biosciences Division Berkeley, CA, United States
Sept. 2003 – Jan. 2004	Visiting scholar, School of Chemistry, University of St Andrews St Andrews, United Kingdom
Jul. 2001 – Sept. 2003	Lab assistant, Fudan University, Shanghai, China

Honors and Awards

2025 Highly Cited Researcher by Clarivate
2025 Fellow of the American Chemical Society
2025 Lauren and Lee Fixel Distinguished Professor
2025 ACS ENFL MidCareer Award
2024 Highly Cited Researcher by Clarivate
2023 Highly Cited Researcher by Clarivate
2023 Fellow of the Royal Society of Chemistry
2023 NASA Deep Space Food Challenge Phase 2 Finalist
2023 Program Chair, American Chemical Society, Energy & Fuels Division
2020 Scialog Fellow, Negative Emissions Science (NES) initiative, sponsored by the RCSA and Alfred P. Sloan Foundation
2020 Emerging Investigator, Journal of Materials Chemistry A (RSC)
2019 Robert Grasselli Development Professor of Chemical and Biomolecular Engineering (University of Delaware)
2017 Class of Influential Researchers, Industrial & Engineering Chemistry Research (ACS)
2015 Outstanding Junior Faculty Member, College of Engineering (University of Delaware)
2014 National Science Foundation CAREER Award
2011 University of Delaware Research Foundation Award
2010 American Chemical Society Petroleum Research Foundation NDI Award
2008 Material Research Society Graduate Student Award
2007 Electrochemical Society Student Research Award of the Battery Division
2007 Electrochemical Society Student Travel Award

Editorial Board

2022 – Present	Chemical Engineering Journal (Editor)
2021 – Present	Renewables (Advisory Board Member)
2020 – Present	Journal of Materials Chemistry A (Advisory Board Member)
2019 – Present	Cell Reports Physical Science (Advisory Board Member)
2019 – Present	Materials Today Sustainability (Editorial Board Member)
2018 – Present	Trends in Chemistry (Advisory Board Member)
2023 – 2024	Transactions of Tianjin University (Editor)
2016 – 2020	Scientific Reports (Editorial Board Member)
2011 – 2015	Journal of Chemical Engineering & Process Technology (Editorial Board Member)

Publications

*Total citations: >**26,000**; Average citations per paper: ~**206**; H-index: **73**; Data source: Google Scholar, January 2026.*
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Google Scholar: https://scholar.google.com/citations?user=Yk2r4x0AAAAJ&hl=en

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2. X. Wang, N. Liu, Z. Huang, J. Yang, G. Chen, B. Li, T. Xie, S. Overa, et al. Electrified vapour deposition at ultrahigh temperature and atmospheric pressure for nanomaterials synthesis. Nature Synthesis 5, 14-26 (2025).
3. W. Deng, S. Xing, G. W. P. Maia, Z. Wang, B. S. Crandall, F. Jiao. Diaphragm-based carbon monoxide electrolyzers for multicarbon production under alkaline conditions. Nature Communications 16, 8444 (2025).
4. Z. Wang, C. Zhang, F. Jiao. Building Food from CO_2: Can We Transform Global Food Production to Net Zero? ACS Agricultural Science & Technology 5, 681-686 (2025).
5. H. Li, F. Jiao. Tandem catalytic strategy for converting biogas into carbon nanofibers. Chem Catalysis 5, 101363 (2025).
6. R. Xia, S. Dronsfield, A. Lee, B. S. Crandall, J. Liang, B. Hasa, A. Redder, G. Wu, T. J. Goncalves, S. Siahrostami, F. Jiao. Electrochemical oxidation of nitric oxide to concentrated nitric acid with carbon-based catalysts at near-ambient conditions. Nature Catalysis 8, 328-337 (2025). 10.1038/s41929-025-01315-8
7. W. Deng, A. Lee, W. Dai, L. Cherniack, B. S. Crandall, H. Li, F. Jiao. Techno-economics of polymer-membrane-based CO2 electrolysers. Nature Reviews Clean Technology 1, 255-268 (2025). 10.1038/s44359-025-00045-1
8. L. H. Cherniack, K. U. Hansen, Z. Li, A. K. Taylor, K. C. Neyerlin, F. Jiao. An Interfacial Engineering Approach toward Operation of a Porous Solid Electrolyte CO2 Electrolyzer. ACS Energy Letters 10, 1508-1516 (2025). 10.1021/acsenergylett.5c00079
9. J. Luterbacher, B. Weckhuysen, S. Haussener, B. R. Cuenya, D. E. Resasco, C. G. Morales-Guio, F. Jiao, N. Zheng, K. Domen, P. Concepciv≥n, L. Olsson, C. Berlinguette, H. Xin. Connecting scales in reaction engineering. Nature Chemical Engineering 2, 156-159 (2025). 10.1038/s44286-025-00197-8
10. A. K. Sahu, T. E. Rufford, S. H. Ali, R. Knibbe, S. Smart, F. Jiao, A. T. Bell, X. Zhang. Material needs for power-to-X systems for CO2 utilization require a life cycle approach. Chemical Science 16, 5819-5835 (2025). 10.1039/D4SC07752K
11. B. S. Crandall, M. Naughton, S. Park, J. Yu, C. Zhang, S. Mahtabian, K. Wang, X. Liang, K. Fu, F. Jiao. Transforming CO2 into advanced 3D printed carbon nanocomposites. Nature Communications 15, 10568 (2024). 10.1038/s41467-024-54957-w
12. B. S. Crandall, M. Harland-Dunaway, R. E. Jinkerson, F. Jiao. Electro-agriculture: Revolutionizing farming for a sustainable future. Joule 8, 2974-2991 (2024). 10.1016/j.joule.2024.09.011
13. K. U. Hansen, A. Lee, F. Jiao. Enabling low-IrO2 proton exchange membrane water electrolysis via microporous layer-supported catalyst-coated membranes. Chem Catalysis 4, 101036 (2024). 10.1016/j.checat.2024.101036
14. B. S Crandall, Z. Qi, A. C. Foucher, S. E. Weitzner, S. A. Akhade, X. Liu, A. R. Kashi, A. K. Buckley, S. C. Ma, E. A. Stach, J. B. Varley, F. Jiao, J. Biener. Cu Based Dilute Alloys for Tuning the C2+ Selectivity of Electrochemical CO2 Reduction. Small 44, 2401656 (2024). 10.1002/smll.202401656
15. B. S. Crandall, B. H. Ko, S. Overa, L. Cherniack, A. Lee, I. Minnie, F. Jiao. Kilowatt-scale tandem CO2 electrolysis for enhanced acetate and ethylene production. Nature Chemical Engineering 1, 421 (2024). 10.1038/s44286-024-00076-8
16. W. Y. Deng, and F. Jiao. Enhancing the durability of CO electrolysis systems. Joule 7, 2663-2665 (2023). 10.1016/j.joule.2023.11.017
17. R. Xia, R. Wang, B. Hasa, A. Lee, Y. Liu, X. Ma, and F. Jiao. Electrosynthesis of ethylene glycol from C1 feedstocks in a flow electrolyzer. Nature Communications 14, 4570 (2023). 10.1038/s41467-023-40296-9
18. H. Tang, E. Jeng, Y. Kang, Y. Yan, B. Xu, and F. Jiao. Enhancing Hydrogen Diffusion in Catalytic Removal of Nitrate Using a Flow Reactor. Topics in Catalysis, 66, 1260-1269 (2023). 10.1007/s11244-023-01837-0
19. B. S. Crandall, S. Overa, H. Shin, and F. Jiao. Turning Carbon Dioxide into Sustainable Food and Chemicals: How Electrosynthesized Acetate Is Paving the Way for Fermentation Innovation. Accounts of Chemical Research, 56, 1505-1516 (2023). 10.1021/acs.accounts.3c00098
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35. H. H. Heenen, H. Shin, G. Kastlunger, S. Overa, J. A. Gauthier, F. Jiao and K. Chan. Mechanism for acetate formation in electrochemical CO2 reduction on Cu: Selectivity with potential, pH, and nanostructuring. Energy Environmental Science 15, 3978-3990 (2022). 10.1039/D2EE01485H
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39. B. H. Ko, B. Hasa, H. Shin, Y. R. Zhao and F. Jiao. Electrochemical Reduction of Gaseous Nitrogen Oxides on Transition Metals at Ambient Conditions. Journal of the American Chemical Society 144, 1258 (2022). 10.1021/jacs.1c10535
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Physical Vapor Deposition Methods. ACS Applied Materials & Interfaces 14, 7731 (2022). 10.1021/acsami.1c17860

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43. R. Xia, D. Tian, S. Kattel, B. Hasa, H. Shin, X. B. Ma, J. G. G. Chen and F. Jiao. Electrochemical reduction of acetonitrile to ethylamine. Nature Communications 12, 1949 (2021). 10.1038/s41467-021-22291-0
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47. T. Y. Li, Y. G. Yao, B. H. Ko, Z. N. Huang, Q. Dong, J. L. Gao, W. Chen, J. G. Li, S. K. Li, X. Z. Wang, R. Shahbazian-Yassar, F. Jiao and L. B. Hu. Carbon-Supported High-Entropy Oxide Nanoparticles as Stable Electrocatalysts for Oxygen Reduction Reactions. Advanced Functional Materials 31, 2010561 (2021). 10.1002/adfm.202010561
48. B. Hasa, M. Jouny, B. H. Ko, B. J. Xu and F. Jiao. Flow Electrolyzer Mass Spectrometry with a Gas-Diffusion Electrode Design. Angewandte Chemie-International Edition 60, 3277 (2021). 10.1002/anie.202013713
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110. F. Jiao and H. Frei. Nanostructured manganese oxide clusters supported on mesoporous silica as efficient oxygen-evolving catalysts. Chemical Communications 46, 2920 (2010). 10.1039/b921820c
111. F. Jiao and H. Frei. Nanostructured cobalt and manganese oxide clusters as efficient water oxidation catalysts. Energy & Environmental Science 3, 1018 (2010). 10.1039/c002074e
112. Y. Ren, A. R. Armstrong, F. Jiao and P. G. Bruce. Influence of Size on the Rate of Mesoporous Electrodes for Lithium Batteries. Journal of the American Chemical Society 132, 996 (2010). 10.1021/ja905488x
113. F. Jiao and H. Frei. Nanostructured Cobalt Oxide Clusters in Mesoporous Silica as Efficient Oxygen-Evolving Catalysts. Angewandte Chemie-International Edition 48, 1841 (2009). 10.1002/anie.200805534
114. Y. Ren, F. Jiao and P. G. Bruce. Tailoring the pore size/wall thickness of mesoporous transition metal oxides. Microporous and Mesoporous Materials 121, 90 (2009). 10.1016/j.micromeso.2009.01.008
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116. F. Jiao, J. L. Bao, A. H. Hill and P. G. Bruce. Synthesis of Ordered Mesoporous Li-Mn-O Spinel as a Positive Electrode for Rechargeable Lithium Batteries. Angewandte Chemie-International Edition 47, 9711 (2008). 10.1002/anie.200803431
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118. K. M. Shaju, F. Jiao, A. Debart and P. G. Bruce. Mesoporous and nanowire Co3O4 as negative electrodes for rechargeable lithium batteries. Physical Chemistry Chemical Physics 9, 1837 (2007). 10.1039/b617519h
119. F. Jiao, A. Harrison, A. H. Hill and P. G. Bruce. Mesoporous Mn2O3 and Mn3O4 with crystalline walls. Advanced Materials 19, 4063 (2007). 10.1002/adma.200700336
120. F. Jiao, A. Harrison and P. G. Bruce. Ordered three-dimensional arrays of monodispersed Mn3O4 nanoparticles with a core-shell structure and spin-glass behavior. Angewandte Chemie-International Edition 46, 3946 (2007). 10.1002/anie.200700087
121. F. Jiao and P. G. Bruce. Mesoporous crystalline beta-MnO2- a reversible positive electrode for rechargeable lithium batteries. Advanced Materials 19, 657 (2007). 10.1002/adma.200602499
122. F. Jiao, J. L. Bao and P. G. Bruce. Factors influencing the rate of Fe2O3 conversion reaction. Electrochemical and Solid State Letters 10, A264 (2007). 10.1149/1.2783268
123. F. Jiao, J. C. Jumas, M. Womes, A. V. Chadwick, A. Harrison and P. G. Bruce. Synthesis of ordered mesoporous Fe3O4 and gamma-Fe2O3 with crystalline walls using post-template reduction/oxidation. Journal of the American Chemical Society 128, 12905 (2006). 10.1021/ja063662i
124. F. Jiao, A. Harrison, J. C. Jumas, A. V. Chadwick, W. Kockelmann and P. G. Bruce. Ordered mesoporous Fe2O3 with crystalline walls. Journal of the American Chemical Society 128, 5468 (2006). 10.1021/ja0584774
125. F. Jiao, K. M. Shaju and P. G. Bruce. Synthesis of nanowire and mesoporous low-temperature LiCoO2 by a post-templating reaction. Angewandte Chemie-International Edition 44, 6550 (2005). 10.1002/anie.200501663
126. F. Jiao and P. G. Bruce. Two- and three-dimensional mesoporous iron oxides with microporous walls. Angewandte Chemie-International Edition 43, 5958 (2004). 10.1002/anie.200460826
127. F. Jiao, B. Yue, K. K. Zhu, D. Y. Zhao and H. Y. He. Œ±-Fe2O3 nanowires: Confined synthesis and catalytic hydroxylation of phenol. Chemistry Letters 32, 770-771 (2003). 10.1246/cl.2003.770

Patents

(1) Jiao, F., Jouny, M. & Lv, J. J. Electrochemical generation of carbon-containing products from carbon dioxide and carbon monoxide. US Patent US11959184B2 (2024).
(2) Jiao, F., Lu, Q., Hutchings, G. S., & Chen, J. G. Electrocatalyst for hydrogen evolution and oxidation reactions. US Patent: US9994961 B2 (2018).
(3) Frei, H. M. & Jiao, F. Nanostructured transition metal oxides useful for water oxidation catalysis. US Patent: US8613900 B2 (2013).

Book Chapters

(1) Yonemoto, B. T., Hutchings, G. S., & Jiao, F. The Need for a Storage Revolution for a Green Energy Economy. In *Green Energy Economies*, Chapter 11, 232-252 (2014). ISBN: 978-1-4128-5375-0

Teaching

Energy Conversion and Storage (EECE 4061)
– elective, ~20 students, instructor, 2024-Present
Characterization Methods in Energy and Catalysis (EECE 5220)
– elective, ~20 students, instructor, 2025-Present

Previous teaching experience at the University of Delaware
Introduction to Engineering (EGGG 101)
– undergraduate level, ~100 students, co-instructor, 2015
Chemical Engineering Thermodynamics I (CHEG 231)
– undergraduate level, ~100 students, co-instructor, 2011-2014 & 2020-2022
Chemical Engineering Thermodynamics II (CHEG 325)
– undergraduate level, ~100 students, co-instructor, 2015, 2016, 2018-2020
Chemical Engineering Kinetics (CHEG 332)
– undergraduate level, ~100 students, co-instructor, 2010
Chemical Engineering Laboratory I (CHEG 345)
– undergraduate level, ~100 students, co-instructor, 2012-2015
Chemical Engineering Laboratory II (CHEG 445)
– undergraduate level, ~80 students, co-instructor, 2016
Electrochemical Energy Engineering (CHEG632)
– undergraduate/graduate elective, ~30 students, instructor, 2018, 2019, 2021
Special Topics in Energy (CHEG 614)
– undergraduate/graduate elective, ~30 students, co-instructor, 2011-2016, 2023
Electrochemical Processes (CHEG850)
–graduate level, ~30 students, instructor, 2022, 2023

Presentations at International/National Conferences and Workshops (2015 - Present)

1. "CO_2 Electrolysis Systems for Chemical and Food Production", invited talk, Oak Ridge National Laboratory, Oak Ridge, TN (2025)
2. "CO_2 Electrolysis Systems for Chemical and Food Production", invited talk, School of Chemical Engineering, University of New South Wales, Sydney, Australia (2025)
3. "CO_2 Electrolysis Systems for Chemical and Food Production", invited seminar, Department of Chemical Engineering, University of Sydney, Sydney, Australia (2025)
4. "CO_2 Electrolysis Systems for Chemical and Food Production", invited seminar, Department of Chemical Engineering, University of Kansas, Lawrence, KS (2025)
5. "CO_2 Electrolysis Systems for Chemical and Food Production", invited seminar, Department of Chemical Engineering, University of South Carolina, Columbia, SC (2025)

6. "Tandem CO_2 Electrolysis Systems", oral presentation, 21st International Conference on Carbon Dioxide Utilization (ICCDU 2025), Lisbon, Portugal (2025)
7. "CO_2 Electrolysis Systems for Chemical and Food Production", invited talk, TorontoTalks Seminar Series, University of Toronto, Toronto, Canada (2025)
8. "CO_2 Electrolysis Systems for Chemical and Food Production", invited Distinguished Seminar, Department of Chemical Engineering, Auburn University, Auburn, AL (2025)
9. "Enhancing System Robustness of CO_2 Electrolyzers", invited talk, ACS Spring National Meeting, San Diego, CA (2025)
10. "CO_2 Electrolysis Systems for Chemical and Food Production", invited colloquium, Lenfest Center, Columbia University, New York, NY (2025)
11. "CO_2 Electrolysis Systems for Chemical and Food Production", invited seminar, New York University, New York, NY (2025)
12. "Tandem CO_2 Electrolysis Systems for Chemical Production", invited talk, WUT–Nature Conference: CO_2 Conversion by Renewable Energy, Wuhan, China (2024)
13. "CO_2 Electrolysis Systems for Chemical Production", invited talk, 7th SFSC Conference, Dalian, China (2024)
14. "Tandem CO_2 Electrolysis Systems for Chemical Production", invited talk, ACS Fall National Meeting, Denver, CO (2024)
15. "Tandem CO_2 Electrolysis Systems for Chemical Production", invited talk, Surf-Cat Summer School, Denmark (2024)
16. "CO_2 Electrolysis Systems for Chemical Production", invited talk, 21st International Conference on Carbon Dioxide Utilization (ICCDU), Dalian, China (2024)
17. "CO_2/CO Electrolysis Systems for Chemical Production", invited talk, ACS Spring National Meeting, New Orleans, LA (2024)
18. "Electrocatalytic Conversion of CO_2 and CO", invited talk, Gordon Research Seminar on Renewable Energy: Solar Fuels, CA (2024)
19. "CO_2 Electrolysis Systems for Chemical Production", invited seminar, University of Alabama, Tuscaloosa, AL (2024)
20. "CO_2 Electrolysis Systems for Chemical Production", invited seminar, Huazhong University of Science and Technology, Wuhan, China (2024)
21. "CO_2 Electrolysis Systems for Chemical Production", invited seminar, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian, China (2024)
22. "CO_2 Electrolysis Systems for Chemical Production", invited speaker, International Summer School, Westlake University, Hangzhou, China (2024)
23. "CO_2 Electrolysis Systems for Chemical Production", invited speaker, International Summer School, Fudan University, Shanghai, China (2024)
24. "CO_2 Electrolysis Systems for Chemical Production", invited seminar, Leiden University, Leiden, Netherlands (2024)
25. "CO_2 Electrolysis Systems for Chemical Production", invited seminar, Delft University of Technology, Delft, Netherlands (2024)
26. "CO_2 Electrolysis Systems for Chemical Production", invited seminar, University of Louisiana at Lafayette, Lafayette, LA (2024)
27. "Electrocatalytic Conversion of CO_2 and CO", invited seminar, Northwestern University, Evanston, IL (2024)
28. "CO_2 Electrolysis Systems for Chemical and Food Production", invited plenary speaker, International Symposium on Green Transformation of Carbon Dioxide, Brisbane, Australia (2023)
29. "Tandem CO_2 Electrolysis System for Chemical Production", invited talk, AIChE Annual Meeting, Orlando, FL (2023)
30. "Novel Electrocatalysts for Nitrogen Oxides Reduction at Ambient Conditions", oral presentation, AIChE Annual Meeting, Orlando, FL (2023)
31. "Electrocatalysis for Carbon Dioxide Utilization", invited tutorial presentation, AIChE Annual Meeting, Orlando, FL (2023)
32. "Electrochemical Systems for Carbon Dioxide Utilization", invited keynote, 28th North American Meeting of the North American Catalysis Society (NAM), Providence, RI (2023)

33. "Electrochemical Systems for Carbon Dioxide Utilization", invited speaker, Canadian Chemistry Conference and Exhibition, Vancouver, Canada (2023)
34. "Electrochemical Systems for Carbon Dioxide Utilization", invited speaker, ENFL, ACS Spring National Meeting, Indianapolis, IN (2023)
35. "Electrocatalysis for Carbon Dioxide Utilization", invited speaker, Catalysis Club of Philadelphia, Philadelphia, PA (2023)
36. "Electrocatalysis for Carbon Dioxide Utilization", invited seminar, Iowa State University, Ames, IA (2023)
37. "Electrocatalysis for Carbon Dioxide Utilization", invited virtual seminar, University of Houston, Houston, TX (2023)
38. "Tandem CO_2 Electrolysis System for Chemical Production", invited seminar, Technical University of Denmark, Denmark (2023)
39. "Tandem CO_2 Electrolysis System for Chemical Production", invited seminar, Tsinghua University, Beijing, China (2023)
40. "Tandem CO_2 Electrolysis System for Chemical Production", 638th Xinda Lectureship, Peking University, Beijing, China (2023)
41. "Electrocatalytic Conversion of Small Molecules for Chemical and Food Production", invited seminar, University of Massachusetts Lowell, Lowell, MA (2023)
42. "CO_2 Electrolysis Systems for Chemical Production", invited seminar, Villanova University, Villanova, PA (2023)
43. "Carbon Dioxide Electrolysis for Sustainable Chemical Production", invited speaker, International Young Scientists Salon on Photo & Electro Catalytic CO_2 Reduction Reaction (2022)
44. "Electrocatalytic Carbon Dioxide Conversion into Valuable Chemicals", invited speaker, 9th Irsee Symposium Meeting, Irsee, Germany (2022)
45. "A Tandem Electrolysis Process for Multi-Carbon Chemical Production from Carbon Dioxide", oral presentation, DOE/NETL CO_2 Capture Technology Project Review Meeting, Pittsburgh, PA (2022)
46. "Electrochemical Reduction of Gaseous Nitrogen Oxides on Transition Metals at Ambient Conditions", oral presentation, 27th North American Catalysis Society Meeting, New York, NY (2022)
47. "Electrocatalysis for Carbon Dioxide Utilization", invited speaker, KAUST Conference – Carbon Capture and Utilization, Saudi Arabia (2022)
48. "Electrocatalysis for Carbon Dioxide Utilization", invited seminar, Washington University in St. Louis, MO (2022)
49. "Electrocatalysis for Carbon Dioxide Utilization", invited seminar, University of Cincinnati, OH (2022)
50. "Recent Advances in Carbon Dioxide Electrocatalysis", invited seminar, Dalian Institute of Chemical Physics, Dalian, China (2022)
51. "Recent Advances in Carbon Dioxide Electrocatalysis", invited seminar, Huazhong University of Science and Technology, Wuhan, China (2022)
52. "Recent Advances in Carbon Dioxide Electrocatalysis", invited seminar, Tianjin University, Tianjin, China (2022)
53. "Recent Advances in Carbon Dioxide Electrocatalysis", invited seminar, Fudan University, Shanghai, China (2022)
54. "Recent Advances in Carbon Dioxide Electrocatalysis", invited seminar, Southern University of Science and Technology, Shenzhen, China (2022)
55. "Tandem Electrolysis Process for Multi-Carbon Chemical Production from Carbon Dioxide", invited speaker, Indo–US Scoping Workshop on Carbon Utilization and Conversion (2022)
56. "Electrocatalytic Carbon Dioxide Conversion into Valuable Chemicals", invited speaker, NOW CHAINS, Annual Dutch Chemistry Conference (2021)
57. "Electrocatalytic Carbon Dioxide Conversion into Valuable Chemicals", invited speaker, APS-CPS Symposium on Energy and Sustainability (2021)
58. "Scialog Negative Emissions Science Workshop", participant, Research Corporation for Science Advancement and Alfred P. Sloan Foundation (2021)
59. "A Tandem Electrolysis Process for Multi-Carbon Chemical Production from Carbon Dioxide", oral presentation, DOE/NETL CO_2 Capture Technology Project Review Virtual Meeting (2021)
60. "Carbon Dioxide Electrolysis for Sustainable Chemical Production", invited talk, NanoFe Fall Meeting (2021)
61. "Carbon Dioxide Electrolysis for Sustainable Chemical Production", oral presentation, ECS Fall National Meeting (2021)

62. "Carbon Dioxide Electrolysis for Sustainable Chemical Production", oral presentation, ACS Fall National Meeting (2021)
63. "Carbon Dioxide Electrolysis for Sustainable Chemical Production", invited keynote speaker, 15th International Conference on Materials Chemistry, Dublin, Ireland (2021)
64. "Electrocatalytic Carbon Dioxide Conversion into Valuable Chemicals", invited speaker, Nature Sustainability Workshop Series, Springer Nature (2021)
65. "Electrocatalytic Carbon Dioxide Conversion into Valuable Chemicals", keynote speaker, International Symposium on Electrocatalysis and Electrosynthesis, Chinese Chemical Society (2021)
66. "Carbon Dioxide Electrolysis for Chemical Production", oral presentation, ACS Spring National Meeting (2021)
67. "Electrocatalytic Carbon Dioxide Conversion into Valuable Chemicals", keynote speaker, Competitive Energy Systems Symposium, AIChE (2021)
68. "Electrocatalytic Carbon Dioxide Conversion into Valuable Chemicals", invited seminar, Nanyang Technological University, Singapore (2021)
69. "Electrocatalytic Carbon Dioxide Conversion into Valuable Chemicals", invited seminar, KAIST, South Korea (2021)
70. "A Tandem Electrolysis Process for Multi-Carbon Chemical Production from Carbon Dioxide", oral presentation, DOE/NETL CO_2 Capture Technology Project Review Virtual Meeting (2020)
71. "Electrochemical CO_2 Conversion to Valuable Chemicals", virtual presentation, AIChE Annual Meeting (2020)
72. "Electrochemical CO_2 Reduction – Challenges and Opportunities", invited talk, ACS Energy and Fuels Division Monthly Invited Talk Series (2020)
73. "Electrochemical Conversion of Carbon Dioxide to Alcohols", oral presentation, NETL CO_2 Capture Technology Project Review Virtual Meeting (2020)
74. "Reactive CO_2 Capture Workshop", participant, DOE/NREL, Golden, CO (2020)
75. "African School of Catalysis", course instructor, Kigali, Rwanda (2020)
76. "Formation of Carbon–Nitrogen Bonds in Carbon Monoxide Electroreduction", invited talk, AIChE Annual Meeting, Orlando, FL (2019)
77. "Electrochemical CO_2 Conversion to Valuable Chemicals", oral presentation, AIChE Annual Meeting, Orlando, FL (2019)
78. "Carbon Utilization Using Electrochemical Approaches", oral presentation, ACS National Meeting, Orlando, FL (2019)
79. "Two-Dimensional Copper Nanosheets for Electrochemical Reduction of Carbon Monoxide to Acetate", invited talk, ACS National Meeting, San Diego, CA (2019)
80. "CO_2 Electrolysis: State-of-the-Art, Techno-Economic Analysis, and Challenges", invited speaker, CIFAR Ion Selective Membranes in CO_2 Electrolysis, Pittsburgh, PA (2019)
81. "Electrochemical Conversion of Carbon Dioxide to Alcohols", oral presentation, NETL CO_2 Capture Technology Project Review Meeting, Pittsburgh, PA (2019)
82. "Electrochemical CO Conversion to Valuable Chemicals", invited talk, ACS National Meeting, Orlando, FL (2019)
83. "Electrochemical Conversion of Carbon Dioxide to Alcohols", oral presentation, NETL CO_2 Capture Technology Project Review Meeting, Pittsburgh, PA (2018)
84. "Electrochemical CO_2 Conversion to Valuable Chemicals", invited talk, AIChE Annual Meeting, Pittsburgh, PA (2018)
85. "Bimetallic Catalyst with a Core–Shell Structure for CO_2 Reduction", invited talk, ACS National Meeting, Boston, MA (2018)
86. "Electrochemical CO_2 Conversion to Valuable Chemicals", invited talk, ACS National Meeting, Boston, MA (2018)
87. "Electrochemical Carbon Dioxide Conversion to Alcohols", invited talk, ACS National Meeting, New Orleans, LA (2018)
88. "Ag–Sn Bimetallic Catalyst with a Core–Shell Structure for CO_2 Reduction", oral presentation, AIChE Annual Meeting, Minneapolis, MN (2017)
89. "Electrochemical Conversion of Carbon Dioxide to Alcohols", oral presentation, NETL CO_2 Capture Technology Project Review Meeting, Pittsburgh, PA (2017)
90. "Ultra-Thin Electrocatalysts for Carbon Dioxide Reduction", oral presentation, 25th North American Catalysis Society Meeting, Denver, CO (2017)

91. "Nanostructured Materials as Advanced Electrocatalysts", oral presentation, 25th North American Catalysis Society Meeting, Denver, CO (2017)
92. "Nanoporous Materials: Synthesis and Electrocatalytic Properties", invited keynote presentation, ACS National Meeting, Washington, DC (2017)
93. "Mesoporous Metal Sulfides and Carbides", oral presentation, AIChE Annual Meeting, San Francisco, CA (2016)
94. "Novel Nanostructured Materials for Energy Applications", invited keynote presentation, ACS National Meeting, Philadelphia, PA (2016)
95. "Electrochemical Conversion of Carbon Dioxide", invited speaker, Solar Fuels Generation: PV and Electrolysis Workshop, Newark, DE (2016)
96. "Nanostructured Catalysts for Solar Fuel Production", invited speaker, KAUST Catalysis Center Symposium, Saudi Arabia (2016)
97. "Nanostructured Metals: Advanced Electrocatalysts for Carbon Dioxide Reduction", oral presentation, AIChE Annual Meeting, Salt Lake City, UT (2015)
98. "Cobalt Oxide Nanocubanes for Photocatalytic Water Oxidation", oral presentation, ACS National Meeting, Boston, MA (2015)
99. "Nanostructured Metals for Electrochemical Carbon Dioxide Reduction", oral presentation, ACS National Meeting, Boston, MA (2015)
100. "Nanoporous Bimetallic Catalyst for Hydrogen Evolution", oral presentation, ACS National Meeting, Boston, MA (2015)
101. "In Situ/Operando XAS Studies of Electrochemical Systems", invited speaker, ACS National Meeting, Denver, CO (2015)
102. "Nanoporous Materials for Energy Applications", invited speaker, ACS National Meeting, Denver, CO (2015)
103. "Synthesis of Mesoporous Metal Sulfides", oral presentation, ACS National Meeting, Denver, CO (2015)

Reviewer/Panelist/Contributor for national and international organizations/committees

1. Agency for Science, Technology and Research (A*STAR), Singapore
2. Natural Sciences and Engineering Research Council of Canada (NSERC), Canada
3. Mission Innovation Carbon Capture, Utilization and Storage Experts' Workshop (Electrochemistry and Photochemistry Panelist), Houston, TX (2017)
4. Testified before the U.S. Senate Committee on Environment and Public Works at the hearing of the Utilizing Significant Emissions with Innovative Technologies Act (or USE IT Act), 2018.
5. Contributor to the 2019 National Petroleum Council report - "Meeting the Dual Challenge, A Roadmap to At-Scale Deployment of Carbon Capture, Use and Storage"
6. National Science Foundation (CBET, SBIR), USA
7. Department of Energy (BES, SBIR-STTR, ARPA-E), USA
8. American Chemical Society - Petroleum Research Foundation, USA
9. National Aeronautics and Space Administration (NASA), USA
10. Research Grants Council (RGC) of Hong Kong, China
11. National Research Foundation, Singapore

Reviewer for Journals (selected list)

Accounts of Chemical Research
ACS Applied Materials & Interfaces
ACS Catalysis
ACS Energy Letters
ACS Nano
ACS Sustainable Chemistry & Engineering
Advanced Materials
Advanced Functional Materials
Advanced Energy Materials
AIChE Journal
Angewandte Chemie International Edition
Applied Catalysis B: Environmental
Catalysis Science and Technology
Chem
Chem Catalysis
Chemical Communications
Chemistry of Materials
ChemCatChem
ChemSusChem
Energy and Environmental Science
Energy and Fuels
Industrial & Engineering Chemistry Research

Joule
Journal of Catalysis
Journal of Materials Chemistry A
Journal of the American Chemical Society
Nano Energy
Nature
Nature Catalysis
Nature Chemical Engineering
Nature Chemistry
Nature Communications
Nature Energy
Nature Nanotechnology
Nature Sustainability
Physical Chemistry Chemical Physics
Science Advances

Membership in Professional Societies

American Chemical Society
American Institute of Chemical Engineering
The Electrochemical Society
Royal Society of Chemistry (Affiliate Member)

Conference Symposium Organizer/Session Chair

1. Program Chair, Division of Energy & Fuels, American Chemical Society (2023)
2. Symposium organizer, Division of Energy & Fuels, American Chemical Society (2022-2026)
3. The 27th North American Catalysis Society Meeting, Session Chair: Electrocatalytic CO_2 reduction (2022)
4. Symposium organizer, Division of Energy & Fuels, American Chemical Society (2021)
5. AICHE Annual Meeting, Symposium Session chair: Electrocatalysis and Photoelectrocatalysis (2020).
6. American Chemical Society National Meeting, ENFL, Symposium co-organizer: Electrochemistry Enables Catalysis for Energy, Chemicals and Materials (2020).
7. American Chemical Society National Meeting, ENFL, Symposium co-organizer: Sustainable Energy & Water via Innovative Electrocatalytic, Photocatalytic & Hybrid Catalytic System (2019).
8. AICHE Annual Meeting, Session chair: Electrocatalysis and Photoelectrocatalysis (2019).
9. American Chemical Society National Meeting, ENFL, Symposium co-organizer: Sustainable Energy Conversion via Innovative Electrocatalysis & Photocatalysis (2019).
10. AICHE Annual Meeting, Session chair: Electrocatalysis and Photoelectrocatalysis (2018).
11. American Chemical Society National Meeting, ENFL, Symposium co-organizer: Carbon Dioxide Conversion & Artificial Photosynthesis (2018).
12. American Chemical Society National Meeting, ENFL, Symposium co-organizer: Sustainable Energy Conversion via Innovative Electrocatalysis & Photocatalysis (2018).
13. AICHE Annual Meeting, Session co-chair: Electrocatalysis and Photoelectrocatalysis (2017).
14. 25th Biennial North American Meeting of the North American Catalysis Society, Session co-chair: Catalysis Poisoning and Deactivation 1 (2017).
15. 25th Biennial North American Meeting of the North American Catalysis Society, Session co-chair: Environmental: CO_2 conversion 1 (2017).
16. American Chemical Society National Meeting, ENFL, Symposium co-organizer: Innovative Chemistry & Electrocatalysis for Low-Carbon Energy & Fuels: Discovery to Application (2017).
17. American Chemical Society National Meeting, CATL, Symposium co-organizer: Advances in Carbon Dioxide Utilization (2017).
18. 91st American Chemical Society Colloid and Surface Science Symposium, Session co-organizer, New York (2017).
19. American Chemical Society National Meeting, ENFL, Symposium organizer: Innovative Chemistry & Electrocatalysis for Low-Carbon Energy & Fuels: Discovery to Application (2015).
20. American Chemical Society National Meeting, ENFL, Session co-chair: Carbon Dioxide Management: Recent Advances in Carbon Dioxide Capture, Conversion, Utilization and Storage (2014).
21. AICHE Annual Meeting, Session co-chair: Biocomposites (2013).
22. AICHE Annual Meeting, Session co-chair: Structure, Properties and Characterization of Nanocomposites (2012).

Collaborators (Current & Past)

Chulsung Bae (Rensselaer Polytechnic Institute)
Aditya Bhan (University of Minnesota)
Peter Bruce (University of Oxford)
Karen Chan (Technical University of Denmark)
Fanglin Che (UMass Lowell)
Jingguang Chen (Columbia University)
Susie Dai (TAMU)
Kun Fu (University of Delaware)
William A. Goddard III (Caltech)
Jinlong Gong (Tianjin University)
Liangbing Hu (Yale)
Xiaoqing Huang (Xiamen University)
Robert Jinkerson (UC, Riverside)
Jean-Claude Jumas (University Montpellier)
Yijin Kang (UESTC)
Freddy Kleitz (University of Vienna)
Xinhua Liang (WUSTL)
Yuanyue Liu (University of Texas at Austin)
Raul Lobo (University of Delaware)
Qi Lu (Tsinghua University)
Xinbin Ma (Tianjin University)
KC Neyerlin (NREL)
Alissa Park (UCLA)
Brian Seger (Technical University of Denmark)
Samira Siahrostami (University of Calgary)
Yuyan Shao (PNNL)
Fan Shi (NETL)
Wilson Smith (NREL)
Mark Snyder (Lehigh University)
Dong Su (Institute of Physics, CAS)
Dion Vlachos (University of Delaware)
John Xiao (University of Delaware)
Hongliang Xin (Virginia Tech)
Bingjun Xu (Peking University)
Xiaoxiang Xu (Tongji University)
Yushan Yan (University of Delaware)
Yang Yang (University of Central Florida)
Pierre Yao (University of Delaware)
Joshua Yuan (WUSTL)
Haotian Wang (Rice University)
Gang Wu (WUSTL)
Haimei Zheng (LBNL)
Kake Zhu (ECUST)

Graduate Students (Current)

Ahryeon Lee	(2022 – Present)
Siyang Xing	(2023 – Present)
Wentao Dai	(2023 – Present)
Zhaoxi Wang	(2023 – Present)
Jinghan Zhao	(2024 – Present)
Xiang Yao	(2024 – Present)
Haocheng Xu	(2025 – Present)
Weiran Gong	(2025 – Present)
Ryan Rasmussen	(2025 – Present)

Undergraduate Student (Current)

Chelsea Zhang
Cindy Borrayo-Carrera
Ross de Burca

Alumni

1. Wanyu Deng – Postdoc (2023–2025)
2. Junnan Li – Postdoc (2023–2025)
3. Jia Yu – Postdoc (2023–2025)
4. Hefei Li – Postdoc (2023–2025)
5. Zoushuang Li – Postdoc (2023–2025)
6. Nannan Meng – Postdoc (2023–2025)
7. Miao Miao – Postdoc (2023–2025)
8. Matt Naughton – Graduate Student (2022–2023)
9. Izak Minnie – Graduate Student (2022–2023)
10. Gen Yarema – Graduate Student (2022–2023)
11. Bradie Crandall – PhD (2021–2024)

12. Luke Cherniack – PhD (2021–2025)
13. Kentaro Hansen – Graduate Student (2020–2024)
14. Haeun Shin – PhD (2019–2023)
15. Sean Overa – PhD (2019–2023)
16. Bjorn Hasa – Postdoc (2019–2022)
17. Rong Xia – Postdoc (2019–2022)
18. Byung Hee (Brian) Ko – PhD (2017–2022)
19. Emily Jeng – M.Ch.E. (2017–2020)
20. Hongjie Tang – Postdoc (2017–2019)
21. Jingjing Lyu – Visiting Graduate Student (2017–2019)
22. Wenlei Zhu – Postdoc (2017–2018)
23. Matthew Jouny – PhD (2015–2020)
24. Andrew Craft – M.Ch.E. (2015–2017)
25. Wesley Luc – PhD (2014–2019)
26. Qi Lu – Postdoc (2012–2016)
27. Yan Zhang – M.Ch.E. (2012–2015)
28. Jonathan Rosen – PhD (2011–2016)
29. Bryan Yonemoto – PhD (2010–2015)
30. Gregory Hutchings – PhD (2010–2015)
31. Seif Yusuf – M.Ch.E. (2010–2012)

Undergraduate Students (Past)

Andy Redder	(2022 – 2023)	Dillon Gashi	(2016)
Abdul Fayeed	(2020 – 2022)	William Barndt	(2016)
Ruixue Xiong	(2021 – 2022)	Richard Sherrer	(2015 – 2016)
Wilson Chen	(2019)	Kaelan Reed	(2014 – 2015)
Sarah DiBenede	(2018 – 2019)	Alex Moore	(2014)
Zachary LaDuca	(2018)	Sean Rivera	(2014)
John Foster	(2017)	Kevin Abraham	(2013)
Jacob Brennan	(2017)	Jinghan Zhao	(2011 – 2013)
Lukas Wieder	(2017)	Touseef Habib	(2011 – 2012)
Sean Overa	(2017)	Hasan Raboui	(2011)
Ning Zhao	(2017)	Kameron Conforti	(2012 – 2013)
Albert Schaeffer	(2017)	Mengguang Wang	(2011 – 2013)
Charles Collins	(2014 – 2017)	Jamie Bakri	(2011)
Samuel Haas	(2016)	Yuan Wei	(2011)

High School Summer Interns (Past)

Chelsea Zhang	(2024)
Lily Giang	(2022)
Zimo Liu	(2022)
Jeffrey Yao	(2022)
Kate Li	(2022)
Ashrith Kandula	(2021)
Edward Bao	(2012 – 2013)