

JIN HUANG, PH.D.

Address: McCourtney Hall 140F, Notre Dame, IN 46556

Email: jin.huang@nd.edu; Phone: 310-614-3370

Website: <https://huanggroup.nd.edu/>

ACADEMIC APPOINTMENTS

Assistant Professor, University of Notre Dame
Department of Chemical and Biomolecular Engineering
Materials Science and Engineering Program

July 2026

EDUCATION AND TRAINING

IIN Postdoctoral Fellow, Northwestern University

April 2022 to June 2026

Department of Chemistry and International Institute for Nanotechnology

Advisor: Prof. Chad A. Mirkin

Ph.D., University of California, Los Angeles (UCLA)

September 2021

Materials Science and Engineering

Advisor: Prof. Yu Huang

Dissertation: Combining theory and experiment in Pt-based catalysts design for energy conversion

B.E., Wuhan University of Technology, China

June 2016

Materials Science and Engineering with highest honor

Advisor: Prof. Rong Tu

SELECTED HONORS AND AWARDS

2026 Carbon Future Young Investigator Honorable Mention Award	2026
CAS Future Leaders Top 100 Award, American Chemical Society	2025
International Institute for Nanotechnology (IIN) Outstanding Researcher Award	2024
ACS ENFL Future Investigator, American Chemical Society	2023
International Institute for Nanotechnology (IIN) Postdoctoral Fellowship	2023
UCLA Outstanding Materials Science PhD (commencement award, one per academic year)	2022
UCLA Dissertation Year Fellowship (one to two students from each department each year)	2020
Best Bachelor Thesis in Hubei Province, China	2016
National Endeavor Scholarship, Ministry of Education of China	2013
Outstanding Award, National Innovation & Entrepreneurship Training Program, China	2013

PUBLICATIONS

40 journal publications in total, 10 first-authored; 4,000+ citations h-index: 22/ Google Scholar link †: Contribute equally, *: Corresponding author

1. Lin, Z.†; Wang, Z.†; **Huang, J.†**; Yang, Y.; Cheng, Y.; Ye, Z.; Cai, Z.; Kulaksizoglu, A.; Zhang, H.; Zhang, X.; Mirkin, C. A.*, **2026**, In preparation.
2. Lin, Z.†; **Huang, J.†**; Pietryga, J.; Wang, Z.; Clarke, T.; Ye, Z.; Mirkin, C. A.* **2026**, In preparation.
3. **Huang, J.†**; Kulaksizoglu, A.†; Pietryga, J.†; Shi, Z.; Zhang, X.; Ye, Z.; McCormick, C. M.; Sargent, E. H.; Wolverton, C.; Mirkin, C. A.* *M In Preparation*
4. Ye, Z.†; Kang, D.†; Shen, B.; **Huang, J.**; Pietryga, J.; Lin, Z.; Zhang, X.; Wolverton, C. M.*; Mirkin, C. A.* A Three-component Strategy for Synthesizing High-Entropy Alloy Nanoparticles with High-Index Facets. *J. Am. Chem. Soc.* **2026**, 148, 17, 18095–18102
5. Wang, Z.; **Huang, J.**; Chen, C.; Ye, Z.; Mirkin, C. A.* Polyelemental Nanoparticle Synthesis Enabled by Noncontact Metallothermic Reactions. *J. Am. Chem. Soc.* **2025**, 147, 40, 36669–36676

6. Peng, B.†; Liu, Z.†; Ma, X.†; Ni, W.; Huang, J.; Menon, A.; Kanatzidis, M.; Xie, K.; **Huang, J.**; Sargent, E. H.* A cation-functionalized layer for ethylene electrosynthesis via CO reduction paired with H₂ oxidation in a pure-water-fed solid-state electrolyser, *Nat. Energy*. **2026**, 11, 689-698
7. Mirkin, C. A.*; et al., **Huang, J.** 33 Unresolved Questions in Nanoscience and Nanotechnology *ACS Nano* **2025**, 19, 36, 31933–31968
8. **Huang, J.†**; Tsai, Y.-H.†; Zheng, S.; Zhang, A.; Wang, S.; Pu, H.; Peng, B.; Liu, Z.; Hsiao, T.; Ma, C.; Li, B.; Wang, M.; Huang, Y.* Synthesis of PtCo nanotwinned catalysts via laser ablation. *Nano Res.*, **2025**, 18(12): 94908136
9. **Huang, J.†**; Wang, Z.†; Liang, J.†; Li, X.; Pietryga, J.; Ye, Z.; Smith, P. T.; Kulaksizoglu, A.; McCormick, C. M.; Kim, J.; Peng, B.; Liu, Z.; Xie, K.; Torrisi, S. B.; Montoya, J. H.; Wu, G.; Sargent, E. H.*; Mirkin, C. A.* Accelerating the pace of OER catalyst discovery through megalibraries. *J. Am. Chem. Soc.* **2025**, 147, 34, 30956–30966.
Highlighted in 14 news outlets including ScienceDaily, Science News Today, EurekAlert
Northwestern now news: Clean hydrogen's iridium problem? Solved in an afternoon
10. Ye, Z.†; Shen, B.†; Kang, D.†; Shen, J.; **Huang, J.**; Wang, Z.; Huang, L.; Wolverton, C. M.*; Mirkin, C. A.* A data-driven approach for the guided regulation of exposed facets in nanoparticles. *Nat. Synth.* **2024**, 3, 922–929
11. Ye, Z.†; Shen, B.†; Kang, D.; **Huang, J.**; Wang, Z.; Wahn, C. B.; Shin, D.; Huang, L.; Shen, J.; Wolverton, C. M.*; Mirkin, C. A.* Using Surface Composition and Energy to Control the Formation of Either Tetrahedral or Hexoctahedral High-Index Facet Nanostructures. *J. Am. Chem. Soc.* **2024**, 146, 19, 13519-13526.
12. **Huang, J.†**; Peng, B.†; Zhu, C.†; Xu, M.; Liu, Y.; Liu, Z.; Zhou, J.; Wang, S.; Duan, X.; Heinz, H.*; Huang, Y.* Surface molecular pump enables ultrahigh catalyst activity. *Sci. Adv.* **2024**, 10, eado3942
13. Peng, B.†; Liu, Z.†; Sementa, L.; Jia, Q.; Sun, Q.; Segre, C. U.; Liu, E.; Xu, M.; Tsai, Y.-H.; Yan, X.; Zhao, Z.; **Huang, J.**; Pan, X.; Duan, X.; Fortunelli, A.*; Huang, Y.* Embedded oxide clusters stabilize sub-2 nm Pt nanoparticles for highly durable fuel cell. *Nat. Catal.* **2024**
14. Zheng, S.; **Huang, J.**; Huang, S.; Murali, N.; Huang, Y.; Marian, J.; Wang, M.; Lavernia, E.; Apelian, D.; Li, X.* New dispersion mechanism for oxide dispersion-strengthened steels by liquid metallurgy. *Materialia* **2024**, 35, 102123.
15. Huang, Z.†; Cheng, T.†; Shah, A. H.†; Zhong, G.; Wan, C.; Wang, P.; Ding, M.; **Huang, J.**; Wan, Z.; Wang, S.; Cai, J.; Peng, B.; Liu, H.; Huang, Y.*; Goddard, W. A.*; Duan, X.* Edge sites dominate the hydrogen evolution reaction on platinum nanocatalysts. *Nat. Catal.* **2024**, 5, (6), 513-523.
16. Smith, P. T.; Ye, Z.; Pietryga, J.; **Huang, J.**; Wahl, C. B.; Orbeck, J. K.; Mirkin, C. A.* Molecular Thin Films Enable the Synthesis and Screening of Nanoparticle Megalibraries Containing Millions of Catalysts. *J. Am. Chem. Soc.* **2023**, 145, 25, 14031-14043.
17. Wan, C.; Zhang, Z.; Dong, J.; Xu, M.; Pu, H.; Baumann, D.; Lin, Z.; Wang, S.; **Huang, J.**; Shah, A. H.†; Pan, X.; Hu, T.; Alexandrova, A. N.*; Huang, Y.*; Duan, X.* Amorphous nickel hydroxide shell tailors local chemical environment on platinum surface for alkaline hydrogen evolution reaction. *Nat. Mater.* **2023**, 22, 1022-1029.
18. Zhu, E.†; Liu, Y.†; **Huang, J.**; Zhang, A.; Peng, B.; Liu, Z.; Liu, H.; Yu, J.; Li, Y.-R.; Yang, L.; Duan, X.; Huang, Y.* Bubble-Mediated Large-Scale Hierarchical Assembly of Ultrathin Pt Nanowire Network Monolayer at Gas/Liquid Interfaces. *ACS Nano* **2023**, 17, 14 14152-14160.
19. Cai, J.; Zhao, Q.; Hsu, W.-Y.; Choi, C.; Liu, Y.; Martirez, J. P.; Chen, C.; **Huang, J.**; Emily, C. A.*; Huang, Y.* Highly Selective Electrochemical Reduction of CO₂ into Methane on Nanotwinned Cu. *J.*

20. Liu, Y.†; Zhu, E.†; **Huang, J.**; Zhang, A.; Shah, A. H.; Jia, Q.; Xu, M.; Liu, E.; Sun, Q.; Duan, X.; Huang, Y.* Periodic Assembly of Diblock Pt–Au Heteronanowires for the Methanol Oxidation Reaction. *Nano Lett.* **2023**, 23, 7, 2758-2763.
21. Wang, L.†; Wang, P.†; **Huang, J.**; Peng, B.; Jia, C.; Qian, Q.; Zhou, J.; Xu, D.; Huang, Y.; Duan, X.* A general one-step plug-and-probe approach to top-gated transistors for rapidly probing delicate electronic materials. *Nat. Nanotechnol.* **2022**, 17, 1206-1213.
22. **Huang, J.**; Sementa, L.; Liu, Z.; Barcaro, G.; Feng, M.; Liu, E.; Jiao, L.; Xu, M.; Leshchev, D.; Lee, S.-J.; Li, M.; Wan, C.; Zhu, E.; Liu, Y.; Peng, B.; Duan, X.; Goddard, W. A.*; Fortunelli, A.*; Jia, Q.*; Huang, Y.* Experimental Sabatier plot for predictive design of active and stable Pt-alloy oxygen reduction reaction catalysts. *Nat. Catal.* **2022**, 5, 513-523.
Highlighted in 10 news outlets including Science Springs, ELETimes, Hydrogen Central, Green Car Congress
Nature Catalysis news & views: Timoshenko, J, Spectroscopy predicts catalyst functionality. *Nat. Catal.*, **2022**, 5, 469-470.
Brookhaven National Laboratory newsroom: <https://www.bnl.gov/newsroom/news.php?a=220875>
UCLA newsroom: UCLA-led study could be step toward cheaper hydrogen-based energy.
23. **Huang, J.**†; Peng, B.†; Stracensky, T.; Liu, Z.; Zhang, A.; Xu, M.; Liu, Y.; Zhao, Z.; Duan, X.; Jia, Q.; Huang, Y.* 1D PtCo nanowires as catalysts for PEMFCs with low Pt loading. *Sci. China Mat.* **2021**, 65, 704-711.
24. Ma, C.; Xu, D.; Wang, P.; Lin, Z.; Zhou, J.; Jia, C.; **Huang, J.**; Li, S.; Huang, Y.*; Duan, X.* Two-dimensional van der Waals thin film transistors as active matrix for spatially resolved pressure sensing. *Nano Res.* **2021**, 14, 3395-3401.
25. Zheng, S.; Rementeria, R.; Kan, W.; Xu, M.; **Huang, J.**; Huang, Y.; Pan, X.; Apelian, D.; Liang, Y.; Lin, J.; Perez, M.; Li, X.* Nanoparticle enabled high performance high modules steels. *Scr. Mater.* **2021**, 201, 113954.
26. Cao, B.; Zhao, Z.; Peng, L.; Shiu, H.-Y.; Ding, M.; Song, F.; Guan, X.; Lee, C. K.; **Huang, J.**; Zhu, D.; Fu, X.; Wong, G. C.; Liu, C.; Nealson, K.; Weiss, P. S.; Duan, X.*; Huang, Y.* Silver nanoparticles boost charge-extraction efficiency in *Shewanella* microbial fuel cells. *Science* **2021**, 373, 1336-1340.
27. Hu, M.; **Huang, J.**; Zhang, S.; Liu, Z.; Li, Q.; Yang, M.; Li, H.; Goto, T.; Tu, R.* In situ synthesis of V₂O₃@Ni as an efficient hybrid catalyst for the hydrogen evolution reaction in alkaline and neutral media. *Int. J. Hydrogen Energy.* **2021**, 46, 9101-9109.
28. Hu, M.; **Huang, J.**; Li, Q.; Tu, R.*; Zhang, S.; Yang, M.; Li, H.; Goto, T.; Zhang, L. Self-supported MoS_x/V₂O₃ heterostructures as efficient hybrid catalysts for hydrogen evolution reaction. *J. Alloys Compd.* **2020**, 827, 154262.
29. Lee, S.-J.; Lin, Z.; **Huang, J.**; Choi, C. S.; Chen, P.; Liu, Y.; Guo, J.; Jia, C.; Wang, Y.; Wang, L.; Liao, Q.; Shakir, I.; Duan, X.; Dunn, B.; Zhang, Y.; Huang, Y.*; Duan, X.* Programmable devices based on reversible solid-state doping of two-dimensional semiconductors with superionic silver iodide. *Nat. Electron.* **2020**, 3, 630-637.
30. Ma, C.; Xu, D.; Huang, Y.-C.; Wang, P.; **Huang, J.**; Zhou, J.; Liu, W.; Li, S.*; Huang, Y.*; Duan, X.* Robust Flexible Pressure Sensors Made from Conductive Micropylamids for Manipulation Tasks. *ACS Nano* **2020**, 14, 12866-12876.
31. Liu, Y.†; Wang, P.†; Wang, Y.; Lin, Z.; Liu, H.; **Huang, J.**; Huang, Y.; Duan, X.* van der Waals integrated devices based on nanomembranes of 3D materials. *Nano Lett.* **2020**, 20, 2, 1410-1416.

32. **Huang, J.**; Liu, Y.; Xu, M.; Wan, C.; Liu, H.; Li, M.; Huang, Z.; Duan, X.; Pan, X.; Huang, Y.* PtCuNi Tetrahedra catalysts with Tailored Surface for efficient alcohol oxidation. *Nano Lett.* **2019**, 19, 8, 5431-5436.
33. Zhao, Z.†; Chen, C.†; Liu, Z.†; **Huang, J.**; Wu, M.; Liu, H.; Li, Y.*; Huang, Y.*; Pt-based nanocrystal for electrocatalytic oxygen reduction reaction. *Adv. Mater.* **2019**, 31, 1808115.
34. Li, M.†; Duanmu, K.†; Wan, C.†; Cheng, T.†; Zhang, L.; Dai, S.; Chen, W.; Zhao, Z.; Li, P.; Fei, H.; Zhu, Y.; Yu, R.; Luo, J.; Zang, K.; Lin, Z.; Ding, M.; **Huang, J.**; Sun, H.; Guo, J.; Pan, X.; Goddard, W. A.; Philippe, S.*; Huang, Y.*; Duan, X.* Single-atom tailoring of platinum nanocatalysts for high-performance multifunctional electrocatalysis. *Nat. Catal.* **2019**, 2, 495-503.
35. Zhu, E.; Yan, X.; Wang, S.; Xu, M.†; Wang, C.; Liu, H.; **Huang, J.**; Xue, W.; Cai, J.; Heinz, H.; Li, Y.*; Huang, Y.*; Peptide-assisted 2D assembly toward free-floating ultrathin Platinum nanoplates as effective electrocatalysts. *Nano Lett.* **2019**, 19, 6, 3730-2736.
36. Zhao, Z.†; Liu, H.†; Gao, W.; Xue, W.; Liu, Z.; **Huang, J.**; Pan, X.; Huang, Y.*; Surface-engineered PtNi-O nanostructure with record-high performance for electrocatalytic hydrogen evolution reaction. *J. Am. Chem. Soc.* **2018**, 140, 29, 9046-9050.
37. Zhang, C.†; **Huang, J.†**; Tu, R.*; Zhang, S.; Yang, M.; Li, Q.; Shi, J.; Li, H.; Zhang, L.; Goto, T.; Ohmori, H. Transfer-free growth of graphene on Al₂O₃ (0001) using a three-step method. *Carbon* **2018**, 131, 10-17.
38. Zhang, C.; Tu, R.; Zhang, S.*; **Huang, J.**; Gao, T.; Yang, M.; Li, Q.; Shi, J.; Zhang, L.; Goto, T. Synthesis of large size uniform single-crystalline trilayer graphene on premelting copper. *Carbon* **2017**, 122, 352-360.
39. Tu, R.*; **Huang, J.**; Zhang, L.; Zhang, S. Epitaxial Growth of Copper Film by MOCVD. *Key Engineering Materials* **2016**, 680, 507-510.
40. Xie, J.; Chen, X.; **Huang, J.**; Liu, Z.; Li, H.* Synthesis and characterization of stable graphene colloidal dispersions. *Journal of Functional Materials* **2014**, 12, 108-112.

PATENTS

1. Mirkin, C. A.; **Huang, J.** US Patent, Method For Screening Nanoparticle Megalibrary For Electrocatalytic Activity (filed)
2. Li, H.; Chen, X.; Xie, J.; **Huang, J.** Chinese Patent, A Synthesis Method of Stable Graphene Colloidal Dispersions, patent number: 201410184134.3

CONFERENCE PRESENTATIONS

1. Oral (Invited) **2026 Fall ACS meeting**, Division of Energy and Fuels, *Cracking Catalysts Secrets through Accelerated Materials Discovery*
2. Poster **2025 248th ECS Meeting**, *Accelerating the Pace of Oxygen Evolution Reaction (OER) Catalyst Discovery through Megalibraries*
3. Poster **2025 AIChE Annual Meeting**, November 2, Meet the Faculty and Post-Doc Candidates Poster Session *Electrifying Chemical Synthesis for Sustainable and Value-Added Chemicals: From High-Throughput Discovery to Scalable Electrochemical Manufacturing*
4. Poster **CCI-MOSAIC Workshop**, June 2-4, 2025, *High-Performance Catalyst Discovery via Megalibrary Synthesis, Screening, and Machine Learning*

5. Oral (Invited) **2025 Spring ACS meeting**, Data Analytics and AI for Manufacturing and Healthcare, March 25, *Quest to replace Ir as a catalyst for the oxygen evolution reaction*
6. Poster **2024 AIChE Annual Meeting**, Meet the Faculty and Post-Doc Candidates Poster Session, October 27, *Accelerating the Pace of Materials Discovery for Energy Conversion*
7. Oral (Invited) **2023 Fall ACS meeting**, Division of Energy and Fuels, ACS ENFL Future Investigator Spotlight, August 13–17, *High-performance electrocatalyst discovery for energy conversion*
8. Poster **2023 Gordon Research Conference**, Nanomaterials for Applications in Energy Technology, February 26 - March 3, 2023, *Catalyst discovery through megalibrary synthesis, screening, and machine learning*
9. Oral (Invited) **2022 Fall ACS meeting**, Division of Energy and Fuels, Electrochemistry-Enabled Catalysis for Energy, Chemicals & Materials, August 24, 2022, *Boosting oxygen reduction reaction kinetics by interfacial Le Chatelier's principle*
10. Oral (Invited) **2022 Spring ACS meeting**, CATL Electrocatalysis Symposium, March 23, 2022, *Understanding reaction kinetics at catalyst-electrolyte interface*
11. Oral **2021 Fall MRS**, Symposium: EN14.04: Fuel Cells I, December 1, 2021, *Overcome the Dilemma between Low Loading and High Power Density for PEMFCs Using Ultrathin 1D PtCo Nanowire Catalyst*
12. Oral **2021 Fall MRS**, Symposium: EN11: Electrocatalytic Materials to Sustainably Convert Atmospheric C, H, O and N into Fuels and Chemicals, December 1, 2021, *Experimental Sabatier Plot for Predictive Design of Active and Stable Pt-alloy Oxygen Reduction Reaction Catalysts*

INVITED SEMINAR TALKS

1. **The Department of Chemistry and Biochemistry, The University of Notre Dame**, March, 2027 (scheduled), *Cracking Catalyst Secrets Through Accelerated Materials Discovery*
2. **The Department of Materials Science and Engineering, The University of Texas at Dallas**, February 4, 2026, *Cracking Catalyst Secrets Through Accelerated Materials Discovery*
3. **The Department of Chemical and Biomolecular Engineering, The University of Notre Dame**, January 22, 2026, *Cracking Catalyst Secrets Through Accelerated Materials Discovery*
4. **The Department of Chemistry, The University of Utah**, January 14, 2026, *Cracking Catalyst Secrets Through Accelerated Materials Discovery*
5. **The Department of Chemistry, The University of Texas at Austin**, January 7, 2026, *Cracking Catalyst Secrets Through Accelerated Materials Discovery*
6. **Pritzker School of Molecular Engineering, Materials Special Seminar, University of Chicago**, April 1, 2025, *Accelerate the Pace of High-Performance Catalyst Discovery for Energy Conversion*
7. **MSE247 seminar, UCLA, Winter, 2024**: Nanoscale Materials: Challenges and Opportunities, *High-performance electrocatalyst discovery for energy conversion*

TEACHING EXPERIENCE

Guest Lecturer, UCLA

Nanoscale Materials: Challenges and Opportunities (MSE247)

2024

Mentored Discussion of Teaching, Northwestern University

As a trainee to audit Fundamentals of Chem I (Chem 131)

2024

Teaching Assistant, UCLA

Nanoscale Materials: Challenges and Opportunities (MSE247)	2021 Fall
General and Organic Chemistry Laboratory II (CHEM14CL), (Evaluation: 7.8/9.0)	2019 Fall
Mechanical Behavior of Materials (MSE143A), (Evaluation: 7.9/9.0)	2019 Winter
General and Organic Chemistry Laboratory II (CHEM14CL), (Evaluation: 8.4/9.0)	2018 Fall
Mechanical Behavior of Materials (MSE143A), (Evaluation: 8.3/9.00)	2018 Winter

MENTORING EXPERIENCE

Directly mentor 2 junior postdocs, 9 graduate students from Chemistry, Materials Science and Engineering, or Chemical Engineering, and 2 Chemistry undergraduate students

Postdocs

Thomas B. Clarke - Northwestern University, Chemistry	2024 Fall - Present
Connor R. McCormick - Northwestern University, Chemistry	2023 Fall - Present

Graduate Students

Silas Bollen - Northwestern University, Chemistry	2024 Fall - Present
Xinsui Zhang - Northwestern University, Chemical and Biological Engineering	2024 Fall - Present
Zifeng Lin - Northwestern University, Materials Science and Engineering	2023 Fall - Present
Alp Kulaksizoglu - Northwestern University, Materials Science and Engineering	2022 Fall - Present
Jacob Pietryga - Northwestern University, Materials Science and Engineering	2022 Fall - Present
<i>—Mentored to secure the NSF Graduate Student Fellowship and Ryan Fellowship</i>	
Yu-Han Tsai - UCLA, Materials Science and Engineering	2021 Fall - 2022 Spring
Ao Zhang - UCLA, Materials Science and Engineering	2019 Fall - 2022 Spring
Yang Liu - UCLA, Materials Science and Engineering	2019 Fall - 2022 Spring
Joon ho Gha - UCLA, Materials Science and Engineering	2019 Fall - 2020 Spring

—now yield engineer, TSMC

Undergraduate Students

Zugen Wu, UCLA	2019 Summer
<i>—now National University of Singapore Chemistry PhD candidate</i>	
Yang Liu, UCLA	2018 Summer and 2019 Spring
<i>—now UCLA Materials Science and Engineering PhD candidate</i>	

PROFESSIONAL SERVICES

Symposium Organizer

ACS Division of Energy and Fuels (ENFL) 2026 Fall
Symposium: Electrochemical Interface

Journal Reviewer

Journal of the American Chemical Society, Nature Communications, ACS Nano, Chemical Engineering Journal, Nano Research, Materials Chemistry Frontiers, Micro & Nano Letters

Conference Paper Reviewer

IEEE Nanotechnology Materials and Devices Conference (NMDC)

OUTREACH ACTIVITIES

Undergraduate Student Research Competition, Northwestern University

Judging Committee Member 2024 and 2025

ENFL Student Award Competition, American Chemical Society

Judging Committee Member 2023

Nano Scout Day, Northwestern University

Volunteer, Leading 2-5 troops of boy and girl scouts at a nanoscience camp 2023

GRC power hour, Ventura, CA, U.S.

Attendee, discuss gender and racial/ethnic identities in STEM contexts 2023