

FENGWANG LI, PhD

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RESEARCH SUMMARY

Since 2020, I have started up and led the Electrochemical Engineering Laboratory at The University of Sydney. Specialising in electrochemistry, catalysis, nanomaterials and chemical engineering, our mission is to create a carbon-net-zero future by advancing new chemistry and processes able to produce sustainable fuels and chemicals using only renewable resources (e.g., water, air, biomass) – powered by renewable electricity instead of fossil fuels. Over the past three years, my lab has secured over \$8.1 million in research income to support our research. We have produced significant outcomes, including publishing over 10 articles per year in top 10% journals such as *Science* and obtaining two patents. Since 2020, I have trained over 20 higher degree research students and postdoctoral researchers, given over 10 invited talks per year in conferences and research institutes, and reached out to more than 400 members from the general public through outreach events.

EMPLOYMENT

2024 –	University of Sydney	Senior Lecturer
2020 – 2023	University of Sydney	Lecturer, DECRA Fellow
2018 – 2020	University of Toronto	Postdoctoral Fellow
	Advisor: Prof. Edward H. Sargent	
	Research focus: Catalysts and systems for CO ₂ conversion	
2016	University of Warwick	Visiting Scholar
	Supervisor: Prof. Patrick R. Unwin	
	Research focus: Scanning electrochemical cell microscopy	

EDUCATION

2020 – 2021	University of Sydney	Graduate Certificate in Educational Studies (Higher Education)
2014 – 2017	Monash University	PhD in Chemistry (Conferred on 16 Nov 2017)
	Thesis: Two-dimensional catalysts for CO ₂ reduction	
	Supervisor: A/Prof. Jie Zhang, Prof. Douglas R. MacFarlane	
2010 – 2013	Renmin University of China	MEng in Applied Chemistry
	Thesis: Unconventional nanofabrication methods	
	Supervisor: Prof. Meining Zhang, Prof. Tingbing Cao	
2006 – 2010	Renmin University of China	BS in Chemistry

HONOURS & AWARDS

Since 2020	World's Top 2% Scientists, ranked by Stanford University
2025	Sydney Nanopitch Discovery Prize (runner-up, \$20,000)
2025	Australian Academy of Science Le Fèvre Medal
2025	American Chemical Society (ACS) Energy & Fuels Rising Star
2024	Clarivate Highly Cited Researcher (cross-field)
2024	Waterloo Institute for Nanotechnology (WIN) Rising Star Award
2024	ARC Future Fellowship
2024	RACI A.M. Bond Medal
2024	Institution of Chemical Engineers & Elsevier Carbon Capture Future Leader Award
2023	Top 100 Entry in the Create the Future Design Contest by the Tech Briefs magazine
2023	Winner of Australian Museum Eureka Prize for Outstanding Early Career Researcher

2023	University of Sydney Research Accelerator (SOAR) Prize
2022	Royal Society of Chemistry <i>Nanoscale</i> Emerging Investigators
2021	MIT Technology Review 35 Innovators Under 35 (China list)
2021	Vice-Chancellor's Award for Outstanding Early Career Research
2021	Faculty of Engineering Dean's Award for Early Career Research Excellence
2021	Sydney Nano Publication Award
2021	Institution of Chemical Engineers Nicklin Medal
2021	Royal Society of Chemistry <i>Journal of Materials Chemistry A</i> Emerging Investigators
2020	Metrohm-RACI (Electrochemistry Division) Young Electrochemist Award
2019	ARC Discovery Early Career Researcher Award (DECRA)
2018	Mollie Holman Medal ("Best PhD thesis award"), Monash University
2017	Monash Publication Postgraduate Award
2016	Chinese Government Award for Outstanding Self-Financed Students Abroad
2013	Chinese National Scholarship for Graduate Students

PUBLICATIONS (†equal contribution; *corresponding author)

Total citations: 19,273, H-index: 60 (Google Scholar), 5-year Field-Weighted Citation Impact: 6.79 (Scopus).

Highlights: 1× *Nature*, 3× *Science*, 7× *Nat. Catal.*, 2× *Nat. Synth.*, 2× *Nat. Energy*, 13× *Nat. Commun.*, 5× *J. Am. Chem. Soc.* and 5× *Angew. Chem.*; 23 WoS 'Highly Cited Paper'.

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2. Immobilized azole layer tunes interfacial hydrogen source for CO₂ electroreduction in strong acid, Y. Shi†, Y. Yang†, A. Xu, K. N. Hui, F. Li*, J. Zeng*, **J. Am. Chem. Soc.**, 2025, 147, 35698-35704.
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3. H. Huang, J. Xiao, X. Sun, J. Li, Z. Fan, Y. Zhao, X. Ding, X. Zi, R. Zeng, M. Liu, L. Wang, F. Li, A. Xu, M. Luo*, Residual faraday efficiency enabling interpretable data-driven optimization of mass transport for CO₂ electroreduction, **ACS Energy Lett.**, 2025, 10, 4260-4268.
4. M. Sun, J. Xiao, Y. Yang, W. Zhang, J. Huang, Y. Hao, J. Xiong, Y. Shi, Y. Zeng, A. Ozden, T. Liu, A. Xu*, F. Li*, Highly selective electrochemical semi-hydrogenation via a palladium membrane reactor, **Nano Lett.**, 2025, 25, 12075-12080.
5. Z. Li†, R. Chen†, W. Ge, K. Xie, Y. Wang, L. Zhang, Z. Song, F. Li, Y. Li*, C. Li*, Molecular scale interfacial water management switching reaction pathway of carbon dioxide electroreduction, **Angew. Chem. Int. Ed.**, 2025, 64, e202508801.
6. M. Sun, Y. Wang, Y. Zeng, J. Xiong, J. Li, T. Liu, A. Xu, F. Li*, Minireview and outlook of electrochemical palladium membrane reactors for sustainable hydrogenation, **Energy Fuels**, 2025, 39, 13997-14006.
7. C. Wang, K. Jiang, H. Yu, S. Li, Y. Zhao, Z. Zheng, H. Liu, X. Xia, P. Zhao, Y. Li, H. Liu, S. Yang, Y. Yang, W. Zhang, H. Zheng, F. Li*, K. Li*, Review of electrochemical carbon dioxide capture towards practical application, **Next Mater.**, 2025, 8, 100660.
8. Y. Yang, Y. Shi, J. Liu, A. Xu, F. Li*, Enhancing data reproducibility and relevance for performance-mechanism studies in CO₂ electrocatalysis, **Joule**, 2025, 9, 101970.
9. W. Zhang, A. Ozden, Y. Yang, A. Xu*, F. Li*, Hidden acidification challenges in electrochemical ocean decarbonization, **ACS Energy Lett.**, 2025, 10, 2788-2792.
10. P. Liu†, H. Ma†, Y. Qin*, J. Li, F. Li, J. Ye, Q. Guo, N. Su, C. Gao, L. Xie, X. Sheng, S. Zhao, G. Jiang, Y. Ren, Y. Sun*, Z. Zhang*, Enhancing C–C bond cleavage of glycerol electrooxidation through spin-selective electron donation in Pd–PdS₂–Cox heterostructural nanosheets, **Angew. Chem. Int. Ed.**, 2025, 64, e202506032.

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14. J. Li, J. Xiong, M. Sun, F. Li*, Anodic reactions matter for cathodic electrocarboxylation with CO₂, **Chem Catal.**, 2025, 5, 101263.
15. A. Ozden*, F. Li, M. Luo, K. Polychronopoulou*, Carbon dioxide electrolysis systems for high carbon efficiency, **Energy Convers. Manag.**, 2025, 326, 119443.
16. W. Tang, Y. Shen, Y. Yang, C. Li, Y. Li, S. Yin, F. Li*, H. Li*, C. Li*, Amplifying cation effects on high-curvature nanostructures via enhancing interfacial electric field for CO₂RR to multicarbon product, **Nano Res.**, 2025, 18, 94907200.
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18. H. Deng†, T. Liu†, W. Zhao†, J. Wang, Y. Zhang, S. Zhang, Y. Yang, C. Yang, W. Teng, Z. Chen, G. Zheng, F. Li, Y. Su*, J. Hui*, Y. Wang*, Substituent tuning of Cu coordination polymers enables carbon-efficient CO₂ electroreduction to multi-carbon products, **Nat. Commun.**, 2024, 15, 9706.
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20. H. Rabiee*, B. Ma, Y. Yang, F. Li, P. Yan, Y. Wu, X. Zhang, S. Hu*, H. Wang, L. Ge*, Z. Zhu*, Advances and challenges of carbon-free gas-diffusion electrodes (GDEs) for electrochemical CO₂ reduction, **Adv. Funct. Mater.**, 2024, 2411195.
21. Y. Chai, R. Chen, X. Ma, Y. He, H. Zhang, T. Xia, J. Chen, Y. Wang, H. Ma, X. Wang, W. Rao, X. Zhang, Y. Wang, J. Ji, F. Li, M. Xue*, Electrical anisotropy in two-dimensional reduced graphene oxide/polypyrrole-based ordered conjugated system ensure multi-stimulus response signal adapter, **Sci. China Mater.**, 2024, 67, 3966-3975.
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23. Y. Liang†, F. Li†, R. K. Miao†, S. Hu, W. Ni, S. Zhang, Y. Liu, Y. Bai, H. Wan, P. Ou, X.-Y. Li, N. Wang, S. Park, F. Li*, J. Zeng*, D. Sinton*, E. H. Sargent*, Efficient ethylene electrosynthesis through water dissociation promoted C-O cleavage, **Nat. Synth.**, 2024, 3, 1104-1112.
** Highlighted by Nature Synthesis News & Views: "Efficient ethylene electrosynthesis by accelerating water dissociation".
24. J. Knezevic, T. Zhang*, R. Zhou*, J. Hong, R. Zhou, C. Barnett, Q., Y. Gao, W. Xu, D. Liu, N. Proschogo, B. Mohanty, J. Strachan, B. Soltani, F. Li, T. Maschmeyer, E. C. Lovell, P. J. Cullen*, Long-chain hydrocarbons from nonthermal plasma-driven biogas upcycling, **J. Am. Chem. Soc.**, 2024, 146, 12601-12608.
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28. W. Zhang, Y. Yang, Y. Li, F. Li*, M. Luo*, Recent progress on integrated CO₂ capture and electrochemical upgrading, **Mater. Today Catal.**, 2023, 2, 100006.
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 ** Highlighted at Phys.org, Chines Academy of Sciences Newsroom, AZO Materials, etc.
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30. Y. Zhao†, L. Hao†, A. Ozden†, S. Liu†, R. K. Miao, P. Ou, T. Alkayyali, S. Zhang, J. Ning, Y. Liang, Y. Xu, M. Fan, Y. Chen, J. E. Huang, K. Xie, J. Zhang, C. P. O'Brien, F. Li*, E. H. Sargent, D. Sinton*, Conversion of CO₂ to multicarbon products in strong acid by controlling the catalyst microenvironment, **Nat. Synth.**, 2023, 2, 403-412.
 ** Highlighted at over 100 media outlets including Uni Sydney News & Opinions, The Canberra Times, The West Australian, Yahoo News, AAAS EurekAlert!, Phys.org, Technology Networks, Lab Manager, etc.
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33. R. Chen†, H. Ma†, X. Ma, T. Ai, Y. Chai, H. Zhang, F. Li, X. Wang, C. Li, J. Ji, M. Xue*, Polymer crystallization regulation in liquid phase enables wearable full-featured thermoplastic-based smart Janus film, **Chem. Eng. J.**, 2023, 457, 141163.
34. T. Xia, Y. Yang, Q. Song, M. Luo, M. Xue, K. Ostrikov*, Y. Zhao*, F. Li*, In-situ characterisation for nanoscale structure-performance studies in electrocatalysis, **Nanoscale Horiz.**, 2023, 8, 146-157.
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36. A. Xu†, S.-F. Hung†, A. Cao†, Z. Wang†, N. Karmodak, J. E. Huang, Y. Yan, A. S. Rasouli, A. Ozden, F.-Y. Wu, Z.-Y. Lin, H.-J. Tsai, T.-J. Lee, I. Grigioni, F. Li, M. Luo, Y. Wang, X. Wang, J. Abed, Z. Wang, D.-H. Nam, Y. C. Li, A. H. Ip, D. Sinton, C. Dong*, E. H. Sargent*, Copper/alkaline earth metal oxide interfaces for electrochemical CO₂-to-alcohol conversion by selective hydrogenation, **Nat. Catal.**, 2022, 5, 1081-1088.
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37. C. Wang, X. Kong, J. Huang, Y. Yang, H. Zheng, H. Wang, S. Dai, S. Zhang, Y. Liang, Z. Geng*, F. Li*, J. Zeng*, Promoting electrocatalytic CO₂ methanation using a molecular modifier on Cu surfaces, **J. Mater. Chem. A**, 2022, 10, 25725-25729.
38. D. Wang, J. Gui, B. Pan, M. Li, Y. Kuang, C. Zhang, J. Mao, Y. Loua, C. Pan, F. Li, Y. Li, Y. Wang*, Y. Zhu*, Y. Zhang*, Multi-microenvironment synergistically promoting CO₂ electroreduction activity on porous Cu nanosheets, **Appl. Catal. B Environ.**, 2023, 322, 122119.

39. T. Zhang[†], R. Zhou^{†*}, S. Zhang[†], R. Zhou, J. Ding, F. Li, J. Hong, L. Dou, T. Shao^{*}, A. B. Murphy, K. Ostrikov, P. J. Cullen, Sustainable ammonia synthesis from nitrogen and water by one-step plasma catalysis, **Energy Environ. Mater.**, 2023, 6, e12344.
40. D.-H. Nam, O. Shekhah, A. Ozden, C. McCallum, F. Li, X. Wang, Y. Lum, T. Lee, J. Li, J. Wicks, A. Johnston, D. Sinton^{*}, M. Eddaoudi^{*}, E. H. Sargent^{*}, High-rate and selective CO₂ electrolysis to ethylene via metal-organic framework-augmented CO₂ availability, **Adv. Mater.**, 2022, 34, 2207088.
41. X. Jing, F. Li^{*}, Y. Wang^{*}, Assessing the economic potential of large-scale, carbonate-formation-free CO₂ electrolysis, **Catal. Sci. Technol.**, 2022, 12, 2912-2919.
42. S.-F. Hung[†], A. Xu[†], X. Wang[†], F. Li[†], S.-H. Hsu, Y. Li, J. Wicks, E. G. Cervantes, A. S. Rasouli, Y. C. Li, Mi. Luo, D.-H. Nam, N. Wang, T. Peng, Y. Yan, G. Lee, E. H. Sargent^{*}, A metal-supported single-atom catalytic site enables carbon dioxide hydrogenation, **Nat. Commun.**, 2022, 13, 819.
****‘Highly Cited Paper’ (Web of Science)*
43. X. Zang[†], Y. Jiang[†], Y. Chai, F. Li, J. Ji, M. Xue^{*}, Tunable metallic-like transport in polypyrrole, **Mater. Futures**, 2022, 1, 011001.
44. H. Zhang, Y. Yang, Y. Liang, J. Li, A. Zhang, H. Zheng, Z. Geng^{*}, F. Li^{*}, J. Zeng^{*}, Molecular stabilization of sub-nanometer Cu clusters for selective CO₂ electro-methanation, **ChemSusChem**, 2022, 15, e2021020.
***Very Important Paper (top 5%)*
****‘Top 10 Most Downloaded Papers’ among works published in ChemSusChem in 2021.*
45. T. Xia, Z. Wang, F. Li^{*}, Seeing is believing: in-situ visualising dynamic evolution in CO₂ electrolysis, **Curr. Opin. Electrochem.**, 2022, 31, 100846.
***Invited contribution to the ‘‘Electrochemical Materials and Engineering 2022’’ theme.*
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47. J. E. Huang[†], F. Li^{†*}, A. Ozden[†], A. S. Rasouli, F. G. de Arquer, S. Liu, S. Zhang, M. Luo, X. Wang, Y. Lum, Y. Xu, K. Bertens, R. K. Miao, C.-T. Dinh, D. Sinton^{*}, E. H. Sargent^{*}, CO₂ electrolysis to multi-carbon products in strong acid, **Science**, 2021, 372, 1074-1078.
***Highlighted at Uni Sydney News & Opinions, Uni Toronto News, AAAS EurekAlert!, Phys.org, Cosmos, ScienMag, ScienceDaily, MIRAGE, etc.*
****‘Highly Cited Paper’ (Web of Science)*
48. S. Zhang[†], C. Chen[†], K. Li, H. Yu, F. Li^{*}, Materials and system design for direct electrochemical CO₂ conversion in capture media, **J. Mater. Chem. A**, 2021, 9, 18785-18792.
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49. D. Wang[†], C. Liu[†], Y. Zhang, Y. Wang, Z. Wang, D. Ding, Y. Cui, X. Zhu, C. Pan, Y. Lou, F. Li^{*}, Y. Zhu^{*}, Y. Zhang^{*}, CO₂ electroreduction to formate at a partial current density up to 590 mA mg⁻¹ via micrometer-scale lateral structuring of bismuth nanosheets, **Small**, 2021, 17, 2100602.
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54. A. Ozden[†], Y. Wang[†], F. Li[†], M. Luo, J. Sisler, A. Thevenon, A. Rosas-Hernández, T. Burdyny, Y. Lum, H. Yadegari, T. Agapie, J. C. Peters, E. H. Sargent*, D. Sinton*, Cascade CO₂ electroreduction enables efficient carbonate-free production of ethylene, **Joule**, 2021, 5, 706-719.
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56. G. Lee[†], Y. Li[†], J. Kim, T. Peng, D.-H. Nam, A. S. Rasouli, F. Li, M. Luo, A. Ip, Y.-C. Joo, E. H. Sargent*, Electrochemical upgrade of CO₂ from amine capture solution, **Nat. Energy**, 2021, 6, 46-53.
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57. D.-H. Nam[†], O. Shekhah[†], G. Lee[†], A. Mallick, H. Jiang, F. Li, B. Chen, J. Wicks, M. Eddaoudi*, E. H. Sargent*, Intermediate binding control using metal-organic frameworks enhances electrochemical CO₂ reduction, **J. Am. Chem. Soc.**, 2020, 142, 21513-21521.
58. Y. Li[†], A. Xu[†], Y. Lum[†], X. Wang, S.-F. Hung, B. Chen, Z. Wang, Y. Xu, F. Li, J. Abed, J. E. Huang, A. S. Rasouli, J. Wicks, L. K. Sagar, T. Peng, A. H. Ip, D. Sinton, H. Jiang, C. Li*, E. H. Sargent*, Promoting CO₂ methanation via ligand-stabilized metal oxide clusters as hydrogen-donating motifs, **Nat. Commun.**, 2020, 11, 6190.
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62. W. R. Leow[†], Y. Lum[†], A. Ozden, Y. Wang, D. -H. Nam, B. Chen, J. Wicks, T. Zhuang, F. Li, D. Sinton, E. H. Sargent*, Chloride-mediated selective electrosynthesis of ethylene and propylene oxides at high current density, **Science**, 2020, 368, 1228-1233.
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66. F. Li[†], Y. C. Li[†], Z. Wang[†], J. Li, D-H Nam, Y. Lum, M. Luo, X. Wang, A. Ozden, S.-F. Hung, B. Chen, Y. Wang, J. Wicks, Y. Xu, Y. Li, C. M. Gabardo, C.-T. Dinh, Y. Wang, T.-T. Zhuang, D. Sinton, E. H. Sargent*, Cooperative CO₂-to-ethanol conversion via enriched intermediates at molecule-metal catalyst interfaces, **Nat. Catal.**, 2020, 3, 75-82.

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68. Y. Wang[†], Z. Wang[†], C. -T. Dinh[†], J. Li[†], A. Ozden, M. G. Kibria, A. Seifitokaldani, C. -S. Tan, C. M. Gabardo, M. Luo, H. Zhou, F. Li, Y. Lum, C. McCallum, Y. Xu, M. Liu, A. Proppe, A. Johnston, P. Todorovic, T. -T. Zhuang, D. Sinton, S. O. Kelley, E. H. Sargent*, Catalyst synthesis under CO₂ electroreduction favors faceting and promotes renewable fuels electrosynthesis, **Nat. Catal.**, 2020, 3, 98-106.

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69. F. Li[†], A. Thevenon[†], A. Rosas-Hernández[†], Z. Wang[†], Y. Li[†], C. M. Gabardo, A. Ozden, C. -T. Dinh, J. Li, Y. Wang, J. P. Edwards, Y. Xu, C. McCallum, L. Tao, Z. -Q. Liang, M. Luo, X. Wang, H. Li, C. P. O'Brien, C. -S. Tan, D. -H. Nam, R. Quintero-Bermudez, T. -T. Zhuang, Y. C. Li, Z. Han, R. D. Britt, D. Sinton, J. C. Peters*, T. Agapie*, E. H. Sargent*, Molecular tuning of CO₂-to-ethylene conversion, **Nature**, 2020, 577, 509-513.

****Highlighted at UofT News, Caltech News, Canadian Light Source News, Phys.org, ACS C&EN, AAAS EurekAlert!, ScienceDaily, Inverse, Long Room, CTV "Your Morning", Naked Scientists, etc.*

****Preview article at Joule: C. Hahn & T. F. Jaramillo, Using Microenvironments to Control Reactivity in CO₂ Electrocatalysis, Joule, 2020, 4, 292-294.*

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70. Y. Lum[†], J. E. Huang[†], Z. Wang, M. Luo, D. -H. Nam, W. R. Leow, B. Chen, J. Wicks, Y. C. Li, Y. Wang, C. -T. Dinh, J. Li, T. Zhuang, F. Li, T. -K. Sham, D. Sinton, E. H. Sargent*, Tuning hydroxyl binding energy enables selective electrochemical oxidation of ethylene to ethylene glycol, **Nat. Catal.**, 2020, 3, 14-22.

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72. F. P. G. Arquer[†], C. -T. Dinh[†], A. Ozden[†], J. Wicks[†], C. McCallum, A. R. Kirmani, D. -H. Nam, C. M. Gabardo, A. Seifitokaldani, X. Wang, Y. C. Li, F. Li, J. Edwards, L. J. Richter, S. J. Thorpe, D. Sinton*, E. H. Sargent*, CO₂ electrolysis to multicarbon products at activities greater than 1 A cm⁻², **Science**, 2020, 367, 661-666.

****Highlighted at UofT News, Chemistry World, Phys.org, AAAS EurekAlert!, LongRoom, Environmental News Network, Nanowerk, 7thSpace, etc.*

****Highly Cited Paper' (Web of Science)*

73. M. Luo[†], Y. C. Li[†], Z. Wang[†], J. Li, F. Li, Y. Lum, D. -H. Nam, B. Chen, J. Wicks, A. Xu, T. Zhuang, W. R. Leow, X. Wang, C. -T. Dinh, Y. Wang, Y. Wang, D. Sinton, E. H. Sargent*, Hydroxide promotes carbon dioxide electroreduction to ethanol on copper via tuning of adsorbed hydrogen, **Nat. Commun.**, 2019, 10, 5814.
***"Top 50 Chemistry and Materials Sciences Articles" in 2019.
74. X. Wang[†], Z. Wang[†], T. -T. Zhuang, C. -T. Dinh, J. Li, D. -H. Nam, F. Li, C. -W. Huang, C. -S. Tan, Z. Chen, M. Chi, C. M. Gabardo, A. Seifitokaldani, P. Todorović, A. Proppe, Y. Pang, A. R. Kirmani, Y. Wang, A. H. Ip, L. J. Richter, B. Scheffel, A. Xu, S. -C. Lo, S. Kelley, D. Sinton, E. H. Sargent*, Efficient upgrading of CO to C₃ fuel using asymmetric C-C coupling active sites, **Nat. Commun.**, 2019, 10, 5186.
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75. J. Li[†], Z. Wang[†], C. McCallum[†], Y. Xu, F. Li, Y. Wang, C. Gabardo, C. -T. Dinh, T. -T. Zhuang, L. Wang, J. Y. Howe, Y. Ren, E. H. Sargent*, D. Sinton*, Constraining CO coverage on copper promotes high-efficiency ethylene electroproduction, **Nat. Catal.**, 2019, 2, 1124-1131.
76. T. Zhuang[†], D. -H. Nam[†], Z. Wang[†], H. -H. Li, C. Gabardo, Y. Li, Z. -Q. Liang, J. Li, X. -J. Liu, B. Chen, W. R. Leow, R. Wu, X. Wang, F. Li, Y. Lum, J. Wicks, C. O'Brien, T. Peng, A. Ip, T. -K. Sham, S. -H. Yu, D. Sinton, E. H. Sargent*, Dopant-tuned stabilization of intermediates promotes electrosynthesis of valuable C₃ products, **Nat. Commun.**, 2019, 10, 4807.
77. J. Li[†], S. Guo[†], F. Li, F. Li, X. Zhang, J. Ma*, D. R. Macfarlane, A. M. Bond, J. Zhang*, Electrohydrogenation of carbon dioxide using a ternary Pd/Cu₂O-Cu catalyst, **ChemSusChem**, 2019, 12, 4471-4479.
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***"Highly Cited Paper" (Web of Science)
80. Y. Pang[†], J. Li[†], C. -S. Tan, P. -L. Hsieh, T. -T. Zhuang, Z. Liang, C. Zou, X. Wang, P. D. Luna, J. P. Edwards, Y. Xu, F. Li, C. -T. Dinh, M. Zhong, L. -J. Chen, E. H. Sargent*, D. Sinton*, Efficient electrocatalytic conversion of carbon monoxide to propanol using fragmented copper, **Nat. Catal.**, 2019, 2, 251-258.
***"Highly Cited Paper" (Web of Science)
81. T. -T. Zhuang[†], Y. Pang[†], Z. -Q. Liang, Y. Li, C. -S. Tan, H. Yuan, J. Li, C. -T. Dinh, P. D. Luna, P. -L. Hsieh, T. Burdyny, H. -H. Li, M. Liu, Y. Wang, F. Li, A. Proppe, A. Johnston, Z. -Y. Wu, Y. -R. Zheng, E. Bladt, A. Ip, H. Tan, L. -J. Chen, S. Bals, J. Hofkens, S. -H. Yu, S. O. Kelley, D. Sinton*, E. H. Sargent*, Copper nanocavities confine intermediates for efficient electrosynthesis of C₃ alcohol fuels from carbon monoxide, **Nat. Catal.**, 2018, 1, 946-951.
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- **Book chapters**

116. F. Li, J. Zhang*, Electrocatalytic Reduction of CO₂ in Ionic Liquid-based Electrolytes in *Encyclopedia of Ionic Liquids*, Springer, Singapore, 2019.
117. F. Li, M. Xue*, Two-Dimensional Transition Metal Dichalcogenides for Electrocatalytic Energy Conversion Applications in *Two-dimensional Materials – Synthesis, Characterization and Potential Applications*, IntechOpen, London, 2016.

PATENTS & INNOVATIONS

1. F. Li, J. Huang, HYDROGEN FROM AMMONIA. Application no. AU2025902509 on 19/06/2025.
2. P. J. Cullen, T. Zhang, R. Zhou, F. Li, AMMONIA PRODUCTION. Application no. PCT WO/2024/011285 on 12/07/2023.
3. J. E. Huang, F. Li, A. Ozden, D. Sinton, E. H. Sargent, CO₂ ELECTROREDUCTION TO MULTI-CARBON PRODUCTS IN STRONG ACID. Publication no. WO/2022/184905 on 09/09/2022.
4. A. Ozden, Y. Wang, F. Li, D. Sinton, E. H. Sargent, CASCADE CO₂ ELECTROREDUCTION SYSTEM AND RELATED METHODS FOR ENHANCED PRODUCTION OF ETHYLENE. Publication no. WO/2022/148837 on 14/07/2022.
5. T. Agapie, A. R. Hernandez, F. Li, J. C. Peters, E. H. Sargent, A. Thevenon, STABILIZATION OF A CO-BOUND INTERMEDIATE VIA MOLECULAR TUNING PROMOTES CO₂-TO-ETHYLENE CONVERSION. Patent no. US 11,746,426, date of patent: 05/09/2023.

CONFERENCES & INVITED TALKS Frequently invited to attend domestic and international conferences and give 20+ invited talks and colloquia at various research institutions since 2020.

- | | |
|------|---|
| 2025 | Invited talk “Coordination polymer catalyst for electrochemical CO ₂ conversion”, IUPAC 2025, Kuala Lumpur, Malaysia, July. |
| 2025 | Invited talk “Electrochemical engineering for a sustainable future”, Korea University, Seoul, July. |
| 2025 | Keynote speech “Coordination polymer catalyst for electrochemical CO ₂ conversion”, Nano Korea 2025, Seoul, Korea, July. |
| 2024 | Keynote speech “Molecular tuning of CO ₂ electrolysis”, 24th Australasian Electrochemistry Symposium, Melbourne, December. |
| 2024 | Keynote speech “Electrochemical CO ₂ transformation”, 11th Annual Workshop on Clean Energy Materials, Australian Institute for Bioengineering and Nanotechnology, The University of Queensland, Brisbane, December. |
| 2024 | Keynote speech “Electrocatalytic CO ₂ conversion”, International Conference on Advanced Materials for Energy, Environment, and Health (ICAMEEH), Adelaide, Australia, September. |
| 2023 | Invited speaker “Micro-environment tuning for CO ₂ electrocatalysis”, 4th Asia-Pacific Conference on Energy Storage and Conversion (APEnergy2023), Xiamen, China, November. |
| 2023 | Invited talk “Micro-environment tuning for CO ₂ electrocatalysis”, Peking University, Tsinghua University, Renmin University of China, Fudan University, Shanghai Jiaotong University, University of Science and Technology of China (USTC), University of Electronic Science and Technology of China, Soochow University, China, September. |
| 2023 | Keynote speech “Electricity driven chemical/fuel production”, Innovate UK Global Business Innovation Program (Hydrogen-Australia), Sydney, Australia, August. |
| 2023 | Invited talk “Micro-environment tuning for CO ₂ electrocatalysis”, International Conference on Energy and Environmental Materials, Gold Coast, Australia, August. |
| 2023 | Invited talk “Micro-environment tuning for CO ₂ electrocatalysis”, International Conference on Materials Innovation, Brisbane, Australia, August. |
| 2023 | Keynote speaker “Green hydrogen research in action”, Australian Singapore International Hydrogen R&D Delegation, Singapore, June. |
| 2023 | Invited speaker “Micro-environment tuning for CO ₂ electrocatalysis”, International Conference on Nano Bio Intelligence, Sydney, Australia, June. |

- 2022 Keynote speaker and panel discussion “Nanotechnology for a net-zero future: addressing grand challenges at nanoscale”, 1st Net Zero Initiative Conference, Sydney, Australia, November.
- 2022 Invited speaker “Nanocatalysts for CO₂ electrolysis”, 4th International Conference on Emerging Advanced Nanomaterials (ICEAN 2022), Newcastle, Australia, October.
- 2022 Invited speaker “Inorganic/organic hybrid materials for electrochemical CO₂ conversion”, International Young Scientists Salon on Photo & Electro Catalytic CO₂ Reduction (virtual), Tianjin, China, September.
- 2022 Invited talk “Electrochemical CO₂ Utilisation – Catalysts, Device, and System” Adelaide University, Adelaide, Australia, July.
- 2022 Invited talk “Electrochemical CO₂ Utilisation – Catalysts, Device, and System” UTS, Sydney, Australia, July.
- 2022 Session chair and invited speaker “In situ XAS study of copper coordination polymer for electrocatalysis”, 18th International Conference on X-Ray Absorption Fine Structure (XAFS) 2022, Sydney, Australia, July.
- 2022 Invited speaker “Stable Cu coordination polymer for efficient CO₂ electroreduction”, RACI 2022 National Congress, Brisbane, Australia, July.
- 2022 Invited speaker “Cu catalysts for electrochemical CO₂ conversion”, 2022 International Symposium on Clean Energy Materials, Gold Coast, Australia, June.
- 2022 Invited talk “Electrochemical CO₂ Utilisation – Catalysts, Device, and System” Monash University, Melbourne, Australia, May.
- 2022 Organiser and chair of the “1st Sydney Nano Grand Challenge Solar Fuels Symposium”, University of Sydney, April.
- 2021 Invited talk “Molecular tuning of electrochemical CO₂ reduction”, Pacifichem 2021 (virtual), Hawaii, US, December.
- 2021 Invited talk “Electrochemical CO₂ Utilisation – Catalysts, Device, and System” Materials Research Society-Taiwan International Conference (virtual), Taiwan, November.
- 2021 Keynote speaker “Interfacial modulation for electrochemical CO₂ reduction”, International Symposium on Advanced Materials and Catalysis for Energy and Environmental Applications, Jiannan University – University of Central Florida (virtual), July.
- 2021 Invited talk “Electrochemical carbon dioxide conversion – catalysts, devices, systems”, The University of Queensland, Brisbane, Australia, July & March.
- 2021 Moderator of “Workshop on electrochemical CO₂ conversion to chemicals”, The University of Queensland, Brisbane, Australia, June.
- 2020 Invited talk “Electrochemical carbon dioxide utilisation”, CSIRO, Newcastle, Australia, November.
- 2020 Invited talk “Molecular tuning of electrochemical CO₂ reduction”, The Martlets Society, online, October.
- 2020 Keynote speaker on Molecules and Devices Symposium, “Electrochemical CO₂ conversion”, online, September.
- 2020 Invited talk “Molecular tuning of electrochemical CO₂ reduction”, Scientific Cloud, online, March.
- 2020 Invited talk “Molecular tuning of electrochemical CO₂ reduction”, UNSW, Sydney, Australia, February.
- 2020 Invited talk “Molecular tuning of electrochemical CO₂ reduction”, École polytechnique fédérale de Lausanne (EPFL), Lausanne, Switzerland, January.
- 2019 Invited talk “Molecular tuning of electrochemical CO₂ reduction”, Renmin University of China, Huazhong University of Science and Technology, Shaanxi Normal University, China, December.
- 2019 Invited talk “Electrocatalytic CO₂ reduction – catalyst, mechanism and system”, University of Science and Technology of China, Hefei, China, April.
- 2016 Invited talk “2D materials for electrocatalytic CO₂ reduction”, Renmin University of China, Beijing, China, September.
- 2016 Invited talk “2D metal sulphide materials for electrocatalytic reduction of CO₂ in aqueous medium”, Leiden University, Leiden, the Netherlands, August.

- 2016 Royal Australian Chemical Institute Centenary Congress, “Two-dimensional electrocatalysts for CO₂ reduction”, Melbourne, Australia, July.
- 2016 ARC Centre of Excellence for Electromaterials Science Full Centre Meeting, “Artificial photosynthesis – with and without wires”, Canberra, Australia, September.
- 2016 67th Annual Meeting of the International Society of Electrochemistry, “Graphene supported 2D metal sulphide materials for electrocatalytic reduction of CO₂”, The Hague, the Netherlands, August.
- 2016 11th Annual International Electromaterials Science Symposium, “Polyethylenimine promoted electrocatalytic reduction of CO₂ to CO in aqueous media by graphene-supported molybdenum sulphide”, Melbourne, Australia, February.
- 2016 11th Annual International Electromaterials Science Symposium, “Graphene Supported Materials for Electrocatalytic CO₂ Reduction”, Melbourne, Australia, February.

SELECTED GRANTS

- 2025–2027 USYD Faculty of Engineering Breakthrough Challenge “AI-guided catalyst design” (\$145,000, lead CI)
- 2025–2026 USYD DVCR Research Impact Proof-of-Concept Fund “High-efficiency, low-cost electrochemical ammonia cracker (e-cracker) for decentralised green hydrogen production” (DVCR POC 04-2025, \$79,522, lead CI)
- 2025–2028 ARC Discovery Project “Diagnostics and management of heat for electrolyser upscaling” (DP250100576, \$664,600, lead CI)
- 2025–2029 ARC Future Fellowship “Electrocatalytic green ammonia synthesis using reactive dinitrogen” (FT240100376, \$923,048, solo CI)
- 2024–2025 Client Commissioned Research on green ammonia synthesis (\$250,265, solo CI)
- 2024 Digital Sciences Initiative (DSI) Ignite Grant “Digital CO₂ catalyst: Australia’s first net-zero database” (\$10,000, 2nd CI)
- 2024 USYD/NHMRC Equipment Grant “Nano Spectrochemical Imaging Platform (NSIP)” (\$200,000, lead CI)
- 2024–2028 ARC Centre of Excellence for Green Electrochemical Transformation for Carbon Dioxide (GETCO2) Strategic Fund (\$163,382, lead CI)
- 2024–2029 Australian Renewable Energy Agency (ARENA) Transformative Research Accelerating Commercialisation Program “Advanced Manufacturing Alkaline Electrolyser Cell-Stacks for Affordable and Scalable Green Hydrogen Production” (2023/TRAC734, \$2,243,513, 2nd CI)
- 2023–2024 University of Sydney Research Accelerator (SOAR) Prize (\$100,000, solo CI)
- 2023–2026 Minerals Research Institute of Western Australia (MRIWA) “Advanced electrometallurgy for improved recovery of green metals” (M10477, \$378,785, 2nd CI)
- 2023–2030 ARC Centre of Excellence for Green Electrochemical Transformation for Carbon Dioxide (CE230100017, \$34,956,464, 7th/19 CI & flagship program lead)
- 2023 ARC Linkage Infrastructure, Equipment and Facilities (LIEF) “Comprehensive and versatile in-house X-ray absorption spectroscopy facility” (LE230100052, \$549,859, 2nd/9 CI)
- 2023 ARC Linkage Infrastructure, Equipment and Facilities (LIEF) “Integrated high-throughput material synthesis and characterisation system” (LE230100070, \$740,700, 6th/12 CI)
- 2022–2023 Australian Institute of Nuclear Science and Engineering (AINSE) Early Career Researcher Grant (\$9,000, solo CI)
- 2022 Net Zero Initiative (NZI) seed fund (\$37,500 + \$37,500 industry match, CI)
- 2022–2024 ARC Discovery Project “Plasma-catalytic bubbles for sustainable ammonia” (DP220102246, \$462,539, 2nd CI)
- 2022–2023 Sydney Nano Grand Challenge “Solar Fuels” (\$150,000, lead CI)
- 2022 Faculty of Engineering Major Equipment Scheme (\$80,000, lead CI)

2022–2024 CSIRO Collaborative Research Project (\$30,000, solo CI)
 2020–2023 ARC Discovery Early Career Researcher Award “Developing sustainable liquid fuels from carbon dioxide conversion” (DE200100477, \$420,770, solo CI)

MEMBERSHIP FOR PROFESSIONAL SOCIETIES

2023–now American Association for the Advancement of Science (AAAS)
 2020–now Royal Australian Chemical Institute (RACI)
 2020–now Royal Society of Chemistry (RSC)
 2020–now American Chemical Society (ACS)

SERVICES FOR JOURNALS/ORGANISATIONS/CONFERENCES

2025– Associate Editor for SmartMat (Wiley, top10% journal in General Materials Science)
 2025– Early Career Board member for *Nano Letters* (ACS, top10% journal in General Materials Science)
 2025– Early Career Board member for *Energy & Fuels* (ACS, Q1 journal in General Chemical Engineering)
 2025 Organiser of symposium “Electrochemical CO₂ capture and conversion”, Pacificchem2025, Hawaii, US
 2024 Australian–China Delegation of the International Hydrogen Research Collaboration Program, Department of Climate Change, Energy the Environment and Water (DCCEEW) and CSIRO
 2024– XAS/MEX Program Advisory Committee (PAC) member for ANSTO Australian Synchrotron
 2024– ECR Editorial Board member for *eScience* (top10% journal in Materials Chemistry)
 2024 Organising Committee member for the 2nd International Congress on Separation and Purification Technology (ISPT2024)
 2024 Guest editor for *Nano Energy* (Elsevier) on the special issue “Advances in Electrochemical CO₂ Conversion for Net-Zero Chemical Production”
 2023– Research Program Committee member for the ARC Centre of Excellence for Green Electrochemical Transformation of Carbon Dioxide
 2023– Advisory Committee member of the CANStore Energy Research Centre, Canada
 2023 Organising Committee member for the International Conference on Nano Bio Intelligence
 2023 Australian–Singapore Delegation of the International Hydrogen Research Collaboration Program, DCCEEW and CSIRO
 2023 Organising Committee member for the 23rd Australasian Electrochemistry Symposium
 2022–2023 Judge for NSW Science Teachers Association (STANSW) Young Scientist Awards
 2022–now Member for Sydney Analytical X-Ray User Group and Vibrational Spectroscopy Group
 2021– Editorial Board for *Materials Futures* (IOP)
 2021–2024 Early Career Researcher Editorial Board for *Materials Today Energy* (Elsevier)

REVIEWER FOR FUNDING ORGANISATIONS

2020– Australian Research Council (DP, Linkage, Future Fellow, DECRA, Industry Fellowships)
 2021– Australian Synchrotron
 2023 Israel Science Foundation
 2022 Belgian Research Foundation Flanders (FWO), for Odysseus Programme
 2022 The Dutch Research Council (NWO)
 2021 Swiss National Science Foundation

REVIEWER FOR JOURNALS (selected list, reviewing ~20 papers annually)

ACS Catalysis	ACS Energy Letters
Advanced Energy Materials	Advanced Functional Materials
Angewandte Chemie	Chemical Engineering Journal
Joule	Journal of Materials Chemistry A
Journal of the American Chemical Society	Nature

Nature Catalysis
Nature Energy
Nano Letters

Nature Chemical Engineering
Nature Communications
Science Advances

SERVICE AT USYD

2025– Associate of Head of School (Research), School of Chemical and Biomolecular Engineering (CBE)
2024–2025 CBE Learning & Teaching Director
2024 CBE Forth-Year Coordinator
2021–2023 CBE thesis coordinator for undergraduate thesis and coursework master's capstone project
2020– CBE undergraduate thesis supervisor
2021– CBE MIPPS supervisor
2021– CBE Research Executive Committee member

TEACHING

2024 Chemical Engineering Thermodynamics (CHNG2804, lecturer, core unit, student survey score above School average; Faculty of Engineering Unit of Study Survey Commendation)
2023–2024 Introduction to Sustainability (SUST1001, co-lecture with Science, Business, FASS, and DVC)
2023– Chemical Engineering Modelling and Analysis (CHNG2802, coordinator & lecturer, core unit, student survey score above School average & the highest in recent 9 years for this unit; Faculty of Engineering Unit of Study Survey Commendation)
2021–2023 Nanotechnology in Chemical Engineering (CHNG5008, coordinator in 2023)
2020 Conservation of Mass and Energy (CHNG1103, 9103, lecturer)

MENTORSHIP & SUPERVISION

I am currently the primary supervisor of 12 PhDs, 1 MPhil, 2 Honours, and 2 postdoctoral fellows. I also mentor 1 Sydney Horizon Fellow (40 in total across USyd). I have graduated 4 PhDs (two as the primary supervisor), 3 MPhils (as primary supervisor), and 14 Honours students, and trained 1 postdoctoral fellow. I believe in the value of diversity in promoting research excellence, and 47% of current group members are female. My supervision and mentorship have been well received by group members and my lab has gradually established its reputation locally and globally. For instance, my 1st PhD graduate, Dr Shuzhen Zhang, started up the company eCarbonZero Pty using technology we have developed in my lab, receiving the Women in Climate and Energy Fellowship by EnergyLab, the largest cleantech start-up accelerator in ANZ, and the Career Advancement Award by the Faculty of Engineering that rewards research excellence. My 2nd PhD, Dr Yu Yang, received the Best Oral Presentation Award and Best Poster Presentation Award in two international conferences, the Career Advancement Award and a China Scholarship Council (CSC) Award for Outstanding Self-Financed Students Abroad. My postdoctoral fellow, Dr Yong Zhao, has been awarded an ARC DECRA and is now a lecturer at The University of Newcastle. A full list of personnel is as below.

- *Research Fellows & Postdoctoral Fellows*

Dr. Aoni Xu (2024–, Sydney Horizon Fellow)
Dr. Yu Yang (2025–, Postdoctoral Fellow)

Dr. Jiyuan Liu (2024–, Postdoctoral Fellow)

- *Higher degree research (HDR) students*

Ms. Jialei Huang (2022–2025)
Ms. Wei Zhang (2023–2027)
Ms. Yawen Hao (2024–2028)
Mr. Yaoti Cheng (2024–2028)
Mr. Yuanhong Ren (2025–2029)
Ms. Zifang Peng (2025–2029)
Mr. Shihao Zhang (2025–2029)
Mr. Todd Hartshorn (2025–2029, supervisor B)

Mr. Minghao Sun (2022–2026)
Ms. Yaohui Shi (2022–2026)
Mr. Yifan Zeng (2024–2028)
Mr. Qian Zhang (2025–2029)
Mr. Dan Villamanca (2025–2029)
Mr. Jinqi Xiong (2025–2029)
Mr. Zhenghui Zhu (2025–2027)
Ms. Thi Thuy Kieu Tran Tran (2024–2028, supervisor B)

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| Ms. Femida Vayoli (2024–2028, supervisor B) | Mr. Fabian Garay Rairan (2024–2028, supervisor B) |
| Mr. Qi Wang (2022–2026, supervisor B) | Mr. Yushi Leng (2021–2025, supervisor B) |
| Ms. Luyao Ding (2021–2025, supervisor B) | |
- *Undergraduate Thesis, Master’s Capstone Project and MIPPS students*

Ms. Emily Mackay (2025, Honours)	Ms. Jasmine Wang (2025–2026, Honours)
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 - *Alumni*

Dr. Shuzhen Zhang (2020–2023, PhD)	Dr. Yu Yang (2021–2024, PhD)
Dr. Yong Zhao (2021, Research Assistant)	
Mr. Haowei Zhang (2022–2023, MPhil)	Mr. Dongfang Li (2021–2022, MPhil)
Mr. Sk Mahmud (2019–2022, MPhil)	
Dr. Josip Knezevic (2019–2023, PhD, supervisor B)	Dr. Tianqi Zhang (2020–2023, PhD, supervisor B)
Dr. Aklima Nasrin (2019–2023, PhD, supervisor B)	
Ms. Amy Worsfold (2024–2025, Honours)	Ms. Xin Chen (2024–2025, Honours)
Ms. Hannah Jones (2024, Honours)	Ms. Jingwen Chi (2023–2024, Honours)
Ms. Jun Wu (2023–2024, Capstone)	Ms. Mia Andersen-Cooke (2023, Honours)
Mr. Muhammad Agus Setiawan (2023, Dissertation)	Ms. Melanie Porter (2021, Honours)
Ms. Sharome Umaharan (2022, Honours)	Mr. Haowei Zhang (2021–2022, Honours)
Mr. Shuyi Lou (2022, Honours)	Mr. Xuechen Jing (2020–2021, Honours)
Ms. Zara Zbrog (2025, MIPPS)	Mr. Theodore Mower (2024, MIPPS)
Ms. Kiri Mitchell (2023, MIPPS)	Ms. Anna Wong (2022, MIPPS)
Ms. Yuqing Li (2021, MIPPS)	
Ms. Xue Zhou (2023–2024, visiting PhD, Tianjin U)	Ms. Siyu Zhong (2024, visiting PhD, KIT)
Ms. Chengyuan Jin (2025, master intern)	Mr. Suvan Shrestha (2024, undergraduate intern)
Ms. Jasmine Wang (2024, undergraduate intern)	Mr. Charlie Burns (2023, undergraduate intern)
Mr. Shing Hang Yan (2021, summer internship)	Mr. Jiacheng Wu (2021, summer internship)

OUTREACH

- 2022, National Science Week “Lines of Best Fit: Science Week Improv Comedy”: our show attracted ~100 students and members of the general public on the topic of sustainability. Highlighted by Inspiring NSW: [Lines of Best Fit evolves](#).
- 2022, Open Day: I served as an academic advisor for the Faculty of Engineering at the 2022, engaging in meaningful conversations with over 100 high school students and parents.
- 2022, Academy of Technological Sciences & Engineering’s (ATSE) ACTIVE: I represented the Faculty of Engineering at the event, showcasing the role of sustainable energy in a net-zero future to over 50 high school students.
- 2022, Engineers Australia Summer School: I inspired more than 60 Year-11 students to pursue education and careers in engineering.