

ZIANG LIU

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EDUCATION

Nanjing University (NJU)

Nanjing, China

B.E. in New Energy Science and Engineering

Sep 2021 – Jun 2025

- GPA (overall): 4.60/5.00
- GPA ranking: 1/25
- Core classes: Foundations of Materials Science and Engineering (99), Polymeric Materials Science (99), Organic Chemistry (98), Mathematical Methods of Physics (98), Energy Conversion and Storage (97), Physical Chemistry (96.7), Electrochemical Methods (96)

Harvard University

Boston, USA

Visiting Undergraduate Research Intern

Jul 2024 – Dec 2024

- Research about Li-CO₂ Batteries

RESEARCH EXPERIENCE

Harvard University (School of Engineering and Applied Sciences)

Boston, USA

Research Intern to Professor Xin Li

Jul 2024 – Dec 2024

Topic: Solid-state Li-CO₂ Batteries

- Set up the first set of CO₂ battery equipment in the laboratory and redesigned it with SolidWorks;
- Tried to improve the contact between the solid-state electrolyte and the gas diffusion layer;
- Tested the system under oxygen conditions.

Nanjing University (College of Engineering and Applied Sciences)

Nanjing, China

Research Assistant to Professor Jia Zhu

Oct 2023 – Jun 2024

Topic: Electrochemical Acid CO₂ Reduction

- Refined the drop-casting method of loading the catalyst ink onto the gas diffusion electrode, reducing preparation time (from over 2 hours to 0.5 hour) while improving performance and repeatability by controlling the degree of dispersant gasification;
- Analyzed and corrected the deviation of gas chromatography data;
- Optimized the processing of the data from gas chromatography and electrochemical workstations with codes to improve processing efficiency and data reliability;
- Retrofit the seal of the reactor, enabling the originally atmospheric pressure device to operate continuously for over 40 hours at 3 atmospheres and withstand up to 7 atmospheres of pressure;
- Proposed the additional role of a new kind of cation in acidic carbon dioxide reduction compared to alkali cations, reducing the overpotential of the reaction by a non-catalytic method, which is more universal.

Nanjing University (College of Engineering and Applied Sciences)

Nanjing, China

Research Assistant to Professor Hongtao Yuan

Feb 2023 – Sep 2023

Topic: Polarization Raman and Stress Regulation in MoCl₃ Layered Semiconductors

- Prepared MoCl₃ films which were mechanically exfoliated by a kind of special tape with weak adhesion;
- Demonstrated the anisotropy of MoCl₃ through polarized Raman spectroscopy;
- Transferred the sample onto a PET substrate and cut PET according to the stretching direction;
- Measured Raman spectroscopy via strain engineering.

PUBLICATION

1. Sun, Y., **Liu, Z.**, Li, Z., Qin, F., Huang, J., Qiu, C., & Yuan, H. (2024). Unravelling the anisotropic light-matter interaction in strain-engineered trihalide MoCl₃. *Nano Research*, 17(4), 2981-2987. [\[URL\]](#)

SELECTED AWARDS & HONORS

- Candidate for Dongliang Scholarship (highest honor at NJU, 15 candidates) 2024
- Merit student of Jiangsu Province (1,754 of ~2.62 million college students in Jiangsu) 2024
- Zhenggang Scholarship (30,000 China Yuan) 2023
- Outstanding Student (top 5% at NJU, twice) 2022, 2023
- 81 Physics Scholarship (the only one in the college) 2023
- Outstanding Student Organization Cadre 2023
- First Grade Award in the 26th Forum of Sciences & Arts (top 3% of ~400 participants) 2023
- National Scholarship (highest nationwide honor, first in the class) 2022
- First Place in the Jiangsu Orienteering Championship (best result in team history) 2022

LEADERSHIP

Academic Development Association

Co-founder

- Acted as the co-founder for Academic Development Association of the College of Engineering and Applied Sciences, providing various academic assistance to undergraduate students in the college;
- In charge of the Engineering Workshop under the Association (Sep 2022 – Jun 2024), organizing 32 academic tutoring (80 hours) with over 800 person-times of participation;
- Member of the Q&A Workshop under the Association (Sep 2022 – Jun 2024), providing Q&A service for students for more than 160 hours as a volunteer;
- Awarded *Student Organization Cadre* since the results of the work were significant and the number of academic alerts was reduced by about half compared to when the association had been founded.

Nanjing University Orienteering Team (a sport of running with a map)

Vice-captain

- Acting as vice-captain of Nanjing University Orienteering Team (September 2022 - present), responsible for weekly training;
- Organized the first orienteering competition of Nanjing University in 2023 and served as the starting judge in the competition, with 299 students participating;
- Planned a series of team activities, including 2 training camps, improving the orienteering level of team members;
- Participated in the 2022 Jiangsu Orienteering Championship as a main player and won several awards such as *the First Place in the Overall Team* and *the Second Place in the Team Competition*.

SKILLS & INTERESTS

- **Computer Skills:** Python, Origin, SolidWorks, ChemDraw, Cinema 4D
- **Lab Skills:** gas chromatography, electrochemical workstation, drop-casting method, Raman, XRD, solvothermal method, tube furnace, battery assembly, battery testing systems
- **Research interests:** electrocatalysis, chemical synthesis, CO₂ conversion, solid-state batteries, sustainable energy