

# ZIANG LIU

College of Engineering and Applied Sciences  
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## EDUCATION

### Nanjing University (NJU)

B.E. in New Energy Science and Engineering

Nanjing, China

Sep 2021 – Jul 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

Visiting Undergraduate Research Intern

Boston, USA

Jul 2024 – Dec 2024

- Research about Li-CO<sub>2</sub> Batteries

## RESEARCH EXPERIENCE

### Harvard University (John A. Paulson School of Engineering and Applied Sciences)

Research Intern to Professor Xin Li

Boston, USA

Jul 2024 – Dec 2024

#### Topic: Solid-state Li-CO<sub>2</sub> Batteries

- Set up the first set of CO<sub>2</sub> reduction equipment in the laboratory and redesigned it with SolidWorks;
- Used ethanol instead of NMP reported in the literature as catalysts solvent to improve the uniformity of the catalyst on carbon paper as well as preparation efficiency.

### Nanjing University (College of Engineering and Applied Sciences)

Research Assistant to Professor Jia Zhu

Nanjing, China

Oct 2023 – Jun 2024

#### Topic: Electrochemical Acid CO<sub>2</sub> 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)

Research Assistant to Professor Hongtao Yuan

Nanjing, China

Feb 2023 – Sep 2023

#### Topic: Polarization Raman and Stress Regulation in Anisotropic MoCl<sub>3</sub> Layered Semiconductors

- Prepared MoCl<sub>3</sub> films which were mechanically exfoliated by a kind of special tape with weak adhesion;
- Demonstrated the anisotropy of MoCl<sub>3</sub> 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

- 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 MoCl<sub>3</sub>. *Nano Research*, 17(4), 2981-2987.

## SELECTED AWARDS & HONORS

- Merit student of Jiangsu Province (1,754 of ~2.62 million college students in Jiangsu Province) May 2024
- Zhenggang Scholarship (30,000 China Yuan) Dec 2023
- Outstanding Student (top 5% at NJU, twice) Jun 2022, Dec 2023
- 81 Physics Scholarship (the only one in the college) Dec 2023
- Outstanding Student Organization Cadre Jun 2023
- First Grade Award in the 26th Forum of Sciences & Arts of Nanjing University (top 3% of ~400 participants) May 2023

- National Scholarship (highest nationwide honor for merit students) Dec 2022
- First Place in the Overall Team of Jiangsu Orienteering Championship (best result in team history) Sep 2022

## LEADERSHIP & EXTRACURRICULAR ACTIVITY EXPERIENCE

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### Academic Development Association

- 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), organized 32 academic tutoring (80 class hours), and over 800 students participated in the activities;
- Member of the Q&A Workshop under the Association (Sep 2022 – Jun 2024), providing Q&A service for students for more than 160 hours;
- 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)

- Acting as deputy leader 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

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- **Computer Skills:** Python, Origin, SolidWorks
- **Lab Skills:** gas chromatography, electrochemical workstation, drop-casting method, Raman, XRD, solvothermal method, tube furnace, battery assembly
- **Research interests:** electrocatalysis, chemical synthesis, CO<sub>2</sub> reduction, sustainable energy, batteries