ZIANG LIU

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EDUCATION

Nanjing University (NJU) Nanjing, China
B.E. in New Energy Science and Engineering Sep 2021 – Jun 2025

- Overall Ranking: 1/25
- GPA: 4.60/5.0
- 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

- Selected for competitive research program under Prof. Xin Li
- Focus: Advanced Solid-state Li-CO_2 Battery Systems

RESEARCH EXPERIENCE

Solid-state Li-CO_2 Batteries Jul 2024 – Dec 2024
Advisor: Professor Xin Li, Harvard University

- Set up the first set of CO_2 battery equipment in the laboratory and redesigned it with SolidWorks;
- Tested the new system under oxygen with liquid electrolyte;
- Synthesized Co_3O_4 in the presence of Li_2O.

Electrochemical Acid CO_2 Reduction Oct 2023 – Jun 2024
Advisors: Professor Jia Zhu & Assistant Professor Xiaojun Wang, NJU

- Developed the drop-casting method of loading the catalyst ink, reducing preparation time (from 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;
- Normalized 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 device to operate continuously for over 40 hours at 3 atmospheres and withstand up to 7 atmospheres;
- Proposed the additional role of a new kind of cations in acidic carbon dioxide reduction compared to alkali cations, reducing the overpotential of the reaction by a non-catalytic method, which is more universal.
- Manuscript in preparation, targeted for submission in early 2025

Polarization Raman and Stress Regulation in $MoCl_3$ Semiconductors Feb 2023 – Sep 2023
Advisor: Professor Hongtao Yuan, NJU

- Prepared $MoCl_3$ films which were mechanically exfoliated according to the weak interlayer force;
- Demonstrated the anisotropy of $MoCl_3$ through polarized Raman spectroscopy;
- Optimized the process to transfer the sample onto PET substrates and confirm the stretching direction;
- Measured Raman spectroscopy via accurate and continuous strain engineering;
- Research resulted in publication in *Nano Research* as co-first author.

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 $MoCl_3$. *Nano Research*, *17*(4), 2981-2987. (*equal contribution) [URL]

SELECTED AWARDS & HONORS

- Merit student of Jiangsu Province (top 0.067% among 2.62 million college students) 2024
- Outstanding Student Model (top 0.5% at NJU) 2024
- Outstanding Student (top 5% at NJU, twice) 2022, 2023
- Zhenggang Scholarship (30,000 China Yuan, 4,000+ USD equivalent) 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

- Provided academic assistance to undergraduate students in the college, particularly those from disadvantaged backgrounds;
- 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 *(Sep 2022 – present)*

- Organized the first orienteering competition of Nanjing University in 2023 and served as the starting judge in the competition, with 299 students participating;
- 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,* broking the team's historical best performance record.

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, CO_2 conversion, energy storage, sustainable energy