

Madeline A. Murphy

✉ murp1677@umn.edu

🔗 <https://maddymurphy.github.io/>

Education

University of Minnesota—Twin Cities

Minneapolis, MN

B.S. Chemical Engineering with Honors, GPA 4.00/4.00

2020-2024

Advisor: Paul Dauenhauer

Honors Thesis: Circumfluence of Catalytic Loops — will defend May 2024

Scholarships & Fellowships

2023 Charles A. Mann Scholarship | University of Minnesota
2020-2024 National Scholarship | University of Minnesota
2020 College Fairs of Denver Scholarship

Awards & Honors

2020-2023 College of Science and Engineering Dean's List | University of Minnesota
2020 Lakewood High School Valedictorian
2020 National Merit Commended

Publications

1. **Murphy M**, Gathmann SR, Bartel CJ, Abdelrahman OA, Dauenhauer P. Catalytic Resonance Theory: Circumfluence of Programmable Catalytic Loops. ChemRxiv. Cambridge: Cambridge Open Engage; 2023; <https://doi.org/10.26434/chemrxiv-2023-xmb84>.
2. Brauer S, Mastalski I, **Murphy M**, Hoekstra B, Monson L, Dauenhauer P, et al. Reaction Kinetics of the Autocatalytic Hydrolyses of Alkyl Lactates. ChemRxiv. Cambridge: Cambridge Open Engage; 2023; <https://doi.org/10.26434/chemrxiv-2023-0qf21>.

Research Experience

University of Minnesota—Twin Cities

Minneapolis, MN

Undergraduate Researcher, Dauenhauer Group

Aug. 2022 – May 2024

- Led a computational project researching catalytic resonance theory applied to a loop reaction.
- Successfully applied computational skills by using Julia and parallel computing resources to model the desired chemical reactions and processes.

Teaching Experience

University of Minnesota—Twin Cities

Minneapolis, MN

Undergraduate Teaching Assistant

Aug. 2022 – Dec. 2023

- Introduction to the Science and Engineering of Materials (MATS 2001)

Undergraduate Tutor

- College of Science and Engineering Tutor, Taylor Tutoring Center
- Organic Chemistry Tutor, Organic Chemistry Connections

Jan. – May 2022

Jan. – Dec. 2021

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Work Experience

ABV Technology

St. Paul, MN

Chemical Engineering Intern

May 2022 – Aug. 2022

- Calibrated and tested 10 beta-units of new analytical equipment and trained all internal employees and customers on operating the equipment.
- Led the development of sample preparation for the analytical equipment and introduced a new method of degassing that significantly decreased the CO₂ concentration in the input beverage, reducing the error in the measured results.
- Immersed myself in studying the complex thermal modeling implemented in the equipment and grew a deeper understanding of circuit boards and software engineering.

Leprino Foods Co.

Denver, CO

Chemistry Laboratory Intern

June 2021-Aug. 2021

- Fostered a clean and organized lab environment to ensure accurate and reliable results while performing quality assurance and research testing.
- Demonstrated the ability to quickly learn and follow standard operating procedures.

Leadership Experience

University of Minnesota—Twin Cities

Minneapolis, MN

American Institute of Chemical Engineers, Secretary

Aug. 2023 – May 2024

- Crafted weekly emails to inform members of upcoming events, department notices, and potential scholarship, research, and job opportunities.
- Participated in DEI initiatives within the executive team. Created monthly presentations to bring awareness for underrepresented groups and current worldwide opportunities.

Department of Chemical Engineering and Materials Science, Ambassador

Aug. 2023 – 2024

- Led events tailored for new and prospective students interested in pursuing a major in the department.
- Created initiative to increase community amongst undergraduate students in the department through planning new events to drive connections and engagement.

Ski and Snowboard Club, President

Aug. 2023 – May 2024

- Led a club of over 400 members and an executive team of 15 officers: established priorities, delegated responsibilities, planned events, and communicated with club sponsors/partners.
- Planned and recruited for an international club trip to Banff, AB in Canada for over 90 members.
- Held an Officer position for 2 years prior to Presidential appointment.