Abby M. Cardoza

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Education

Colorado School of Mines — Golden, CO
Doctor of Philosophy in Applied Chemistry (in progress) — *Expected December 2027*

University of Oklahoma — Norman, OK
Bachelor of Chemistry and Biochemistry — *May 2023*

- GPA: 3.92

Research Experience

Graduate Research, Colorado School of Mines — 2023 – Present
Advisor: Dr. Annalise Maughan

- Focus on the synthesis of halide spinel-based solid-state electrolytes using low-temperature synthetic procedures in application for all-solid-state-batteries.
- Investigate ionic conductivity through structure-property relationships. Employ electrochemical techniques such as electrochemical impedance spectroscopy. Resolve highly disordered structures with X-Ray diffraction and neutron scattering.

Undergraduate Research, University of Oklahoma — 2022 – 2023
Advisors: Dr. Bayram Saparov, Dr. Daniel T. Glatzhofer

- Explored optoelectronic properties of hybrid polymer perovskites. Synthesized materials using solid-state and organic techniques to produce the layered structures, then characterized with nuclear magnetic resonance, thermogravimetric analysis, and differential scanning calorimeter.

Undergraduate Research, University of Oklahoma — 2022 – 2023
Advisor: Dr. Bayram Saparov

- Studied earth-abundant and environmentally benign optical materials though the synthesis of hybrid organic-inorganic copper (I) metal halides. Utilized powder and single crystal X-Ray diffraction along with diffuse reflectance and photoluminescence spectroscopy to characterize structural and optoelectronic properties.

Undergraduate Research, University of Oklahoma — 2021 – 2022
Advisor: Dr. Bin Wang

- Gained extensive experience in computer programs such as command line interfaces (CLI), OU's high performance computing software, and Vesta for data analysis related to the development of lithium-sulfur batteries for energy storage and conversion.

Publications

3. **A. M. Cardoza**, T. B. Case, C. L. Rom, K. Davis, D. M. Halat, A. E. Maughan; "From Cation Order to Disorder: Unlocking Ion Transport Pathways in Li-Zn-Zr-Cl Halspinels", *Chemistry of Materials*, **2026**. [doi]

2. C. L. Rom, P. Yox, **A. M. Cardoza**, R. W. Smaha, M. Q. Phan, T. R. Martin, A. E. Maughan; "Expanding the phase space for halide-based solid electrolytes: Li-Mg-Zr-Cl spinels", *Chemistry of Materials*, **2024**. [doi]

1. D. A. Popy, Y. Singh, Y. Tratsiak, **A. M. Cardoza**, J. M. Lane, L. Stand, M. Zhuravleva, N. Rai, B. Saparov; "Stimuli-responsive photoluminescent copper(I) halides for scintillation, anticounterfeiting, and light-emitting diode applications", *Aggregate*, **2024**, e602. [doi]

Presentations

- Mines Graduate Research and Discovery Symposium (GRADS) Oral Presentation, **2026**.
- ACS Spring Conference Oral Presentation and Poster, **2026**.
- Colorado Center for Advanced Ceramics (CCAC) Oral Presentation, **2025**.
- Front Range Electrochemistry Workshop Poster, **2025**.
- Mines Graduate Research and Discovery Symposium (GRADS) Poster, **2025**.
- Colorado Center for Advanced Ceramics (CCAC) Poster, **2024**.
- Mines Graduate Research and Discovery Symposium (GRADS) Poster, **2024**.

Fellowships, Honors & Awards

WCC/Lilly Emerging Talent Award 2026
ACS Women Chemist Committee, Eli Lilly & Company

2025 Chemistry of Materials Lectureship and Best Paper Award 2025
American Chemical Society, Chemistry of Materials
- "Expanding the Phase Space for Halide-Based Solid Electrolytes: Li-Mg-Zr-Cl Halospinels"

First Place Poster, Front Range Electrochemistry Workshop 2025
University of Colorado Boulder

National Defense Science and Engineering Graduate Student Fellowship 2024
Department of Defense
- 3-year long fellowship awarded to pursue a PhD in DoD mission-related research

First Place Poster, Graduate Research and Discovery Symposium 2024
Colorado School of Mines
- Environmental and Energy Research Category

Outstanding New Graduate Student Fellowship Award 2023
Colorado School of Mines

President's List 2020, 2021, 2022, 2023
Unviersity of Oklahoma
- Awarded for 4.0 GPA

Dean's List 2019, 2021
University of Oklahoma
- Awarded for 3.5-4.0 GPA

Academic Achievement Scholarship 2019
University of Oklahoma
- Awarded for ACT Scores

Teaching Experience

Rocky Mountain Mathematics Engineering Science Achievement Mentor 2023 – 2025
Colorado School of Mines RM MESA

- Interact with students on a weekly basis at high schools in the Denver Metro area to design an engineering focused project along with strengthen and develop skills such as problem-solving, critical thinking, and teamwork.

General Chemistry 1 Teaching Assistant 2023 – 2024
Colorado School of Mines

- Supervises two laboratory sections per week, gives brief lectures on the chemistry behind the experiments, grades weekly assignments, proctors examinations, and helps answer questions related to the class and laboratory component of the course.

Tutor 2021 – 2022
Self-Employed

- Tutored undergraduate students in the subjects of General Chemistry, Organic Chemistry, General Physics, and Statistics.

Leadership & Service

OU Climbing President 2022 – 2023
University of Oklahoma

- Assisted in coordinating a new competition circuit and performed administrative work for the South-Central Climbing region.

Make-A-Wish Fundraising Events 2020 – 2023
University of Oklahoma

- Participated in 10 different fundraising events for the Make-A-Wish Foundation.