

Abby Cardoza

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EDUCATION

Colorado School of Mines

Doctor of Philosophy in Applied Chemistry (in progress)

Golden, CO

Expected May 2027

University of Oklahoma

Bachelor of Chemistry and Biochemistry

Norman, OK

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 and galvanostatic cycling. Resolve highly disordered structures with X-Ray diffraction and neutron scattering.

Undergraduate Research, University of Oklahoma

2022 – 2023

Advisor: Dr. Bayram Saparov

- Studied earth-abundant and environmentally benign optical materials through 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.
- Independently led project focusing on investigating the 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

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

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

- 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

First Place Poster, Front Range Electrochemistry Workshop	2025
<i>University of Colorado Boulder</i>	
National Defense Science and Engineering Graduate Student Fellowship	2024
<i>Department of Defense</i>	
• 3-year long fellowship awarded to pursue a PhD in DoD mission-related research	
First Place Poster, Graduate Research and Discovery Symposium	2024
<i>Colorado School of Mines</i>	
• Environmental and Energy Research Category	
Outstanding New Graduate Student Fellowship Award	2023
<i>Colorado School of Mines</i>	
President's List	2020, 2021, 2022, 2023
<i>University of Oklahoma</i>	
• Awarded for 4.0 GPA	
Dean's List	2019, 2021
<i>University of Oklahoma</i>	
• Awarded for 3.5-4.0 GPA	
Academic Achievement Scholarship	2019
<i>University of Oklahoma</i>	
• Awarded for ACT Scores	

TEACHING EXPERIENCE

Rocky Mountain Mathematics Engineering Science Achievement Mentor	2023 – Present
<i>Colorado School of Mines RM MESA</i>	
• 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
<i>Colorado School of Mines</i>	
• 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
<i>Self-Employed</i>	
• 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.