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## EDUCATION

### Ph.D. in Material Science

June 2024-Current

Colorado School of Mines, Golden, CO

GPA 4.00

Advisor: Annalise Maughan

### Bachelor of Science in Chemical Engineering (magna cum laude)

May 2024

Rose-Hulman Institute of Technology, Terre Haute, IN

GPA 3.80

Minors: Materials Science and Engineering, Mechanical Engineering

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## RESEARCH EXPERIENCE

### Colorado School of Mines; Golden, CO

June 2024-Current

Graduate Research Assistant, Principal Investigator: Dr. Annalise Maughan

- Fabricate, characterize and test film composite  $\text{Li}_6\text{PS}_5\text{Cl}$  solid-state electrolytes

### National Renewable Energy Laboratory; Golden, CO

Summer 2023

Science Undergraduate Laboratory Internship, Principal Investigator: Dr. Robert Tenent

- Enhanced ultrasonic spray deposition parameters to enable scalable synthesis of NiO electrochromic films, achieving improved uniformity and electrochemical performance
- Conducted comprehensive electrochemical characterization via cyclic voltammetry, elucidating redox mechanisms and evaluating the durability and reversibility of NiO films
- Presented insights on electrochromic film optimization at a poster session and through a technical report

### Colorado School of Mines; Golden, CO

Summer 2022

Undergraduate Research Assistant, Principal Investigator: Dr. Colin Wolden

- Developed a solution-phase synthesis method for  $\text{Na}_3\text{SbSe}_4$  solid-state electrolyte, optimizing the route for improved purity and yield
- Characterized structural and electrochemical properties of  $\text{Na}_3\text{SbSe}_4$  using x-ray diffraction and electrochemical impedance spectroscopy, contributing to purity and conductivity analyses
- Strengthened research methodology and technical communication skills through weekly seminars

### Rose-Hulman Institute of Technology; Terre Haute, IN

IP/ROP Research, Principal Investigator: Dr. Matt Riley

Spring 2024

- Designed and implemented a process to fabricate carbon fiber-epoxy-iron composite toroid samples, enabling material characterization of magnetic properties
- Developed and validated an experimental setup to measure magnetic permeability in composite materials, assessing their suitability for electromagnetic acceleration in flywheel applications

Undergraduate Research, Principal Investigator: Dr. Alex Kamasah

Spring 2023

- Synthesized electrochromic quantum dots ( $\text{WO}_3$ ) and transparent conductive materials (silver nanowires) to develop scalable methods for producing electrochromic films
- Constructed and tested electrochromic cells, enhancing their durability and optical performance

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## OTHER WORK EXPERIENCE

### Rose-Hulman Institute of Technology; Terre Haute, IN

Rose Prime Mentor

Aug. 2022 & 2023

- Mentored and tutored students during an intensive two-week summer program, focusing on foundational math concepts to strengthen their skills and confidence

Learning Center Tutor

Sept. 2021-May 2024

- Provided tutoring in physics, math, and chemistry, adapting explanations to diverse learning styles
- Organized and led review sessions for finals, enhancing student understanding of complex topics

Teaching Assistant

Fall 2022 & Fall 2023

- Guided students in learning Solidworks, offering hands-on assistance to help them develop proficiency in CAD

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## ACTIVITIES & LEADERSHIP

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<b>Mentorship at National Renewable Energy Laboratory</b>	<b>Jan. 2025-Current</b>
<ul style="list-style-type: none"><li>Supported training of new researchers to ensure and enable high-quality experimental work</li><li>Assisted undergraduate researchers in data analysis and presentation</li></ul>	
<b>NSF REU Program at Colorado School of Mines</b>	<b>Summer 2024</b>
<ul style="list-style-type: none"><li>Mentored undergraduate researchers during professional development sessions</li><li>Provided constructive feedback on research posters and proposal drafts to improve scientific communication skills</li></ul>	
<b>Rose Research Fellows</b>	<b>Nov. 2023-May 2024</b>
<ul style="list-style-type: none"><li>Guided undergraduate students exploring research opportunities and career development</li></ul>	
<b>Rose-Hulman Varsity Softball Team</b>	<b>Sept. 2020-May 2024</b>
<ul style="list-style-type: none"><li>Developed leadership, discipline, and time management skills</li></ul>	
<b>Engineers for a Sustainable World</b>	<b>Sept. 2021-May 2023</b>
<i>Vice President of Environmental Awareness</i>	<i>Fall 2022-Fall 2023</i>
<ul style="list-style-type: none"><li>Directed campus sustainability initiatives and organized outreach projects promoting environmental awareness</li></ul>	

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## PUBLICATIONS & PRESENTATIONS

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- S. A. Vaselabadi, **K. Palmer**, W. H. Smith, and C. A. Wolden, “Scalable Synthesis of Selenide Solid-State Electrolytes for Sodium-Ion Batteries,” *Inorg. Chem.*, vol. 62, no. 42, pp. 17102–17114, Oct. 2023, [doi](#).
  - (in submission) R. J. Tancin, M. C. Schulze, **K. J. Palmer**, A. Wadehra, A. E. Maughan, M. B. Preefer, J. N. Weker, A. Colclasure, “Scaling Production and Electrochemical Testing of All-Solid-State Li-Ion Batteries: Dry-Processed Catholytes, Robust Separators, and Compact and Low-Cost Pressure Jig”
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- Provisional Patent (submitted): M. C. Schulze, R. J. Tancin, **K. J. Palmer**, Compact Spring Jig for Solid State Batteries
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- K. J. Palmer**, M. C. Schulze, A. Colclasure, A. E. Maughan, “Enabling scalable production of composite solid-state lithium electrolytes”, GRADS Research Symposium at Colorado School of Mines (2025)
- K. J. Palmer**, M. C. Schulze, A. Colclasure, A. E. Maughan, “Enabling scalable production of composite solid-state lithium electrolytes”, Front Range Electrochemistry Workshop (2025)
- K. J. Palmer**, M. Riley, “Magnetic Permeability Characterization of Short Order Fiber Composites”, IP/ROP Poster Session at Rose-Hulman Institute of Technology (2024)
- K. J. Palmer**, R. Tenent, “Synthesizing and testing nickel oxide electrochromic films for smart windows”, Poster Session at National Renewable Energy Laboratory (2023)
- K. J. Palmer**, S.A. Vaselabadi, C. Wolden, “Scalable Manufacturing of Selenide Solid-State Electrolytes” REU Research Symposium at Colorado School of Mines (2022)
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## HONORS & AWARDS

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Outstanding New Graduate Student Fellowship, Fall 2024	Colorado School of Mines
IP/ROP Research Grant Spring 2024	Rose-Hulman
Dean’s List 2020-2024	Rose-Hulman
CSC Academic All-District honoree in 2023 and 2024	Rose-Hulman Softball
Academic All-HCAC honoree in 2022, 2023, and 2024	Rose-Hulman Softball
HCAC All-Sportsmanship Team, 2022	Rose-Hulman Softball

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## SKILLS

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### Materials Characterization

*Spectroscopy* – IR, FTIR, Raman, NMR, electrochemical impedance, and cyclic voltammetry

*Experimental Techniques* – XRD, gas and liquid chromatography, melting point characterization, liquid-liquid extraction, metal and composite materials property testing, alloy characterization, slurry casting, and spray coating

**Modeling and Numerical Analysis** –Python, MATLAB, Aspen Plus, Solidworks, Autodesk Inventor, Visio