

# Charlie Ruppe

## Education

*2022-2026 (expected)*

### **Carleton College**

Bachelor of Arts, Mathematics: Cumulative GPA: 3.73/4.0 Major GPA: 3.97/4.0

Relevant Coursework: Advanced Linear Algebra, Computational Mathematics, Algebraic Geometry, Programming Languages, Abstract Algebra, Topology, Real Analysis II: Measure Theory, Intro to Computer Graphics.

*September 2024-December 2024*

### **Budapest Semesters in Mathematics** Graduated with Honors

Relevant Coursework: Quantum Logic and Quantum Probability, Functional Analysis, Commutative Algebra and Algebraic Geometry, Conjecture and Proof

## Research Experience

*June 2025-August 2025*

**International Commutative Algebra REU** Research on binomial edge ideals with faculty from University of Nebraska-Lincoln at Centro de Investigación en Matemáticas (CIMAT) in Mexico. Wrote and animated an expository video here. Selected to present at Joint Mathematics Meetings. arxiv preprint (2025).

*June 2024-August 2024*

### **Geometric Number Theory Research with Dr. Corey Brooke**

Research on organizing integer solutions of quadratic forms as trees parameterized by matrix representations of free groups. Delivered a 25-minute presentation on our results to our summer research peers. Manuscript in preparation.

*June 2023-June 2024*

**Mesoscale Magnetic Research with Dr. Barry Costanzi in the Physics Department at Carleton College** Modeled energy landscapes of 250nm permalloy dots in Golang/Python. Implemented system for managing simulations using Github. Assembled and operated our sputtering system, for depositing metal features used in experiments. Processed samples, wrote LabVIEW code for measurement taking. Used a scanning electron microscope to image our samples for computer simulations. Results given in a poster session: “Magnetic Configurations in Mesoscale Magnetic Dots” Student Research and Internship Symposium. Carleton College, Northfield, MN, October 2023.

## Teaching Experience

*September 2023-June 2024*

### **Math Teaching Assistant/Grader at Carleton College**

Lead collaborative study sessions for Calculus II and graded for Computational Mathematics (in Julia).

## Activities

*September 2023-current*

### **President of Carleton College Problem Solving Club**

- Competition Math preparation (eg. for Putnam and regional competitions)
- Compile problems, guide, and organize meetings
- President since September 2023, member since 2022.

## Relevant Skills

- Vulkan, OpenGL, Python, Julia, MATLAB, Mathematica, LabVIEW, C, C++, and Java.
- SEM (electron microscope).
- Intermediate German
- Extracurriculars: I swim and dive for my college's varsity team, and am the RA for the Culinary Interest House.

## Other Experience

*September 2025-June 2026*

### **Resident Assistant at Carleton College**

Act as a Peer Leader on campus, exemplifying the standards and expectations of the college as well as being a resource for conflict mediation, first aid, and Title IX compliance.