Northfield, Minnesota

+1 703-470-1353
ruppe.charlie@gmail.com
ruppec.github.io

Curriculum Vitae
Charlie Ruppe

Education

2022-2026 (expected)

Carleton College
Bachelor of Arts, Mathematics: Cumulative GPA: 3.72/4.0 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. Presented our results as a group, recorded here. Presented our results solo at the Northfield Undergraduate Mathematics Symposium (2025). 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.

Publications & Preprints

[1] Belotserkovskiy, Dennis, Mariana Landín, Charlie Ruppe, and Lizzy Teryoshin. 2025. "Asymptotic Invariants of Symbolic Powers of Binomial Edge Ideals." Version 1. Submitted, arXiv. https://doi.org/10.48550/ARXIV.2510.14272.

Presentations

[1] Belotserkovskiy, Dennis, and Charlie Ruppe. 2026 (**Accepted/Upcoming**). "Asymptotic Invariants of Symbolic Powers of Binomial Edge Ideals." 2026 Joint Mathematics Meetings (JMM 2026), January 4. https://meetings.ams.org/math/jmm2026/meetingapp.cgi/Paper/54917.

[2] Ruppe, Charlie. 2025. "Symmetric Cubic Surfaces in S3." Show-and-ask. Illustrating Mathematics Seminar Online, December 12.

[3] Ruppe, Charlie. 2025. "Aymptotic Invariants of Symbolic Powers of Binomial Edge Ideals." Northfield Undergraduate Mathematics Symposium, September 30.

[4] What Is... a Binomial Edge Ideal? 2025. With Charlie Ruppe, Bryan E. Flores-Silva, and Zoe Siegelnickel. 2:23. https://www.youtube.com/watch?v=GdGTsFzHxRs.

[5] Belotserkovskiy, Dennis, Mariana Landín, Charlie Ruppe, and Lizzy Teryoshin. 2025. "Asymptotic Invariants of Symbolic Powers of Binomial Edge Ideals." International REU in Commutative Algebra, Aug 6 2025. https://www.youtube.com/watch?v=vsOWdoBv_ZQ.

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).

September 2022-June 2024

Math Tutor at Carleton College
Tutored other college students in Calculus I,II, and III, ODEs, Linear Algebra, and the intro-proofs course.

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.