Harry Fluck

Ph.D. Candidate

Contact Information

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Education

Ph.D. in Mathematics, Cornell University: 2021-Present
Thesis advisor: Prof. Xiaodong Cao

M.S. in Mathematics, Durham University: 2017-2021
Classification: First Class Honors (86% degree average)
Dissertation advisor: Prof. Pankaj Vishe
Dissertation title: Oppenheim's Conjecture and the Dynamics of Homogeneous Spaces

Research Interests

I study geometric analysis, with my primary interest being Ricci flow. I am particularly interested in singularity formation and its applications to topology.

Publications and Preprints

An ϵ-Regularity Theorem for Non-collapsed Ricci Flow (with M. Hallgren), *arxiv:2509.14154*

The Curvature Operator of the Second Kind in Dimension Three (with X. Li), *The Journal of Geometric Analysis* **34**(187) (2024)

Awards and Honors

Robert John Battig Graduate Student Prize: Cornell University **(**2023)
-Awarded for excellence and promise in mathematics.

Edward Collingwood Memorial Prize: Durham University **(**2021)
-Awarded to a student graduating with a masters in mathematics who shows great promise in research.

Baxter Prize: Hatfield College, Durham University **(**2019, 2020)
-Awarded to the highest attaining mathematics students in a given year group.

Title of College Scholar: Hatfield College, Durham University **(**2018-2021)
-Awarded for consistent first class academic attainment.

Invited Talks

Epsilon-Regularity for Non-Collapsed Limits of Ricci Flows: Stochastic Analysis Seminar at Auburn, Auburn University (October 2025)

Epsilon-Regularity for Non-Collapsed Limits of Ricci Flows: AMS Special Session, UC Riverside (October 2024)

Conferences and Seminars

Rutgers Geometric Analysis Conference: Rutgers University **(**May 2025)

Upper NYS Geometric Analysis Workshop: Cornell University (April 2025)

Flows and Variational Methods in Riemannian and Complex Geometry: SLMath (June 2024)

Kansas Geometric Analysis Conference: Wichita State University (April 2024)

Recent Advances in Geometric Analysis: CIRM **(**November 2023)

Rutgers Geometric Analysis Conference: Rutgers University **(**May 2023)

Upper NYS Geometric Analysis Workshop: Cornell University (April 2023)

Southern California Geometric Analysis Seminar: UC Irvine (March 2023)

Graduate Student Topology and Geometry Conference: Georgia Institute of Technology **(**April 2022)

Analysis and Geometric Analysis Seminar: Cornell University **(**Fall 2021-present)

Teaching Experience

Instructor: Cornell University

- **Calculus 1** (Spring 2025)

Mentor: Cornell University

- **Harnack Bounds for Heat Equations:** Cornell Research Experience for Undergraduates (Summer 2023)

Teaching Assistant: Cornell University

- **Honors Introduction to Analysis** (Fall 2025)
- **Multivariable Calculus for Engineers** (Spring 2024, Spring 2023, Fall 2022)
- **Linear Algebra for Engineers** (Fall 2023, Fall 2021)
- **Introduction to Real Analysis** (Spring 2022)

Outreach and Service

Graduate Mentor: Cornell University (2022-present)
-Assisting early stage graduate students in making the transition from undergraduate to graduate education by discussing successful research habits.

Directed Reading Project: Cornell University (Spring 2024, Fall 2023, Fall 2022)
-Led several undergraduate reading projects with topics including Riemannian geometry, elliptic PDE, and smooth manifolds.