Max Hallgren

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Areas of specialization

Ricci Flow, Geometric Analysis

Education

2016-2022	**PhD in Mathematics**, Cornell University: –M.S. received in 2018 –Advisor: Xiaodong Cao –Research Area: Ricci Flow, Geometric Analysis
2017	**Visiting Student**, Fields Institute –Thematic Program on Geometric Analysis, Fall 2017 semester
2012-2016	**B.A. in Mathematics**, Cornell University

Employment

2022-	**NSF Mathematical Sciences Postdoctoral Research Fellowship**, Rutgers University

Grants, honors & awards

2022	**Mathematical Sciences Postdoctoral Research Fellowship**, National Science Foundation
2019	**Hutchinson Fellowship**, Cornell University –Awarded for excellence in research, provides one semester of teaching relief
2017	**Eleanor Norton York Award**, Cornell University
2016	**Summa cum Laude**, Cornell University
	Harry S. Kievel Prize in Mathematics, Cornell University

Publications & talks

Papers and Preprints

Dates on the left denote the year uploaded to arxiv.

2022	**Tangent Flows of Kähler Metric Flows,** with J. Wangjian https://arxiv.org/abs/2202.06185
	Canonical Surgeries in Rotationally Invariant Ricci Flow, with T. Buttsworth and Y. Zhang https://arxiv.org/abs/2201.09387
2021	**Ricci Flow with Ricci Curvature and Volume Bounded Below,** https://arxiv.org/abs/2104.03386
2020	**The Entropy of Ricci Flows with Type-I Scalar Curvature Bounds,** *Advances in Mathematics* 418, (2023)
2019	**Local Stability of Einstein Metrics Under Ricci Iteration,** With T. Buttsworth *Journal of Functional Analysis* 280, No. 2 (2021)
2018	**Nonexistence of Noncompact Type-I Ancient Three-Dimensional κ-Solutions of Ricci Flow with Positive Curvature,** *Communications in Contemporary Mathematics* 21, No. 06, (2019)
2017	**A Differential Harnack Inequality for the Newell-Whitehead-Segel Equation,** With D. Booth, J. Burkart , X. Cao, Z. Munro, J. Snyder, T. Stone *Anal. Theory Appl.*, 35 (2019), pp. 192-204.

Talks

2023	**Tangent Flows of Kähler Metric Flows** Rutgers Geometric Analysis Seminar (Spring 2023)
2022	**Nonsmooth Limits of Kähler-Ricci Flows** Rutgers-Newark Colloquium (Fall 2023)
	Tangent Flows of Kähler Metric Flows Yale Geometric Analysis & Applications Seminar (Spring 2022, online)
	The Tensor Maximum Principle Austrilian Geometric PDE Seminar (Spring 2022, online)
	Ricci Flow with a Lower Bound on Ricci Curvature and Volume University of Iowa Differential Geometry Seminar (Spring 2022, online)
	Ricci Flow with a Lower Bound on Ricci Curvature and Volume GeoTop Seminar at the University of Copenhagen (Winter 2022, online)
2021	**Ricci Flow with a Lower Bound on Ricci Curvature and Volume** Online seminar "Metric Measure Spaces and Convergence" (Fall 2021, online)
	Ricci Flow with a Lower Bound on Ricci Curvature and Volume Beijing International Center for Mathematical Research (Spring 2021, online)
	Ricci Flow with a Lower Bound on Ricci Curvature and Volume City University of New York Geometric Analysis Seminar (Spring 2021, online)
2020	**Singular Ricci Flows** Cornell Geometric Analysis Seminar (Fall 2020, online)
	Entropy convergence of Ricci flows with a Type-I scalar curvature bound University of Wisconson-Madison Geometry and Topology Seminar (Fall 2020)
	Almost Splitting Theorem University of California at San Diego Cheeger-Colding Seminar (3-part talk) (Summer 2020, online)
	Quantitative Stratification University of California at San Diego Cheeger-Colding Seminar (2-part talk) (Summer 2020, online)
2019	**Entropy convergence of Ricci flows with a Type-I scalar curvature bound.** Rutgers Complex Analysis and Geometry Seminar (Fall 2019)
	Entropy convergence of Ricci flows with a Type-I scalar curvature bound. Cornell Analysis Seminar (Fall 2019)
2018	**Backward Uniqueness for Parabolic Equations.** Bonn University Summer School: Unique Continuation and Inverse Problems (Fall 2018)
2016	**Neckpinch Singularities in Ricci Flow.** Cornell Geometric Analysis Seminar (2-part talk) (Fall 2016)
	Curvature, Topology, and Pinched Spheres. Cornell Undergraduate Math Club (Spring 2016)

Teaching

2017-2022   **Teaching Assistant**, Cornell University

- Differential Geometry (Spring 2022)

- Applied Complex Analysis (Fall 2021)

- Graduate Differentiable Manifolds (Fall 2020)

- Graduate Applied Functional Analysis (Spring 2020)

- Partial Differential Equations (Spring 2019)

- Theoretical Linear Algebra and Calculus (Fall 2018)

- Graduate Partial Differential Equations (Spring 2018, Spring 2020)

- Calculus for the Life Sciences (Spring 2017)

2019   **Instructor**, Cornell University

- Calculus I (Fall 2019)

2014-2015   **Tutor**, Cornell University Math Support Center (August 2014-December 2015)

Service

2020   **Mentor,** Cornell University Directed Reading Program (Spring 2021-Spring 2022)

2017   **Co-organizer,** Cornell Olivetti Seminar (Spring 2017)

2016   **Mentor,** Cornell Research Experience for Undergraduates in "Nonlinear Heat Equations" (Summer 2016)