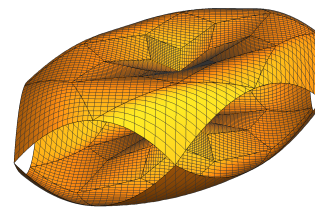


Nate Fisher

University of Wisconsin–Madison, Department of Mathematics

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Appointments

University of Wisconsin–Madison, Van Vleck Visiting Assistant Professor

Fall 2021 - Present

Education

Ph.D. in Mathematics, Tufts University

May 2021

Thesis: *Boundaries, random walks, and nilpotent groups*

Adviser: [Moon Duchin](#)

M.S. in Mathematics, Tufts University

May 2017

B.A. in Mathematics, Boston College

May 2013

College of Arts and Sciences Honors Program

Magna Cum Laude, Phi Beta Kappa, Pi Mu Epsilon

Research interests

In general: geometric group theory, metric geometry, geometric topology

Specifically: the interplay between finitely generated nilpotent groups and nilpotent Lie groups, horofunction boundaries, the dynamics of group actions, random walks on groups, Teichmüller geometry, translation surfaces, infinite-type surfaces

Research papers

Nate Fisher and Sebastiano Nicolussi Golo. "Sub-Finsler Horofunction Boundaries of the Heisenberg Group." *Analysis and Geometry in Metric Spaces* 9.1 (2021): 19-52. ([arxiv](#))

Moon Duchin and Nate Fisher. "Stars at infinity in Teichmüller space." *Geometriae Dedicata* (2021): 1-15. ([arxiv](#))

Expository writing

Notes on nilpotent groups and their geometry

[Online](#). (with Moon Duchin)

Notes on curvature in complex hyperbolic space

[Online](#).

Talks and Conferences

Invited and contributed talks

University of Wisconsin–Madison Dynamics Seminar	Sep. 2021
Tufts University Geometric Group Theory and Topology Seminar	May 2021
Binghamton Geometry and Topology Seminar	Apr. 2021
AMS Special Session on Geometric and Functional Inequalities	Mar. 2021
University of Milwaukee Topology Seminar	Feb. 2021
University of Jyväskylä Geometric Analysis Seminar	Feb. 2021
Graduate Student Summer Speaker Series, Tufts University	June 2020
Virtual Miniconference on Analysis and Probability (replacing AMS special session)	Apr. 2020
Tufts Geometric Group Theory and Topology Seminar	Mar. 2020
Group Theory Seminar, ICMAT-UAM, Spain	Nov. 2019
Research Seminar, Universidad de Salamanca, Spain	Nov. 2019
Temple GSCAGT, Philadelphia, MA	June 2019
LGeometry&TopologyBQ, Ann Arbor, MI	June 2019
Topology Students Workshop, Atlanta, GA	June 2018

Other talks at Tufts University

Horofunctions in sup metrics	Feb. 2019
Nilpotent groups and their geometry	Oct. 2018
Stars at infinity and Hopf's theorem	Apr. 2018
The geometry of horospheres in complex hyperbolic space	Dec. 2017
The ergodicity of geodesic flow in quotients of hyperbolic space	Dec. 2017
Nonwandering sets and stability	May 2017
An introduction to representation theory	Dec. 2016

Workshop organized

Taller en matemáticas y pedagogía	Jan. 2018
<i>Organized and led a 2-day workshop for in-service math teachers in Mistrató, Colombia, focused on analyzing, understanding, and responding to student work.</i>	

Teaching experience and outreach

University of Wisconsin–Madison

The Theory of Single Variable Calculus	Fall 2021
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Tufts University

Differential Equations	Summer 2021
Linear Algebra	Spring 2020
Graduate Development Seminar (for first year PhD students)	Fall 2018 - Spring 2019
Introduction to Calculus	Summer 2018

Teaching assistant (Tufts University)

Calculus III, recitation leader	Spring 2021
Linear Algebra	Fall 2020
Introduction to Statistics	Summer 2020
Calculus II, recitation leader	Spring 2019
Mathematics of Social Choice	Fall 2018, Fall 2017

Poincaré Institute for Mathematics Education

The [Poincaré Institute](#) provides online graduate level math education courses to in-service middle school teachers with the aim of improving the teaching and learning of mathematics. I served as an instructor to a small group of teachers, created and edited course materials, and studied the effectiveness of the courses as a research assistant.

From Numbers to Functions	Fall 2015
Change and Invariance	Spring 2016
Transformations and Equations	Fall 2016
Research Assistant	Summer 2016, Spring 2017, Spring 2018

Mentorship

Geometric Group Theory Reading Seminar	Fall 2020 - Spring 2021
<i>Organized and led a virtual weekly reading seminar for graduate students, focusing one semester on Bass-Serre Theory and the other on the Geometrization Conjecture.</i>	
PROMYS Math Circle	Spring 2017 - Fall 2019
<i>Developed exploratory group-based problem sets and mentored a weekly student-led math circle for high school students from underrepresented backgrounds</i>	
Tufts Directed Reading Program	Summer 2017
<i>Mentored an undergraduate student for a summer reading project on linear programming - the revised simplex method and applications to economics.</i>	

Honors and awards

Finalist for Robert P. Guertin Student Leadership Award	Spring 2021
GEAR Graduate Intern, with sponsoring scientist Javier Aramayona	Oct. - Dec. 2019
Tufts Math Department Head Teaching Assistant	Fall 2018 - Spring 2019
US Junior Oberwolfach Fellow	Oct. 2018
NSF Travel Award	July 2016

Service[Tufts Organization of Graduate Students in Mathematics](#) (AMS Student Chapter)

President	Fall 2017 - Spring 2019
<i>Organized talks by Tufts faculty, a graduate mentorship program, and other events to develop departmental community</i>	
Treasurer	Fall 2016 - Spring 2017
Tufts Math Department DEI Committee Member	Fall 2020 - Spring 2021
Organizer of Tufts Directed Reading Program	Summer 2018