

Karen Butt

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Last updated: September 22, 2025

RESEARCH INTERESTS Geometry and dynamics: spaces of nonpositive curvature, geodesic flows, hyperbolic dynamical systems, rigidity, locally symmetric spaces

EMPLOYMENT **University of Chicago**, Chicago, Illinois
L. E. Dickson Instructor, September 2023 –
NSF Postdoctoral Fellow July 2024 –

EDUCATION **University of Michigan**, Ann Arbor, Michigan
Ph.D. in Mathematics, April 2023
Thesis: *Closed geodesics and stability of negatively curved metrics*
Advisor: Ralf Spatzier

University of Michigan, Ann Arbor, Michigan
M.S. in Mathematics, May 2019

University of Chicago, Chicago, Illinois
B.A. with Honors in Mathematics, June 2017

- PAPERS**
5. *Quantitative marked length spectrum rigidity for surfaces*,
arXiv:2509.16829.
 4. *Monotonicity of the Liouville entropy along the Ricci flow on surfaces*,
joint with A. Erchenko, T. Humbert, D. Mitsutani arXiv:2504.07290.
 3. *Approximate rigidity of the marked length spectrum*,
Mathematics Research Reports, Volume 4 (2023), pp. 63-82.
 2. *Approximate control of the marked length spectrum by short geodesics*,
to appear in Ergodic Theory & Dynamical Systems, arXiv:2210.15101
 1. *Quantitative marked length spectrum rigidity*,
to appear in Geometry & Topology, arXiv:2203.12128

TEACHING **University of Chicago:**

Spring 2026	Math 274	Differentiable Manifolds	Primary Instructor
Fall 2025	Math 204	Analysis in \mathbb{R}^n -2	Primary Instructor
Spring 2024	Math 205	Analysis in \mathbb{R}^n -3	Primary Instructor
Winter 2024	Math 204	Analysis in \mathbb{R}^n -2	Primary Instructor
Fall 2023	Math 203	Analysis in \mathbb{R}^n -1	Primary Instructor (2 sections)

University of Michigan:

Winter 2023	Math 215	Calculus III	Lab Instructor (MATLAB)
Fall 2022	Math 116	Calculus II	Primary Instructor
Fall 2021	Math 116	Calculus II	Primary Instructor
Fall 2020	Math 116	Calculus II	Primary Instructor
Fall 2019	Math 215	Calculus III	Lab Instructor (MATLAB)
Winter 2019	Math 116	Calculus II	Primary Instructor
Fall 2018	Math 116	Calculus II	Primary Instructor
Winter 2018	Math 115	Calculus I	Primary Instructor
Fall 2017	Math 105	Data, Functions, and Graphs	Primary Instructor

University of Chicago:

Summer 2017	UChicago REU	Linear Algebra	TA
Summer 2017	UChicago REU	Apprentice Program	Mentor
Spring 2017	Math 24300	Intro to Algebraic Curves	Grader
Fall 2017	Math 20250	Abstract Linear Algebra	TA
Fall 2014	Math 13100	Elementary Functions & Calculus 1	TA

AWARDS

- NSF postdoctoral research fellowship 2024-
- AIM SQuaRE “Flexibility and rigidity for geodesic flows” 2024- with Alena Erchenko, Tristan Humbert, Daniel Mitsutani
- AIM SQuaRE “Sectional curvature of solvmanifolds” 2024- with Romina Arroyo, Karla Garcia, Ruth Gornet, Meera Mainkar, Tracy Payne
- Travel Grant (\$1000), Association for Women in Mathematics, (2023)
- Allen Shields Memorial Fellowship, University of Michigan Mathematics Department (2021)
- Juha Heinonen Memorial Fellowship, University of Michigan Mathematics Department (2019)
- FRQNT (Quebec Scientific Research Foundation) Master’s Scholarship (2017-2019)
- Paul R. Cohen Prize, University of Chicago, for highest record in undergraduate mathematics (2017)
- Phi Beta Kappa Honor Society, University of Chicago (2017)

SERVICE

- Mentor, UChicago REU (Summer 2025)
- Co-organizer, Dynamics Seminar, University of Chicago (2023–)
- Mentor for “Flexibility of entropies for negatively curved surfaces” graduate reading group, Big Ideas in Dynamics, AIM Research Community (Fall 2023)
- Differential Topology Qualifying Exam Study Group Leader, University of Michigan (Summer 2021, Summer 2022)
- Co-founder and co-organizer, UM Directed Reading Program (2018-2022)
- Co-organizer, Student Dynamics, Geometry, and Topology Seminar, University of Michigan (2019-2020)
- DRP Mentor (Fall 2018, Winter 2019, Winter 2020)
- Secretary, Association of Women in Mathematics - UM student chapter (2018-2020)
- Second Year Representative, Student Advisory Board, University of Michigan (2018-2019)

INVITED TALKS

- Geometry, Topology, Dynamics Seminar, University of Illinois–Chicago, October 2025
- Geometry, Topology Dynamics Seminar, University of Michigan, September 2025
- Dynamische Systeme Workshop, Oberwolfach, Germany, July 2025
- Midwest Summer School in Geometry, Topology, and Dynamics, Madison, WI, June 2025
- Differential Geometry/Geometric Analysis Seminar, University of Chicago, April 2025
- Virtual Seminar on Geometry with Symmetries, April 2025
- Dynamics Seminar, Northwestern University, April 2025
- Bloomington Geometry Workshop, Indiana University-Bloomington, April 2025
- Zoom Geometry Seminar, Pennsylvania State University, April 2024
- Groups, Geometry, and Dynamics Seminar, Yale University, April 2024
- Geometry Seminar, Michigan State University, March 2024
- AMS Special Session on Metric Geometry and Topology, Joint Mathematics Meetings, San Francisco, January 2024
- Geometry and Dynamics Day, Institut Mathématique Jussieu, France, December 2023
- Geometry Seminar, Dartmouth College, October 2023
- Zurich Dynamics Conference, University of Zurich, June 2023
- Graduate Recruitment Weekend, University of Michigan, March 2023
- Dynamics Seminar, University of Toronto, February 2023
- Topology/Geometry Zoom Seminar, University of Oregon, February 2023
- Dynamics Seminar, University of Wisconsin–Madison, February 2023
- Dynamics Seminar, Pennsylvania State University, January 2023
- Dynamics Seminar, University of Chicago, January 2023
- AMS Special Session on Dynamics, Geometry and Group Actions, Joint Mathematics Meetings, Boston, January 2023
- Dynamics Seminar, University of Maryland, December 2023
- Max Dehn Seminar on Geometry, Topology, Dynamics, and Groups, University of Utah, December 2022
- Differential Geometry Seminar (virtual), Heidelberg University, July 2022
- Midwest Dynamical Systems Early Career Conference, University of Notre Dame, May 2022
- Topology Seminar, The Ohio State University, April 2022

**CONTRIBUTED
TALKS &
POSTERS**

- Midwest Geometry Conference, Kansas State University, March 2023
- Geometry, Dynamics, and Topology Seminar, University of Michigan, November 2022
- Workshop on Dynamical Systems and Related Topics, Pennsylvania State University, November 2022
- Houston Workshop on Hyperbolic Dynamics, University of Houston, May 2022
- Workshop on Dynamical Systems and Related Topics, University of Maryland, April 2022
- Geometry Seminar, University of Michigan, March 2022
- Flexibility and Rigidity in Dynamical Systems (poster), Simons Center for Geometry and Physics, March 2022
- Topology Students Workshop (virtual), Georgia Institute of Technology, July 2020

**OTHER
CONFERENCES
& WORKSHOPS**

- Midwest Dynamical Systems Conference, University of Illinois-Chicago, October 2023
- Women in Geometry 3 Workshop, Banff International Research Station, September 2023
- School on Microlocal and Probabilistic Methods in Geometry and Dynamics, IMJ-PRG, July 2023
- Anosov Dynamics, CIRM, April 2023
- Recent Advances in Dynamis, Geometry, and Number Theory
Pennsylvania State University, August 2022
- Midwest Dynamical Systems Conference
Northwestern University, November 2021
- Midwest Dynamical Systems Conference
University of Illinois at Chicago, November 2019
- Houston Dynamics Summer School
University of Houston, June 2019
- Graduate Student Topology and Geometry Conference
University of Illinois at Urbana-Champaign, April 2019
- Summer School on Teichmuller Theory
Fields Institute, Toronto, August 2018
- Summer School in Dynamics
ICTP, Trieste, Italy, July 2018
- DRP (Directed Reading Program) Network
Massachusetts Institute of Technology, May 2018
- Houston Dynamics Summer School
University of Houston, May 2018
- Graduate Student Topology and Geometry Conference
University of Illinois at Chicago, April 2018
- Graduate Workshop in Algebraic Geometry for Women and Mathematicians of
Minority Genders
Harvard & MIT, February 2018
- Nebraska Conference for Undergraduate Women in Mathematics
University of Nebraska-Lincoln, February 2017

- Nebraska Conference for Undergraduate Women in Mathematics
University of Nebraska-Lincoln, February 2016