

Theodore Weisman

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Department of Mathematics
University of Michigan

POSITIONS

Postdoctoral researcher, Max Planck Institute for Mathematics in the Natural Sciences
Leipzig, Germany 2023 – 2024

Assistant professor (non-tenure) and research fellow, University of Michigan
Ann Arbor, Michigan 2022 – present (on leave 2023 – 2024)

EDUCATION

University of Texas at Austin, Austin, Texas
Ph.D. in Mathematics August 2022
Advisor: Jeffrey Danciger
Thesis: Higher-rank generalizations of convex cocompact and geometrically finite dynamics

Yale University, New Haven, Connecticut
B.S. in Mathematics (intensive), magna cum laude May 2016

AWARDS AND HONORS

NSF Postdoctoral Research Fellowship 2022 – present

Frank Gerth III Outstanding Dissertation Award 2022
University of Texas at Austin

Provost's Graduate Excellence Fellowship 2016 – 2021
University of Texas at Austin

Outstanding Presentation Award 2014
MAA Mathfest Undergraduate Paper Sessions

PUBLICATIONS AND PREPRINTS

1. *Cubulated hyperbolic groups admit Anosov representations* (with S. Douba, B. Fléchettes, and F. Zhu). arXiv:2309.03695, 2023 (submitted, 59 pages).
2. *Combination theorems for geometrically finite convergence groups* (with A. Traaseth). arXiv:2305.08011, 2023 (submitted, 38 pages).
3. *Stability of hyperbolic groups acting on their boundaries* (with K. Mann and J. Manning). arXiv:2206.14914, 2022 (submitted, 22 pages).
4. *An extended definition of Anosov representation for relatively hyperbolic groups*. arXiv:2205.07183, 2022. (submitted, 78 pages).
5. *Dynamical properties of convex cocompact actions in projective space*. *Journal of Topology*, 16.3 (2023), pp 990-1047A.
6. *Realization of Groups with Pairing as Jacobians of Finite Graphs* (with L. Gaudet, D. Jensen, D. Ranganathan, and N. Wawrykow). *Annals of Combinatorics*, 22.4 (2018), pp 781-801.

TEACHING EXPERIENCE

Teaching Assistant, University of Texas at Austin

M427L (Advanced calculus for applications II)
M408C (Differential and integral calculus)
M408S (Integral calculus for science)

Spring 2022
Fall 2018, Spring 2020
Spring 2019

SI (Supplemental Instruction) Teaching Assistant, University of Texas at Austin

M408C (Differential and integral calculus)

Fall 2019

In addition to taking on normal TA duties, SI teaching assistants meet weekly to develop better teaching strategies and discuss ways to improve classroom environment.

Peer Tutor, Yale University

MATH 244 (Discrete mathematics)
MATH 222 (Linear algebra with applications)

Fall 2014, Fall 2015
Spring 2016

MENTORSHIP

Faculty mentor, University of Michigan math REU

University of Michigan

Summer 2023

Advised an undergraduate student on a research project relating to hyperbolic groups and finite-state automata.

Faculty mentor, Lab of Geometry at Michigan

University of Michigan

Winter 2023

Designed and led an undergraduate project aimed at producing computer visualizations of Coxeter group actions in projective space.

Mentor, Texas Geometry Lab

University of Texas at Austin

Spring 2021, Fall 2021, Spring 2022

Mentored a group of undergraduates on a computer visualization project. Met with students twice a week, provided guidance and suggestions for their programming project, and helped build the website for the lab.

Mentor, UT Directed Reading Program

University of Texas at Austin

2017–2021

Mentored an undergraduate student through the process of reading a mathematical text. Mentoring involved meeting the student weekly to discuss the text and coaching them through a 15-minute talk at the end of the semester.

OUTREACH

Volunteer, Sunday Morning Math Group

University of Texas at Austin

2019–2020

Worked with Austin middle school and high school students biweekly on math problems, and gave a talk at one session on geometry of map projections.

Volunteer teacher, Splash at Yale

Yale University

Summer/Fall 2014, Spring 2015

Taught one-hour long minicourses to high school students. Each class met 1-4 times and had 20-30 students. Titles included *Abstract algebra*, *What is a number?*, and *The game of hex*.

MathCounts Coach, Columbus Family Academy

New Haven, CT

2013

Led weekly problem sessions for 7-10 students on the Columbus Family Academy middle school MathCounts team.

INVITED TALKS

1. “Anosov representations of cubulated hyperbolic groups”

University of Texas Groups & Dynamics seminar

September 2023

2. "Combination theorems for geometrically finite convergence groups"
Nearly Carbon Neutral Geometric Topology June 2023
3. "Topological stability for (relatively) hyperbolic boundary actions"
Geometric Topology in New York, Columbia University June 2023
4. "Topological stability for hyperbolic group actions on their boundaries"
CUNY hyperbolic geometry seminar October 2022
5. "Ping-pong, automata, and hyperbolic stability"
University of Michigan geometry seminar September 2022
6. "Extended geometrically finite representations"
AMS-SMF-EMS Joint International Meeting special session (deformation spaces of geometric structures) July 2022
7. "Extended geometrically finite representations"
Spring Topology and Dynamical Systems Conference: Special Session on Geometric Topology March 2022
8. "Relative Anosov representations and convex projective structures"
University of Virginia geometry seminar February 2022
9. "Extended convergence dynamics and relative Anosov representations"
NUS Topology and Geometry seminar February 2022
10. "Extended convergence dynamics and relative Anosov representations"
Heidelberg University differential geometry seminar December 2021
11. "Relative Anosov representations and convex projective structures."
University of Wisconsin dynamics seminar October 2021
12. "Relative Anosov representations and convex projective structures."
Rice University topology seminar September 2021
13. "Relative Anosov representations and convex projective structures."
Florida State University geometry and topology seminar September 2021
14. "Extended convergence dynamics, relative Anosov representations, and stability"
IHES September 2021
15. "Anosov representations: the relatively hyperbolic case." (Expository talk)
Workshop on Anosov representations in Aussois September 2021
16. "Group actions on boundaries of convex divisible domains."
AMS Fall Southeastern Sectional Meeting special session (geometric structures on manifolds) November 2019

CONTRIBUTED TALKS

- "Expansion/contraction dynamics for non-strictly convex projective manifolds."
GTA Philadelphia, Temple University May 2021
- "Jacobians of finite graphs," with L. Gaudet and N. Wawrykow.
MAA Mathfest Undergraduate Paper Sessions August 2014

OUTREACH TALKS

1. "The word problem and the isoperimetric problem." *UMich undergraduate math club* Winter 2023
2. "Basics of the probabilistic method." *UT undergraduate math club* Spring 2022
3. "Geometry in Minkowski space." *UT undergraduate math club* Spring 2021
4. "Solving the word problem with geometry." *UT undergraduate math club* Fall 2020
5. "Map projections." *UT Sunday morning math group* Fall 2019

SERVICE

Minicourse leader

- "Boundaries of Groups and Spaces" June 2020
 "Hyperbolic Groups" August 2019

Led weeklong courses for graduate students as part of a University of Texas summer minicourse program

Organizer , Topology seminar <i>University of Michigan</i>	<i>Fall 2022 - Winter 2023</i>
Co-organizer , Learning seminar on geometric group theory <i>University of Texas at Austin</i>	<i>Fall 2021, Spring 2022</i>
Organizer , Learning seminar on relative Anosov representations <i>University of Texas at Austin</i>	<i>Summer 2020</i>
Organizer , Junior Topology Seminar <i>University of Texas at Austin</i>	<i>Fall 2019</i>
Co-organizer , Geometric topology seminar <i>University of Texas at Austin</i>	<i>2018 - 2021</i>
Co-founder , SUMS <i>Yale University</i>	<i>2014 – 2016</i>
Co-organized weekly meetings for math talks given by a small group of undergraduates	

CONFERENCES ATTENDED

1. Graduate Student Geometry and Topology Conference, Michigan State University	<i>April 2017</i>
2. Graduate Student Conference in Algebra Geometry and Topology, Temple University	<i>May 2017</i>
3. Texas Geometry and Topology Conference, University of Texas at Austin	<i>November 2017</i>
4. Thin Groups in Number Theory, Geometry, and Topology, Rice University	<i>May 2018</i>
5. Representation Varieties and geometric structures in low dimensions, University of Warwick	<i>July 2018</i>
6. Young Topologists Meeting, University of Copenhagen	<i>July 2018</i>
7. Young Geometric Group Theory, UPV/EHU	<i>June 2019</i>
8. Aspects of Geometric Group Theory, IHES	<i>July 2019</i>
9. Nearly Carbon Neutral Geometric Topology (virtual)	<i>June 2020</i>
10. Virtual Topology Festival, NUS	<i>January 2021</i>
11. Graduate Student Geometry and Topology Conference (virtual), University of Indiana Bloomington	<i>April 2021</i>
12. GTA Philadelphia (virtual)	<i>May 2021</i>
13. Nearly Carbon Neutral Geometric Topology (virtual)	<i>June 2021</i>
14. Beyond Hyperbolicity, The Ohio State University	<i>July 2021</i>
15. Workshop on Anosov representations in Aussois, France	<i>August-September 2021</i>
16. Virginia Topology Conference (Geometry and dynamics in hyperbolic space), University of Virginia	<i>November 2021</i>
17. Texas Geometry and Topology Conference, University of Texas Dallas	<i>February 2022</i>
18. Spring Topology and Dynamical Systems Conference, Baylor University	<i>March 2022</i>
19. Geometry, Arithmetic, and Groups, University of Texas at Austin	<i>June 2022</i>
20. AMS-SMF-EMS International Meeting	<i>July 2022</i>
21. Oberwolfach Arbeitsgemeinschaft on Higher Teichmüller Theory	<i>October 2022</i>
22. Geometric Topology in New York, Columbia University	<i>June 2023</i>
23. Homogeneous Dynamics and Geometry in Higher-Rank Lie Groups, IHES	<i>June 2023</i>
24. Nearly Carbon Neutral Geometric Topology (virtual)	<i>June 2023</i>