

# Casandra D. Monroe

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## CONTACT INFORMATION

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## RESEARCH INTERESTS

Geometry and Topology; discrete subgroups of Lie groups, deformations of geometric structures on manifolds, and hyperbolic links and their complements

## ACADEMIC EMPLOYMENT

**Department of Mathematics, University of Michigan**  
Parekh IBL Research Assistant Professor  
September 2025 -

## EDUCATION

**Department of Mathematics, University of Texas at Austin**  
PhD, Mathematics (Graduated August 2025)  
Advisor: Jeff Danciger  
Thesis: Branched Bending in Finite-Volume Hyperbolic Manifolds

**Department of Mathematics, Princeton University**  
A.B. Degree, Mathematics (Graduated May 2018)

## FELLOWSHIPS, GRANTS, AND AWARDS

2023 NSF Grant DMS - 2302155:  
Texas Women in Math Symposium at UT Austin  
2018 NSF Graduate Fellowship  
2018 UT Provost's Graduate Excellence Fellowship

## PUBLICATIONS & PREPRINTS

*Branched Bending in Finite-Volume Hyperbolic Manifolds*  
Preprint. arXiv:2604.22004

*Interval and  $\ell$ -interval Rational Parking Functions*  
with T. Aguilar-Fraga, et al.

*Discrete Mathematics and Theoretical Computer Science*, vol. 26:1, Permutation Patterns 2023 #10

*On Parking Functions and The Tower of Hanoi*  
with Y. Aguillon, et al.  
*The American Mathematical Monthly*, 130:7, 618-624

*Ordered multiplicity inverse eigenvalue problem for graphs on six vertices*  
with J. Ahn, et al.  
*The Electronic Journal of Linear Algebra*: Vol. 37 (2021), 316-358

## ARTICLES TOWARDS THE PROFESSION

*People Over Math: A Co-created Principle for Successful Research Communities*  
R. Garcia, et al. (feat 3 faculty, 2 graduate, and 18 undergraduate authors)  
*MAA Focus*, June/July 2022, p. 26-31.

## TEACHING EXPERIENCE

Fall 2025 -	<b>Instructor</b> , Abstract Algebra	UM
Spring 2021	<b>Teaching Assistant</b> , Plan II: Modern Mathematics	UT
Fall 2020	<b>Teaching Assistant</b> , M408N: Calculus I	UT
Summer 2020	<b>Junior Faculty</b> , Theory of Computation	BEAM
Summer 2019	<b>Teaching Assistant</b> , Mathematical Games and How to Win Them; Solving Big Problems; Math Team Strategies	BEAM

## RESEARCH TALKS

October 2025	<b>Geometry &amp; Topology Seminar</b> Yale University	(Invited)
October 2025	<b>Computational Problems about 3-manifolds, Associated Groups, and Varieties</b> Rutgers University, Newark	
April 2025	<b>Geometry Seminar</b> The University of Virginia	(Invited)
March 2025	<b>Geometry MMA Seminar</b> George Mason University	(Invited)
March 2025	<b>RTG Seminar Topology, Geometry, Dynamics</b> The University of Michigan	(Invited)
December 2024	<b>Mary Winston Newsom Lecture</b> Kansas State University	(Invited)
November 2024	<b>Columbia Geometric Topology Seminar</b> Columbia University	(Invited)
November 2024	<b>Geometry-Topology Seminar</b> Arizona State University	(Invited)
September 2024	<b>Rice Geometry-Topology Seminar</b> Rice University	(Invited)
September 2024	<b>AMS Central Sectional Meeting</b> “Geometric Group Theory and Low-Dimensional Topology”	(Invited)
July 2024	<b>Joint Meeting AMS-UMI</b> “Anosov representations and higher Teichmüller theory”	(Invited)
July 2024	<b>Moving to higher rank: from hyperbolic to Anosov</b> Cetraro, Italy	(Lightning)
May 2024	<b>GTA Philadelphia</b> Temple University, Philadelphia	
January 2024	<b>Joint Math Meetings</b> AMS Special Session on EDGE	(Invited)
November 2023	<b>Texas Geometry and Topology Conference</b> Rice University	(Lightning)
July 2023	<b>Geometry, Arithmetic, and Groups</b> The University of Texas at Austin	(Lightning)
July 2023	<b>Group Actions and Low-Dimensional Topology</b> El Barco de Avila, Spain	(Lightning)
June 2023	<b>Nearly Carbon Neutral Geometric Topology Conference</b> Session on Discrete subgroups of Lie groups	(Invited)
January 2022	<b>Joint Math Meetings</b> MSRI Special Session on the MSRI Undergraduate Program	(Invited)
August 2021	<b>GT GAPS</b> “Deformations of hyperbolic structures on manifolds”	(Invited)

WORKSHOPS ATTENDED

April 2026	<b>Homogeneous Dynamics and Anosov Representations</b> SLMath, Berkeley, CA
January 2026	<b>Pathways Workshop: Topological and Geometric Structures in Low Dimensions &amp; Geometry and Dynamics for Discrete Subgroups of Higher Rank Lie Groups</b> SLMath, Berkeley, CA
July 2023	<b>Women in Geometry and Groups and Dynamics</b> Ashton, ID
June 2023	<b>Homogeneous Dynamics and Geometry in Higher Rank Lie groups</b> IHES, Bures-sur-Yvette, FR
January 2023	<b>Surfaces in 3-manifolds Log Cabin</b> Young, AZ
July 2020	<b>Georgia Tech Topology Students Workshop</b> Virtual

OUTREACH TALKS

Winter 2026	<b>UM Math Circle</b> “Turing Machines and the Halting Problem”	(Invited)
Fall 2023	<b>UT Math Club</b> “A Solid List: An Exploration of Geometric Solids”	(Invited)
Fall 2022	<b>UT Math Club</b> “A Peek into Geometric Topology”	(Invited)
Spring 2022	<b>Sunday Morning Math Group</b> “Topology: The Greatest Hits Vol. 1”	
Spring 2022	<b>UT Math Club</b> “Topology: The Greatest Hits Vol. 1”	(Invited)
Spring 2021	<b>UT Math Club</b> “I Don’t Know (But Maybe You Do): A Survey of Some (Surprisingly) Open Problems”	(Invited)
Spring 2021	<b>Mathematicians of Color Alliance</b> “What is... a Geometry?”	
Fall 2020	<b>Mathematicians of Color Alliance</b> “What is... Graph Theory?”	
Fall 2020	<b>Sunday Morning Math Group</b> “The Geometry of Spot It”	
Spring 2020	<b>UT Math Club</b> “Turing Machines & Their Properties”	(Invited)
Spring 2020	<b>Sunday Morning Math Group</b> “Turing Machines and the Halting Problem”	
Fall 2019	<b>Sunday Morning Math Group</b> “Mathematical Games and How to Win Them”	
Spring 2019	<b>Sunday Morning Math Group</b> “Spot it!”	

SERVICE

Fall 2026 **Conference Co-Organizer**  
AMS Special Session “Computation in low dimensional topology”  
Duluth, MN

Spring 2023 **Conference Co-Organizer**  
5th Annual Texas Women in Math Symposium  
The University of Texas at Austin

Fall 2020-  
Fall 2023 **Seminar Organizer, Various at UT Austin**  
A-Polynomial Learning Seminar, Mapping Class Group Learning  
Seminar, Junior Topology Seminar, Characteristic Classes Learn-  
ing Seminar, Lie Groups and Lie Theory Learning Seminar

Fall 2020 **Committee Member**  
College of Natural Sciences DEI Taskforce

Fall 2020-  
Spring 2021 **Co-Founder/Graduate Representative**  
Department of Mathematics at UT Austin

Summer 2020-  
**Co-Founder/Graduate Representative**  
Mathematicians of Color Alliance at Texas

Spring 2020-  
**Co-Organizer**  
Directed Reading Program

MATH OUTREACH

Fall 2024-  
Spring 2025 **Sunday Morning Math Group Organizer**  
Department of Mathematics at UT Austin

Summer 2021 **Graduate TA**  
MSRI Undergraduate Program: Parking Functions

Summer 2020 **Junior Faculty**  
BEAM Summer Away LA

Summer 2019 **Math Counselor/TA**  
BEAM Summer Away LA

Spring 2017 **Featured Speaker**  
*“Pascal’s Triangle - Numberphile”*  
<https://www.youtube.com/watch?v=0iMtlus-af0>

REFERENCES

**Dick Canary**, Professor of Mathematics Department of Mathematics, University of Michigan  
(734)-763-5861, [canary@umich.edu](mailto:canary@umich.edu)

**Jeff Danciger**, Associate Professor, Department of Mathematics, University of Texas at Austin  
(512)-471-1140, [jdanciger@math.utexas.edu](mailto:jdanciger@math.utexas.edu)