Jake Murphy

Curriculum Vitae

Contact Information

Email: jmurphy4@oberlin.edu

Education & Employment

Visiting Assistant Professor 2025-present

Oberlin College

Visiting Assistant Professor 2024-2025

College of Wooster

Ph.D., Mathematics 2018-2024

Louisiana State University, Baton Rouge

Advisor: Pallavi Dani

B.S., Mathematics 2014-2018

University of Connecticut, Storrs

Research Interests

Geometric Group Theory, in particular: quasiconvex subgroups of Coxeter groups.

Teaching Experience

Oberlin College

- **Math 327 Abstract Algebra 1: Group Theory:** Fall 2026
- **Math 232 Linear Algebra:** Fall 2025
- **Math 231 Multivariable Calculus:** Spring 2026, Fall 2026 (Two sections)
- **Math 133 Calculus I:** Fall 2025, Spring 2026 (Two sections)

College of Wooster

- **Math 223 Combinatorics and Graph Theory:** Spring 2025
- **Math 212 Multivariate Calculus:** Spring 2025
- **Math 125 Theory of Integral Calculus:** Spring 2025
- **Math 115 Theory of Differential Calculus:** Spring 2025
- **Math 110 Applied Differential Calculus:** Fall 2024 (Three sections)
- **Math 100 Math in Contemporary Society:** Fall 2024

Louisiana State University

- **Math 1530 Differential Calculus**: Summer 2021, Fall 2022
- **Math 7999 Problem Lab in Topology-Practice for PhD Qualifying Exam in Topology:** Summer 2022
- **Math 1021 College Algebra:** Fall 2020, Spring 2021, Fall 2021, Spring 2022
- **Math 1552 Calculus II, TA:** Summer 2020
- **Math 1431 Business Calculus, Lead TA:** Fall 2019, Spring 2020
- **Math 1431 Business Calculus, TA:** Fall 2018, Spring 2019
- **Graded for Math 7510 Topology:** Fall 2022
- **Graded for Math 1550 Calculus:** Fall 2021
- **Graded for Math 4005 Geometry:** Spring 2021

Awards and Funding

Arthur K. Barton Superior Graduate Student Scholarship October 2022

NSF grant DMS-1812061 The geometry of non-positively curved groups (PI Pallavi Dani) Spring 2023

NSF grant DMS-2231492 RTG: Topology, Representation Theory, and Mathematical Physics at Louisiana State University (PI Pramod Achar) Fall 2023-Spring 2024

Publications and Preprints

Adam Giambrone and Jake Murphy. “The linking-unlinking game”. In: Involve, a Journal of Mathematics 12.7 (2019), pp. 1109–1141.

Appiah, B., et al. "The algebraic structure of hyperbolic graph braid groups." International Journal of Algebra and Computation 35.03 (2025), pp. 329-342

Jake Murphy. "Subroups of Coxeter groups and Stallings foldings." [PhD Dissertation] (2024).

Megan Fairchild, Hailey Garcia, Jake Murphy, Hannah Percle. “On the non-orientable 4-genus of torus knots with braid index 5 or 6” Journal of Knot Theory and Its Ramifications 35.07 (2026)

Amit Kumar, Jake Murphy, Brian Naff. “Legendrian knots and multi-crossings.” *arXiv preprint arXiv:2405.04724* (2024).

Talks

Upcoming Ohio Speaker’s Circuit talk at the College of Wooster Spring 2027

“Subgroups of Coxeter groups and Stallings foldings” Invited talk, 40th Summer Conference on Topology and its Applications (Geometric group theory parallel session) July 2026

“Stallings-like techniques for subgroups of Coxeter groups” Invited talk, Kenyon College March 2025

“Stallings-like techniques for subgroups of Coxeter groups” Invited talk, *AMS Spring 2024 Central Sectional meeting at University of Wisconsin-Milwaukee* April 2024

“Subgroups of Coxeter groups and Stallings foldings.” Talk, *LSU Geometry and Topology Seminar* February 2024

“Bestvina Brady Morse Theory and Virtually Fibered Right-Angled Coxeter groups” Talk, *LSU Informal Geometry and Topology Seminar* October 2023

“Quasiconvex Subgroups of Coxeter Groups.” Talk, *LSU Informal Geometry and Topology Seminar* April 2023

"Folded Graphs and Subgroups of Free Groups." Talk, *LSU Informal Geometry and Topology Seminar* October 2022

"The Linking-Unlinking Game." Poster, *UConn Frontiers in Undergraduate Research Poster Exhibition* April 2018

"The Linking-Unlinking Game." Talk, *Merrimack College North Shore Undergraduate Math Conference* April 2018

Conferences Attended

AMS Spring 2024 Central Sectional Meeting, *University of Wisconsin-Milwaukee* April 2024

Hot Topics: Artin Groups and Arrangements, *Simons Laufer Mathematical Sciences Institute* March 2024

Joint Mathematics Meeting January 2024

Texas Geometry and Topology Conference, *Rice University* November 2023

Cube Complexes and Combinatorial Geometry, Centre de *Recherches Mathématiques* June 2023

Geometry of Subgroups, *Centre de Recherches Mathématiques* May 2023

Young Geometric Group Theory XI, *University of Münster* February 2023

Graduate Student Concentration Week on Metric Geometry, *Texas A&M University* July 2022

Service

Volunteer, GEAUX Orientation Program August 2019/2020/2022

Coordinator, LSU Graduate Student Colloquium Fall 2023

Calculus Placement, Oberlin College 2026-2027