

# Jake Murphy

## Curriculum Vitae

### Contact Information

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Email: jakmurphy@wooster.edu

### Education & Employment

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**Visiting Assistant Professor** 2024-Present

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

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

### Teaching Experience

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#### 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

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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

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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." *To appear in International Journal of Algebra and Computation* (2024).

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

Megan Fairchild, Hailey Garcia, Jake Murphy, Hannah Percle. "Non-orientable 4-genus of torus knots" *arXiv preprint arXiv: 2405.04737* (2024).

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

## Presentations

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"Stallings-like techniques for subgroups of Coxeter groups" Invited talk, Kenyon College	March 2025
"Stallings-like techniques for subgroups of Coxeter groups" Invited talk, <i>AMS Spring 2024 Central Sectional meeting at University of Wisconsin-Milwaukee</i>	April 2024
"Subgroups of Coxeter groups and Stallings foldings." Talk, <i>LSU Geometry and Topology Seminar</i>	February 2024
"Bestvina Brady Morse Theory and Virtually Fibered Right-Angled Coxeter groups" Talk, <i>LSU Informal Geometry and Topology Seminar</i>	October 2023
"Quasiconvex Subgroups of Coxeter Groups." Talk, <i>LSU Informal Geometry and Topology Seminar</i>	April 2023
"Folded Graphs and Subgroups of Free Groups." Talk, <i>LSU Informal Geometry and Topology Seminar</i>	October 2022
"The Linking-Unlinking Game." Poster, <i>UConn Frontiers in Undergraduate Research Poster Exhibition</i>	April 2018
"The Linking-Unlinking Game." Talk, <i>Merrimack College North Shore Undergraduate Math Conference</i>	April 2018

## Conferences Attended

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AMS Spring 2024 Central Sectional Meeting, <i>University of Wisconsin-Milwaukee</i>	April 2024
Hot Topics: Artin Groups and Arrangements, <i>Simons Laufer Mathematical Sciences Institute</i>	March 2024
Joint Mathematics Meeting	January 2024
Texas Geometry and Topology Conference, <i>Rice University</i>	November 2023

Cube Complexes and Combinatorial Geometry, Centre de <i>Recherches Mathématiques</i>	June 2023
Geometry of Subgroups, <i>Centre de Recherches Mathématiques</i>	May 2023
Young Geometric Group Theory XI, <i>University of Münster</i>	February 2023
Graduate Student Concentration Week on Metric Geometry, <i>Texas A&amp;M University</i>	July 2022

## Service

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Volunteer, GEAUX Orientation Program	August 2019/2020/2022
Coordinator, LSU Graduate Student Colloquium	Fall 2023