

# Jake Murphy

## Curriculum Vitae

### Education & Employment

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**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

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

### Teaching Experience

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#### Oberlin College

- **Math 232 Linear Algebra:** Fall 2025
- **Math 231 Multivariable Calculus:** Spring 2026
- **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

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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 and Preprints

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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 |
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| 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, <i>Centre de 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             |