

# Kenneth McCabe

Northeastern University, Department of Mathematics, Boston, MA  
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## Research Interests

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Topological data analysis, computational geometry and topology, persistent homology.

## Education

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**PhD in Mathematics, Northeastern University**, Boston, MA 2024–2029 (expected)

Advisor: José A. Perea

**MA in Mathematics, University at Albany, SUNY**, Albany, NY 2022–2024

Advisor: Michael Lesnick

GPA: 3.94

**BA in Mathematics, University at Albany, SUNY**, Albany, NY 2020–2022

Minor: Music

Dean's List (3 semesters)

## Preprints

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3. **K. McCabe**. *Lower Bounds for Approximating the Vietoris–Rips Filtration*. arXiv:2607.06524.
2. M. Lesnick and **K. McCabe**. *Sparse Approximation of the Subdivision-Rips Bifiltration for Doubling Metrics*. arXiv:2408.16716.
1. M. Lesnick and **K. McCabe**. *Nerve Models of Subdivision Bifiltrations*. arXiv:2406.07679.

## Teaching

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### Northeastern University (Teaching Assistant)

MATH7234 Optimization & Complexity Spring 2026

MATH7241 Probability 1 Fall 2025

MATH1341 Calculus for Science & Engineering Summer 2025, Summer 2026

MATH4571 Advanced Linear Algebra Spring 2025

MATH1231 Calculus for Business & Economics Fall 2024

### University at Albany, SUNY (Teaching Assistant)

Precalculus, Calculus I & II, Elementary Statistics Fall 2023 – Spring 2024

### University at Albany, SUNY (Student Grader)

AMAT584 Topological Data Analysis II Spring 2023

## Presentations

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### Invited Talks

*Nerve Models of the Subdivision-Rips Bifiltration* Mar. 2025  
AMS Spring Southeastern Sectional Meeting, Clemson, SC

*Nerve Models of the Subdivision-Rips Bifiltration* Oct. 2024  
AMS Fall Eastern Sectional Meeting, Albany, NY

### Contributed Talks & Posters

*Wasserstein Stability of the Nerve Map (Poster)* May 2026  
ICERM, Brown University, Providence, RI

*The Shape of Data: An Introduction to Persistent Homology* Apr. 2026  
NEU Graduate Student Seminar, Boston, MA

*Sparse Approximation of the Subdivision-Rips Bifiltration for Doubling Metrics* Nov. 2024  
Applied Topology in Albany (ATiA) Seminar, Albany, NY

*Interleavings and Stability of Persistent Homology* June 2024  
Summer School on TDA & Geometric Invariant Theory, Montréal, QC

*Nerve Models of Subdivision Bifiltrations* Apr. 2024  
UAlbany Graduate Student Seminar, Albany, NY

*Shellability: Connection Between Topology and Combinatorics (poster)* Apr. 2024  
UAlbany Showcase Day, Albany, NY

*Computability of the Subdivision-Rips Bifiltration* Apr. 2023  
UAlbany Showcase Day, Albany, NY

### Service

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External Reviewer, *ICALP 2026* 2026

Referee, *Homology, Homotopy, and Applications* 2025

### Conference and Workshop Participation

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Computational Persistence 2025 Oct. 2025  
University at Albany, SUNY, Albany, NY

Graduate School on Configuration Spaces July 2025  
Fields Institute, Toronto, ON (online)

Computational Persistence 2023 Sep. 2023  
Purdue University, West Lafayette, IN (online)

Randomness in Topology and its Applications Mar. 2023  
Institute for Mathematical and Statistical Innovation, Chicago, IL

Joint Mathematics Meetings (JMM) Jan. 2023  
Boston, MA

Computational Persistence 2022 Oct. 2022  
Purdue University, West Lafayette, IN (online)

### Memberships

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American Mathematical Society 2023–Present