

Alexander McCleary

Curriculum Vitae

Employment

- Fall 2023 – **Postdoctoral Research**, *School of Computing*, Montana State University, Bozeman, MT
Present
Fall 2021 – **Visiting Assistant Professor**, *Department of Mathematics*, Ohio State University, Columbus, OH
Spring 2023

Education

- 2016–2021 **PhD in Mathematics**, *Colorado State University*, Fort Collins, CO
Advisor: Amit Patel
2012–2016 **BS in Mathematics**, *Virginia Commonwealth University*, Richmond, VA
Cum Laude with departmental honors

Teaching Experience

Primary Instructor

- Spring 2023 **Topological Data Analysis and Neuroscience**, *Ohio State University*
Spring 2022 **Math 4570 – Applied Algebraic Topology**, *Ohio State University*
Spring 2021 **Math 155 – Calculus for Biological Scientists**, *Colorado State University*
Fall 2019 **Math 261 – Calculus III**, *Colorado State University*
Spring 2019 **Math 261**, *Colorado State University*
Spring 2018 **Math 261**, *Colorado State University*
Fall 2017 **Math 155**, *Colorado State University*

Teaching Assistant

- Spring 2017 **Math 155**, *Colorado State University*
Fall 2016 **Math 155**, *Colorado State University*

Publications

- [1] Marco Aldi and Alexander McCleary. Darboux calculus. *Involve, a Journal of Mathematics*, 12(3):361–380, 2018.
- [2] Torie Chomko, Kevin McCall, Alexander McCleary, Jamie Shive, and Dewey T Taylor. Ring dominating functions in graph products. *Bull. ICA*, 84:65–78, 2018.
- [3] Aziz Burak Gulen and Alexander McCleary. Galois connections in persistent homology. *arXiv preprint arXiv:2201.06650*, 2022.

- [4] Alexander McCleary and Amit Patel. Positivity of multiparameter persistence diagrams and bottleneck stability. *arXiv preprint arXiv:1905.13220v3*, 2019.
- [5] Alexander McCleary and Amit Patel. Bottleneck stability for generalized persistence diagrams. *Proceedings of the American Mathematical Society*, 148:3149–3161, Mar 2020.
- [6] Alexander McCleary and Amit Patel. Edit distance and persistence diagrams over lattices. *SIAM Journal on Applied Algebra and Geometry*, 6(2), 2022.

Invited Talks

- June 2023 **Interleavings and Couplings**, *CG Week*, Workshop on Möbius Inversions and Reeb Spaces
- May 2023 **Interleavings and Couplings**, *Topology Seminar*, Colorado State University
- January 2023 **Galois Connections in Persistent Homology**, *Joint Mathematics Meetings*
- May 2022 **Multiparameter Persistence Diagrams and Rota’s Galois Connection Theorem**, *Western AMS Sectional Meeting*
- April 2022 **Introduction to Multiparameter Persistent Homology**, *Geometry and Topology Seminar*, VCU
- January 2022 **Persistence Diagrams over Finite Posets**, *UF TDA 2022*, UF
- September 2021 **Persistent Homology via the Möbius Inversion**, *Topology, Geometry, and Data Analysis Seminar*, Ohio State University
- December 2020 **Edit Distance and Persistence Diagrams Over Lattices**, *Applied Topology in Albany*, Online Seminar
- September 2019 **Multiparameter Persistence Diagrams**, *Union College Mathematics Conference*, Union College

Other Talks

- February 2020 **Verdier Duality**, *Category Theory Lab*, Colorado State University
- January 2020 **Stable ∞ -Categories**, *Category Theory Lab*, Colorado State University
- September 2019 **Matroids**, *Topology Seminar*, Colorado State University
- June 2019 **Multiparameter Persistent Homology**, *Geometry and Topology Meet Data Analysis and Machine Learning*, Ohio State University
- March 2019 **Persistent Homology**, *SPLINTER*, Colorado State University
- March 2019 **Simplicial Objects and the Dold-Kan Correspondence**, *Category Theory Lab*, Colorado State University
- November 2018 **Fibrations, Cofibrations, and Weak Equivalences**, *Category Theory Lab*, Colorado State University
- October 2018 **Magnitude Homology**, *Topology Seminar*, Colorado State University

- October 2018 **Galois Theory, Group Extensions, and Higher Categories**, *SPLINTER*, Colorado State University
- October 2018 **Introduction to Adjoint Functors**, *Category Theory Lab*, Colorado State University
- September 2018 **Infinity Categories**, *Category Theory Lab*, Colorado State University
- August 2018 **A General Introduction to Category Theory**, *Category Theory Lab*, Colorado State University
- June 2018 **Kan Extensions**, *Category Theory Lab*, Colorado State University

Activities

- January 2024 **Co-organizer of AMS Special Session on Applied Topology: Theory, Algorithms, and Applications**, *JMM 2024*
- March 2022 **Co-organizer of the workshop on algebraic combinatorics and category theory in TDA**
- Fall 2021 – Present **Co-organizer of the Topology, Geometry, and Data Analysis Seminar at OSU**
- June 2018 – March 2020 **Co-founder and organizer of Category Theory Lab at CSU**
- April 2022 **Reviewer for Conference on Decision and Control**
- December 2019 **Referee for Journal of Computational Geometry**
- December 2018 **Reviewer for Symposium on Computational Geometry**