

KYLE BINDER

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APPOINTMENTS

Louisiana State University	2025 – Present
<i>Postdoctoral Researcher</i>	

EDUCATION

The Ohio State University	2019 – 2025
<i>M.S. & Ph.D. in Mathematics</i>	<i>Advisor: Eric Katz</i>
Baylor University	2015 – 2019
<i>B.A. in Mathematics and Linguistics (University Scholars)</i>	

RESEARCH INTERESTS

Combinatorial algebraic geometry, combinatorics, toric varieties, matroids, vector bundles, tropical geometry.

PAPERS AND PREPRINTS

1. *The Top-Nonvanishing Weight Cohomology of a Smooth Toric Variety*, in preparation.
2. *Real-Rootedness in the Singular Cohomology Ring of a Uniform Matroid* (with Lorenzo Vecchi), in preparation.
3. *The Singular Cohomology Ring of a Uniform Matroid: Combinatorics and Lefschetz Properties*, submitted, [arXiv:2606.07490](https://arxiv.org/abs/2606.07490).
4. *The Singular Cohomology Ring of a Matroid*, submitted, [arXiv:2412.05732](https://arxiv.org/abs/2412.05732).
5. *The Unipotent Tropical Fundamental Group* (with Eric Katz), submitted, [arXiv:2406.13973](https://arxiv.org/abs/2406.13973).
6. *Limit Sets and Internal Transitivity in Free Group Actions* (with Jonathan Meddaugh), preprint, [arXiv:1908.07382](https://arxiv.org/abs/1908.07382).
7. *On 2-coloring the integers to forbid a distance and monochromatic translates of a triangle*, *Geombinatorics* **27** (2018), no. 4, 137–146.

TALKS

<i>A Tropical Approach to the Unipotent Fundamental Group of a Hyperplane Arrangement Complement</i>	October 2025
Hyperplane Arrangements and Polytopes Special Session AMS Southeastern Sectional Meeting	
<i>Cohomology of Toric Varieties from Matroids</i>	September 2025
LSU Geometry and Topology Seminar	
<i>The Tropical Unipotent Fundamental Group</i>	October 2024
5 Minute Talk at Tropical Geometry: Moduli Spaces and Matroids Workshop	
<i>Higher Tor Groups of Matroids</i>	May 2024
5 Minute Talk at Workshop of the Kentucky–Ohio Algebra Alliance (KOALA)	
<i>Higher Tor Groups of Matroids</i>	April 2024
OSU Combinatorics and Probability Seminar	

<i>Higher Tor Groups of Stanley–Reisner Rings of Matroids</i> 5 Minute Talk at Workshop of the Kentucky–Ohio Algebra Alliance (KOALA)	May 2023
<i>The Tropical Unipotent Fundamental Group</i> 20 Minute Talk at Workshop on Matroids and Tropical Combinatorics (MaTroCom)	January 2023
<i>A Survey of Tropical Cohomology</i> OSU Algebraic Geometry Seminar	September 2022
<i>The Geometries of Hyperplane Arrangement Complements</i> OSU Student Algebraic Geometry Seminar	April 2022
<i>p-adic Integration on Hyperelliptic Curves</i> OSU Student Algebraic Geometry Seminar	February 2021
POSTERS	
<i>The Singular Cohomology Ring of a Matroid</i> Combinatorics at the Confluence	July 2026
<i>The Singular Cohomology Ring of a Matroid</i> Texas Algebraic Geometry Symposium	April 2026
<i>The Singular Cohomology Ring of a Matroid</i> Arizona–New Mexico Symposium on Commutative Algebra	December 2025
<i>What is the Cohomology of a Non-Compact Toric Variety?</i> Kentucky, Ohio, Indiana (KOI) Combinatorics Lectures	December 2023
TEACHING	
LSU Math 1550 – Calculus 1 <i>Instructor of Record</i>	Fall 2025
OSU MATH 1131 – Business Calculus <i>Recitation Instructor</i>	Spring 2024
OSU MATH 1131 – Business Calculus <i>Recitation Instructor</i>	Autumn 2022
OSU MATH 1148 – College Algebra <i>Recitation Instructor</i>	Autumn 2021
OSU MATH 1148 – College Algebra <i>Recitation Instructor, Virtual (Zoom)</i>	Autumn 2020
ORGANIZATION	
Special Session on Algebraic and Geometric Aspects of Matroid Theory at AMS Central Sectional Meeting <i>Co-organizer</i>	October 2026
LSU Geometry and Topology Seminar <i>Co-organizer</i>	2025 – Present
OSU Directed Reading Program (DRP) <i>The DRP pairs undergraduates with a graduate student mentor. Students read a math book together, and the undergraduate gives a final presentation.</i>	2021 – 2025
Kentucky, Ohio, Indiana (KOI) Combinatorics Lectures <i>Local Organizer</i>	December 2023