

Emma H. Pickard (she/her/hers)

Updated June 25, 2025

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Research Interests

Combinatorial Algebraic Geometry, Intersection theory, Brill-Noether theory

Education

University of Kentucky Lexington, Kentucky
Ph.D. in Mathematics August 2023 – Present
Advisors: David H. Jensen and Christopher A. Manon
Topic: The Demazure product in the context of Prym varieties

Wake Forest University Winston-Salem, North Carolina
M.S. in Mathematics August 2021 – May 2023
Thesis subject: Khovanov Homology Advisor: Hugh Howards
GPA: 3.499

University of North Carolina at Chapel Hill Chapel Hill, North Carolina
GPA: 3.493 August 2019 – May 2021

Honors & Awards

Graduate Teaching Assistantship (UKY) Fall 2023 – Present
Graduate Teaching Assistantship (WFU) Fall 2021 – Spring 2023
Funded speaker and attendee (UGA Topology Conference) June 2022
Funded attendee (AWM BRIDGES Conference) June 2022

Research Experience

Readings in Algebraic Geometry May 2024 - Present
Working with David H. Jensen and Christopher A. Manon on applying Demazure products to Prym varieties. Based partially on the work of Nathan Pflueger.

Master's Thesis on Khovanov Homology Aug 2021 - May 2023
Worked with Hugh Howards and postdoctoral fellow Thomas Kindred on the effect of Reidemeister moves on Khovanov Homology class representatives.

Directed Reading Program: *The Knot Book* Aug 2020 - May 2021
Worked with graduate student Andrew Adair on reading *The Knot Book* by Colin Adams and gave a presentation on the development of the Jones Polynomial.

Professional Experience

Readings on p -adic Numbers and Projective Geometry Spring 2021
Worked with Andrey Smirnov on concepts connecting p -adic numbers and projective geometry.

Teaching Assistant at the University of Kentucky Aug 2023 - Present
Lead recitations for Calculus 1, Elementary Calculus, Finite Math, and College Algebra.

Instructor for the JHU Center for Talented Youth Nov 2024 - Feb 2025
Piloted an online course on combinatorial game theory for advanced students across the world grades 6-8.

NC Governor's School Instructor Summer 2023 - 2025
Designed and taught a course on abstract algebra and knot theory to a select group of students from all over the state of North Carolina. Additionally gave multiple seminars throughout the summer on advanced topics and taught a course on social and emotional health.

Teaching Assistant at Wake Forest University Aug 2021 - May 2023
Lead study sessions and graded for Calculus 1, Calculus 3, and Linear Algebra. Tutored for all levels of Calculus.

Executive Curriculum Coordinator Summer 2022
Responsible for developing, coordinating, and overseeing the math curriculum for the Freedom School Summer Immersion Program for Title I students grades k-8.

Professional Organizations and Outreach

American Mathematical Society Fall 2021 – Current
Association for Women in Mathematics Fall 2019 – Present
Social Media Officer (UNC), Officer at Large (WFU), Secretary (UKY).
University of Kentucky Working Group on Ethics, Equity, Inclusion, and Justice in the Mathematical Sciences Fall 2023 – Present
Spectra: Association for LGBTQ+ Mathematicians Fall 2023 – Present
Vice President (2024-2025)

Conferences

WARTHOG (algebra workshop), U of Oregon Aug 2025
Fields SMS Commutative Algebra Summer School June 2025
Georgia Algebraic Geometry Symposium March 2025
Kentucky Ohio Algebra Alliance June 2024

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| Graduate Students in Topology & Geometry Conference | Mar 2024 |
| Empowering Women of Mathematics Conference | Mar 2023 |
| <i>Served as the sole organizer.</i> | |
| Triangle Area Graduate Mathematics Conference | Mar 2023 |
| Triangle Lectures in Combinatorics | Sept 2022 |
| Nearly Carbon Neutral Geometric Topology Conference | Sept 2022 |
| AWM BRIDGES Summer School, University of Utah | June 2022 |
| Annual Topology Conference, University of Georgia | June 2022 |
| <i>Topic: Quantum Knot Invariants, Gave a talk on Khovanov Homology.</i> | |
| Triangle Area Graduate Mathematics Conference | Mar 2022 |
| Conference for Undergraduate Women in Mathematics | Jan 2021 |