

LUKE CONNERS

University of Zurich \diamond Institute of Mathematics
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RESEARCH INTERESTS

- Link Homology, Categorification, Quantum Topology

EMPLOYMENT

University of Zurich, Zurich, Switzerland *September 2025 - Present*
Postdoctoral Researcher
Supervisor: Anna Beliakova

EDUCATION

University of North Carolina, Chapel Hill, NC *August 2019 - May 2025*
Ph.D. in Mathematics
Advisor: David E.V. Rose
Dissertation Title: Colored Torus Link Homology

Rice University, Houston, TX *August 2015 - May 2019*
B.S. in Mathematics, B.A. in Physics *Cum Laude*

GRANTS, HONORS AND AWARDS

- **Silver Graduate Thesis Award, International Congress of Chinese Mathematicians, 2024**
Awarded for “Row-Column Mirror Symmetry for Colored Torus Knot Homology” (C.)
- **UNC-Chapel Hill Graduate Summer Research Fellowship**, Summer 2023
- **Early-career AMS-NSF-Simons-ICM Travel Grant**, awarded for travel to and local expenses at the 2022 International Congress of Mathematicians in St. Petersburg, Russia. (Canceled due to international conflict.)
- **Rice University Trustee Distinguished Scholar**, 2015-2019
- **United States Presidential Scholar**, awarded annually to one male and one female graduating senior from each U.S. state and territory (Kansas, 2015)

PUBLICATIONS AND PREPRINTS

Reviewed Publications

1. L. Conners. **Row-Column Mirror Symmetry for Colored Torus Knot Homology**. 87 pages. *Selecta Mathematica*, vol. 30, no. 97 (2024). Available at [arXiv:2303.16271](https://arxiv.org/abs/2303.16271).
2. L. Conners. **Fray Functors and Equivalence of Colored HOMFLYPT Homologies**. 2024. 83 pages. Accepted for publication at *Quantum Topology*. Available at [arXiv:2405.00875](https://arxiv.org/abs/2405.00875).

Preprints

3. L. Conners. **Reduced Colored HOMFLY Homology of Torus Knots**. In preparation.

SOFTWARE

- **Colored Torus Knot Homology** (2024): Software package computing HOMFLY homology of exterior-colored torus knots.

Available at <https://github.com/lukeconners/Colored-Torus-Knot-Homology>.

INVITED CONFERENCE AND SEMINAR TALKS

- Minicourse: *Colored Link Homology and Categorified Projectors*, Basel, Switzerland, September 2025
- AMS Eastern Sectional, Special Session on Advances in representation theory, combinatorics, and interactions with machine learning, *Colored Torus Link Homology via Fray Functors*, April 2025
- Annual meeting of Simons Collaboration on New Structures in Low-Dimensional Topology, March 2025 (Poster presentation)
- University of Zurich, *Column-Colored HOMFLY Homology via Fray Functors*, January 29, 2025
- Virginia Tech, Geometry/Topology Seminar, *Row-Column Mirror Symmetry for Colored Torus Knot Homology*, October 15, 2024
- UNC-Chapel Hill, Graduate Mathematics Seminar, *Reidemeister's theorem using transversality*, August 26, 2024
- UC Davis, Algebra and Discrete Mathematics Seminar, *Row-Column Mirror Symmetry for Colored Torus Knot Homology*, April 23, 2024
- MIT, Geometry and Topology Seminar, *Row-Column Mirror Symmetry for Colored Torus Knot Homology*, February 26, 2024
- UNC-Chapel Hill, Geometric Methods in Representation Theory Seminar, *Row-Column Mirror Symmetry for Colored Torus Knot Homology*, February 9, 2024
- UNC-Chapel Hill, Graduate Mathematics Seminar, *Introduction to Categorification and Link Homology*, September 18, 2023
- Duke University, Triangle Area Graduate Mathematics Conference (TAGMaC), *Link Polynomials from Representation Theory*, February 25, 2023
- UNC-Chapel Hill, Graduate Mathematics Seminar, *Introduction to Categorification*, October 25, 2022
- Duke University, TAGMaC, *Introduction to Categorification and Link Homology*, November 13, 2021
- UNC-Chapel Hill, Advanced Graduate Mathematics Seminar, *An Invitation to Derived Categories and Derived Functors*, September 27, 2021
- AIM Link Homology Seminar, *Computing Hochschild Cohomology of the Full Twist*, August 11, 2021

TEACHING ACTIVITIES

University of Zurich

Zurich, Switzerland

September 2025 - Present

Lead Instructor:

- MAT 581 (Modern Homological Algebra), Fall 2025 (20 students)

University of North Carolina - Chapel Hill

Chapel Hill, NC, USA

August 2019 - May 2025

- MATH 347 (Linear Algebra), Summer 2022 (19 students)
- MATH 381 (Discrete Mathematics), Spring 2022 (29 students)

- MATH 383 (Differential Equations), Fall 2021 (16 students)
- MATH 232 (Calculus II), Summer 2021 (23 students)
- MATH 117 (Aspects of Finite Mathematics), Spring 2021 (34 students)

Teaching Assistant:

- MATH 347 (Linear Algebra), Spring 2022
- MATH 233 (Calculus III; also led multiple recitation sections), Fall 2021
- MATH 551 (Euclidean and Non-Euclidean Geometry), Fall 2020
- MATH 233 (Calculus III; also led multiple recitation sections), Fall 2020
- MATH 533 (Elementary Number Theory), Summer 2020
- MATH 381 (Discrete Mathematics), Summer 2020
- MATH 233 (Calculus III; also led recitation), Summer 2020
- MATH 231 (Calculus I; also led recitation), Summer 2020
- MATH 578 (Algebraic Structures), Spring 2020
- MATH 577 (Linear Algebra), Spring 2020
- MATH 383 (Differential Equations), Fall 2019

PROFESSIONAL SERVICE

- UNC Graduate and Professional Student Government (GPSG) Vice President for Communications, Spring 2023 - Spring 2024
- UNC Graduate Mathematics Association (GMA) President, Spring 2022 - Spring 2023
- UNC GMA Vice President, Spring 2021 - Spring 2022
- Organizing Committee Member for UNC Directed Reading Program, Fall 2021 - Spring 2023
- Co-organizer of UNC-Chapel Hill Graduate Mathematics Seminar, Summer 2020 - Spring 2022
- Co-organizer of Launch Point (North Carolina mathematics conference targeting undergraduate students from historically underrepresented groups), April 2021
- American Mathematical Society (AMS) UNC Chapter Secretary, Fall 2020 - Spring 2021
- Co-organizer of MathGems undergraduate seminar series, Fall 2020 - Spring 2021
- UNC GPSG senator, Spring 2020 - Spring 2021
- Co-organizer of Triangle Area Graduate Mathematics Conference (TAGMaC), December 2020

MENTORSHIP

Graduate Students

- Selected to lead nine-week review sessions preparing graduate students for written comprehensive exam in the following topics:
 - Geometry/topology: Summer 2022 and 2021
 - Algebra: Summer 2024

Undergraduate Students

- Parth Mayadeo, Directed Reading Program Advisor, Spring 2025. Topic: Smooth manifolds.
- John Shook, Directed Reading Program Advisor, Spring 2023. Topic: Smooth Manifolds and Lie Groups

- Lauren Copperthwaite, Directed Reading Program Advisor, Fall 2021. Topic: Applications of Dynamical Systems to Neuroscientific Phenomena
- Monty Evans, Directed Reading Program Advisor, Spring 2021. Topic: Applications of Dynamical Systems to Neuroscientific Phenomena