

**Research interests** algebraic & geometric topology, manifolds, operads, homotopy calculus

**Education** **University of Notre Dame** South Bend, IN  
MS, PhD candidate in Mathematics August 2019 – May 2024  
Adviser: Mark Behrens  
Thesis: Some results on operads and configuration spaces

**University of Alabama** Tuscaloosa, AL  
BA, MA in Mathematics 2015 – 2019  
Adviser: Lawrence Roberts

**Employment** **Max Planck Institute of Mathematics** Bonn, Germany  
Postdoctoral Researcher July 2024 - Present  
Mentor: Peter Teichner

## Publications

**Koszul self duality of manifolds.** 2023. to appear in *Journal of Topology*. [arxiv](#)

**The stable embedding tower and operadic structures on configuration spaces.**

2023. to appear in *Homology, Homotopy and Applications*. [arxiv](#)

**An elementary proof of the homotopy invariance of stabilized configuration spaces.**

*Proc. Amer. Math. Soc.* 151 (2023), 3635-3644. [arxiv](#)

## Preprints

**One point compactifications of configuration spaces and the self duality of the little disks operad.** 2023. [arxiv](#)

## Invited Talks

**TBA.** May 2024. University of Victoria Topology Seminar

**Generalizing a result of Cohen on the homology of configuration spaces.** April 2024. University of Massachusetts Amherst Geometry and Topology Seminar

**Koszul Duality and Orthogonal Calculus.** January 2024. Copenhagen Algebra/Topology Seminar

**Koszul Duality and Functor Calculus.** January 2024. Stockholm Topology Seminar

**Configuration spaces with labels in a spectral Lie algebra.** January 2024. JMM Special Session: *Homotopy theory*. San Francisco

**Homotopy invariance results for configuration spaces.** January 2024. JMM Special Session: *Modern developments in the theory of configuration spaces*. San Francisco

**On the intersection of embedding calculus, Goodwillie calculus, and chromatic homotopy theory.** November 2023. Spaces of Manifolds: Algebraic and Geometric Approaches. Banff International Research Station

**A tautological construction of the self duality of the little disks operad.** November 2023.

University of Illinois Urbana-Champaign Topology Seminar

**A scanning construction of the self duality of the little disks operad.** November 2023. Ohio

State University Homotopy Theory Seminar

**Koszul duality with applications to axiomatic functor calculus.** November 2023. New Mexico

State University Geometry and Topology Seminar

**Applications of Koszul duality to Goodwillie calculus and factorization homology.** October 2023. University of Chicago Algebraic Topology Seminar

**Koszul duality and manifold calculus.** June 2023. *Advances in Homotopy theory IV.*

**Embedding calculus of singular manifolds.** March 2023. University of Lafayette Topology Seminar

**The homotopy theory of configuration spaces.** February 2023. University of Alabama Algebra and Topology Seminar

**Koszul duality and the Lie bracket on the homology of configuration spaces.** September 2022.

European Autumn School in Topology

**Duality in topology.** August 2022. Notre Dame Math Orientation

### Seminars Organized

**Factorization Homology Seminar.** Notre Dame Graduate Student Topology Seminar. Spring 2023.

**Embedding Calculus Seminar.** Notre Dame Graduate Student Topology Seminar. Spring 2021.

### Teaching experience

**Instructor, Notre Dame Department of Mathematics:**

Spring 2024 Calculus II

**Teaching assistant, Notre Dame Department of Mathematics:**

2020-2023 Calculus A, Calculus B, Calculus II, Calculus III

**Grader, Notre Dame Department of Mathematics:** Topology I, Topology II

### Fellowships

Bayer Fellowship (Notre Dame)	2022
Schmitt Fellowship (Notre Dame)	2019
Thomas W. Palmer Scholarship (University of Alabama)	2019
University of Alabama Presidential Scholarship	2015
National Merit Scholarship	2015

### Contributed Talks

**TBA.** February 2024. Notre Dame Graduate Student Topology Seminar

**Transforms in calculus and category theory.** February 2024. Notre Dame Graduate Student Seminar

**K-theory methods in manifold topology.** October 2023. BIRS Workshop Online Seminar

**Koszul duality from a homotopical perspective.** September 2023. Notre Dame Graduate Student Seminar

**Koszul self duality of manifolds.** July 2023. Young Topologists Meeting

**Differentiating automorphisms of the  $E_n$  operad.** July 2023. Stability in Topology, Arithmetic, and Representation Theory Workshop

**An operadic proof of Poincaré-Koszul duality.** March 2023. Notre Dame Graduate Topology Seminar

**An introduction to factorization homology.** February 2023. Notre Dame Graduate Topology Seminar

**Nonabelian Poincaré Duality.** February 2023. Notre Dame Graduate Topology Seminar

**Resolutions of moduli spaces by moduli spaces.** October 2022. Notre Dame Graduate Topology Seminar

**Spectral Lie algebra models for unstable  $v_n$ -periodic homotopy theory.** April 2022. Notre Dame Graduate Topology Seminar

**Diff isomorphic implies diffeomorphic.** September 2021. Notre Dame Graduate Topology Seminar

**Demystifying buzzwords: real homotopy theory is derived algebra.** September 2021. Notre Dame Graduate Seminar

**Operads and manifold Calculus.** March 2021. Notre Dame Graduate Topology Seminar

**Homotopy sheaves and manifold calculus.** March 2021. Notre Dame Graduate Topology Seminar

**Funky manifolds.** September 2020. Notre Dame Graduate Topology Seminar

**Applications of the Poincaré conjecture.** September 2020. Notre Dame Graduate Topology Seminar

**Manifold up to homotopy = Poincaré duality + what?.** August 2020. Notre Dame Graduate Seminar

**Spaces of manifolds, cobordism categories, and the Madsen-Weiss theorem.** July 2020. Notre Dame Oral Exam

**The geometric model structure on categories.** January 2020. Notre Dame Reading Seminar

**The Hopf invariant 1 problem via Adams operations.** November 2019. Notre Dame Graduate Topology Seminar

**Homotopy and its application to the Brouwer fixed point theorem.** April 2019. Troy MathFest

**Games on groups.** August 2018. University of Alabama Algebra & Topology seminar

**On subsums of series with positive terms.** April 2018. University of Tennessee Undergraduate Math Conference