

**Research interests** algebraic & geometric topology, homotopy theory, operads, functor calculus

**Education**

<b>University of Notre Dame</b>	South Bend, IN
MS, Ph.D. in Mathematics	August 2019 – May 2024
Adviser: Mark Behrens	
Dissertation: Some results on operads and configuration spaces	

<b>University of Alabama</b>	Tuscaloosa, AL
BA, MA in Mathematics	2015 – 2019
Adviser: Lawrence Roberts	

**Employment**

<b>Max Planck Institute for Mathematics</b>	Bonn, Germany
Postdoctoral Researcher	July 2024 - Present
Mentor: Peter Teichner	

## Publications

**One point compactifications of configuration spaces and the self duality of the little disks operad.** 2024. to appear in *Algebraic & Geometric Topology*. [arxiv](#)

**Koszul self duality of manifolds.** *J. Topol.*, 17: e12334 (2024). [arxiv](#)

**The stable embedding tower and operadic structures on configuration spaces.** *HHA* 26 (2024), 229-258. [arxiv](#)

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

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

## Preprints

**Koszul duality and a classification of stable Weiss towers.** 2024. [arxiv](#) (joint with N. Taggart)

## Selected Talks

**Deformation theory for factorization algebras.** August 2024. Max Planck Physical Math Seminar

**Manifold calculus in the style of Goodwillie.** May 2024. University of Victoria Topology Seminar

**The stable chain rule in orthogonal calculus.** September 2024. Topologie. Oberwolfach

**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 (2 semesters)

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

### Service

Max Planck Institute Postdoc Election Committee Member	Fall 2024
Oberwolfach Workshop Reporter for “Topologie”	Fall 2024

### Awards

Richard Sady Dissertation Award (Notre Dame)	2024
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

**Norm maps in equivariant and parametrized stable homotopy theory.** 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