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Education

- Ph.D. in Mathematics, Johns Hopkins University, 2016
  Thesis Advisor: Jack Morava
  Thesis Title: "Coalgebraic Structure and Intermediate Hopf-Galois Extensions of Thom Spectra in Quasicategories"
- B.S. in Mathematics, University of Central Florida, 2010
  Thesis Advisor: Piotr Mikusiński
  Thesis Title: "A Sheaf of Boehmians"

Employment

- University of Nevada, Reno, Assistant Professor, 2020 – present
- Georgia Institute of Technology, Visiting Assistant Professor, 2019 – 2020
- University of Washington, Acting Assistant Professor, 2016 – 2019
- Johns Hopkins University, Graduate Teaching Assistant, 2010 – 2016

Submitted Work

1. "Projective Geometries and Matroids as $\mathbb{F}_1$-modules" with S. Nakamura.
2. "Higher Groups and Higher Normality" with L. Fox.
3. "Dynkin Systems and the One-Point Geometry."
4. "The Eilenberg-MacLane Spectrum of $\mathbb{F}_1$."

Published and Accepted Work

12. "Brauer-Wall Groups and Truncated Picard Spectra of K-theory" with K. Luecke and J. Morava. Accepted for publication in *Algebraic & Geometric Topology*.
11. "Skeleta and Categories of Algebras" with T. Lawson, *Advances in Mathematics*, 457 (2024).
10. "Labelled Cospan Categories and Properads," with P. Hackney, *Journal of Pure and Applied Algebra*, 228 No. 2 (2024).
9. "On Bialgebras, Comodules, Descent Data and Thom Spectra in ∞-categories," *Homology, Homotopy and Applications*, Vol. 25(2) (2023), 219-242.

8. "Koszul Duality in Higher Topoi," with M. Péroux, *Homology, Homotopy and Applications*, 25(1), (2023), 53-70.

7. "The Operadic Nerve, Relative Nerve, and the Grothendieck Construction," with L.Z. Wong, *Theory and Applications of Categories*, 34 No. 13 (2019), 349–374.

6. "A Grothendieck Construction for Enriched Categories," with L.Z. Wong, *Advances in Mathematics* 344 (2019), 234–261.

5. "A Theorem on Multiplicative Cell Attachments with an Application to Ravenel's $X(n)$ Spectra," *Journal of Homotopy and Related Structures*, 14 (2019), 611–624.

4. "Toward a Galois Theory of the Integers Over the Sphere Spectrum," with J. Morava, *Journal of Geometry and Physics* 131 (2018), 41–51.

3. "A User's Guide: Relative Thom Spectra via Operadic Kan Extensions," *Enchiridion: Mathematical User's Guides* Vol. 3 (2017), 1–15.

2. "Relative Thom Spectra via Operadic Kan Extensions," *Algebraic & Geometric Topology* 17-2 (2017), 1151–1162.

1. "A Sheaf of Boehmians," with P. Mikusiński *Annales Polinici Mathematici* 107 (2013), 293–307.

Grants

1. Simons Foundation, 5 Year Collaboration Grant for Mathematicians, *Higher Categorical Structure in Algebraic Topology, Geometry and Arithmetic*, Award #853272 $42,000, 2021-2026.
2. NSF Conference Grant, *Recent Developments in Noncommutative Algebra and Related Areas, 2019*, with James Zhang (DMS-1764210), $21,920.
3. NSF Conference Grant, *2018 Young Topologists Meeting*, (DMS-1818905), $30,000.

Advising

- Landon Fox, PhD Thesis Advisor, expected date of graduation Spring 2028.
- Landon Fox, Master's Thesis Advisor, "On Normal Maps and Noether's Isomorphism Theorems for ∞-groups," University of Nevada, Reno, 2024.
- Brendan Murphy, PhD Thesis Commitee Member, University of Utah, expected date of graduation Spring 2027.
- Alex Milham, PhD Thesis Committee Member, University of Nevada, Reno, 2023.
- Aras Ergus, PhD Thesis Commitee Member, École Polytechnique Fédérale de Lausanne, 2022.
- Jenna Judd, Master's Thesis Committee Member, University of Nevada, Reno, 2021.
- Suhyeon Lee, Brendan Murphy, Luke Trujillo, Research Experience for Undergraduates "Hopf-algebras and Monoidal Categories," Georgia Institute of Technology, 2020.

- Liang Ze Wong, PhD Thesis Committee Member, University of Washington, 2019.
- Sebastian Gant, Undergraduate Thesis Advisor, "Reflective Subcategories of *Top*: Hausdorffization and the Like," University of Washington, 2018.

Invited Lectures

42. University of Washington, Seattle Noncommutative Algebra Conference, TBD, 2025.
41. Brigham Young University, Topology Seminar, TBD, 2025
40. Johns Hopkins University, Algebraic Geometry Seminar, TBD, 2025.
39. Caltech, Information, Geometry and Physics Seminar, "A mysterious appearance of quantum probability in projective geometry," 2025.
38. Duke University, Geometry and Topology Seminar, "Some Homotopical Aspects of the Field with One Element," 2025.
37. Johns Hopkins University, Topology Seminar, "$\mathbb{F}_1$ as a Bridge from Combinatorics to Stable Homotopy," 2024.
36. $\mathbb{F}_1$ World Seminar (Online), "Toward Higher Algebra of Connes-Consani $\mathbb{F}_1$-modules," 2024.
35. UC-Irvine, Algebra Seminar, "An Embedding of Matroids into Connes-Consani $\mathbb{F}_1$-modules," 2024.
34. UIUC, Topology Seminar, "Group Theory and Normality for ∞-groups," 2023.
33. UCLA, Topology Seminar, "Some Interpretations of the Truncated Picard Spectra of K-theory," 2023.
32. Kyushu University, Low Dimensional Topology and Number Theory XIV, "Toward Higher Algebra Over $\mathbb{F}_1$," 2023.
31. BIRS-CMO Workshop on Cobordisms, Strings and Thom Spectra, Oaxaca, "Interpretations of the Truncated Picard Spectra of KU and KO," 2022.
30. University of Nevada Reno, C^*-algebra Seminar, "Brauer Groups of Graded C^*-algebras from Picard Spaces of Topological K-theories," 2022.
29. University of Washington, "Minicourse on ∞-categories," (five day lecture series) 2022.
28. University of Glasgow, Geometry and Topology Seminar, "Braids and the Noncommutative Galois Theory of Algebra Over Stable Homotopy," 2022.
27. Ohio State University, Student Topology Seminar, "Three Equivalent Notions of Orientation for Thom Spectra," 2021.
26. University of Nevada, Reno, Mathematics and Statistics Colloquium "Some Galois Theory for Bordism Homology," 2020.
25. Jilin University, Third Conference on Operad Theory and Related Topics, "On the PROB of Singular Braids," 2020.
24. Johns Hopkins University, Conference on Riemann-Roch in Characteristic One and Related Topics, "Some Galois Extensions of $K(\mathbb{F}_1)$," 2019.
23. University of Nevada, Reno, Mathematics and Statistics Colloquium, "Generalized Galois Extensions in Derived Algebra," 2019.

22. University of Vermont, Mathematics Colloquium "Generalized Galois Extensions in Derived Algebra," 2019.
21. University of Louisiana at Lafayette, Topology Seminar, "Group Actions and Cogroup Coactions in ∞-topoi," 2019.
20. University of Illinois at Chicago, Algebraic K-theory Seminar, "Koszul Duality in Higher Topoi," 2019.
19. University of Nevada, Reno, Topology Seminar "Koszul Duality in Higher Topoi," 2019.
18. Universität Wuppertal, Bergische, Oberseminar Topologie, "Koszul Duality in Higher Topoi," 2019.
17. Ruhr-Universität Bochum, Oberseminar Topologie, "Koszul Duality in Higher Topoi," 2019.
16. University of British Columbia, Topology Seminar, "Comodule and Coalgebra Structure on Derived Quotients in ∞-categories," 2018.
15. University of Washington, Seattle Noncommutative Algebra Day, "An Operadic Approach to Noncommutative Geometry," 2018.
14. AMS Spring Western Sectional Meeting – Special Session on Algebraic Topology, Portland, "Operads of Singular and Virtual Braids," 2018.
13. Joint Mathematics Meetings – Special Session on Noncommutative Algebras and Noncommutative Invariant Theory, San Diego, "Toward Derived Hopf-Galois Extensions," 2018.
12. University of Washington, Seattle Noncommutative Algebra Day, "Some Hopf-Galois Extensions in the Derived Setting," 2017.
11. Macquarie University, Category Theory Seminar, "A Third Isomorphism Theorem for Thom Spectra and Hopf-Galois Extensions," 2017.
10. University of Melbourne, Mathematics Seminar, "Graphical Spaces as a Model for Infinity Properads," 2017.
9. University of British Columbia, 58th Cascade Topology Seminar, "Iterated Quotients of Ring Spectra and Spectral Torsors," 2017.
8. Temple University, Algebra Seminar, "An Introduction to Thom Spectra and Hopf-Galois Extensions," 2017.
7. University of British Columbia, Topology Seminar "Iterated Thom Spectra with Examples," 2016.
6. Ohio State University, Topology Seminar, "Hopf-Galois Extensions of Ring Spectra and the Nilpotence Theorem," 2015.
5. University of Chicago, Topology Seminar, "MU Without Manifolds," 2015.
4. University of Illinois, Urbana-Champaign, Topology Seminar, "Hopf-Galois Extensions of Ring Spectra and the Nilpotence Theorem," 2015.
3. Johns Hopkins University, Topology Seminar, "Non-Commutative Bialgebras in Spectra and Hopf-Galois Extensions," 2015.
2. University of Virginia, Toplogy Seminar, "Ravenel's $X(n)$ Spectra as Iterated Hopf-Galois Extensions," 2015.
1. Ohio State University, Topology Seminar, "Ravenel's $X(n)$ Spectra as Iterated Hopf-Galois Extensions," 2014.

Other Presentations

13. Chromatic Nullstellensatz Seminar (Online), "Picard Spaces and Orientations," 2023.
12. "A Very Brief Introduction to Stable Homotopy Theory," invited survey lecture, Roma Tre University, 2021.
11. "Symmetry, Topology and the Nobel Prize," lecture for high school students on topological phases of matter, given at the University of Washington's Math Day, 2018.
10. "The Nerve, the Bar Construction and Classifying Spaces," several lectures given in J. Zhang's student seminar, University of Washington, 2018.
9. University of Regensburg, The Transatlantic Transchromatic Homotopy Theory Conference, "Structured Quotients of Ring Spectra and Obstructions to A_∞ Complex Orientations," 2017.
8. "Simplicial Sets and Simplicial Homotopy Theory," several lectures given in J. Zhang's student seminar, University of Washington, 2017.
7. "An Introduction to Operads," several lectures given in J. Zhang's student seminar, University of Washington, 2017.
6. "An Introduction to Homotopy Theory," Current Topics Seminar, University of Washington, 2017.
5. École Polytechnique Fédérale de Lausanne, Young Topologists Meeting "Thom Spectra and Coalgebraic Structure," 2015.
4. University of Illinois Urbana-Champaign, Graduate Student Topology and Geometry Conference "Non-Commutative Bialgebras in Spectra and Hopf-Galois Extensions," 2015.
3. University of Regensburg, Modular Invariants in Topology and Analysis, "A New Class of Hopf-Galois Extensions in Chromatic Homotopy Theory," 2014.
2. University of Manchester, Structured Ring Spectra and Their Invariants, "Descent Cohomology and Twisted Forms in Homotopy Theory," 2014.
1. "Stabilization of ∞-categories," West Coast Algebraic Topology Student Seminar, University of Oregon, 2013.

Certifications and Trainings

- *Certificate in Effective College Instruction*, Association of College and University Educators (UNR), 2022.
- *Microcredential in Creating an Inclusive and Supportive Online Learning Environment*, Association of College and University Educators (UNR), 2021.
- *Intersections: Preventing Harassment and Sexual Violence*, Everfi (UNR), 2020.

Service

- Co-organizer, *Fundamental Geometries*, SAIS-JHU Bologna, 2026.
- Co-organizer, *AMS Special Session in Homotopy Theory*, Joint Mathematics Meetings 2024.
- Co-organizer, *UNR Homological Algebra Seminar*, 2023-present
- Co-organizer, *UNR Algebraic and Geometric Topology Seminar*, 2020-present

- Lead Acting Assistant Professor, University of Washington, 2018–2019
- Organizer, *University of Washington Topology Seminar*, 2017-2019
- Co-Organizer, *Young Topologists Meeting*, University of Copenhagen, 2018
- Co-organizer, *Recent Developments in Noncommutative Algebra and Related Areas*, University of Washington, 2018
- Co-organizer and Moderator, *Panel on Mental Health for Graduate Students in Math*, University of Washington, 2018
- Organizer, *AMS Special Session in Homotopy Theory*, University of California, Riverside, 2017
- Co-organizer, *Johns Hopkins Graduate Student Topology Seminar*, 2011–2016
- Peer Reviewer for: Advances in Mathematics, Algebraic and Geometric Topology, Journal of Pure and Applied Algebra, Journal of Topology

Classes Taught

- Math 734–Algebraic Geometry, University of Nevada, Reno
- Math 743–Homotopy Theory, University of Nevada, Reno
- Math 741–Algebraic Topology I, University of Nevada, Reno
- Math 373–Theory of Positive Integers, University of Nevada, Reno
- Math 449/649–Category Theory and TQFTs, University of Nevada, Reno
- Math 295–Proof Writing, University of Nevada, Reno
- Math 2552–Differential Equations, Georgia Institute of Technology
- Math 324–Advanced Multivariable Calculus, University of Washington
- Math 300–Introduction to Mathematical Reasoning, University of Washington
- Math 441–Topology, University of Washington
- Math 443–Differential Geometry II, University of Washington
- Math 442–Differential Geometry I, University of Washington
- Math 301–Elementary Number Theory, University of Washington
- Math 498–Independent Study in Topology, University of Washington
- Math 308–Matrix Algebra, University of Washington
- Math 202–Vector Calculus, Johns Hopkins University
- Math 109–Calculus II, Johns Hopkins University