Emily Riehl

CONTACT
Department of Mathematics
Johns Hopkins University
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RESEARCH INTERESTS
Topics in category theory related to homotopy theory: e.g., ∞-categories, (∞, n)-categories, homotopy type theory, model categories, weak factorization systems, the small object argument, Reedy categories, simplicial categories, derived functors, functor calculus, and multivariable adjunctions and mates.

ACADEMIC POSITIONS

Johns Hopkins University, Baltimore, MD

Associate Professor, July 2019–present
Assistant Professor, July 2015–June 2019

Harvard University, Cambridge, MA

Benjamin Peirce Postdoctoral Fellow and NSF Postdoctoral Fellow, July 2011–June 2015

VISITING POSITIONS

Mathematical Sciences Research Institute, Berkeley, CA

Chern Professor, January–May 2020

Centre for Advanced Study, Norwegian Academy of Science and Letters, Oslo, Norway

Fellow, May–June 2019

Centre of Australian Category Theory, Sydney, Australia

Visitor, January–July 2017

Max Planck Institute for Mathematics, Bonn, Germany

"Higher structures in Geometry and Physics" Program Participant, January 2016

Hausdorff Research Institute for Mathematics, Bonn, Germany

"Homotopy theory, manifolds, and field theories" Program Participant, May–June 2015

Mathematical Sciences Research Institute, Berkeley, CA

Research Member, January–May 2014

EDUCATION
University of Chicago, Chicago, IL

Ph.D. in Mathematics, June 2011; M.A. in Mathematics, June 2009
- Thesis: "Algebraic model structures" advised by J. Peter May.

University of Cambridge, Churchill College, Cambridge, UK

Certificate of Advanced Study in Mathematics (Part III) with Distinction, June 2007
- Essay: "Higher category theory" advised by Martin Hyland.

Harvard University, Cambridge, MA

A.B. Mathematics, *magna cum laude*, June 2006
- Thesis: "Lubin-Tate formal groups and local class field theory" advised by Frank Calegari.

AWARDS AWM-Birman Research Prize in Topology and Geometry, 2021.

Principal Investigator, "Synthetic and Constructive Mathematics of Higher Structures in Homotopy Type Theory," AFOSR MURI grant with Mike Shulman, Steve Awodey, Favonia, Bob Harper, and Dan Licata, 2021–2025.

Principal Investigator, "Toward Mathematical Intelligence and Certifiable Automated Reasoning: From Theoretical Foundations to Experimental Realization," ARO MURI grant with Arthur Jaffe, Mikhail Lukin, and Zhenghan Wang, 2020–2025.

Johns Hopkins President's Frontier Award, 2020.

Johns Hopkins Catalyst Award, 2018.

Joel Dean Award for excellence in teaching, 2017, 2019.

Principal Investigator, "Model-Independent Foundations for Higher ∞-Categories," National Science Foundation CAREER Grant DMS-1652600, 2017–2022

Simons Visiting Professorship at Oberwolfach, 2016

Principal Investigator, "Reimagining the Foundations of Infinite Dimensional Category Theory," National Science Foundation Grant DMS-1551129, 2015–2018

Harvard University Certificate of Teaching Excellence, 2014, 2015

AMS-Simons Travel Grant, 2014

National Science Foundation Mathematical Sciences Postdoctoral Research Fellowship, 2011–2014

National Science Foundation Graduate Research Fellowship, 2006–2011

Churchill Scholarship, The Winston Churchill Foundation of the United States, 2006

Barry M. Goldwater Scholarship, 2005

Harvard University Certificate of Distinction in Teaching, 2004, 2005, 2006

3rd Place in Intel Science Talent Search, 2002

BOOKS E. Riehl and D. Verity, *Elements of ∞-Category Theory*, to appear with Cambridge University Press, xvi+769pp, available from: www.math.jhu.edu/~eriehl/elements.pdf

B. Gross, J. Harris, E. Riehl, *Fat Chance: Probability from 0 to 1*, Cambridge: Cambridge University Press, 2019.

E. Riehl, *Category Theory in Context*, Aurora: Modern Math Originals, Dover Publications, 2016, xvii+240 pp. also available from www.math.jhu.edu/~eriehl/context.pdf

E. Riehl, *Categorical Homotopy Theory*, New Mathematical Monographs, 24. Cambridge University Press, 2014, xviii+352 pp. also available from www.math.jhu.edu/~eriehl/cathtpy.pdf

PUBLISHED RESEARCH E. Riehl and D. Verity, *On the construction of limits and colimits in ∞-categories*, Theory Appl. Categ. **35**

(2020), no. 30, 1101–1158, arXiv:1808.09835

E. Riehl and D. Verity, *Recognizing quasi-categorical limits and colimits in homotopy coherent nerves*, Appl. Categ. Struct., **28**(4), (2020), 669–716, arXiv:1808.09834

E. Riehl and D. Verity, *∞-category theory from scratch*, Higher Structures 4(1):115–167, 2020, arXiv:1608.05314

R. Garner, M. Kędziorek, and E. Riehl, *Lifting accessible model structures*, J. Topology, **13** (2020), no. 1, 59–76, arXiv:1802.09889

E. Riehl and D. Verity, *The comprehension construction*, Higher Structures **2** (2018), no. 1, 116-190, arXiv:1706.10023

K. Bauer, B. Johnson, C. Osborne, E. Riehl, and A. Tebbe, *Directional derivatives and higher order chain rules for abelian functor calculus*, Topology Appl. Women in Topology II: Further collaborations in homotopy theory **253** (2018), 375–427, arXiv:1610.01930

E. Riehl and M. Shulman, *A type theory for synthetic ∞-categories*, Higher Structures **1** (2017), no. 1, 116–193, arXiv:1705.07442

K. Hess, M. Kędziorek, E. Riehl, and B. Shipley, *A necessary and sufficient condition for induced model structures*, J. Topology **10** (2017), no. 2, 324–367, arXiv:1509.08154

E. Riehl and D. Verity, *Kan extensions and the calculus of modules for ∞-categories*, Algebr. Geom. Topol. **17** (2017), no. 1, 189–271, arXiv:1507.01460

E. Riehl and D. Verity, *Fibrations and Yoneda's lemma in an ∞-cosmos*, J. Pure Appl. Algebra **221** (2017), no. 3, 499–564, arXiv:1506.05500

M. Ching and E. Riehl, *Coalgebraic models for combinatorial model categories*, Homol. Homotopy Appl. **16** (2014), no. 2, 171–184, arXiv:1403.5303

E. Riehl and D. Verity, *Completeness results for quasi-categories of algebras, homotopy limits, and related general constructions*, Homol. Homotopy Appl. **17** (2015), no. 1, 1–33, arXiv:1401.6247

M. Bayeh, K. Hess, V. Karpova, M. Kędziorek, E. Riehl, and B. Shipley, *Left-induced model structures and diagram categories*, Contemp. Math. **641** (2015), 49–81, arXiv:1401.3651

E. Riehl and D. Verity, *Homotopy coherent adjunctions and the formal theory of monads*, Adv. Math **286** (2016), 802–888, arXiv:1310.8279

T. Barthel, J.P. May, and E. Riehl, *Six model structures for DG-modules over DGAs: model category theory in homological action*, New York J. Math **20** (2014), 1077-1159, arXiv:1310.1159

E. Riehl and D. Verity, *The 2-category theory of quasi-categories*, Adv. Math. **280** (2015), 549–642, arXiv:1306.5144

E. Riehl and D. Verity, *The theory and practice of Reedy categories*, Theory Appl. Categ. **29** (2014), no. 9, 256–301, arXiv:1304.6871

E. Cheng, N. Gurski, and E. Riehl, *Cyclic multicategories, multivariable adjunctions and mates*, J. K-theory **13** (2014), no. 2, 337–396, arXiv:1208.4520

A.J. Blumberg and E. Riehl, *Homotopical resolutions associated to deformable adjunctions*, Algebr. Geom. Topol. **14** (2014), no. 5, 3021–3048, arXiv:1208.2844

T. Barthel and E. Riehl, *On the construction of functorial factorizations for model categories*, Algebr. Geom. Topol. **13** (2013), no. 2, 1089–1124, arXiv:1204.5427

E. Riehl, *Monoidal algebraic model structures*, J. Pure Appl. Algebra **217** (2013), no. 6, 1069–1104, arXiv:1109.2883

C. Kennett, E. Riehl, M. Roy, M. Zaks, *Levels in the toposes of simplicial sets and cubical sets*, J. Pure and Appl. Algebra **215** (2011), no. 5, 949–961, arXiv:1003.5944

E. Riehl, *On the structure of simplicial categories associated to quasi-categories*, Math. Proc. Camb. Phil. Soc. **150** (2011), no.3., 489–504, arXiv:0912.4809

E. Riehl, *Algebraic model structures*, New York J. Math. **17** (2011), 173–231, arXiv:0910.2733

J. D'Angelo, S. Kos, E. Riehl, *A Sharp Bound for the Degree of Proper Monomial Mappings Between Balls*, J. Geom. Anal. **13** (2003), no. 4, 581–593.

E. Graham Evans, Jr. and E. Riehl, *On the intersections of polynomials and the Cayley-Bacharach theorem*, J. Pure and Appl. Algebra **183** (2003), no. 1–3, 293–298.

Published exposition

E. Riehl, *Homotopical categories: from model categories to $(\infty, 1)$-categories*, to appear in a forthcoming volume on spectra to appear in the MSRI Publications Series with Cambridge University Press, (2019), 1–67, arXiv:1904.00886

F. Loregian and E. Riehl, *Categorical notions of fibration*, to appear in Expositiones Mathematicae, (2018), 1–17, arXiv:1806.06129

E. Riehl, *Complicial sets, an overture*, 2016 MATRIX Annals, (2017), 49–76, arXiv:1610.06801

E. Riehl, *The Kan Extension Seminar: An Experimental Online Graduate Reading Course*, Notices Amer. Math. Soc. **61** (2014), no. 11, 1357–1358.

A.M. Bohmann, *A comparison of norm maps*, with an appendix by A.M. Bohmann and E. Riehl, Proc. Amer. Math. Soc. **142** (2014), no. 4, 1413–1423, arXiv:1201.6277

Preprints

E. Riehl and D. Verity, *Cartesian exponentiation and monadicity*, (2021), 1–71, arXiv:2101.09853

E. Riehl, *Homotopy coherent structures*, (2017), 1–26, arXiv:1801.07404, also available via AMS Open Math Notes OMN:201901.110786.

Teaching

Johns Hopkins University, Baltimore, MD

Instructor, 2015–present
- *The model-independent theory of ∞-categories* — a graduate-level topics course
- *Category Theory in Context* — a graduate-level topics course
- *Algebraic Topology II* — a graduate-level course (twice)
- *Algebra I* — a graduate-level course
- *Honors Algebra I* — an undergraduate-level course (twice)
- *Introduction to Abstract Algebra* — an undergraduate-level course
- *Introduction to Proofs* — a (newly developed) undergraduate-level course (thrice)

- *Calculus III* — an undergraduate-level course (twice)

Advising, 2016–present

- *Postdoctoral Mentor*, Martina Rovelli, 2017–2019
- *Graduate Advisor*
  - Daniel Fuentes-Keuthan "Goodwillie Towers of ∞-categories and Desuspension," PhD 2021.
  - Anthony Agwu, tslil clingman, and David Myers
- *Masters Thesis Advisor*, Lyne Moser "Derivators and basic localizers," 2016
- *Research Advisor*, Mira Wattal, 2020-2021.

Harvard University, Cambridge, MA

Instructor in Mathematics, 2012–2015

- *Categorical Homotopy Theory* — a graduate-level topics course
- *Topology I* — an undergraduate-level course (twice)
- *Fun and Games with Discrete Mathematics* — a one-week "Wintersession" course
- *Introduction to Mathematical Logic* — an undergraduate-level course
- *Category Theory in Context* — an undergraduate-level topics course

Faculty Supervisor in Mathematics, 2012–2015

- Undergraduate senior thesis project by Marina Lehner "All Concepts are Kan Extensions"
- Undergraduate reading courses in category theory, simplicial homotopy theory, quasi-category theory, higher category theory, and topos theory.

Teaching Fellow in Mathematics, 2011

- *Multivariable Calculus*

University of Chicago, Chicago, IL

Directed Reading Program, mentor for undergraduates, 2008–2010

- Projects involving category theory and knot theory

Research Experience for Undergraduates, mentor, 2008–2010

- Projects involving topics in algebraic topology, category theory, and number theory

College Fellow in Mathematics, 2008–2009

- *Elementary Number Theory*, mentor: J. Boller
- *Basic Geometry*, mentor: D. Hermann
- *Introduction to Algebraic Topology*, mentor: T. Fiore

LECTURES

Mini Courses & Lecture Series

- Higher structures in homotopy theory, Isaac Newton Institute for Mathematical Sciences, "The model-independent theory of $(\infty, 1)$-categories," Cambridge, UK, July 2018.
- Floer homology and homotopy theory summer school, "Homotopy coherent structures," UCLA, July 2017.
- Higher Structures in Geometry and Physics Workshop, "Weak complicial sets," MATRIX, Mel-

bourne, June 2016.
- Young Topologists Meeting, EPFL Lausanne, "∞-category theory from scratch," July 2015.
- University of Sheffield, "Algebraic model structures and cellularity," April 11-14, 2011.

Public Lectures
- Perimeter Institute Public Lecture, "A solution to the stable marriage problem," May 2021.
- Applied Category Theory 2020 Tutorial Day, "The Yoneda Lemma in the Category of Matrices," July 2020.
- Lambda World, Cádiz, "A categorical view of computational effects," October 2019.
- National Math Festival, "The mathematics of social choice," May 2019.
- Compose Conference, New York, "A categorical view of computational effects," May 2017.
- Women, Gender, and Sexuality Graduate Colloquium and Lecture Series, "Can mathematical proof inform queer epistemology?" Johns Hopkins University, October 2016.
- Johns Hopkins Applied Physics Laboratory Colloquium, "A solution to the stable marriage problem," June 2016.
- Informal Dynamics and Geometry Seminar, PechaKucha: Mathematics 20x20, Harvard University, "A solution to the stable marriage problem," March 2013.

Named Lectures
- London Mathematical Society Lecturer, "Elements of ∞-Category Theory, July 2021.
- Pauline Sperry Lecture at UC Berkeley, "Contractibility as Uniqueness," April 2021.
- Kaori Kitao Lecture at Swarthmore College, "Categorifying Cardinal Arithmetic," October 2018.
- Friends of Harvard Mathematics Junior Faculty Lecture, "The algebra and geometry of ∞-categories," May 2012.
- Friends of Harvard Mathematics Lecture and Honoraria, "Lubin-Tate formal groups and local class field theory," Harvard University, April 2006.

Invited Conference Talks
- Categories and Companions Symposium, "The formal theory of ∞-categories," June 2021.
- LGBTQ+Math Day, Fields Institute "Contractibility as Uniqueness," November 2020.
- Berkeley Undergraduate Number Theory Conference, "Categorifying cardinal arithmetic," November 2020.
- Binghamton University Graduate Conference in Algebra and Topology, "Elements of ∞-Category Theory," November 2020.
- Graduate Research Opportunities for Women 2020, "Categorifying cardinal arithmetic," October 2020.
- University of Chicago REU, "Categorifying cardinal arithmetic," June 2020.
- Workshop on higher structures in geometry and physics, Fields Institute, "A macrocosm principle for cartesian fibrations," November 2019.
- International Conference on Homotopy Type Theory, Carnegie Mellon University, "The equivariant uniform Kan fibration model of cubical homotopy type theory," August 2019.
- International Category Theory Conference, University of Edinburgh, "A formal category theory for ∞-categories," July 2019.
- Summer School on Higher Topos Theory and Univalent Foundations, "The synthetic approach to ∞-category theory," June 2019.

- The Shanks Workshop in Homotopy Theory, Vanderbilt University, "The synthetic theory of ∞-categories," April 2019.
- Workshop on Higher Category Approach to Certifiably Correct Quantum Information Processing Systems, "A type theory for synthetic ∞-categories," February 2019.
- Higher Structures, Centre International de Rencontres Mathématiques, "The complicial sets model of higher ∞-categories," January 2019.
- Between Topology and Quantum Field Theory, a conference in celebration of Dan Freed's 60th birthday, UT Austin, "The complicial sets model of higher ∞-categories," January 2019.
- Women's Intellectual Network Research Symposium Panel Lecture, "Categorifying Cardinal Arithmetic," University of Virginia, September 2018.
- Vladimir Voevodsky Memorial Conference, "The synthetic theory of ∞-categories vs the synthetic theory of ∞-categories," Institute for Advanced Study, September 2018.
- Invited Paper Session "Category theory for all" at the MAA Math Fest, "Categorifying cardinal arithmetic," Denver, August, 2018.
- Higher-Dimensional Rewriting and Algebra, Federated Logic Conference 2018, "Homotopy coherent adjunctions and other structures," July 2018.
- Joint International Meeting of the American Mathematical Society and Chinese Mathematical Society, "A model-independent theory of ∞-categories," Shanghai, June, 2018.
- Infinity-Categories, Infinity-Operads, and their Applications Workshop, "A proof of the model-independence of ∞-category theory," Casa Matemática Oaxaca, May, 2018.
- Keynote lecture, Women in Math and Statistics Conference, Harvard University, "Categorifying Cardinal Arithmetic," April, 2018.
- Keynote lecture, 43rd Annual New York Regional Graduate Mathematics Conference, Syracuse University, "What is a universal property?," March 2018.
- ASL Invited Address, Joint Mathematics Meetings, "A synthetic theory of ∞-categories in homotopy type theory," January 2018.
- Homotopy Type Theory Special Session, Joint Mathematics Meetings, "On the directed univalence axiom," January 2018.
- Women in Topology Workshop, MSRI, "Foundations of $(\infty, 2)$-category theory," November, 2017.
- Topology of manifolds: a conference in honour of Michael Weiss' 60th birthday, "Homology without simplices," University of Lisbon, June 2016.
- Homotopy Type Theory and Univalent Foundations Workshop, "Towards a synthetic theory of $(\infty, 1)$-categories," Fields Institute, Toronto, May 2016.
- Midwest Topology Seminar, Ohio State University, "Model-independent ∞-category theory in the homotopy 2-category," May 2016.
- Higher structures in Geometry and Physics Opening Conference, Max Planck Institute for Mathematics, Bonn, "On model-comparison results for ∞-categories," January 2016.
- Workshop on category theory and algebraic topology, Université catholique de Louvain, "Model-independent ∞-category theory in the homotopy 2-category," September 2015.
- Texas Undergraduate Topology and Geometry Conference, UT Austin, "Self-similiar spaces," February 2015.
- Topologie workshop, Mathematisches Forschungsinstitut Oberwolfach, "Toward the formal theory of (∞, n)-categories," September 2014.
- Institute for Basic Science, Center for Geometry and Physics, Pohang, Korea, "A universal approach to universal algebra," August 2014.

- Days of the Federation de Recherche en Mathématiques de Paris Centre, Institute Henri Poincaré, "The formal theory of adjunctions, monads, algebras, and descent," June 2014.
- Reimagining the Foundations of Algebraic Topology, MSRI, "The formal theory of adjunctions, monads, algebras, and descent," April 2014.
- Graduate Student Topology and Geometry Conference, Young Faculty Speaker, "Quasi-category theory you can use," University of Texas at Austin, April 2014.
- Committee of Academic Sponsors Postdoc Talk, MSRI, "Categorical definitions in algebraic topology," February 2014.
- AMS Special Session on Homotopy Theory, "Homotopy coherent adjunctions," January 2014.
- Conference on Type Theory, Homotopy Theory, and Univalent Foundations, Centre de Recerca Mathemàtica, "Made-to-order weak factorization systems," September 2013.
- International Category Theory Conference, "The formal theory of homotopy coherent monads," July 2013.
- Special Session on Progress in Higher Categories, CMS Summer Meeting, Halifax, "The formal category theory of quasi-categories," June 2013.
- Workshop on Higher Dimensional Algebra, Categories and Types, University of Ljubljana, "Homotopy coherent adjunctions of ∞-categories," June 2012.
- Special Session on Homotopy Theory and Its Applications, Association for Women in Mathematics 40th Anniversary Conference, "Algebraic model structures," September 2011.
- Special Session on Homotopy and Categories, CMS Summer Meeting, Edmonton, "Algebraic model structures," June 2011.

Colloquia
- Topos Institute, "Contractibility as Uniqueness," May 2021.
- The Institute of Mathematical Sciences, Chinese University of Hong Kong, "Elements of ∞-Category Theory," April 2021.
- U(M), "Categorifying Cardinal Arithmetic," April 2021.
- MSU-UM, "Elements of ∞-Category Theory," April 2021.
- MATRIX Institute, "Elements of ∞-Category Theory," March 2021.
- Brown University, "Elements of ∞-Category Theory," February 2021.
- University of California at Berkeley, "Elements of ∞-Category Theory," November 2020.
- Florida State University, "∞-category theory for undergraduates," September 2020.
- Berkeley Logic, "∞-category theory for undergraduates," May 2020.
- Morgan State University, "Homotopy types as a foundation for mathematics," October 2019.
- Naval Academy, "Homotopy types as a foundation for mathematics," September 2019.
- Perimeter Institute for Theoretic Physics, "The complicial sets model of higher ∞-categories," January 2019.
- University of Washington, "Applications of functoriality," April 2018.
- University of Illinois Urbana-Champaign, "Applications of functoriality," November 2017.
- Reed College, "Homotopy types as a foundation for mathematics," October 2017.
- University of Western Ontario, "Applications of functoriality," September 2017.
- Women in Maths special interest group of the Australian Maths society, "On women in topology and abelian functor calculus," July 2017.
- Macquarie University, "Functoriality in algebra and topology," March 2017.
- Indiana University, "On the duality between 'free' and 'forgetful' constructions," January 2015.

- University of Virginia, "On the duality between 'free' and 'forgetful' constructions," January 2015.
- Notre Dame, "On the duality between 'free' and 'forgetful' constructions," January 2015.
- UCLA, "On the duality between 'free' and 'forgetful' constructions," January 2015.
- Johns Hopkins University, "On the duality between 'free' and 'forgetful' constructions," December 2014.
- Boston College, "On the duality between 'free' and 'forgetful' constructions," November 2014.
- Cornell University Oliver Club, "On the duality between 'free' and 'forgetful' constructions," November 2014.
- Wesleyan University, "Homotopy coherent adjunctions," November 2013.

Seminars
- Münster Oberseminar Topologie, "Elements of ∞-Category Theory," April 2021.
- University Quantum Symmetries Lectures, "Elements of ∞-Category Theory," April 2021.
- Wales Mathematical Physics–Physical Mathematics Zoom Seminar, "Elements of ∞-Category Theory," April 2021.
- Trinity College Maths Society, "Categorifying Cardinal Arithmetic," March 2021.
- Harvard Mathematical Picture Languages, "Elements of ∞-Category Theory," February 2021.
- Princeton Algebraic Topology, "Elements of ∞-Category Theory," November 2020.
- Tetrahedral Geometry/Topology, "Homotopy types as a foundation for mathematics," November 2019.
- UC Boulder Topology, "The comprehension construction," August 2019.
- UCLA Topology, "The synthetic theory of ∞-categories," April 2019.
- Penn Topology, "Homotopical categories: from model categories to $(\infty,1)$-categories," April 2019.
- MIT Topology, "The synthetic theory of ∞-categories," November, 2018.
- University of Chicago Topology, "A model-independent theory of $(\infty,1)$-categories," April 2018.
- Homotopy Type Theory Electronic Seminar Talks, "The synthetic theory of ∞-categories vs the synthetic theory of ∞-categories," March 2018.
- Stanford Topology, "A synthetic theory of $(\infty,1)$-categories in homotopy type theory," November 2017.
- University of Illinois Urbana-Champaign Topology, "A synthetic theory of $(\infty,1)$-categories in homotopy type theory," November 2017.
- George Mason, Topology, Arithmetic, Dynamics, "Homotopy types as a foundation for mathematics," October 2017.
- New York City Category Theory, "Towards a synthetic theory of $(\infty,1)$-categories," May 2017.
- Rochester Topology, "Model-independent ∞-category theory in the homotopy 2-category," April 2016.
- CMU Homotopy Type Theory, "Towards a synthetic theory of $(\infty,1)$-categories," April 2016.
- MIT Topology, "The formal category theory of (∞,n)-categories," March 2015.
- Indiana University Topology, "The formal category theory of $(\infty,1)$-categories," December 2014.
- University of Illinois at Urbana-Champaign Topology, "The formal category theory of $(\infty,1)$- categories," December 2014.
- Georgia Tech Geometry and Topology, "On the duality between 'free' and 'forgetful' constructions," December 2014.
- Johns Hopkins University Topology, "Toward the formal theory of higher homotopical categories," October 2014.

- University of Western Ontario Geometry and Topology, "Homotopy coherent adjunctions, monads, and algebras," March 2014.
- MIT Topology, "Cell complex presentations for (generalized) Reedy categories," November 2013.
- Wesleyan University Topology, "Algebraic model categories," November 2013.
- University of Chicago Topology, "Algebraic perspectives on (generalized) Reedy categories," October 2013.
- Northwestern Topology, "Algebraic perspectives on (generalized) Reedy categories," September 2013.
- Algebra/Geometry/Topology, University of Melbourne, "Homotopy coherent adjunctions and the formal category theory of quasi-categories," July 2013.
- Stanford University Topology, "Homotopy coherent adjunctions and the formal category theory of quasi-categories," December 2012.
- MIT Topology, "The formal category theory of quasi-categories," November 2012.
- Wayne State University Topology, "Homotopy coherent adjunctions of quasi-categories," November 2012.
- University of Virginia Topology, "Homotopy coherent adjunctions of quasi-categories," November 2012.
- Midwest Topology, Northwestern University, "Lifting properties and the small object argument," March 2012.
- MIT Topology, "Algebraic model structures and cellularity," December 2011.
- University of Illinois at Urbana-Champaign Topology, "Algebraic model structures," October 2010.
- University of Illinois at Urbana-Champaign, "On the properties of Tits graphs," August 2002.

SELECTED SERVICE

Lead Organizer for a MSRI semester program "Higher categories and categorification," 2020. **Co-Organizer** of the Mathematics Research Community on Homotopy Type Theory, 2017. **Co-Organizer** of the Mid-Atlantic Topology Conference and Co-PI for the associated NSF grant DMS-1619569, 2016.

Co-Mentor for the 2018 MIT Talbot Workshop: the model-independent theory of ∞-categories. **Organizer** of the Kan Extension Seminar, an online graduate reading course in category theory, 2014, 2017. **Co-Host** of the n-Category Café, 2013-present.

Inaugural **Member** of BIRS Board of Equity, Diversity and Inclusion; **Member** of the AWM-AMS Noether Lecture Selection Committee, 2021-2023; **Member** of NSF review panels for the Division of Mathematical Sciences; **Member** of the AMS University Lecture Series Editorial Committee, 2019–2023; **Member** of the AMS Web Editorial Group, 2015–2017 (chair 2017); **Member** of the AMS Mathematics Research Communities Advisory Board, 2017–2020; **Member** of the Scientific Committee for the International Category Theory conference, 2016, 2018. **Member** of the Churchill Scholarship Screening Committee, 2014.

Editor for Journal of Homotopy and Related Structures (2016-present), Homology, Homotopy, and Applications (2015-present), and Cahiers de Topologie et Géométrie Différentielle Catégoriques (2014-2019), and the Journal of Pure and Applied Algebra (2019-present). **Referee** for Advances in Mathematics, Algebraic and Geometric Topology, American Mathematical Monthly, Annals of Mathematics, Applied Categorical Structures, Forum of Math: Sigma, Forum Mathematicum, Geometry and Topology, Journal of the European Mathematical Society, Journal of Pure and Applied Algebra, Mathematical Structures in Computer Science, Mathematische Zeitschrift, New York Journal of Mathematics, Theory

and Applications of Categories, and Transactions of the AMS.

Member of the Qualifying Exams Committee 2011, the Colloquium Committee 2012, and the Graduate Admissions Committee 2015; Junior **Advisor** 2012-2013; Undergraduate Thesis **Supervisor** 2013- 2014; **Assistant Director of Graduate Studies** 2014-2015 at Harvard. **Diversity Champion** for the mathematics department at Johns Hopkins 2015-present.

Last updated July 2, 2021.