# Cary L. Malkiewich

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## Employment

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|---|---|
| Assistant Professor, Binghamton University (SUNY). | 2017 – present |
| J. L. Doob Research Assistant Professor, UIUC. | 2014 – 2017 |

## Visiting Positions

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| Postdoctoral Fellow, Max Planck Institute for Mathematics, Bonn. | Jan 2018 – Dec 2018 |
| Trimester Program *K-Theory and Related Fields*, Hausdorff Institute, Bonn. | Jul 2017 |
| Junior Trimester Program *Topology*, Hausdorff Institute, Bonn. | Sept 2016 |
| Visitor, University of Copenhagen. | Summer 2015 |

## Education

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|---|---|
| Ph.D. in Mathematics, Stanford University. Advisor: Ralph L. Cohen. | 2014 |
| B.A. in Mathematics, Princeton University. | 2009 |

## Research Interests

Algebraic topology. Key words: homotopy theory, spectra, scissors congruence, algebraic $K$-theory, topological Hochschild homology (THH), Nielsen theory (fixed-point theory), $h$-cobordisms, high-dimensional manifolds, free loop spaces, duality and transfers.

## Awards and Grants

| | |
|---|---|
| NSF Award (DMS - 2052923): FRG: Collaborative Research: Trace Methods and Applications for Cut-and-Paste $K$-Theory | 2021-2024 |
| NSF Award (DMS - 2005524): Algebraic $K$-Theory in Fixed-Point Theory and Smooth Manifolds | 2020-2023 |
| Harpur College Teaching Award Honorable Mention (2) | 2020, 2023 |
| NSF Award (DMS - 1612162): Young Topologists Meeting 2016 | 2016 |
| AMS Simons Travel Grant | 2015-2017 |
| Stanford University Centennial Teaching Assistant Award | 2013 |

## Papers and Preprints

*On the functoriality of the space of equivariant smooth h-cobordisms.*
(with Thomas Goodwillie, Kiyoshi Igusa, and Mona Merling.) arxiv.org:2303.14892.
  submitted.

*A Farrell-Jones Isomorphism for K-theory of Polyhedra.*
(with Anna Marie Bohmann, Teena Gerhardt, Mona Merling, and Inna Zakharevich.) arxiv.org:2303.08172.
submitted.

*On the multiplicativity of the Euler characteristic.*
(with John Klein and Maxime Ramzi.) arxiv.org:2211.04992.
accepted, Proceedings of the American Mathematical Society.

*Scissors congruence K-theory is a Thom spectrum.* arxiv.org:2210.08082.
submitted.

*Coherence for bicategories, lax functors, and shadows.* (with Kate Ponto.) arxiv.org:2109.01249.
Theory and Applications of Categories 38 (2022), Paper No. 12, 328–373.

*K-theoretic torsion and the zeta function.* (with John Klein.) arxiv.org:2009.10120.
Annals of K-Theory 7 (2022), no. 1, 77–118.

*K-theory of endomorphisms, the TR-trace, and zeta functions.*
(with Jonathan Campbell, John Lind, Kate Ponto, and Inna Zakharevich.) arxiv.org:2005.04334.
submitted.

*The equivariant parametrized h-cobordism theorem, the non-manifold part.*
(with Mona Merling.) arxiv.org:2001.05563.
Advances in Mathematics 399 (2022): 108242.

*Coassembly is a homotopy limit map.* (with Mona Merling.) arxiv.org:1904.05858.
Annals of K-Theory 5.3 (2020): 373-394.

*Periodic points and topological restriction homology.* (with Kate Ponto.) arxiv.org:1811.12871.
International Mathematics Research Notices (2020).

*Comparing cyclotomic structures on different models for topological Hochschild homology.*
(with Emanuele Dotto, Irakli Patchkoria, Steffen Sagave, and Calvin Woo.) arxiv.org:1707.07862.
Journal of Topology 12.4 (2019): 1146–1173.

*The Morita equivalence between parametrized spectra and module spectra.* (with John Lind.) arxiv.org:1702.07794.
Contemporary Mathematics 707, New Directions in Homotopy Theory (2018): 45–66.

*Equivariant A-theory.* (with Mona Merling.) arxiv.org:1609.03429.
Documenta Mathematica 24 (2019): 815–855.

*The transfer map of free loop spaces.* (with John Lind.) arxiv.org:1604.03067.
Transactions of the American Mathematical Society 371 (2019): 2503–2552.

*Cyclotomic structure in the topological Hochschild homology of $DX$.* arxiv.org:1505.06778.
Algebraic & Geometric Topology 17.4 (2017): 2307–2356.

*The topological cyclic homology of the dual circle.* arxiv.org:1610.06898.
Journal of Pure and Applied Algebra 221.6 (2017): 1407–1422.

*Coassembly and the K-theory of finite groups.* arxiv.org:1503.06504.
Advances in Mathematics 307C (2017): 100–146.

*A tower connecting gauge groups to string topology.* arxiv.org:1209.1778.
Journal of Topology 8.2 (2015): 529–570.

## Other Publications and Preprints

*Parametrized spectra, a low-tech approach.* arxiv.org:1906.04773.
> This has been rewritten into a shorter paper (96 pages) to be re-submitted for publication.

*Spectral Waldhausen categories, the $S_\bullet$-construction, and the Dennis trace.* (with Jonathan Campbell, John Lind, Kate Ponto, and Inna Zakharevich.) arxiv.org:2006.04006.
> This is an expository paper on technical underpinnings of the Dennis trace map.

*The user's guide project: giving experiential context to research papers.* (with Mona Merling, David White, Luke Wolcott, and Carolyn Yarnall.)
> Journal of Humanistic Mathematics (2015) 5 (2): 186-188.

*The stable homotopy category.*
*Homotopy colimits via the bar construction.*
> Expository notes on homotopy theory that are occasionally cited in published works.

*Duality and linear approximations in Hochschild homology, $K$-theory, and string topology.*
> Ph.D. thesis.


## Recent talks

*Higher scissors congruence.* June 2022 - present
Electronic Computational Homotopy Theory Seminar (eCHT), Mid-Atlantic Topology Seminar (Penn), Union College, Hausdorff Institute (Bonn), Upstate NY Topology Seminar, Purdue University, Cornell University, BUGCAT (Binghamton University)

*Introduction to stable homotopy and ring spectra, for symplectic geometers.* Jul 2022
PIMS (Vancouver)

*Colloquium: Fixed-point theory, both old and new.* Nov 2021 - Mar 2022
Colgate, SUNY Buffalo

*The higher characteristic polynomial.* June 2020 - Mar 2022
Universität Regensburg, George Mason University, Johns Hopkins University, AMS Sectional at Purdue, Brandeis University, Columbia University

*$K$-theory of endomorphisms, topological restriction homology, and periodic points.* Autumn 2019
University of Madison

*Homotopical Nielsen theory and periodic points.* June 2019
KU Leuven (Kortrijk, Belgium)

*Periodic orbits and topological restriction homology.* Spring 2017 - Spring 2019
AMS Sectional at IU Bloomington, Hausdorff Institute, SUNY Albany, Midwest Topology Seminar (Wayne State), Stanford University, Higher Geometric Structures along the Lower Rhine, Universität Wuppertal, Ruhr-Universität Bochum, Universität Regensburg, EPFL, University of Copenhagen, Workshop "Manifolds" at the Isaac Newton Institute (Cambridge), University of Rochester, Cornell University

*The transfer map of free loop spaces.* Autumn 2017 - Autumn 2018
AMS Buffalo, Princeton University, NRW Topology Meeting, Universität Regensburg, Universiteit Utrecht

## Recent Teaching

**Binghamton University**

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|---|---|
| Math 601A: Topics in Topology (Stable Homotopy and Algebraic $K$-theory) | Spring 2023 |
| Math 330: Number Systems | Spring 2023 |
| Math 518: Algebraic Topology II | Autumn 2022 |
| Math 479: Real Analysis II | Spring 2022 |
| Math 330: Number Systems | Autumn 2021 |
| Math 518: Algebraic Topology II | Autumn 2021 |
| Math 479: Real Analysis II | Spring 2021 |
| Math 517: Algebraic Topology I | Spring 2021 |
| Math 330: Number Systems | Autumn 2020 |
| Math 601A: Topics in Topology (Fiber Bundles and Differential Topology) | Spring 2020 |
| Math 330: Number Systems | Autumn 2019 |
| Math 518: Algebraic Topology II | Autumn 2019 |
| Math 517: Algebraic Topology I | Spring 2019 |

## Conferences and Workshops Organized

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| *Collaborative workshop on Scissors Congruence, Algebraic K-Theory, and Trace Methods*, Cornell University. | June 2024 |
| *Summer school on Scissors Congruence, Algebraic K-Theory, and Trace Methods*, UI Bloomington. | June 2023 |
| *Summer school on Homotopical Methods in Fixed Point Theory*, UC Boulder. | July 2022 |
| *AMS Sectional (special session co-organizer)*, Binghamton University. | October 2019 |

## Recent Conferences and Workshops Attended

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|---|---|
| *Mid-Atlantic Topology Seminar*, University of Pennsylvania. | April 2023 |
| *Binghamton University Graduate Combinatorics, Algebra, and Topology Conference (BUGCAT)*, Binghamton University. | November 2022 |
| *Upstate New York Topology Seminar (UNYTS)*, Syracuse University. | October 2022 |
| *Followup Junior Trimester Program Workshop*, HIM, Bonn. | September 2022 |
| *Floer Homotopy Theory Summer School*, PIMS, UBC Vancouver. | July 2022 |
| *Union College Mathematics Conference*, Union College. | June 2022 |
| *Cornell Topology Festival*, Cornell University. | May 2022 |
| *AMS Sectional (virtual)*, Purdue University. | March 2022 |
| *Various virtual seminars and workshops during CoVID-19.* | 2020-2021 |
| *Midwest Topology Seminar (MayDay)*, University of Chicago. | October 2019 |
| *AMS Sectional*, Madison. | September 2019 |
| *Nielsen Theory and Related Topics*, Kortrijk, Belgium. | June 2019 |
| *55th Cornell Topology Festival*, Cornell University. | May 2019 |
| *Manifolds*, Isaac Newton Institute, Cambridge, UK. | December 2018 |
| *30th NRW Topology Meeting*, Universität Münster. | November 2018 |
| *New trends in K-theory and homotopy theory*, Institut Henri Poincaré, Paris. | November 2018 |
| *Utrecht Topology Feest*, Universiteit Utrecht. | August 2018 |
| *Homotopy Theory Summer Berlin*, Freie Universität Berlin. | June 2018 |

*Homotopy Theory Workshop*, Universität Regensburg.  May 2018

*29th NRW Topology Meeting*, Universität Bonn.  April 2018

*Higher Geometric Structures along the Lower Rhine XI*, MPIM Bonn.  March 2018

*Women in Topology*, MSRI.  November 2017