

Maxine Elena Calle

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Citizenship: U.S.A.

EMPLOYMENT AND EDUCATION

Brown University

Tamarkin Assistant Professor

NSF Postdoctoral Research Fellow

– Postdoc mentor: Thomas Goodwillie

Providence, RI

2027–2031

University of Bonn

Hausdorff Center for Mathematics postdoctoral scholar

– Postdoc mentor: Stefan Schwede

Bonn, Germany

2026–2027

University of Pennsylvania

Ph.D. in Mathematics

NSF Graduate Research Fellow

– Thesis advisor: Mona Merling

– Thesis title: “Algebraic K -theory of orbispaces”

Philadelphia, PA

2026

M.A. in Mathematics

– Thesis advisor: Jonathan Block

– Thesis title: “An Introduction to Symplectic Geometry for Lagrangian Floer Homology”

Reed College

B.A. in Mathematics, concentration in Philosophy

Phi Beta Kappa

– Thesis advisor: Kyle Ormsby

– Thesis title: “Morse Theory and Flow Categories”

Portland, OR

2020

RESEARCH INTERESTS

Algebraic topology, homotopy theory, and category theory, with a focus on higher algebraic K -theory, equivariant and stable homotopy theory, and applications to manifolds.

PAPERS AND PUBLICATIONS

Research publications

- *Segal K -theory factors through Waldhausen categories*. Joint with D. Chan. 2025. 14 pages. Available at arXiv:2506.13732. *To appear in Proceedings of the American Mathematical Society*.
- *A linearization map for genuine equivariant algebraic K -theory*. Joint with D. Chan and A. Mejia. 2023. 50 pages. Available at arXiv:2309.08025. *To appear in Algebraic & Geometric Topology*.
- *Squares K -theory and 2-Segal spaces*. Joint with M. Sarazola. *Annals of K-Theory* Vol. 11, No. 2 (2026), pp 261–308.
- *A genuine G -spectrum for the cut-and-paste K -theory of G -manifolds*. Joint with D. Chan. 2026. 15 pages. *Bulletin of the London Mathematical Society*, Vol. 58, No. 4: e70352. 16 pages.
- *Equivariant Trees and Partition Complexes*. Joint with J.E. Bergner, P. Bonventre, D. Chan, and M. Sarazola. 2026. *Theory and Applications of Categories*: Vol. 45, 2026, No. 15, pp 501–536.
- *The spectrum of the Burnside Tambara functor*. Joint with D. Chan, D. Mehrle, J.D. Quigley, B. Spitz, and D. Van Niel. 2026. *International Mathematics Research Notices*: Vol. 2026, Iss. 2, rnaf388. 26 pages.
- *Nested cobordisms, Cyl-objects and Temperley-Lieb algebras*. Joint with R.S. Hoekzema, L. Murray, N. Pacheco-Tallaj, C. Rovi, and S. Sridhar-Shapiro. 2025. *Topology and its Applications*: Vol. 376, 109448. 36 pages.

- *A combinatorial K-theory perspective on the edge reconstruction conjecture in graph theory.* Joint with J. J. Gould. 2025. *Homology, Homotopy, and Applications*: Vol. 27(1), pp.293–322.
- *The Spectrum of the Burnside Tambara Functor of a Cyclic Group.* Joint with S. Ginnett. 2023. *Journal of Pure and Applied Algebra*: Vol. 227, Iss. 8, 107344. 23 pages.
- *The Tambara Structure of the Trace Ideal on Cyclic Groups.* Joint with S. Ginnett, with an appendix by H. Chen and X. Chen. 2020. *Journal of Algebra*: Vol. 560, pp.114–143.
- *Sharp Sectional Curvature Bounds and a New Proof of the Spectral Theorem.* Joint with C. Dunn. 2020. *Involve, a Journal of Mathematics*: Vol. 13, No. 3, pp.445–454.
- *k-Plane Constant Curvature Conditions.* 2019. *Rose-Hulman Undergraduate Mathematics Journal*: Vol. 20, Iss. 2, Article 6. 20 pages.

Preprints

- *On the classifying space of a Morse flow category.* Joint with F. Liu. 2026. 32 pages. Available at arXiv:2603.23695.
- *A comparison of definitions of equivariant trees.* Joint with J.E. Bergner, D. Chan, A. Osorno, and M. Sarazola. 2025. 31 pages. Available at arXiv:2512.14956. *Submitted*.
- *Equivariant algebraic K-theory for symmetric monoidal Mackey functors.* Joint with D. Chan and M. Péroux. 2023. 32 pages. Available at arXiv:2312.04705. *Submitted*.

Other publications

- *Looking into Mirror Symmetry at the 2024 JMM.* In *Feature Stories of the American Mathematical Society*, February 2024.
- *Bringing Math into The Conversation: My Summer as a Mass Media Fellow.* In *Notices of the American Mathematical Society*, February 2024, pp.274–275.
- *A brief illustrated guide to ‘scissors congruence’ – an ancient geometric idea that’s still fueling cutting-edge mathematical research.* Co-authored with M. Merling. 2023. *The Conversation U.S.*
- *Proving Fermat’s last theorem: 2 mathematicians explain how building bridges within the discipline helped solve a centuries-old mystery.* Co-authored with D. Bressoud. 2023. *The Conversation U.S.*

FELLOWSHIPS, GRANTS, AND AWARDS

Academic and research

- Carlitz–Zippin Prize for an exceptional Ph.D. thesis
University of Pennsylvania, Mathematics Department 2026
- Mathematical Sciences Postdoctoral Research Fellowship
National Science Foundation 2026
Award deferred (1 year) for a postdoctoral appointment at the University of Bonn
- AIM SQuaREs grant for “Algebras over genuine equivariant operads”
American Institute of Mathematics 2025
- AIM SQuaREs grant for “An algebraic approach to Thom spectra”
American Institute of Mathematics 2025
- AIM SQuaREs grant for “Two-dimensional nested cobordisms and TQFTs with substructure”
American Institute of Mathematics 2024
- Herbert S. Wilf Memorial Award for excellence in research and communication
University of Pennsylvania, Mathematics Department 2023–2024
- Dean’s Scholar
University of Pennsylvania, School of Arts & Sciences 2023
- Graduate Research Fellowship
National Science Foundation 2020–2025
- Calabi Scholar
University of Pennsylvania, Mathematics Department 2020–2025
- Benjamin Franklin & Fontaine Fellowship
University of Pennsylvania 2020–2025
- Phi Beta Kappa
Reed College 2020

- Commendation for Academic Achievement
Reed College 2016-2020
- Teaching and pedagogy
- Moez Alimohamed Graduate Student Teaching Award for excellence in teaching
University of Pennsylvania, Mathematics Department 2026
 - Prison Teaching Initiative Graduate Fellow
Prison Teaching Initiative at Princeton University 2024-2025
 - CETLI Teaching Certificate
Center for Teaching and Learning at the University of Pennsylvania 2024
 - Master TA
University of Pennsylvania, Mathematics Department 2023-2026
 - Inclusive & Equitable Teaching Fellow
Center for Teaching and Learning at the University of Pennsylvania 2023-2024
 - Good Teaching Award, Math 3700
University of Pennsylvania, Mathematics Department Fall 2022
- Service, communication, and outreach
- Postdoctoral/Advanced Graduate Ambassadorship
Lisa Simonyi and the Women and Mathematics Program at the Institute for Advanced Study 2023-2024
 - Mass Media Fellow
American Association for the Advancement of Science
Sponsored by the American Mathematical Society and hosted by The Conversation U.S. 2023
 - Penn Graduate Community-Engagement Research Fellow
The Netter Center at the University of Pennsylvania Summers 2021 and 2022
 - Elevating Mathematics competition, honorable mention (joint with L. Williams)
National Academies of Sciences, Engineering, and Medicine 2020
 - MAA MathFest Outstanding Presentation Award
Joint Mathematics Meetings 2019

TEACHING EXPERIENCE

The University of Pennsylvania	Philadelphia, PA
Instructor <i>Math 3120: Linear algebra</i>	Summer 2025
Teaching Assistant <i>Math 3700: Algebra</i>	Spring 2026
<i>Math 2600: Honors Calculus II</i>	Spring 2023
<i>Math 3700: Algebra</i>	Fall 2022
Grader <i>Math 6180: Algebraic Topology I</i>	Fall 2025
Workshop Facilitator <i>Trauma-Informed Pedagogy</i>	Spring 2025
<i>Inclusive & Equitable Teaching in Mathematics (mini-course)</i>	Fall 2023
<i>Mathematics Department TA Training</i>	Falls 2023–2025
<i>School of Arts & Sciences Graduate TA Training: Inclusive & Equitable Teaching at Penn</i>	Fall 2023
Reed College	Portland, OR
Individual Tutor and Drop-in Tutor at the Math Help Center <i>Math 111: Calculus, Math 112: Introduction to Analysis, Math 113: Discrete Structures,</i> <i>Math 201: Linear Algebra, Math 202: Vector Calculus, Math 311: Complex Analysis,</i> <i>Math 321: Real Analysis, and Math 332: Abstract Algebra</i>	Spring 2017–Spring 2020
Course Assistant <i>Math 202: Vector Calculus</i>	Fall 2018–Spring 2020
Prison teaching	
Co-instructor at State Correctional Institution Chester <i>Mathematics in the Courtroom</i>	Chester, PA Spring 2026
Co-instructor at South Woods State Prison <i>Math-015: Beginning Mathematics</i>	Bridgeton, NJ Fall 2024

<i>Math-015: Beginning Mathematics</i>	Spring 2022
Co-instructor at Garden State Youth Correctional Facility	Crosswicks, NJ
<i>Math-015: Beginning Mathematics</i>	Fall 2021
• Moez Alimohamed Graduate Student Teaching Award for excellence in teaching <i>University of Pennsylvania, Mathematics Department</i>	2023-2024
Mathematics Tutor at South Woods State Prison	Bridgeton, NJ
<i>Math-010: Number Systems, Math-015: Beginning Mathematics,</i> <i>Math-020: Elementary Algebra</i>	2023–2025
Course Development team leader <i>Math-015: Beginning Mathematics</i>	Summer 2024

OTHER EXPERIENCE AND SERVICE

Seminar and conference organization

- **Talbot Workshop** 2023–2026
 - Talbot 2026: Topological holography
co-organizer with A. Karapetyan, C. Li, and S. Xue
 - Talbot 2025: Homological stability,
co-organizer with A. Karapetyan and E. Sukarto
 - Talbot 2024: Topological cyclic homology of ring spectra,
co-organizer with A. Holeman, A. Karapetyan, L. Keenan, and E. Sukarto
 - Talbot 2023: Computations in stable motivic homotopy theory,
co-organizer with A. Holeman, L. Keenan, E. Sukarto, and L. Yang
- **Atlantic Meeting on Topology, Representation theory, and K -theory (AMTRaK),** 2024–2025
co-organizer with A. Chedalavada and B. Spitz
 - Homological stability, at the University of Pennsylvania March–April 2025
 - Hermitian K -theory, at the University of Virginia February 2025
 - Dualizable categories and continuous K -theory, at Johns Hopkins University November 2024
 - Equivariant and parametrized homotopy theory, at the University of Pennsylvania September 2024
- **Gender Minorities in Topology and Related Areas Konfernce (GeMTRAK)** April 2024
at the University of Pennsylvania, *co-organizer with M. Ong and H. Stufflebeam*
- **Graduate Geometry/Topology Seminar** at the University of Pennsylvania, 2022–2023
co-organizer with A. Mejia
- **Graduate Pizza Seminar** at the University of Pennsylvania, *co-organizer with K. Canzius* 2021–2022
- **UP GRADe** workshop at the University of Pennsylvania, *co-organizer with* October 2021
A. Gibney, J. Hartmann, M. Merling, M. Ong, and E. Urheim

Community building and mentorship

- **Directed Reading Program** at the University of Pennsylvania, *co-organizer with*
L. Ferreira Guilhoto (Fall 2023–Spring 2025) and mentor for the following projects:
 - Shotaro Hiranuma, *Continuing in category theory* Spring 2025
Category theory and logic Fall 2024
 - Talia Becker Calazans, *Combinatorial topology* Fall 2023
 - Elena Isasi Theus, *Algebraic topology and the mathematical basis of topological data analysis* Spring 2023
Fundamentals of computational applied topology Fall 2022
 - Cianán Conefrey-Shinozaki, *2D topological quantum field theories* Spring 2022
 - Michael Zeng, *Simplicial homotopy theory* Fall 2021
- **Prison Education Program** at Eastern University, *volunteer* Spring 2024
- **Prison Teaching Initiative** at Princeton University, *volunteer* 2021–2025
- **GeMs in Math** group at the University of Pennsylvania, *co-coordinator* 2021–2025
- **STEMGeMs** at Reed College, *co-leader and department liaison* 2019–2020

- **Peer Mentor Program** at Reed College, *mentor* 2017-2018

Science communication, outreach, and other service

- **Penn Grad Talks** at Penn Arts & Sciences *Natural Sciences finalist* Spring 2026
- **Math Circles** at West Philadelphia High School *Volunteer* Spring 2024
- **The Conversation U.S.** *Freelancer (Fall 2023) and AMS-AAAS 2023 Mass Media Fellow (Summer 2023)* 2023
- **Math Circles in West Philadelphia** project at the University of Pennsylvania *Graduate fellow, joint project with M. Ong, mentored by M. Merling and Y. Ou* Summer 2022
Philadelphia, PA
- **Mathematics Enrichment and Academically-Based Community Service** project at the University of Pennsylvania *Graduate fellow mentored by M. Merling* Summer 2021
Philadelphia, PA
- **Referee and reviewer** *PUMP Journal of Undergraduate Research, MathSciNet*

SELECTED RESEARCH WORKSHOPS

- **AIM Workshop** at American Institute of Mathematics *Invited participant in "Scissors congruences, algebraic K-theory and Steinberg modules"* July 2024
Caltech, CA
- **Women in Topology IV** at the Hausdorff Institute *Team member for research project on cobordism categories* August 2023
Bonn (Germany)
- **RTG Collaborative Workshop in Homotopy Theory** *Team member for research project on equivariant homotopy theory* August 2022
Lexington, VA
- **Collaborative Mathematics Research Group** at Reed College *Participant in undergraduate research program on algebraic topology* Summer 2019
Portland, OR
- **NSF REU** program at California State University, San Bernardino *Participant in undergraduate research program on differential geometry* Summer 2018
San Bernardino, CA

SELECTED TALKS AND PRESENTATIONS

Research conference talks

- AMS 2025 Fall Eastern Sectional Meeting, Special Session: Homotopy theory *Segal K-theory factors through Waldhausen categories* St. Louis, MO
October 2025
- CMO Workshop: Equivariant Topological Quantum Field Theory *Cut-and-paste K-theory of manifolds and cobordism* Oaxaca, Mexico
September 2025
- Mathematical Congress of the Americas, Special Session: Interactions of equivariant bordism and low dimensional topology *Towards algebraic K-theory of orbifolds* Miami, FL
July 2025
- Joint Mathematics Meetings, Special Session: Homotopical combinatorics *The Edge Reconstruction Conjecture and Combinatorial K-theory* Seattle, WA
January 2025
- Binghamton University Graduate Combinatorics, Algebra, and Topology Conference (BUGCAT) *The Edge Reconstruction Conjecture and Combinatorial K-theory* Binghamton, NY
October 2024
- AMS 2024 Fall Eastern Sectional Meeting, Special Session: Homotopy theory and K-theory *Squares K-theory and 2-Segal spaces* Albany, NY
October 2024
- Graduate Student Conference in Algebra, Geometry, and Topology *Equivariant Trees and Partition Complexes* Philadelphia, PA
June 2024
- Joint Mathematics Meetings, Special Session: Equivariant techniques in stable homotopy theory *A linearization map for equivariant A-theory* San Francisco, CA
January 2024
- Joint Mathematics Meetings, Special Session: Topics in equivariant algebra *Ideals in the Burnside Tambara functor on a cyclic group* San Francisco, CA
January 2024
- Binghamton University Graduate Combinatorics, Algebra, and Topology Conference (BUGCAT) *Equivariant Partition Complexes and Trees* Binghamton, NY
November 2022

Nebraska Conference for Undergraduate Women in Mathematics <i>The Tambara Structure of the Trace Ideal</i>	Lincoln, NE January 2020
Undergraduate Mathematics Symposium <i>Putting the 'k' in Curvature: k-Plane Constant Curvature Conditions</i>	Chicago, IL November 2018
Northwest Undergraduate Mathematics Symposium <i>Putting the 'k' in Curvature: k-Plane Constant Curvature Conditions</i>	Salem, OR November 2018

Invited seminar talks

Texas State Topology Seminar <i>Classifying spaces and Morse flow categories</i>	San Marcos, TX May 2026
University of New Mexico Geometry & Topology Seminar <i>Towards algebraic K-theory of orbifolds</i>	Las Cruces, NM March 2026
University of Pennsylvania Geometry & Topology Seminar <i>Nested cobordisms and TQFTs</i>	Philadelphia, PA February 2026
University of Copenhagen Algebra and Topology Seminar <i>Towards algebraic K-theory of orbifolds</i>	Online February 2026
Topological Quantum Field Theory Club Seminar <i>Nested cobordisms and TQFTs</i>	Online January 2026
University of Indiana Bloomington Topology Seminar <i>Cut-and-paste K-theory of manifolds and SK-automorphisms</i>	Bloomington, IN December 2025
Universität Bonn Topology Seminar <i>Towards algebraic K-theory of orbifolds</i>	Bonn, Germany November 2025
Brown University Topology Seminar <i>Cut-and-paste K-theory of manifolds and SK-automorphisms</i>	Providence, RI November 2025
PIMS Collaborative Research Group "Diagram Categories in Homotopy Theory" Seminar <i>Cut-and-paste K-theory of manifolds and SK-automorphisms</i>	Online October 2025
University of Pennsylvania Geometry & Topology Seminar <i>Towards algebraic K-theory of orbifolds</i>	Philadelphia, PA February 2025
University of Chicago Topology Seminar <i>Towards A-theory of orbifolds</i>	Chicago, IL January 2025
Northwestern University Topology Seminar <i>Towards A-theory of orbifolds</i>	Evanston, IL January 2025
University of Virginia Topology Seminar <i>Towards A-theory of orbifolds</i>	Charlottesville, VA November 2024
Johns Hopkins University Topology Seminar <i>Towards A-theory of orbifolds</i>	Baltimore, MD October 2024
Texas State Topology Seminar <i>A linearization map for equivariant A-theory</i>	San Marcos, TX March 2024
University of Indiana Bloomington Topology Seminar <i>Nested Cobordisms and TQFTs</i>	Bloomington, IN March 2024
University of Minnesota Topology Seminar <i>All connective G-spectra come from K-theory</i>	January 2024 Minnesota, MN
Loyola University TACO Seminar <i>Equivariant Partition Complexes and Trees</i>	Chicago, IL November 2023
Michigan State University RTG Seminar <i>Nested Cobordisms and TQFTs</i>	East Lansing, MI November 2023
SUNY Binghamton Geometry and Topology Seminar <i>Nested Cobordisms and TQFTs</i>	Binghamton, NY September 2023
UCLA Algebraic Topology Seminar <i>Equivariant Partition Complexes and Trees</i>	Los Angeles, CA May 2023
UCSD Topology Seminar <i>Equivariant Partition Complexes and Trees</i>	San Diego, CA May 2023
Purdue University Topology Seminar <i>Equivariant Partition Complexes and Trees</i>	Lafayette, IN April 2023

University of Rochester Topology Seminar
Equivariant Partition Complexes and Trees

Rochester, NY
April 2023

University of Virginia Topology Seminar
Equivariant Partition Complexes and Trees

Charlottesville, VA
February 2023

Invited expository talks

Penn Arts & Sciences Penn Grad Talks

What is math good for, anyways? (short talk)

Philadelphia, PA
March 2026

Moduli spaces of pseudo-holomorphic curves workshop

Orbispaces as stacks: geometry and examples

Otego, NY
May 2025

SLMath Hot Topics Workshop: Life after the Telescope Conjecture
Cyclotomic spectra

Berkeley, CA
December 2024

Talbot 2024: Topological cyclic homology of ring spectra
THH as a cyclotomic spectrum

Nacogdoches, TX
August 2024

Scissors congruences, algebraic K-theory and Steinberg modules AIM Workshop
The scissors congruence K-theory of polytopes is a Thom spectrum

Pasadena, CA
July 2024

Spaces of Manifolds: Algebraic and Geometric Approaches BIRS seminar
The stable parametrized h-cobordism theorem: the K-theory part

Online
October 2023

Scissors Congruence, Algebraic K-Theory, and Trace Methods summer school
Cut-and-paste K-theory of manifolds and square K-theory

Bloomington, IN
June 2023

Talbot 2022: Scissors congruence and algebraic K-theory
Square K-theory and Manifold Invariants

New Lebanon, NY
June 2022

Talks for undergraduates

UPGrade Workshop

Scissors Congruence: how to cut up shapes and get away with it (short talk)

Philadelphia, PA
May 2026

Reed College Mathematics Colloquium

The Edge Reconstruction Conjecture and Combinatorial K-theory

Portland, OR
October 2024

Providence College Mathematics Colloquium

The Edge Reconstruction Conjecture and Combinatorial K-theory

Providence, RI
September 2024

Temple University Math Club

Scissors Congruence: how to cut up shapes and get away with it

Philadelphia, PA
March 2024

Penn Undergraduate Mathematics Society (PUMS) speaker series
Social choice problems and algebraic topology (short talk)

Philadelphia, PA
April 2024

Configurations in the plane (short talk)

November 2023

Scissors Congruence: how to cut up shapes and get away with it

December 2022