J.D. Quigley

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Employment

Assistant Professor, University of Virginia. August 2023 - Present.

RTG Postdoctoral Scholar, University of Oregon. Mentor: Dan Dugger. September 2022 - August 2023.

Postdoctoral Fellow, Max Planck Institute for Mathematics. Mentor: Tobias Barthel. Fall 2022.

H.C. Wang Assistant Professor, Cornell University. Mentor: Inna Zakharevich. July 2019 - June 2022.

Education

Ph.D. in Mathematics, University of Notre Dame. Advisor: Mark Behrens. June 2014 - May 2019.

B.S. in Mathematics, University of Illinois at Urbana-Champaign. August 2011 - December 2013.

Grants, Honors, and Awards

NSF CAREER Grant: Symmetry in geometry, topology, and algebra (PI), DMS-2441241. August 2025-July 2030.

4-VA Collaborative Research Grant: Collaborative workshops in topology (PI J.D. Quigley, co-PIs Harrison Bray, Rebecca Field, Anton Lukyanenko, Sara Maloni, and Allison Moore). June 2025-June 2026.

NSF Standard Grant: Stable homotopy theory in algebra, topology, and geometry (PI), DMS-2414922 (formerly DMS-2314082 and DMS-2203785). December 2022-November 2025.

NSF RTG Grant: Electronic Computational Homotopy Theory Research Community (PI Daniel Isaksen, co-PIs Bertrand Guillou, J.D. Quigley, Vesna Stojanoska), DMS-2135884. August 2022-July 2025.

UVA Internal Grant for Community Engaged Course. Spring 2024.

AMS-Simons Travel Grant. July 2021-June 2023.

Sady Dissertation Prize. Mathematics Department, University of Notre Dame. 2019.

Oberwolfach Junior Fellows Travel Grant. 2018, 2019.

AMS Graduate Student Travel Grant. 2016.

Honorable Mention, National Science Foundation Graduate Research Fellowship. 2015, 2016.

Elizabeth R. Bennett Scholarship in Mathematics. University of Illinois at Urbana-Champaign. 2013.

Elsie Thomas Fraser Award in Mathematics. University of Illinois at Urbana-Champaign. 2012.

Publications

1. *Pathological computations of Mackey functor-valued Tor over cyclic groups*, with David Mehrle and Michael Stahlhauer.
   Bulletin of the London Mathematical Society, to appear. arXiv:2410.11974.
2. *A motivic analogue of the $K(1)$-local sphere spectrum*, with William Balderrama and Kyle Ormsby.
   Journal of the European Mathematical Society, to appear. arXiv:2307.13512.
3. *Chromatic complexity of the algebraic K-theory of $y(n)$*, with Gabriel Angelini-Knoll.
   Journal of Pure and Applied Algebra 229-9 (2025), 108027.
4. *The motivic lambda algebra and motivic Hopf invariant one problem*, with William Balderrama and Dominic Leon Culver.
   Geometry & Topology 29-3 (2025), 1489-1570.
5. *On the parametrized Tate construction*, with Jay Shah.
   Journal of Topology 18-1 (2025), e70018.
6. *The slice spectral sequence for a motivic analogue of the connective $K(1)$-local sphere*, with Hana Jia Kong.
   Proceedings of the London Mathematical Society 129-5 (2024), e70006.
7. *Some smooth circle and cyclic group actions on exotic spheres*.
   Proceedings of the American Mathematical Society 152 (2024), 1777-1788.
8. *The 2-primary Hurewicz image of tmf*, with Mark Behrens and Mark Mahowald.
   Geometry & Topology 27-7 (2023), 2763-2831.
9. *Ranks of $RO(G)$-graded stable homotopy groups of spheres for finite groups G*, with J.P.C. Greenlees.
   Proceedings of the American Mathematical Society, Series B 10 (2023), 101-113.
10. *Free incomplete Tambara functors are almost never flat*, with Mike Hill and David Mehrle.
    International Mathematics Research Notices 2023-5, 4225-4291.
11. *Tate blueshift and vanishing for Real oriented cohomology theories*, with Guchuan Li and Vitaly Lorman.
    Advances in Mathematics 411 (2022), 108780.
12. *tmf-based Mahowald invariants*.
    Algebraic & Geometric Topology 22-4 (2022), 1789-1839.
13. *Algebraic slice spectral sequences*, with Dominic Culver and Hana Jia Kong.
    Documenta Mathematica 26 (2021), 1085-1119.
14. *Motivic Mahowald invariants over general base fields*,
    Documenta Mathematica 26 (2021), 561-582.
15. *kq-resolutions I*, with Dominic Culver.
    Transactions of the American Mathematical Society 374-7 (2021), 4655-4710.
16. *Real motivic and C_2-equivariant Mahowald invariants*.
    Journal of Topology 14-2 (2021), 369-418.
17. *The Segal Conjecture for topological Hochschild homology of the Ravenel spectra*, with Gabriel Angelini-Knoll.
    Journal of Homotopy and Related Structures 16-1 (2021), 41-60.

18. *The motivic Mahowald invariant*.
    Algebraic & Geometry Topology 19-5 (2019), 2485–2534.
19. *Computing Primitively-Rooted Squares and Runs in Partial Words*, with Francine Blanchet-Sadri, Justin Lazarow, Jordan Nikkel, and Xufan Zhang.
    European Journal of Combinatorics 68 (2018), 223-241.
20. *Squares and Primitivity in Partial Words*, with Francine Blanchet-Sadri, Michelle Bodnar, Jordan Nikkel, and Xufan Zhang.
    Discrete Applied Mathematics 185 (2015), 26-37.
21. *Squares in Partial Words*, with Francine Blanchet-Sadri, Yang Jiao, John Machacek, and Xufan Zhang.
    Theoretical Computer Science 530 (2014), 42-57.

Preprints

1. *The spectrum of the Burnside Tambara functor*, with Maxine Elena Calle, David Chan, David Mehrle, Ben Spitz, and Danika Van Niel.
   arXiv:2506.10727.
2. *Real syntomic cohomology*, with Gabriel Angelini-Knoll and Hana Jia Kong.
   Submitted. arXiv:2505.24734.
3. *On the Tambara affine line*, with David Chan, David Mehrle, Ben Spitz, and Danika Van Niel.
   Submitted. arXiv:2410.23052.
4. *A simple η-torsion family in the stable stems,* with Irina Bobkova.
   Submitted. arXiv:2410.21181.
5. *Koszul resolutions over incomplete Tambara functors for cyclic p-groups*, with David Mehrle and Michael Stahlhauer.
   Submitted. arXiv:2407.18382.
6. *New infinite families in the stable homotopy groups of spheres*, with Prasit Bhattacharya and Irina Bobkova.
   Submitted. arXiv:2404.10062.
7. *Bredon homological stability for configuration spaces of G-manifolds*, with Eva Belmont and Chase Vogeli.
   Submitted. arXiv:2311.02459.
8. *Symmetries of exotic spheres via complex and quaternionic Mahowald invariants*, with Boris Botvinnik.
   Submitted. arXiv:2309.04275.
9. *On the equivalence of two theories of real cyclotomic spectra*, with Jay Shah.
   Submitted. arXiv:2112.07462.

Talks

Invited conference talks

Minicourse, Research School on Algebra and Topology in the Philippines, Bohol Island State University. January 2026.

Equivariant, Motivic, and Physical Topology in the Midwest, University of Minnesota. October 2025.

International Workshop on Algebraic Topology, Zhejiang University. July 2025.

New Horizons for Equivariance in Homotopy Theory, Isaac Newton Institute. May 2025.

Upstate New York Topology Seminar, Binghamton University. March 2025.

Special Session: Homotopy and Algebraic K-Theory, AMS Sectional, SUNY Albany. October 2024.

Algebraic Structures in Topology II, San Juan, Puerto Rico. June 2024.

International Workshop on Algebraic Topology, Beijing International Center for Mathematical Research, Peking University. July 2023.

Baues Memorial Conference, Max Planck Institute for Mathematics Bonn. October 2022.

Mini-symposium: K-Theory, Symmetry, and Periodicity, Free University of Berlin. September 2022.

Motivic Geometry Conference, University of Oslo. August 2022.

Parallel Session on Algebraic Topology, Union College Mathematics Conference. June 2022.

Special Session: Homotopy Theory, AMS Sectional, University of Virginia. March 2022. (cancelled)

Midwest Topology Seminar (virtual). October 2020.

Special Session: Motivic Aspects of Topology and Geometry, AMS Sectional, University of Virginia. March 2020. (cancelled)

Workshop on Equivariant Stable Homotopy Theory and p-adic Hodge Theory, Banff International Research Station. March 2020.

International Workshop on Algebraic Topology (grad student talk), Fudan University. August 2019.

Equivariant Topology & Derived Algebra (A Jolly Pleasant Conference for Greenlees), Norwegian University of Science and Technology. August 2019.

Special Session: Structured Homotopy, AMS Sectional, University of Michigan. October 2018.

Young Topologists Meeting, University of Copenhagen. July 2018.

Special Session: Homotopy Theory, AMS Sectional Meeting, Ohio State University. March 2018.

Young Topologists Meeting, University of Stockholm. July 2017.

Invited colloquium and seminar talks

KTH Algebraic Topology Seminar. May 2025.

Massachusetts Institute of Technology Topology Seminar. April 2025.

Oregon State University Colloquium. April 2025.

Oregon State University Geometry-Topology Seminar. April 2025.

Indiana University Topology Seminar. February 2025.

University of Virginia Topology Seminar. September 2024.

Indiana University Topology Seminar. April 2024.

Michigan State University Topology Seminar. April 2024.

Ohio State University Homotopy Theory Seminar. April 2024.

University of Minnesota Topology Seminar. February 2024.

Columbia Algebraic Topology Seminar. November 2023.

University of Virginia Topology Seminar. September 2023.

University of Washington Topology Seminar. March 2023.

University of Oregon Topology Seminar. February 2023.

Case Western Reserve University Colloquium. January 2023.

University of Oregon Colloquium. January 2023.

University of Kentucky Colloquium. January 2023.

University of Virginia Colloquium. January 2023.
Université Sorbonne Paris Nord Topology Seminar. November 2022.
Max Planck Institute for Mathematics Topology Seminar. September 2022.
University of Pennsylvania Homotopy Theory Seminar. September 2022.
University of Osnabrueck Topology Seminar. September 2022.
Monthly meeting, NSF FRG on Trace Methods and Cut-and-Paste K-Theory. October 2021.
Electronic Computational Homotopy Theory Seminar. April 2021.
Indian Institute of Technology Roorkee Motivic Homotopy Theory Seminar. April 2021.
University of Michigan Algebraic Topology Seminar. April 2021.
Princeton University Algebraic Topology Seminar. February 2021.
Free University of Berlin Topology Seminar. November 2020.
University of California, Los Angeles Topology Seminar. November 2020.
Johns Hopkins University Topology Seminar. February 2020.
Wayne State University Topology Seminar. November 2019.
Massachusetts Institute of Technology Topology Seminar. October 2019.
Cornell University Topology and Geometric Group Theory Seminar. September 2019.
University of Osnabrueck Topology Seminar. April 2019.
University of Rochester Topology Seminar. February 2019.
University of Virginia Topology Seminar. November 2018.
University of Illinois at Urbana-Champaign Topology Seminar. November 2018.
University of Chicago Topology Seminar. November 2018.
Northwestern University Topology Seminar. October 2018.
University of Kentucky Topology Seminar. October 2018.
University of Notre Dame Topology Seminar. October 2018.
University of Oslo Topology Seminar. August 2018.
Michigan State University Geometry and Topology Seminar. November 2017.
Ohio State University Motivic Cohomology and Homotopy Theory Seminar. October 2017.

Selected expository and contributed talks

K-Theory Summer School at University of Southern California. August 2018.
European Talbot Workshop. June 2017.
Talbot Workshop. May 2017.
Talbot Workshop. April 2016.

Teaching

University of Virginia

Instructor, Calculus on Manifolds. Spring 2026.
Instructor, Transition to Higher Mathematics. Fall 2025.
Instructor, Homotopy Theory. Fall 2025.
Instructor, Algebraic Topology I. Spring 2025.
Instructor, General Topology. Fall 2024.

Instructor, Transition to Higher Mathematics. Spring 2024.

Instructor, Algebraic Topology II. Fall 2023.

University of Oregon

Instructor, Sequences and Series. Spring 2023.

Instructor, Single-Variable Integral Calculus. Winter 2023.

Cornell University

Instructor, Multivariable Calculus (2 sections). Spring 2022.

Instructor, Prove It!. Fall 2021.

Instructor, Topics in Topology: Stable Homotopy Theory. Spring 2021.

Instructor, Finite Math for the Life and Social Sciences (2 sections). Fall 2020.

Instructor, Calculus III. Spring 2020.

Instructor, Calculus I (2 sections). Fall 2019.

University of Notre Dame

Head TA, Calculus B (2 sections). Spring 2019.

Head TA, Calculus A (2 sections). Fall 2017.

Instructor, Elements of Calculus I. Fall 2016.

TA, Calculus B (2 sections), Notre Dame. Spring 2016.

TA, Calculus A (3 sections), Notre Dame. Fall 2015.

Supervision

Postdoctoral researchers

Oliver Wang. AY 24-27.

Ben Spitz. AY 24-25.

David Mehrle (remote mentor). AY 23-25.

Graduate students

Jing Wang. AY 24-25 - Present.

Undergraduate research projects and directed readings (at University of Virginia unless otherwise noted)

Srinivasan Kannan (UVA), Sam Kaufman (UVA), and Liran Li (Carnegie–Mellon University), “Detecting cycles with genetic algorithms." AY 25-26.

Anthony Doll, “Homotopy theory" (reading course) and “Stable homotopy" (DMP thesis). AY 24-26.

Tán Phát Tran (Ho Chi Minh University), “Generalized (co)homology of projective spaces" (Vietnam Polymath REU project). AY 24-25.

Tanner Leonard, “Spectra and stable homotopy theory," “motivic homotopy theory," and “K-theory and motivic cohomology" (DMP thesis co-supervised with Valia Gazaki). Spring 2024 - Spring 2025.

Nate Bryerton, Arun Jannupreddy, Malik Kurtz, Dailin Li, Rohan Radadiya, Ridge Redding, and Eva Simpson, “Finite fields and coding theory" (Geometry Lab project co-supervised with Michael Wills). Fall 2024.

James Harbour, “Topological modular forms," “motivic homotopy theory." Spring 2024, Fall 2024.

Amartya Shekhar Dubey (NISER, Bhubaneswar, India), "Mahowald invariants.". Summer 2023.

Ting Gong (Notre Dame), "Algebraic number theory" by Jarvis, Neukirch. AY 18-19.

Anthony Napolitano (Notre Dame), "Modern cryptography and elliptic curves" by Shemanske. AY 17-18.

Christian Hokaj (Notre Dame), "Elliptic curves, modular forms, and their L-functions" by Lozano-Robledo. AY 16-17.

External service

Co-organizer, Electronic Computational Homotopy Theory Online Research Community. Fall 2019 - Present.

Main research seminar (co-organizer, Fall 2019 - present), reading seminar on homotopical combinatorics (co-organizer, Spring 2025), reading seminar on Mahowald invariants (co-organizer, Fall 2022), reading seminar on synthetic spectra (technical assistant, Spring 2022), reading seminar on equivariant homotopy theory (co-instructor, Fall 2021), mini-courses (co-organizer, Fall 2021 and Spring 2022), reading seminar on equivariant algebra (co-organizer, Spring 2021), Kan seminar (instructor, Fall 2019 and Fall 2020), and reading seminar on motives (co-organizer, Spring 2020).

Co-organizer, Special Session on Homotopy Theory, Joint Math Meeting. January 2026.

Mentor, Research School on Algebra and Topology in the Philippines. January 2026.

Mentor, Vietnam Polymath REU. AY 24-25.

Co-organizer, 4-VA Collaborative Workshop on Algebraic Topology. Summer 2025.

Co-organizer, Mid-Atlantic Topology Conference. March 2025.

Co-team leader (with Teena Gerhardt), research team for Cut-and-Paste Approaches to K-theory FRG Workshop, Vanderbilt University. Summer 2024.

Lecturer, IAS/PCMI Experimental Math Lab (approximately 30 participants). Summer 2024.

External expert, Master's Project Exam for Max Duparc, École Polytechnique Fédérale de Lausanne. Spring 2021.

Referee or quick opinion* for *Algebraic & Geometric Topology* (4 times, * 1 time); *Communications of the American Mathematical Society*; *Duke Mathematical Journal**; *Geometry & Topology**; *International Mathematics Research Notices* (2 times, * 2 times); *Journal of Automata, Languages, and Combinatorics*; *Journal of Homotopy and Related Structures* (2 times); *Journal of the Institute of Mathematics of Jussieu*; *Journal of Topology* (2 times); *Mathematische Zeitschrift* (2 times); *Memoirs of the American Mathematical Society*; *New York Journal of Mathematics (2 times)*; *Proceedings of the Royal Society of Edinburgh, Section A*; *Transactions of the American Mathematical Society*.

Reviewer for *zbMATH* and *MathSciNet*.

Panelist for NSF DMS.

Internal service (at University of Virginia unless otherwise noted)

Co-organizer, University of Virginia Topology Seminar. Fall 2023 - Present.

AY 24-25: HHMI Committee; Undergraduate Committee; GTA Development Committee; Graduate Admissions Committee; Faculty Advisor, UVA Geometry Lab; Co-organizer, Reading Seminar on Motivic Homotopy Theory (FA24); Thesis Defense Committees for Miika Tuominen and Valentina Zapata Castro (SP25).

AY 23-24: RTG Postdoc Hiring Committee (chair); Instructor, Math Circle; Lower Division Committee; Postdoc Hiring Committee (SP24); Co-coordinator, Calculus III (SP24); Co-organizer, Reading Seminar on Stable Homotopy Theory (SP24); Thesis Defense Committee for Tanner Carawan (SP24); APGF 1-year Renewals Committee (SP24).

AY 22-23 (at University of Oregon): Co-organizer, Topology Seminar. Winter, Spring 2023.

AY 21-22 (at Cornell University): K-12 Education & Outreach Committee; Co-organizer, Topology and Geometric Group Theory (FA21).

AY 19-21 (at Cornell University): Advanced Placement Exams Committee.

AY 16-19 (at Notre Dame): Co-organizer, Graduate Student Topology Seminar.

Topics included functor calculus (Spring 2019), geometric group theory (Fall 2018), topological field theories (Spring 2018), operads and delooping machinery (Fall 2017), equivariant stable homotopy theory (Spring 2017), and rational homotopy theory (Fall 2016).

Outreach

Instructor, MATH 3000, 4770, and 7800 with K-12 outreach components. Spring 2024 - Fall 2025.

Instructor, Math Circle (for grades 5-7), Charlottesville, VA. Fall 2023 - Fall 2024.

Co-organizer, Starr Hill Pathways visits to UVA Geometry Lab, Charlottesville, VA. Fall 2023, Fall 2024.

Instructor, Math Circle (for grades 10-12), Eugene, OR. March 2023 - June 2023.

Volunteer, Eugene Math Festival, Eugene, OR. February 2023.

Advisor and Faculty Organizer, Math Explorer's Club, Cornell University. AY 19-22.

Instructor, Little Circle (Ithaca Math Circle for grades K-3). Spring 2021 - Spring 2022.

Volunteer, Robinson Community Learning Center, South Bend, IN. Spring 2017 - Spring 2019.

Volunteer and Instructor, Riverbend Community Math Center, South Bend, IN. Summer 2014 - 2016.

Assistant Manager, Illinois Geometry Lab, University of Illinois at Urbana-Champaign. Spring 2014.