Thomas Brazelton

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EMPLOYMENT	**Harvard University**	Cambridge, MA
	NSF Postdoctoral Fellow	2023—2026

EDUCATION	**The University of Pennsylvania**	Philadelphia, PA
	Ph.D, Mathematics	2018—2023
	NSF Graduate Research Fellow	
	The Johns Hopkins University	Baltimore, MD
	B.A. + M.A., Mathematics	2014—2018

PUBLICATIONS
AND
PREPRINTS

11. Equivariant enumerative geometry, 36 pages, 2022. Preprint, available at arXiv:2210:08622.
10. An enriched degree of the Wronski, 24 pages, 2022. Submitted, available at arXiv:2206:01143.
9. Residue sums of Dickson polynomials over finite fields, with J. Harrington, M. Litman, T. H. W. Wong. 19 pages, 2021. Submitted, available at arXiv:2103:09119.
8. Bézoutians and the $\mathbb{A}^1$-degree, with S. McKean and S. Pauli. 30 pages, 2021. To appear in *Algebra & Number Theory*.
7. Lifts, transfers, and degrees of univariate maps, with S. McKean. *Mathematica Scandinavica* **129** (2023) pp. 5—38.
6. Homotopy Mackey functors of equivariant algebraic K-theory. *Journal of Pure and Applied Algebra*, **226(8)**, August 2022.
5. An introduction to $\mathbb{A}^1$-enumerative geometry. In Neumann F., Pál A. (eds) *Homotopy Theory and Arithmetic Geometry — Motivic and Diophantine Aspects*. Lecture notes in Mathematics, vol **2292**. Springer, Cham. 2021.
4. A note on semilinearization and twisted group rings. *Communications in Algebra*, **49:8**, 3380—3386, 2021.
3. The trace of the local $\mathbb{A}^1$-degree, with R. Burklund, M. McKean, M. Montoro, M. Opie. *Homology, Homotopy and Applications* **23(1)** (2021) pp. 1—14.
2. Zeros of newform Eisenstein series on $\Gamma_0(N)$, with V. Jakicic, *J. Number Theory* **190** (2018) pp. 109—130.
1. On consecutive primitive nth roots of unity modulo q, with J. Harrington, S. Kannan, and M. Litman, *J. Number Theory* **174** (2017) pp. 494—504.

RESEARCH TALKS	Notre Dame Algebraic Geomerty & Commutative Algebra Seminar	May 2023
	University of Maryland Algebra & Number Theory Seminar	Mar 2023
	Tulane University Algebraic Geometry & Geometric Topology Seminar	Feb 2023
	Emory University Algebra Number Theory Seminar	Feb 2023
	University of Waterloo Geometry/Topology Seminar	Feb 2023
	University of Virginia Topology Seminar	Feb 2023
	Brown University Algebraic Geometry Seminar	Feb 2023
	JMM Special Session on Applied Enumerative Geometry	Jan 2023
	UCLA Topology Seminar	Nov 2022
	Rochester University Topology Seminar	Nov 2022
	Binghamton University Graduate Conference (BUGCAT)	Nov 2022
	Binghamton University Topology Seminar	Nov 2022
	AMS Special Session on K-theory and Chromatic Homotopy Theory, U-Utah	Oct 2022
	Johns Hopkins University Topology Seminar	Oct 2022

Loyola University Chicago Topology, Algebra, Combinatorics & Operators Seminar	Oct 2022
UChicago Topology Seminar	Oct 2022
Young Topologists Meeting 2022, Copenhagen	Jul 2022
Homotopy Theory with Applications to Arithmetic and Geometry, Fields Institute	Jun 2022
GROOT (Graduates Reminisce Online On Topology)	Jun 2022
Algebraic Structures in Topology, San Juan	Jun 2022
Algebra Seminar, Texas A&M University	Mar 2022
FRG Grant on Trace Methods	Jan 2022
SECANT 2021, Cedar Crest College	Jan 2022
Topology/Geometry Seminar, University of Oregon	Nov 2021
Geometry/Topology Seminar, University of Pennsylvania	Nov 2021
Algebra Seminar, University of Pennsylvania	Nov 2021
Young Topologists Meeting 2020/2021	Jul 2021
Algebra Seminar, University of Pennsylvania	Apr 2020
Binghamton University Graduate Conference (BUGCAT)	Nov 2020
Geometry/Topology Seminar, University of Pennsylvania	Oct 2020
AMS Fall Sectional, UW-Madison	Sep 2019
PIMS Workshop on Arithmetic Topology	Jun 2019
Rényi Institute Number Theory Seminar, Budapest	Sep 2016

AWARDS AND FELLOWSHIPS		
	NSF Postdoctoral Research Fellowship	2023—2026
	AMS Travel Grant	2022
	Graduate Fellow for Teaching Excellence, Penn Center for Teaching and Learning	2022—2023
	Moez Alimohamed Graduate Student Award for Distinguished Teaching in Mathematics, University of Pennsylvania	2021
	Graduate Fellow for Equitable and Inclusive Teaching, Penn Center for Teaching and Learning	2021—2022
	Master TA, University of Pennsylvania Mathematics Department	2021—2023
	Dean's Scholar, University of Pennsylvania Honored as one of nine doctoral students across the School of Arts & Sciences.	2020—2021
	Good Teaching Award, University of Pennsylvania Mathematics Department	Fall 2020
	NSF Graduate Research Fellow	2019 — 2024
	Calabi Fellow, University of Pennsylvania Mathematics Department	2017 — 2020
	J.J. Sylvester Award for Excellence in Mathematics (Johns Hopkins)	May 2018
	NSF GRFP, Honorable Mention	2018
	William Lowell Putnam Award (Johns Hopkins)	May 2016

Teaching	**Electronic Computational Homotopy Theory Seminar (eCHT)**	
	Co-organizer, Algebraic, motivic, and topological vector bundles	Fall 2023
	Designed and co-organized a seminar with Morgan Opie.	

Electronic Computational Homotopy Theory Seminar (eCHT)
Co-organizer, Algebraic, motivic, and topological vector bundles — Fall 2023
Designed and co-organized a seminar with Morgan Opie.

University of Pennsylvania
Instructor of record, MATH8100 Enumerative Geometry — Spring 2023
Designed and taught an inquiry-based learning course on enumerative geometry for graduate students and advanced undergrads.

Penn Directed Reading Program — Fall 2019 — Spring 2023

Co-founded and co-organized the DRP at Penn with Mona Merling (Fall 2019), co-organized with George Wang (Spring 2020 — Spring 2021), and with Marielle Ong (Fall 2021 — Present). Mentor for the following projects:

$\mathbb{A}^1$-*Milnor numbers*, Zhong Zhang — Spring 2023
Algebraic geometry from an $\mathbb{A}^1$-viewpoint, Zhong Zhang — Fall 2022
Enumerative geometry and string theory II, Zhong Zhang — Spring 2022
Enumerative geometry and string theory, Zhong Zhang — Fall 2021
Category theory and homotopy theory, Abigail Timmel — Spring 2020
Group theory and applications, Stephanie Wu — Fall 2019
Persistent homology, Mira Wattal (JHU) — Spring 2018

Princeton Prison Teaching Initiative — Spring 2021 — Spring 2022

Volunteer math instructor for South Woods State Prison in New Jersey.
Instructor/Team Leader for MATH015 — Spring 2022
Instructor for MATH020 — Fall 2021
Grader for MATH015 — Spring 2021

Penn Summer Prep — Philadelphia, PA
Instructor, Introduction to Voting Theory — Summer 2021
Designed and taught a two-week course on voting theory for advanced high school students.

University of Pennsylvania — Philadelphia, PA
Teaching Assistant, MATH 370 Algebra I — Spring 2021
Teaching Assistant, MATH 114 Calculus II — Fall 2020

The Johns Hopkins University — Baltimore, MD
Teaching Assistant, AS.110.421 Dynamical Systems — Spring 2018
Teaching Assistant, AS.110.202 Calculus III — Fall 2017

Facilitation

Center for Teaching and Learning, University of Pennsylvania
Designing Problems for STEM Classes — Fall 2022
Designed a university-wide workshop on scaffolding and backwards design in problem sets in STEM.

Inclusive and Equitable Teaching in STEM — Spring 2022
Designed and facilitated a five-session mini-course on inclusive and equitable teaching in STEM disciplines for graduate students.

Inclusive and Equitable Teaching — Fall 2021
Co-facilitated a five-session mini-course on inclusive and equitable teaching for graduate students.

Professional Service

Project leader, Macaulay2 Workshop 2023
Led a team of undergraduates, graduate students, and faculty in designing a Macaulay2 software package on quadratic forms and $\mathbb{A}^1$-Brouwer degrees.

Reviewer, MathSciNet

EXPOSITORY TALKS	Penn Undergrad Math Society *A hands-on introduction to homotopy*	Nov 2022
	Penn Geometry/Topology Grad Seminar *Local homotopy theory and Galois descent* *The algebraic vector bundle problem* *Euler characteristics of real algebraic manifolds*	 Sep 2022 Feb 2022 Oct 2021
	MIT Talbot Workshop, 2021 *Ambidexterity*	Oct 2021
	Penn General Robotics, Automation, Sensing & Perception Laboratory *A Brief Introduction to Topology*	Oct 2019
	Moravian College REU Seminar *A Hands-On Introduction to Homotopy*	Jun 2019
	University of Pennsylvania Graduate Pizza Seminar *How to prevent nuclear war and then decide what to watch on Netflix* *Elliptic curves and the NSA* *Gimbal lock* *Social choice and topology* *The generalized Poincaré conjecture*	 Feb 2023 Jan 2020 Dec 2020 Mar 2019 Oct 2018
	Johns Hopkins Undergraduate Mathematics Seminar *A Crash Course in Homotopy Theory*	Apr 2018
SELECTED CONFERENCES AND WORKSHOPS (* INDICATES ONLINE)	European Autumn School in Topology 2023	Sep 2023
	Stacks Project Workshop 2023, Ann Arbor	Aug 2023
	Recent Advances in Algebraic K-Theory, IHES	Jul 2023
	Motivic and non-commutative aspects of enumerative geometry, Nijmegen	Jul 2023
	Scissors K-theory and Trace Methods, Indiana University	Jun 2023
	Macaulay2 Workshop, University of Minnesota	May 2023
	Mid-Atlantic Topology Conference, Philadelphia	Apr 2023
	Joint Mathematics Meeting, Boston	Jan 2023
	Banff Workshop on Toric Degenerations	Dec 2022
	Binghamton University Graduate Conference in Algebra & Topology	Nov 2022
	AMS Sectional, Salt Lake City	Oct 2022
	Young Topologists Meeting, Copenhagen	Jul 2022
	Homotopical Methods in Fixed Point Theory, CU-Boulder	Jul 2022
	Homotopy Theory with Applications to Arithmetic and Geometry, Fields Institute	Jun 2022
	Algebraic K-theory, motivic cohomology and motivic homotopy theory, INI	Jun 2022
	Algebraic Structures in Topology, San Juan	Jun 2022
	Graduate Student Conference in Algebra, Geometry, & Topology, Temple University	May 2022
	MIT Talbot Workshop: Ambidexterity in Chromatic Homotopy Theory, Plymouth MA	Oct 2021
	Mathematics Teacher-Scholar Symposium, Reed College*	May 2021
	Institute for Mathematics and Democracy 2021*	May 2021
	Graduate Student Conference in Geometry and Topology*	Apr 2021
	Midwest Topology Conference*	Apr 2021
	Binghamton University Graduate Conference in Algebra and Topology*	Nov 2020
	ICERM: Monodromy and Galois groups in enumerative geometry*	Aug–Sep 2020
	Regensburg Transatlantic Transchromatic Homotopy Theory Conference II*	Aug 2020
	IHES Motivic, Equivariant and Non-commutative Homotopy Theory*	July 2020
	Motives and What Not, Universität Regensburg*	May 2020
	Midwest Topology Seminar*	May 2020
	MAGUS*	May 2020
	Motives & Stacks, Universität Duisburg-Essen	Sep 2019
	European Autumn School in Topology 2019, Utrecht	Sep 2019
	AMS Fall Sectional, UW-Madison	Sep 2019
	PIMS Workshop on Arithmetic Topology, UBC	Jun 2019
	Graduate Student Conference in Algebra, Geometry, & Topology, Temple University	Jun 2019
	Arizona Winter School 2019: Topology and Arithmetic	Mar 2019

Homotopy Theory Summer Berlin 2018	Jun 2018
Joint Mathematics Meeting, Atlanta	Jan 2017

SERVICE

Penn Homotopy Theory Seminar   Spring 2021 — Spring 2023

Co-founder/co-organizer of the Penn homotopy theory seminar with Andres Mejia.

Penn Graduate Student Seminar   Fall 2019 — Spring 2020

Co-organizer of the graduate student seminar in the mathematics department with Marielle Ong.

The Franklin Institute Science Museum   2018 — 2022

Volunteer science presenter with Team Boson, responsible for running tables at exhibits and discussing science with the public.

Johns Hopkins Math Club   2015 — 2018

President (2017-2018), Vice President (2016-2017), organizer of speakers and events, test writer / grader / organizer for the Johns Hopkins Math Tournament, held yearly for high school students in the greater DC area. Founder of the Johns Hopkins Undergraduate Math Seminar.

EXPERIENCE

Noblis, Inc   Reston, VA
PhD intern in post-quantum cryptography.   Summer 2018

Texas A&M REU   College Station, TX
Analytic number theory, supervised by Dr. Matthew Young.   Summer 2017

Muhlenberg College REU   Allentown, PA
Number theory, supervised by Dr. Joshua Harrington.   Summer 2016