

# Stephen McKean

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CONTACT INFORMATION	Duke University Department of Mathematics Box 90320 Durham, NC 27708	<a href="mailto:mckean@math.duke.edu">mckean@math.duke.edu</a> <a href="https://github.com/shmckean">shmckean.github.io</a>
RESEARCH INTERESTS	Arithmetic geometry, arithmetic topology, commutative algebra, applied topology. Motivic homotopy theory, enumerative geometry, algebraic cycles, anabelian geometry, residue pairings, topological materials, topological neuroscience.	
EDUCATION	<b>Duke University</b> , Durham, North Carolina Ph.D. in Mathematics, expected May 2022 Advisor: Kirsten Wickelgren Certificate in College Teaching  <b>Georgia Institute of Technology</b> , Atlanta, Georgia M.S. in Mathematics, December 2019  <b>University of Utah</b> , Salt Lake City, Utah B.S. in Mathematics, May 2017 Magna cum laude Minors in Physics and German Undergraduate Research Scholar Designation	
HONORS & AWARDS	2019 <b>FESTA Fellowship</b> , School of Math, Georgia Tech Departmental award for students exhibiting superior academic and leadership skills. 2019 <b>Graduate committee travel support</b> , School of Math, Georgia Tech Departmental award to fund travel to a domestic conference. 2018 <b>Bob Price Travel Fellowship</b> , School of Math, Georgia Tech Departmental award to fund travel to an international conference. 2016 <b>Calvin H. Wilcox Memorial Scholarship</b> , Department of Math, U of U Departmental award for outstanding undergraduates. 2011 <b>President's Scholarship</b> , University of Utah Awarded to matriculating undergraduates on the basis of academic excellence.	
TEACHING AWARDS	2021 <b>Bass Instructional Fellowship</b> , Duke Fellows propose, design, and teach an innovative undergraduate course. 2019 <b>Thank a Teacher Certificate</b> , Georgia Tech Awarded to instructors by their students. 2019 <b>Outstanding Student Evaluations Award</b> , School of Math, Georgia Tech Departmental award for teaching assistants with highest student evaluations.	
PAPERS & PREPRINTS	8. <b>Heights over finitely generated fields</b> , with Soumya Sankar. Preprint, 2021. 7. <b>Conics meeting eight lines over perfect fields</b> , with Cameron Darwin, Aysel Galimova, and Miao (Pam) Gu. Preprint, 2021.	

6. **Bézoutians and the  $A^1$ -degree**,  
with Thomas Brazelton and Sabrina Pauli.  
Submitted, 2021.  
[arXiv:2103.16614](#)
5. **Rational lines on smooth cubic surfaces**.  
Submitted, 2021.  
[arXiv:2101.08217](#)
4. **Constant Bézoutian implies injectivity**.  
Preprint, 2021.  
[arXiv:2005.09797](#)
3. **An arithmetic enrichment of Bézout's Theorem**.  
*Math. Ann.* 379(1), 633–660 (2021)  
[arXiv:2003.07413](#)
2. **All lines on a smooth cubic surface in terms of three skew lines**,  
with Daniel Minahan and Tianyi Zhang.  
Submitted, 2021.  
[arXiv:2002.10367](#)
1. **The trace of the local  $A^1$ -degree**,  
with Thomas Brazelton, Robert Burklund, Michael Montoro, and Morgan Opie.  
*Homology Homotopy Appl.* 23(1), 243–255 (2021)  
[arXiv:1912.04788](#)

#### INVITED TALKS

\* ONLINE

- |      |     |  |
|------|-----|--|
| 2021 | Apr | Algebraic Geometry Seminar*, Ohio State                    |
|      | Feb | Motivic Geometry Seminar*, CAS (Oslo)                      |
| 2019 | Nov | Commutative Algebra Seminar, University of Utah            |
|      | Sep | Geometry and Topology in Arithmetic, AMS Central Sectional |

#### CONTRIBUTED TALKS

\* ONLINE

† SHORT TALK

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|------|-----|---|
| 2020 | Dec | Triangle Area Graduate Math Conference*, NC State |
|      | Mar | Real Enumerative Geometry and Beyond†, Vanderbilt |
| 2019 | Jun | Arithmetic Topology Workshop†, PIMS               |
|      | Jun | Graduate Student Conference in AG&T, Temple       |
| 2018 | Dec | Tech Topology Conference†, Georgia Tech           |

#### SELECTED CONFERENCES ATTENDED

\* ONLINE

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|------|-----|---|
| 2021 | Jul | Motivic Homotopy Graduate Summer School*, PCMI                      |
|      | Jun | Foundations and Perspectives of Anabelian Geometry*, RIMS           |
|      | May | Topological Insights in Neuroscience*, MSRI                         |
|      | Mar | Homotopic and Geometric Galois Theory*, Oberwolfach                 |
| 2020 | Aug | Monodromy and Galois Groups in Enumerative Geometry*, ICERM         |
|      | Aug | Stacks Project Workshop*, University of Michigan                    |
|      | Jul | Motivic, Equivariant, and Non-Commutative Homotopy Theory*, IHÉS    |
| 2019 | Sep | Computations in Motivic Homotopy Theory, Universität Regensburg     |
|      | Jun | Arithmetic Topology Workshop, University of British Columbia (PIMS) |
|      | Mar | Arizona Winter School, University of Arizona                        |
| 2018 | Jul | Homotopy Theory and Arithmetic Geometry, Imperial College           |
|      | Jun | The Roots of Topology, University of Chicago                        |
|      | Mar | Arizona Winter School, University of Arizona                        |

TEACHING EXPERIENCE	2021	Fa	Instructor	The Art of Proof <sup>†</sup> , Duke
	2020	Fa	Instructor	Laboratory Calculus I <sup>*</sup> , Duke
		Sp	TA	Linear Algebra and Differential Equations <sup>*</sup> , Duke
	2019	Fa	Head TA	Differential Calculus, Georgia Tech
		Su	Instructor	Algebra Comp Prep Course, Georgia Tech
		Sp	Instructor	Calculus for Life Sciences, Georgia Tech
	2018	Fa	Head TA	Differential Calculus, Georgia Tech
		Su	LA	Differential Calculus, Georgia Tech
		Sp	TA	Integral Calculus, Georgia Tech
	2017	Fa	TA	Multivariable Calculus, Georgia Tech
		Su	Instructor	Pre-calculus, Statistics, and Algebra, Utah TRIO
		Sp	SI Leader	Trigonometry, University of Utah
	2016	Fa	SI Leader	Intermediate Algebra, University of Utah
		Sp	SI Leader	Intermediate Algebra, University of Utah
	2015	Fa	SI Leader	Calculus I, University of Utah
UNDERGRAD MENTORING	2021	Su	Santino Panzica (Duke),	<i>Topological insulators</i>
		Su	Will Strong (Duke),	<i>Topological insulators</i>
		Su	Luke Triplett (Duke),	<i>Topological insulators</i>
		Sp	Camilo Martinez (Unicauca),	<i>Polynomials over finite fields</i>
	2020	Fa	Michael Klyachman (Whitney Young High School),	<i>Snaith's theorem</i>
		Su	John Igieobo (Georgia Tech),	<i>Unstable Euler classes</i>
		Su	Steven Sanchez (Georgia Tech),	<i>Unstable Euler classes</i>
		Su	Dae'Shawn Taylor (Georgia Tech),	<i>Unstable Euler classes</i>
DEPARTMENT SERVICE	2021		Presenter and panelist for first-year bootcamp, Duke	
	2021–22		Diversity, Equity, and Inclusion Team, Duke	
	2021		DOmath project manager, Duke	
	2021		AWM undergrad mentor, Duke	
	2020, 21		Designed DOmath t-shirts, Duke	
	2020		REU project assistant, Duke	
	2020		Co-organizer, presenter, and panelist for first-year bootcamp, Duke	
	2019		Instructor for first-year TA training, Georgia Tech	
	2019		Panelist for grad student orientation, Georgia Tech	
	2018, 19		Panelist for admitted grad student day, Georgia Tech	
	2018		Panelist for first-year course: “Getting Involved,” Georgia Tech	
	2018		Designed and organized School of Math t-shirts, Georgia Tech	
	2018		Co-organizer of the Intersection Theory Learning Seminar, Georgia Tech	
	2018–19		Co-organizer of the Research Horizons Seminar, Georgia Tech	
	2018–19		Mathematics Graduate Student Council, Georgia Tech	
PROFESSIONAL SERVICE	2021–		Reviewer, Mathematical Reviews	
	2020		Tutor, Durham Public Schools	
	2020–21		Tutor, SPIRE Fellows, Duke	
	2020–21		Reviewer, zbMATH	
	2019		Judge for UROP poster presentations, Georgia Tech	
	2017–19		College of Sciences Graduate Student Diversity Council, Georgia Tech	
	Referee:		IMRN	

OUTREACH	2021	Math Employment Experience for High School Students, Duke
	2021	Co-organizer and instructor, Durham Math Circle
	2020–	Founder, organizer, and mentor, <a href="#">Twoples</a>
	2019	9 <sup>th</sup> Grade Speaker Series, Gwinnett School of Math, Science, and Tech
	2019	SMASH Morehouse Networking Night, Morehouse College
	2017–20	High School Math Competition, Georgia Tech
	2015, 16	Project Youth, University of Utah
RELEVANT SKILLS	Language:	English (native), German (fluent), French (basic)
	Design:	Photoshop/GIMP (proficient), Inkscape (proficient)
	Coding:	Python/Sage (moderate), HTML/CSS (moderate), Macaulay2 (basic)