

Aaron Mazel-Gee

Curriculum Vitae

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date of birth: Dec 29, 1986
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Research Interests

Homotopy theory, derived algebraic geometry, and their connections throughout mathematics and physics.

This currently means: algebraic K-theory and the cyclotomic trace via factorization homology and Goodwillie calculus; shifted symplectic structures, shifted Poisson structures, and duality phenomena in quantum field theory; foliations and their characteristic classes via deformation theory; motivic modular forms (a motivic analog of *tmf*) via Goerss–Hopkins obstruction theory for ∞ -categories.

Education

- 2010–2016 **PhD student in Mathematics**, *University of California*, Berkeley, CA.
Thesis: *Goerss–Hopkins obstruction theory via model ∞ -categories* (available on website).
Advisor: Peter Teichner.
Winner of the Kenneth Ribet & Lisa Goldberg Award.
- Aug–Dec 2015 **Visiting PhD student**, *Montana State University*, Bozeman, MT.
- Jan–Dec 2013 **Visiting PhD student**, *Massachusetts Institute of Technology*, Cambridge, MA.
- Jan–Dec 2012 **Visiting PhD student**, *Max Planck Institute for Mathematics*, Bonn, Germany.
- 2005–2009 **ScM and ScB in Mathematics**, *Brown University*, Providence, RI.

Employment

- 2017–present **Research Assistant Professor**, *University of Southern California*, Los Angeles, CA.
- 2016–2017 **Zassenhaus Assistant Professor**, *Ohio State University*, Columbus, OH.

Publications

- To appear **The geometry of the cyclotomic trace**, with David Ayala and Nick Rozenblyum.
- Preprint **E_∞ automorphisms of motivic Morava E -theories**, draft available upon request.
- Preprint **Goerss–Hopkins obstruction theory for ∞ -categories**, draft available upon request*.
- Oct 16, 2015 **Model ∞ -categories III: the fundamental theorem**, arXiv:1510.04777*.
- Oct 15, 2015 **Model ∞ -categories II: Quillen adjunctions**, arXiv:1510.04392*.
- Oct 14, 2015 **Hammocks and fractions in relative ∞ -categories**, arXiv:1510.03961.
Under revision for *Journal of Homotopy and Related Structures*.
- Oct 13, 2015 **All about the Grothendieck construction**, arXiv:1510.03525.
Submitted.
- Oct 12, 2015 **The universality of the Rezk nerve**, arXiv:1510.03150.
Under revision for *Algebraic & Geometric Topology*.
- Oct 8, 2015 **A user’s guide to co/cartesian fibrations**, arXiv:1510.02402.
Submitted.
- Jan 13, 2015 **Quillen adjunctions induce adjunctions of quasicategories**, arXiv:1501.03146.
New York Journal of Mathematics 22 (2016), 57–93.
- Dec 29, 2014 **Model ∞ -categories I: some pleasant properties of the ∞ -category of simplicial spaces**, arXiv:1412.8411*.
- Sep 29, 2014 **From fractions to complete Segal spaces**, with Zhen Lin Low, arXiv:1409.8192.
Homology, Homotopy, and Applications 17 (2015), no. 1, 321–338.
- Aug 25, 2013 **A relative Lubin–Tate theorem via meromorphic formal geometry**, with Eric Peterson and Nathaniel Stapleton, arXiv:1308.5435.
Algebraic & Geometric Topology 15 (2015), 2239–2268.
- Sep 2, 2009 **A cubical antipodal theorem**, with Kyle E. Kinneberg, Tia Sondjaja, and Francis Su, arXiv:0909.0471.

*The four papers *Model ∞ -categories I–III* and *Goerss–Hopkins obstruction theory for ∞ -categories* have been collected to be submitted together as a memoir.

Aug 2, 2006 **Maximum volume space quadrilaterals**, *Expeditions in Mathematics*, with Thomas Banchoff and Nicholas Haber.

Awards

Spring 2016 **Kenneth Ribet & Lisa Goldberg Award in Algebra**, *UC Berkeley*, dissertation award.
Spring 2016 **Outstanding Graduate Student Instructor Award**, *UC Berkeley*.
2009-2014 **Graduate Student Research Fellowship**, *National Science Foundation*.
2013 **Distinguished Graduate Student Speaker**, *USTARS conference*.
2009 **Howell Prize for Excellence in Mathematics**, *Brown University*.
2009 **Magna cum laude** (highest honor awarded), *Brown University*.
2009 **Phi Beta Kappa**, *Brown University*.
2009 **1st place, Crossword Puzzle Competition**, *Brown University*.
2009 **1st place, Intramural Ultimate Frisbee League**, *Brown University*.
2008 **Karen T. Romer Undergraduate Teaching and Research Award**, *Brown University*.
2005 **Governor's Scholarship**, *California*.

Teaching Experience

Fall 2016 **Seminar ∞** , *Ohio State*, lead instructor.
Fall 2016 **Linear algebra (Math 2568)**, *Ohio State*, lead instructor (three sections).
Summer 2016 **Multivariable calculus (Math W53 – online course)**, *UC Berkeley*, T.A. under Michael Hutchings.
No student evaluations collected, due to an administrative glitch.
Spring 2016 **An invitation to factorization algebras (Math 276)**, *UC Berkeley*, jointly taught with Peter Teichner.
Spring 2016 **Linear algebra (Math 110 – proof-based)**, *UC Berkeley*, T.A. under Edward Frenkel.
Average student ratings for two sections: 6.3/7 and 6.4/7.
Spring 2015 **Directed Reading Program**, *UC Berkeley*, mentor for Robert Housden on category theory and sheaf theory.
Spring 2015 **Single-variable calculus (Math 1B)**, *UC Berkeley*, T.A. under Nikolai Reshetikhin.
Average student ratings for two sections: 6.4/7 and 6.9/7.
Fall 2011 **Single-variable calculus (Math 1A)**, *UC Berkeley*, T.A. under Ian Agol.
Average student ratings for two sections: 6.5/7 and 6.8/7.
Summer 2009 **7th grade math teacher**, *Breakthrough Summerbridge (Austin, TX)*.
Designed and implemented lesson plans for high-potential students from underserved communities.
Spring 2009 **Combinatorial topology (Math 141)**, *Brown University*, T.A. under Thomas Banchoff.
Fall 2008 **Multi-variable calculus for engineers (Math 20)**, *Brown University*, T.A. under Benoît Pausader.
Spring 2008 **Non-Euclidean geometry (Math 104)**, *Brown University*, T.A. under Thomas Banchoff.
2007-2009 **MathCounts**, *The Wheeler School*, assistant coach under Thomas Wharton.
2001-2010 **Math tutor**, self-employed.

Service

2016-present **Associate journal editor**, *Journal of Geometry, Topology, and Mathematical Physics*.
2016 **Journal referee**, *Advances in Mathematics*.
2015 **Journal referee**, *Topology and its Applications*.
2010-2015 **Berkeley–Stanford student topology seminar (“xkcd group”)**.
Co-founder and organizer; travel grant co-administrator.
2006-2009 **Math Department Undergraduate Group**, *Brown University*.
President, 2007-2009; coordinated volunteer tutoring program, 2007-2008; organized annual undergraduate math conference (“SUMS”), 2008-2009.

Selected Talks

Full list of talks (over 60 in all, both original and expository) available on website.

Original

- 2017 **The geometry of the cyclotomic trace**, *Northwestern University, University of Notre Dame, Indiana University*.
- 2013-2016 **Goerss–Hopkins obstruction theory for ∞ -categories**, *Harvard University, Purdue University, Johns Hopkins University, Stanford University, University of Chicago, University of Illinois at Urbana-Champaign, Ohio State University, University of Oregon*, topology seminars; *xkcd group meeting (Stanford University), Young Topologists Meeting (University of Copenhagen)*, “*Structured ring spectra and their invariants*” conference (*University of Manchester*), “*Operations in highly structured homology theories*” workshop (*Banff International Research Station*).
- Apr 19, 2013 **You could’ve invented tmf** , *USTARS conference*, distinguished graduate student speaker.
- Nov 29, 2012 **tmf and transchromatic detection via p -adic modular forms**, *University of Regensburg*, topology seminar.

Expository

- Nov 23, 2016 **The 2016 Nobel prize in physics: topological phases of matter**, *San Quentin State Prison, Prison Universities Project*.
- Fall 2016 **The zen of ∞ -categories**, *Ohio State*, series of 14 lectures (roughly 21 hours total) in Seminar ∞ .
- Spring 2016 **Locally constant factorization algebras**, *UC Berkeley*, series of ten lectures (15 hours total) in Math 276 seminar.
- Dec 10, 2014 **Poincaré–Koszul duality**, *Stanford University*, topology progress seminar.
- Apr 21, 2014 **Algebraic cobordism, algebraic orientations, and motivic Landweber exactness**, *MSRI*, motivic homotopy seminar.
- Dec 14, 2012 **Model categories for algebraists, or: What’s *really* going on with injective and projective resolutions, anyways?**, *UC Berkeley*, toolbox seminar.
- Dec 6, 2011 **Dieudonné modules and the classification of formal groups**, *Stanford University*, xkcd seminar.
- Apr 21, 2009 **Envy-free division algorithms: why nobody should be jealous of anyone else, ever**, *Brown University*, senior lecture for a general audience.

References

David Ayala
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Andrew Blumberg
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Peter Teichner (advisor)
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Martin Olsson (teaching)
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