

Michael A. Hill

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EDUCATION

Massachusetts Institute of Technology Cambridge, MA
Ph.D. in Mathematics, 2006. Thesis Title: *Computational Methods for Higher Real K-theory with applications to tmf*. Thesis Advisor: Michael Hopkins. GPA: 4.0. Research in computational homotopy theory, the theory of topological modular forms, and structured ring spectra.

Harvard University Cambridge, MA
A.B. in Mathematics, *summa cum laude*, 2002. Phi Beta Kappa. John Harvard Scholarship for academic success. GPA: 3.9.

EMPLOYMENT

University of Virginia Charlottesville, VA
2009–Present Assistant Professor of Mathematics. Member of Computer Committee. Teach 2–3 courses a year. Organized seminar.

Harvard University Cambridge, MA
2009–2010 Visiting Post-Doc. Organized conference related to visiting position. Participated in seminars.

University of Virginia Charlottesville, VA
2006 – 2009 Whyburn Instructor of Mathematics. Taught 3 courses a year. Ran Putnam training sessions with other Whyburns. Participated in and organized seminars.

Harvard University Cambridge, MA
Summer 2006, 2007 Visiting Post-Doc.

PUBLICATIONS & PREPRINTS

- (1) The spectra ko and ku are not Thom spectra: an approach using THH (with V. Angeltveit and T. Lawson). *Geometry and Topology Monographs* **16** (2009), 1–8.
- (2) On the existence of a v_2^{32} -self map on $M(1, 4)$ at the prime 2 (with M. Behrens, M. Hopkins, and M. Mahowald). *Homology, Homotopy and Applications* **10** (2008), no. 3, 45–84.
- (3) The 5-local homotopy of eo_4 . *Algebraic and Geometric Topology* **8** (2008), 1741–1761.
- (4) Cyclic comodules, j -homology and the homology of j . *Topology and Its Applications* **155** (2008), no. 15, 1730–1736.
- (5) The 3-local tmf homology of $B\Sigma_3$. *Proceedings of the American Mathematical Society* **135** (2007), no. 12, 4075–4086.
- (6) The topological Hochschild homology of ℓ and ko (with V. Angeltveit and T. Lawson). To appear in *American Journal of Mathematics*.
- (7) The String bordism of BE_8 and $BE_8 \times BE_8$ through dimension 14. To appear in *Illinois Journal of Mathematics*.

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- (8) Homological obstructions to string orientations (with C. Douglas and A. Henriques). Submitted to *Geometry and Topology*.
 - (9) Automorphic forms and cohomology theories associated to Shimura varieties of small discriminant (with T. Lawson). Submitted to *Advances in Mathematics*.
 - (10) Ext and the motivic Steenrod algebra over \mathbb{R} . Submitted to *Journal of Pure and Applied Algebra*.
 - (11) On the non-existence of elements of Kervaire invariant one (with M. Hopkins and D. Ravenel). Preprint on the arXiv.
 - (12) The homotopy of $EO_{2(p-1)}$ (with M. Hopkins and D. Ravenel). Preprint.
 - (13) The action of finite subgroups of the Morava stabilizer group on the Lubin-Tate space of lifts (with M. Hopkins and D. Ravenel). In preparation.
 - (14) The homotopy of $EO_{f(p-1)}(\mathbb{Z}/p)$ (with M. Hopkins and D. Ravenel). In preparation.

GRANTS

- 2009 – Present** NSF grant # DMS-0906285: “Computations in Classical Chromatic Homotopy Theory, Algebraic K-Theory, and Motivic Homotopy”. 3 year research grant for \$100,886.
- 2008 – 2009** UVA Technology & Teaching Initiative Fellowship (with Christian Gromoll). Study computer based assessment in mathematics classes using self-scheduled, repeatable exams. Oversee 6 graduate student proctors and 4 graduate student coders.

TEACHING EXPERIENCE

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| University of Virginia | | Charlottesville, VA |
| Spring 2009 | Math 885 – Computational Algebraic Topology | |
| Fall 2008 | Course coordinator for Math 132 – Calculus II | |
| | Math 231 – Multivariable Calculus | |
| Spring 2008 | Math 552 – Introduction to Abstract Algebra | |
| | Applied Math 308 – Linear Algebra | |
| Fall 2007 | Math 551 – Advanced Linear Algebra | |
| Spring 2007 | Math 351 – Linear Algebra | |
| Fall 2006 | Math 231 – Multivariable Calculus | |
| | Applied Math 212 – Multivariable Calculus | |
| Massachusetts Institute of Technology | | Cambridge, MA |
| 2004 – 2005 | Taught recitation sections for Differential Equations and Calculus I. | |

ORGANIZATIONAL EXPERIENCE

- Conferences.**
- Aug. 2009** Coorganizer of “FRG Workshop: Manifolds, Strings, and 2D Quantum Field Theory”. Harvard University.
- Oct. 2008** Coorganizer of AMS special session in Homotopy Theory: Huntsville, AL.
- Nov. 2007** Coorganizer of “Algebraic and Geometric Topology: A Conference in Honor of Bob Stong”. University of Virginia.
- 2004 – 2007** Cofounder and coorganizer of “Talbot” conference attracting over 25 participants from the US and Europe and funded by National Science Foundation grant DMS-0512714.

Seminars.

- 2006 – Present** Organize the UVA weekly topology seminar.
2007 – 2008 Organized a reading group on algebraic geometry for graduate students and interested faculty.

SELECTED PRESENTATIONS

- (1) Current Developments in Mathematics Conference, Harvard University, November 2009: *The Arf-Kervaire Problem in Algebraic Topology*
- (2) Northwestern University Colloquium, October 2009
- (3) Peter May Birthday Conference, October 2009
- (4) Worcester High School Program, September 2009: *Ruler, Compass, and Origami Constructions*
- (5) University of Illinois at Urbana-Champaign Lecture Series, September 2009
- (6) University of Illinois at Urbana-Champaign Colloquium, September 2009: *On the Non-Existence of Kervaire Invariant One Manifolds*
- (7) University of Oslo, August 2009: *The Slice Spectral Sequence*
- (8) Conference on p -adic Geometry, Norway, August 2009: *On the slice filtration and the Kervaire invariant one problem*
- (9) Isle of Skye Algebra and Topology Conference, June 2009: *On the Non-Existence of Kervaire Invariant One Manifolds*
- (10) Georgia Topology Conference, May 2009: *On the Non-Existence of Manifolds of Kervaire Invariant One*
- (11) University of Virginia, April 2009: *On the Non-Existence of Manifolds of Kervaire Invariant One*
- (12) Wellesley College, February 2009: *Ruler, Compass, and Origami Constructions: Trisecting an Angle and Doubling a Cube*
- (13) University of Rochester, January 2009: *Large Scale Phenomena in Stable Homotopy*
- (14) AMS Annual Meeting, Washington, DC, January 2009: *Differentials in homotopy fixed point spectral sequences.*
- (15) University of Minnesota, December 2008: *Geometric Approaches to Homotopy Fixed Point Spectral Sequences.*
- (16) University of California, San Diego, Colloquium, November 2008: *Asymptotics in Homotopy Theory*
- (17) University of Chicago, October 2007: *Applications of higher real K -theories to real Johnson-Wilson spectra.*
- (18) Oberwolfach: Homotopy Theory Workshop, September 2007: *Recent computational work on EO_n .*
- (19) Talbot Conference, February 2007: *$K(1)$ -local tmf .*
- (20) Birthday Conference for Doug Ravenel and Steve Wilson, March 2007: *The topological Hochschild homology of ℓ and ko .*