# Charles W. Rezk

*Curriculum Vitae*


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*Education*

**University of Pennsylvania** (Philadelphia, PA) *1987—1991*
B.A. in mathematics, May 1991.
M.A. in mathematics, May 1991.

**Massachusetts Institute of Technology** (Cambridge, MA) *1991—1996*
Ph.D. in pure mathematics.
Date of graduation: May 1996.
Thesis title: "Spaces of Algebra Structures and Cohomology of Operads."
Thesis advisor: Michael J. Hopkins.

*Academic Positions*

**Northwestern University** (Evanston, IL) *1996—2001*
Ralph P. Boas Visiting Assistant Professor (9/1996–8/1999).
Instructor (9/1999–8/2001).

**University of Illinois at Urbana-Champaign** (Urbana, IL)
Assistant Professor of Mathematics *2001—2006*
Associate Professor of Mathematics *2006—2014*
Professor of Mathematics *2014—present*

*Visiting Positions*

**Institute for Advanced Study**, (Princeton, NJ) *9/1999—3/2000 and 1/2001—3/2001*
Member

**Massachusetts Institute of Technology** (Cambridge, MA) *1/2006–5/2006*
Visiting instructor

**Mathematical Sciences Research Institute** (Berkeley, CA) *1/2014-5/2014*
Simons Visiting Professor

*Honors*

**Alfred P. Sloan Doctoral Dissertation Fellowship** *1995—1996*
**AMS Centennial Fellowship** *1999—2000*
**Fellow of the AMS** *2014*

*Service*

**Editorial board,** *Compositio Mathematica* *2015–present*

# Charles W. Rezk

*Publications and Creative Works*[1]

**Doctoral Thesis.** "Spaces of Algebra Structures and Cohomology of Operads." (MIT, 1996)

**Publications.**

1. "Notes on the Hopkins-Miller theorem." In *Homotopy Theory via Algebraic Geometry and Group Representations,* Contemporary Mathematics 220, Amer. Math. Soc., 1998, pp. 313-366.
2. "Brown-Comenetz duality and the Adams spectral sequence," with Mark Mahowald. In *American Journal of Mathematics* **121** (1999), pp. 1153–1177.
3. "A model for the homotopy theory of homotopy theory." *Trans. Am. Math. Soc.* **353** (2001), 973–1007.
4. "Simplicial structures on model categories and functors," with B. Shipley and S. Schwede. *Am. J. of Math.* **123** (2001), 551–575.
5. "Every homotopy theory of simplicial algebras admits a proper model." *Topology and its Applications,* **119** (2002), 65–94.
6. "A resolution of the $K(2)$-local sphere at the prime 3," with P. Goerss, H.-W. Henn, and M. Mahowald. *Annals of Mathematics,* **162** (2005), 777–822.
7. "The units of a ring spectrum and a logarithmic cohomology operation." *Journal of the American Mathematical Society,* **19** (2006), 969–1014.
8. "Topological modular forms of level 3," with M. Mahowald. *Pure and Applied Math. Quarterly,* **5** (2009), 853–872.
9. "A cartesian presentation of weak $n$-categories." *Geometry & Topology,* **14** (2010), 521–571. "Correction to 'A cartesian presentation of weak $n$-categories'." *Geometry & Topology,* **14** (2010), 2301–2304.
10. "The congruence condition for power operations in Morava $E$-theory." *Homology, Homotopy, and Applications,* **11** (2010), 327–379.
11. "Modular isogeny complexes." *Algebraic & Geometric Topology,* **12** (2012), 1373–1404.
12. "Reedy categories and the $\Theta$-construction," with J. Bergner. *Mathematische Zeitschrift,* **274** (2013), 499-514.
13. "A streamlined proof of Goodwillie's $n$-excisive approximation." *Algebraic & Geometric Topology,* **13** (2013), 1049–1051.
14. "Comparison of models for $(\infty, n)$-categories, I," with J. Bergner. *Geometry & Topology,* **17** (2013), 2163–2202.

[1] All papers and preprints are available from `http://www.math.uiuc.edu/~rezk`.

15. "An $\infty$-categorical approach to $R$-line bundles, $R$-module Thom spectra, and twisted $R$-homology," with M. Ando, A. Blumberg, D. Gepner, and M. Hopkins. *Journal of Topology* **7** (2014), 869–893.
16. "Units of ring spectra and Thom spectra via structured ring spectra," with M. Ando, A. Blumberg, D. Gepner, and M. Hopkins. *Journal of Topology* **7** (2014), 1077–1117.
17. "On Hopkins' Picard groups for the prime 3 and chromatic level 2", with P. Goerss, H.-W. Henn, and M. Mahowald. *Journal of Topology* **8** (2015), 267–294.
18. "Isogenies, power operations, and homotopy theory." In *Proceedings of the ICM, Seoul 2014,* vol. 2 (2014), 1125–1146.
19. "Spectral algebra models of unstable $v_n$-periodic homotopy theory." To appear in *Surveys around Ohkawa's theorem on Bousfield classes.* (arXiv:1703.02186)
20. "Classifying spaces for 1-truncated compact Lie groups." *Algebraic & Geometric Topology* **18** (2018), 525–546.
21. "Spectral algebra models of unstable $v_n$-periodic homotopy theory," with M. Behrens. 45 pages. To appear in *Surveys around Ohkawa's theorem on Bousfield classes.* (arXiv:1703.02186)
22. "Looijenga line bundles in complex analytic elliptic cohomology." To appear in *Tunisian Journal of Mathematics.* (arXiv:1608.03548)

**Works submitted for publication and other preprints.**

1. "Rings of power operations for Morava $E$-theories are Koszul." (arXiv:1204.4831)
2. "Frobenius pairs and Atiyah duality." (arXiv:1303.3567)
3. "Comparison of models for $(\infty, n)$ categories, II", with Julie Bergner. (arXiv:1406.4182)
4. " The Bousfield-Kuhn functor and Topological Andre-Quillen cohomology," with Mark Behrens. (arXiv:1712.03045)

**Selected invited presentations at conferences.**

- May 15, 2007 – Workshop on Stacks in Geometry and Topology, Fields Instutute, Toronto – "Morava E-theory of commutative S-algebras and the Frobenius congruence".
- Aug 9, 2007 – Abel Symposium, Oslo, Norway – "Colinear approximations to homotopy theory".
- Jun 26, 2008 – Homotopical Group Theory and Topological Algebraic Topology, Bonn, Germany – "The Frobenius congruence for power operations in Morava E-theory".
- Jun 30, 2008 – HOCAT 2008: Homotopy Structures in Geometry and Algebra (invited), CRM, Barcelona, Spain – "Homotopy theory and $(\infty, 1)$-categories".
- May 28, 2009 – Topological Field Theories Conference, Northwestern – "Cartesian presentations of weak n-categories".

- June 11, 2012 – Virginia Topology Conference, U. of Virginia – "Power operations in ellitpic cohomology".
- March 27, 2013 – Equivariant, Chromatic, and Motivic Homotopy Theory, Northwestern University – "Power operations at height 2".
- May 11, 2013 – Midwest Topology Seminar, U. of Kentucky, Lexington – "$p$-isogeny modules, and calculations in multiplicative stable homotopy at height 2"
- April 10, 2014 – Reimagining the Foundations of Algebraic Topology, MSRI – "Calculations in multiplicative stable homotopy theory at height 2"
- June 24, 2014 – Manifolds, K-theory, and Related Topics, Dubrovnik, Croatia – "Koszul resolutions of power operation algebras"
- August 18, 2014 – ICM Invited Lecture, Topology Section, Seoul, South Korea – "Isogenies, power operations, and homotopy theory"
- December 4, 2014 – Notre Dame Topology Seminar, South Bend, IN – "Power operations and elliptic cohomology"
- June 1-19, 2015 – Felix Klein lectures, Hausdorff Institue/Max Planck Institute, Bonn (6 lectures)
- June 29, 2015 – Advances in Homotopy Theory Conference, Strasbourg, France – "Calculating with power operations for Morava E-theory at height 2"
- October 29, 2016 – AMS Sectional Meeting invited address, Minneapolis, MN – "On some approximations to homotopy theory"
- June 8, 2017 – The Transatlantic Homotopy Theory Conference, Regensburg – "Looijenga line bundles and complex analytic elliptic cohomology"
- September 24, 2017 – Mini-Workshop on QFTs and TMF, Notre Dame, South Bend, IN – "Looijenga line bundles and complex analytic elliptic cohomology"

**Graduate students supervised.**

- Rekha Santhanam (Ph.D. student, 2003–May, 2008). Ph.D. Thesis "Units of Equivariant Ring Spectra".
- Barry Walker (Ph.D. student, 2004–May, 2008). Ph.D. Thesis "Multiplicative Orientations of K-Theory and $p$-adic analysis".
- Nathaniel Stapleton (Ph.D. student, 2006–May, 2011). Ph.D. Thesis "Transchromatic Generalized Character Maps".
- Zhen Huan (Ph.D. student, 2010–present).
- Peter Nelson (Ph.D. student, 2010–2016). Ph.D. Thesis "A small presentation for Morava $E$-theory power operations".
- Mychael Sanchez (Ph.D. student, 2011–2018). Ph.D. Thesis "Equivariant $E_\infty$-algebras".
- Nima Rasekh (Ph.D. student, 2013–present).
- William Balderrama (Ph.D. student, 2016–present).
- Robert Joseph Rennie (Ph.D student, 2017–present).