

MICHAEL CHING - CURRICULUM VITAE

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EDUCATION

- **Massachusetts Institute of Technology** (2001-2005)
Ph.D. June 2005
Thesis Advisor: Haynes Miller
- **University of Cambridge - Trinity College** (1997-2001)
M.A. received February 2004 (automatically conferred three years after B.A.)
Certificate of Advanced Study in Mathematics, received June 2001
B.A. Mathematics (Hons.), First Class, received June 2000

EMPLOYMENT

- **Amherst College**
Associate Professor of Mathematics (2017-present)
Assistant Professor of Mathematics (2011-2017)
- **University of Georgia**
Assistant Professor of Mathematics (2008-2011)
- **The Johns Hopkins University**
J.J. Sylvester Assistant Professor (2005-2008)

EXTERNAL FUNDING AND VISITING POSITIONS

- NSF Research Grant: DMS-1709032: RUI: Calculus of Functors and Applications in Homotopy Theory (July 2017 - June 2020)
- NSF Research Grant: DMS-1308933: RUI: Koszul Duality of Operads and the Calculus of Functors (July 2013 - June 2017)
- NSF Research Grant: DMS-0968221: FRG: The Calculus of Functors and the Theory of Operads: Interactions and Applications (June 2010 - May 2013)
- Research Visitor: Hausdorff Trimester Program, Bonn, Germany (July 2015)
- Visiting Assistant Professor: Massachusetts Institute of Technology (Sept - Dec 2014)
- Research Member: Mathematical Sciences Research Institute (January - May 2014)

PUBLICATIONS AND PREPRINTS

12. *Derived Koszul duality and TQ-homology completion of structured ring spectra*
arxiv:1502.06944, submitted
(joint with John E. Harper)
11. *Manifolds, K-theory and the calculus of functors*
Contemporary Mathematics 682 (2017), 1–38
(joint with Gregory Arone)
10. *Cross-effects and the classification of Taylor towers*
Geometry & Topology 20-3 (2016), 1445–1537
(joint with Gregory Arone)
9. *Higher homotopy excision and Blakers-Massey theorems for structured ring spectra*
Advances in Mathematics 298 (2016), 654–692
(joint with John E. Harper)
8. *A classification of Taylor towers for functors of spaces and spectra*
Advances in Mathematics 272 (2015), 471–552
(joint with Gregory Arone)
7. *Coalgebraic models for combinatorial model categories*
Homology, Homotopy and Applications 16(2) (2014), 171–184
(joint with Emily Riehl)
6. *A note on the composition product of symmetric sequences*
J. Homotopy Relat. Struct. 7 (2012), 237–254
5. *Apollonian circle packings of the half-plane*
Journal of Combinatorics 3 (2012), 1–49
(joint with John Doyle)
4. *Bar-cobar duality for operads and modules of spectra*
Journal of Topology 5 (2012), 39–80
3. *Operads and chain rules for the calculus of functors*
Astérisque 338 (2011), 158 pages
(joint with Gregory Arone)
2. *A chain rule for Goodwillie derivatives of functors from spectra to spectra*
Trans. Amer. Math. Soc. 362 (2010), 399–426
1. *Bar constructions for topological operads and the Goodwillie derivatives of the identity*
Geometry & Topology 9 (2005), 833–933

RECENT AND UPCOMING TALKS

- 2017:
 - Amherst College Math Colloquium (February 2017)
- 2016:
 - Stockholm University Topology Seminar (August 2016)
 - Midwest Topology Seminar, Ohio State University (May 2016)
 - MIT Topology Seminar (May 2016)
 - Amherst College Lazerowitz Lecture (April 2016)
- 2015:
 - UMass-Amherst Representation Theory Seminar (September/October 2015)
 - Factorizable Structures in Topology and Algebraic Geometry, Banff (August 2015)

- Functor Calculus Workshop, Münster, Germany (June 2015)
- Lehigh University Geometry and Topology Conference, Bethlehem, PA (May 2015)
- Lecture Series (4 talks) on the Classification of Taylor Towers, UIUC (March 2015)
- 2014:
 - Ohio State University Topology Seminar (October 2014)
 - Structured Ring Spectra and their Invariants, Manchester, UK (September 2014)
 - Category Theory 2014, Cambridge, UK (July 2014)
 - Manifolds, K-theory and Related Topics, Dubrovnik, Croatia (June 2014)
 - MSRI Algebraic Topology Research Seminar, Berkeley, CA (April 2014)
 - MSRI Introductory Workshop: Algebraic Topology, Berkeley, CA (January 2014)
- 2013:
 - Union College Mathematics Conference, Union College, Schenectady, NY (Oct. 2013)
 - Midwest Topology Seminar, University of Kentucky (May 2013)
 - Brown University Geometry/Topology Seminar (March 2013)
 - MIT Topology Seminar (February 2013)
- 2012:
 - Amherst College EDU Club (November 2012)
 - Colby College Mathematics Colloquium (November 2012)
 - Joint Brandeis-Harvard-MIT-Northeastern Colloquium (November 2012)
 - Fourth Arolla Conference on Algebraic Topology, Arolla, Switzerland (August 2012)
 - Conference on Homotopical Algebra and its Applications, Luminy, France (June 2012)
 - Virginia Conference on Algebraic Topology, University of Virginia (June 2012)
 - Canadian Mathematical Society Summer Meeting, Regina, Saskatchewan (June 2012)
 - MIT Talbot Workshop, Garden City, UT (May 2012)
 - Kansas State University Topology Seminar (April 2012)
 - Wesleyan University Topology Seminar (March 2012)
 - Wellesley College Mathematics Colloquium (February 2012)
 - SUNY Albany Topology Seminar (January 2012)
 - JMM: Special Session on the Calculus of Functors and its Applications (January 2012)

RECENT AND UPCOMING CONFERENCES

- Homotopy Theory in the Ecliptic, Reed College, Portland, OR (August 2017)
- Alpine Conference on Applied and Algebraic Topology, Saas, Switzerland (August 2016)
- Topology of Manifolds, Lisbon, Portugal (June 2016)
- Workshop on Homotopy Type Theory, Fields Institute, Toronto, Canada (May 2016)
- Factorizable Structures in Topology and Algebraic Geometry, Banff (August 2015)
- Homotopy Theory, Manifolds and Field Theories, Hausdorff Institute of Mathematics, Bonn, Germany (July 2015)
- Functor Calculus Workshop, Münster, Germany (June 2015)
- Lehigh University Geometry and Topology Conference, Bethlehem, PA (May 2015)
- Mid-Atlantic Topology Conference, Charlottesville, VA (April 2015)
- Geometry and Topology, Princeton, NJ (March 2015)
- Homotopical Algebra, Operads and Grothendieck – Teichmüller groups, Nice, France (September 2014)
- Stable Homotopy Theory: Structured Ring Spectra and Their Invariants, Manchester, UK (September 2014)
- Category Theory 2014, Cambridge, UK (July 2014)
- Manifolds, K-Theory and Related Topics, Dubrovnik, Croatia (June 2014)

- MSRI Semester in Algebraic Topology, Berkeley, CA (January-May 2014)

PROFESSIONAL SERVICE

- Peer reviewer for 9 journals
- NSF panel reviewer
- PhD Thesis Committee: Luis Pereira, MIT (April 2013)
- MIT-Talbot Workshop Mentor (May 2012)
- Girls Inc. Math Tutor Training Workshop, Amherst College (March 2013, February 2012)
- Co-organizer of Banff International Research Station Workshop on Functor Calculus and Operads (March 2011)
- Main organizer for Georgia Topology Conference (May 2010)

TEACHING AT AMHERST COLLEGE

- **Math 111i: Introduction to Calculus (Intensive)** (Fall 2017, Fall 2016, Fall 2015)
first-semester calculus: limits, derivatives, integration (25-35 students)
- **Math 111: Introduction to Calculus** (Fall 2013, Fall 2012, Fall 2011)
first-semester calculus: limits, derivatives, integration (20-25 students)
- **Math 121: Intermediate Calculus** (Spring 2012)
second-semester calculus: integration techniques, sequences and series (20 students)
- **Math 205: Inequality** (Spring 2017)
issues in K-12 math education in the U.S., cross-listed with History and Black Studies (25 students)
- **Math 211: Multivariable Calculus** (Fall 2017, Spring 2015, Spring 2013, Fall 2012, Fall 2011)
curves in \mathbb{R}^n , functions of several variables, Stokes' Theorem (25-50 students)
- **Math 220: Discrete Mathematics** (Spring 2016)
introduction to proof-writing, relations, functions (35 students)
- **Math 271: Linear Algebra** (Spring 2017, Fall 2016, Fall 2015)
linear systems, matrices, vector spaces, linear transformations (35 students)
- **Math 355: Introduction to Analysis** (Spring 2012)
rigorous single-variable mathematical analysis (25 students)
- **Math 410: Galois Theory** (Fall 2013, Spring 2016)
field extensions, Galois Correspondence, solvability by radicals (2-9 students)
- **Math 455: Topology** (Spring 2015, Spring 2013)
an introduction to point-set and algebraic topology (10-20 students)
- **Special Topics courses taught:**
 - Motivic Homotopy Theory (Spring 2015)
 - Topics in Math Education (Spring 2015, Spring 2016)
 - Readings in Mathematics - Half Course (Spring 2015)
 - Homotopy Type Theory (Spring 2016)
 - Game Theory (Spring 2017)
 - Algebraic Topology (Spring 2017)
 - Reflections on Calculus (Fall 2017)
- **Senior Thesis Students:**
 - Sunny Xiao (2013-14):
1 – 2 *Quadruples in Self-Similar Unbounded Apollonian circle packings*
 - Kyle Ferendo (2015-16):
The Maximal and Free (∞, n) -Categories of an $(\infty, n + 1)$ -Category

- Fraser Binns (2016-17):
The Kervaire Invariant of the Lie Framed Torus
- Faseeh Ahmad (2017-18)

COLLEGE SERVICE

- Faculty Computing Committee (2015-2017)
- Faculty Committee on Student Fellowships (2017-2018)

DEPARTMENTAL SERVICE

- Walker Prizes Coordinator (2016-2018)
- Math Colloquium Coordinator (2015)
- MAA Student Chapter and Math Club Advisor (2012-2013, 2015-2017)
- Putnam Exam Problem-Solving Sessions (2011, 2012, 2013)
- Faculty Search Committees (2012-2013, 2015-2017)

SCHOLARSHIPS AND AWARDS

- Amherst College Lazerowitz Lectureship (2016)
- Amherst College Trustee Faculty Fellowship (2014)
- Excellence in Teaching Award (JHU Department of Mathematics, 2007)
- Dean's Educational & Student Advising Award (MIT School of Science, 2005)
for dedication to educational programs and student advising
- MIT Graduate Assistantship (2002-2005)
- Kennedy Memorial Trust Scholarship (2001-2002)
- International Mathematical Olympiad: Gold Medal (1996), Silver Medal (1997)