

Teena M Gerhardt

CURRICULUM VITAE

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EDUCATION:

MIT: Ph.D. in Mathematics, 2007. Advisor: Lars Hesselholt

Stanford University: B.S. in Mathematics, 2002. Department and university honors.

EMPLOYMENT:

Michigan State University, Associate Professor, 2017 - present.

Michigan State University, Assistant Professor, 2010 - 2017.

Indiana University, Zorn Postdoctoral Fellow, 2007 - 2010.

VISITING POSITIONS:

MSRI, Eisenbud Professor, Jan - June, 2020. *Higher Categories and Categorification* program

MSRI, Program Organizer, Jan - June, 2014. *Algebraic Topology* program

RESEARCH FUNDING:

2018 - 2021: NSF Research Grant DMS-1810575.

2012 - 2018: NSF CAREER Grant DMS-1149408.

2010 - 2013: NSF Research Grant DMS-1007083.

2010 - 2012: AIM SQuaRE grant.

2004 - 2007: NSF Graduate Research Fellowship.

2002 - 2004: National Defense Science and Engineering Graduate Fellowship.

RESEARCH INTERESTS:

Algebraic K -theory and Algebraic Topology.

PUBLICATIONS:

The $R(S^1)$ -graded equivariant homotopy of $\mathrm{THH}(\mathbb{F}_p)$,
Algebraic and Geometric Topology **8**(4) (2008) 1961-1987.

On the K -theory of truncated polynomial algebras over the integers,
joint with V. Angeltveit and L. Hesselholt,
Journal of Topology **2**(2) (2009) 277-294.

$RO(S^1)$ -graded TR-groups of \mathbb{F}_p , \mathbb{Z} , and ℓ ,
joint with V. Angeltveit,

Journal of Pure and Applied Algebra **215** (2011) 1405-1419.

On the algebraic K -theory of the coordinate axes over the integers,
joint with V. Angeltveit,

Homology, Homotopy and Applications **13**(2) (2011), 103-111.

On the algebraic K -theory of truncated polynomial algebras in several variables,
joint with V. Angeltveit, M. Hill, and A. Lindenstrauss,

Journal of K-Theory **13**(1) (2014), 57-81

Interpreting the Bökstedt smash product as the norm,

joint with V. Angeltveit, A. Blumberg, M. Hill, and T. Lawson,

Proceedings of the AMS **144** (2016), 5419-5433.

Computational tools for topological coHochschild homology,

joint with A.M. Bohmann, A. Høgenhaven, B. Shipley, and S. Ziegenhagen,

Topology and its Applications **235** (2018), 185-213.

Topological cyclic homology via the norm,

joint with V. Angeltveit, A. Blumberg, M. Hill, T. Lawson, and M. Mandell,

Documenta Mathematica **23** (2018), 2101-2163.

The Witt vectors for Green functors,

joint with A. Blumberg, M. Hill, and T. Lawson,

Journal of Algebra **537** (2019), 197-244.

Computational tools for twisted topological Hochschild homology of equivariant spectra,
joint with K. Adamyk, K. Hess, I. Klang, and H. Kong

Submitted (2020). arXiv:2001.06602

A modern introduction to stable homotopy theory,

Edited volume. Co-edited together with A. Blumberg and M. Hill,

To be published by MSRI Book Series, Cambridge University Press.

PREPRINTS AND IN PREPARATION:

Topological coHochschild homology and the homology of free loop spaces,
joint with A.M. Bohmann and B. Shipley

On the algebraic K -theory of the group ring $\mathbb{Z}[C_2]$,

joint with V. Angeltveit

The topological Hochschild homology of a Thom spectrum as a cyclotomic spectrum,

joint with V. Angeltveit, A. Blumberg, M. Hill, T. Lawson, and M. Mandell

Real Topological Hochschild homology and Witt vectors for Hermitian Mackey functors,

joint with G. Angelini-Knoll and M. Hill

Equivariant shadows and twisted topological Hochschild homology,

joint with K. Adamyk, K. Hess, I. Klang, and H. Kong

AWARDS:

Michigan State University College of Natural Science Fritz Excellence in Teaching Award, 2019.
 Michigan State University College of Natural Science Teaching Prize, 2016.
 MSU STEM Gateway Fellowship, 2016-2018.
 Michigan State University Teacher-Scholar Award, 2014.
 Frame Teaching Excellence Award, MSU Mathematics Department, 2013.
 National Science Foundation CAREER Award, 2012-2018.
 MIT Housman Award for Excellence in Teaching (second place), 2007.
 MIT Presidential Fellowship, 2002.
 Barry Goldwater Scholarship for Excellence in Math, Science, and Engineering, 2001-2002.

REU AND CONFERENCE GRANTS:

NSF REU Grants, *REU Site in Applied and Discrete Math*, Co-PI. 2016-2019, 2011-2014.
NSA REU Grants, *Summer Undergraduate Research Institute in Experimental Mathematics*, Co-PI. 2020, 2019, 2018, 2016, 2015, 2014, 2013.
NSA Conference Grant, *Connections for Women: Algebraic Topology*, Lead PI. 2014.
NSA Conference Grant, *Introductory Workshop: Algebraic Topology*, Co-PI. 2014.
NSF REU Grant, *REU Site in Applied and Discrete Math*, Senior Personnel. 2019-2022.
NSA REU Grant, *Summer Undergraduate Research Institute in Experimental Mathematics*, Senior Personnel. 2011-2013.

SELECTED INVITED LECTURES:

INVITED MINICOURSES:

Summer School on Motivic, Equivariant, and Non-commutative Homotopy Theory, 3 lectures, IHES, France, 2020.
 Summer School on Trace Methods in Algebraic K-Theory, 3 lectures, Indiana Univ., 2017.

CONFERENCE TALKS:

(∞, n) -Categories, Factorization Homology, and Algebraic K -Theory, MSRI, 2020.
AMS Invited Address, Central Section Meeting, UW-Madison, 2019.
 Algebraic K -theory Meeting, Oberwolfach, Germany, 2019.
 AMS session on Structured Homotopy Theory, University of Michigan, 2018.
 Equivariant and Motivic Homotopy Theory, Newton Institute, Cambridge, England, 2018.
 AMS session on Homotopy Theory, Indiana University, 2017.
 Shanks Workshop in Homotopy Theory, Vanderbilt University, March 2017.
 Graduate Research Opportunities for Women Conference, Northwestern University, 2016.

Midwest Women in Math Symposium, UIUC, 2016.
K-theory, Cyclic Homology and Motives - Weibel's 65th birthday conference, Rutgers, 2015.
K-Theory: Future Directions, Ohio State University, 2015.
 Arithmetic and Algebraic Differentiation, UC Berkeley, 2015.
 AWM Workshop on Homotopy Theory, San Antonio, TX, 2015.
 Midwest Topology Seminar, Northwestern University, 2014.
 Workshop on Differential Cohomologies, CUNY Graduate School, 2014.
 Midwest Women in Math Symposium, Notre Dame, 2014.
 Algebraic Topology: Applications and New Directions, Stanford Univ., 2012.
 West Coast Algebraic Topology Summer School on *K*-theory, Stanford Univ., 2012.
 Arolla Conference on Algebraic Topology, Arolla, Switzerland, 2012.
 Virginia Conference on Algebraic Topology, University of Virginia, 2012.
 Witt Vectors in Arithmetic, Geometry, and Topology, Univ. of New Mexico, 2012.
 40 Years and Counting: AWM's Celebration of Women in Math: Special Session on Homotopy Theory and its Applications, Brown University, 2011.
 Structured Ring Spectra, Hamburg, Germany, 2011.
 New Directions in Algebraic *K*-Theory, Oberwolfach, Germany, 2011.
 Mathematical Association of America – Michigan Section, Western Michigan Univ., 2011.
 Graduate Student Topology and Geometry Conference, Young Faculty Speaker, MSU, 2011.
 Hot Topics Workshop: Kervaire Invariant, MSRI, Berkeley, CA, 2010.
 Cascade Topology Seminar, Banff International Research Station, 2010.
 Mayday 2009: New Contexts in Homotopy Theory, Univ. of Chicago, 2009.
 Conference on *p*-Adic Geometry and Homotopy Theory, Loen Norway, 2009.
 Motivic Cohomology and Algebraic *K*-theory Meeting, Oberwolfach, Germany, 2009.
 Midwest Topology Seminar, University of Minnesota, 2009.
 AMS Special Session on Homotopy Theory and Algebraic Topology, Huntsville, AL, 2008.
 AMS Special Session on Homotopy Theory, Kalamazoo, MI, 2008.
 AMS Special Session on Applications of Ring Spectra, Bloomington, IN, 2008.
 AMS Special Session on Algebraic Topology, Murfreesboro, TN, 2007.
 Algebraic *K*-theory Meeting, Oberwolfach, Germany, 2006.
 Conference on Automorphisms of Manifolds, Talbot Workshop, 2006.

DEPARTMENT COLLOQUIUA:

Mathematics Colloquium, UCLA, 2020.
 Mathematics Colloquium, Vanderbilt University, 2019.
 Mathematics Colloquium, Indiana University, 2014.
 Mathematics Colloquium, Calvin College, 2011.

Mathematics Colloquium, Michigan State University, 2009.

SEMINAR TALKS:

UCLA: 2020.
 University of Chicago: 2019, 2011, 2007, 2006.
 Electronic Computational Homotopy Theory Seminar: 2017.
 MIT Electronic Math Education Seminar: 2017.
 Ohio State University: 2017.
 MIT: 2016, 2011, 2007.
 Wayne State University: 2013, 2010.
 Northwestern University: 2012, 2008, 2006.
 University of Kentucky: 2012.
 University of Western Ontario: 2011.
 University of Virginia: 2011.
 Stanford University: 2010, 2008.
 Indiana University: 2009, 2007.
 University of Illinois at Urbana-Champaign: 2008, 2006.
 University of California Berkeley: 2008.
 Wesleyan University: 2006.

TALKS FOR UNDERGRADUATES:

Combing the Hair on a Spherical Cat, REU guest lecture, MSU, 2019.
Algebra in Topology and Topology in Algebra, AWM lecture series, MSU, 2018
Algebra in Topology and Topology in Algebra, Graduate Research Opportunities for Women
 Conference, Northwestern University, 2016.
Combing the Hair on a Spherical Cat, Undergraduate Colloquium, MSU, 2016.
Brussels Sprouts and Bridges, REU guest lecture, MSU, 2012.
Brussels Sprouts and Bridges, Calvin College colloquium, 2011.

TEACHING EXPERIENCE:

MICHIGAN STATE UNIVERSITY:

MTH 103 – COLLEGE ALGEBRA
 MTH 124 – SURVEY OF CALCULUS I
 LB 118 – CALCULUS I
 LB 220 – CALCULUS III
 MTH 301 – FOUNDATIONS OF HIGHER MATH
 MTH 317H – HONORS LINEAR ALGEBRA
 MTH 327H – HONORS INTRODUCTION TO ADVANCED ANALYSIS
 MTH 490 – DIRECTED STUDIES – ALGEBRAIC TOPOLOGY
 MTH 490 – DIRECTED STUDIES – DIFFERENTIAL TOPOLOGY
 MTH 869 – GRADUATE GEOMETRY AND TOPOLOGY II
 MTH 890 – DIRECTED STUDIES - SPECTRAL SEQUENCES

MTH 890 – DIRECTED STUDIES - CATEGORY THEORY

INDIANA UNIVERSITY:

M 119 – BRIEF SURVEY OF CALCULUS I
 M 211 – CALCULUS I
 M 212 – CALCULUS II
 M 522 – GRADUATE TOPOLOGY II

RESEARCH MENTORSHIP:

WOMEN IN TOPOLOGY:

Led a research team (with Brooke Shipley) through the Women in Topology program, 2016.
 Led a research team (with Kathryn Hess) through the Women in Topology program, 2019.

POSTDOC:

Postdoctoral supervisor to Gabe Angelini-Knoll – 2017-2019.
 MSRI Postdoctoral mentor to Sarah Yeakel – 2020.

GRADUATE STUDENTS:

PhD students:

Sarah Klanderma – 2014 - 2020.
 Danika Van Niel – current second year.
 Chloe Lewis – current second year.

Masters degree advisor to Jessica Berg – 2016-17.

Ph.D. thesis committee member for students in Topology, Topological Data Analysis, and Mathematics Education.

UNDERGRADUATE STUDENTS:

From 2012-present, one of three co-organizers of the NSF and NSA funded Math REU program: Summer Undergraduate Research Institute in Experimental Mathematics (SURIEM) at Michigan State University. This 8-week residential summer REU program, targeted at early-career undergraduates, draws participants from around the country.

Supervised undergraduate research students from Ohio University, UT Austin, Butler University, Grinnell College, Michigan State, and Xi'an Jiaotong University.

HIGH SCHOOL STUDENT:

Research project advisor to Monika Francsics – 2015-2017.

OTHER MENTORSHIP:

Panelist at the Graduate Research Opportunities for Women (GROW) conference at the University of Michigan, 2018.

Speaker and panelist at the Graduate Research Opportunities for Women (GROW) conference at Northwestern University, 2016.

Invited speaker at the MIT Women in Math lunch for undergraduates, graduate students, postdocs, and faculty members, 2016.

Mentor at the AWM Mentoring Lunch at the Joint Mathematics Meeting, 2015.

Organized weekly Women in Topology lunches for graduate students, postdocs, and faculty members during the MSRI semester program on Algebraic Topology, 2014.

Organized and moderated a faculty panel on "Women in Mathematics" for graduate students and postdocs at the Connections for Women Workshop at MSRI, 2014.

Organized and moderated a faculty panel for graduate students on "Academic Jobs and Life as a Mathematician," at the Midwest Topology Seminar, 2012.

PROFESSIONAL SERVICE:

CONFERENCE AND PROGRAM ORGANIZATION:

- 2020:** Co-organizer of *Equivariant Techniques in Stable Homotopy* workshop at AIM.
- 2020:** Co-organizer for *Equivariant Stable Homotopy Theory and p-adic Hodge Theory* workshop at Banff International Research Station (BIRS)
- 2019:** Lead organizer for *Homotopy Theory* special session at AMS meeting in Madison
- 2019:** Lead organizer for *Midwest Topology Seminar* conference at MSU
- 2019:** Co-organizer for *Equivariant Homotopy Theory and Trace Methods* special session at AMS meeting in Honolulu, HI
- 2018:** Co-organizer for *Homotopy Theory Summer: Classical, Equivariant, and Motivic Homotopy Theory* conference in Berlin, Germany.
- 2016:** Co-organizer for *Equivariant Derived Algebraic Geometry* workshop at AIM.
- 2016:** Co-organizer for *Equivariant Derived Algebraic Geometry* workshop at BIRS
- 2015:** Co-organizer for *Algebraic and Geometric Topology Special Session* at the Midwest Women in Mathematics Symposium at Dominican Univ.
- 2014:** Co-organizer for semester-long program: *Algebraic Topology*, Mathematical Sciences Research Institute (MSRI), Berkeley, CA
- 2014:** Co-organizer for *Introductory Workshop: Algebraic Topology* conference at MSRI
- 2014:** Lead organizer for *Connections for Women: Algebraic Topology* conf. at MSRI
- 2013:** Co-organizer for *MSRI Summer Graduate Workshop on Algebraic Topology*
- 2012:** Lead organizer for *Midwest Topology Seminar* conference at MSU
- 2012:** Scientific co-organizer for *West Coast Algebraic Topology Summer School: Advances in K-theory* at Stanford University
- 2012:** Co-organizer for *Algebraic K-Theory & Equivariant Homotopy* workshop at BIRS

2011: Co-organizer for *Special Session on Algebraic K-Theory and Homotopy Theory* at AMS Sectional Meeting in Iowa City, IA

REVIEWING AND REFEREEING:

Served on 5 NSF panels in the Topology program, and one panel in the CAREER program

Article referee, for journals including: *Algebraic and Geometric Topology*, *Journal of Pure and Applied Algebra*, *Journal of Topology*, *AMS Contemporary Mathematics*.

DEPARTMENT SERVICE:

Math department Strategic Planning: Undergraduate Program Subcommittee, 2019.

Math dept. Chair Search Committee member and Diversity, Equity, and Inclusion officer, 2019.

Math department Undergraduate Studies Committee member and Diversity, Equity, and Inclusion officer, 2017-2019.

Math department Graduate Studies Committee member, 2015-2017.

Math department Frame Award Committee member, 2015.

Mathematics Advanced Track Advisory Ad-Hoc Committee member, 2014-2015.

Women in Math Dinners: Co-founder and co-organizer of Women in Mathematics dinners in the MSU Mathematics Department, 2012-present.

UNIVERSITY SERVICE:

College of Natural Science Strategic Planning: Mission, Values, and Vision work group, 2019.

Faculty advisor for Assoc. for Women in Mathematics (AWM) Chapter at MSU, 2018-present.

Faculty panelist for college and university workshops on writing NSF grants, 2016, 2017, 2018.

Faculty panelist for a College of Natural Science Reappointment, Promotion, and Tenure Workshop for junior faculty, 2018.

Member of the Faculty Advisory Committee for MSU's NSF ADVANCE Grant: 2011-2013.

Faculty co-advisor for Lyman Briggs Women in Science student group at MSU, 2011- 2012.

OUTREACH:

Judge for the Association for Women in Mathematics Essay Contest: 2012-2014, 2017-2020.

Classroom outreach: "Möbius Magic!" at Montessori Radmoor School, MI (ages 3-6), 2019.

Interview for Association for Women in Mathematics (AWM) Newsletter – *Mathematics + Motherhood*, 2018.

Starred in two mathematics videos for the MSRI-sponsored Numberphile youtube channel. Together they have over 450,000 youtube views. 2014.

Starred in a video, “Sizes of Infinite Sets,” for the Girls’ Angle Women in Mathematics Video Series. Over 13,000 youtube views. 2012.

Sonia Kovalevsky High School Math Day for Girls – Panelist and assistant with Topology activities, Indiana University, 2009.

NATIONAL COMMITTEES:

Mathematical Sciences Research Institute (MSRI) Human Resources Advisory Committee (HRAC), 2017-2022.

Association for Women in Mathematics (AWM) and American Mathematical Society (AMS) joint Noether Lecture Selection Committee, 2017-2022. Chair: 2018, 2019.

Selection committee for MSRI *Summer Research in Mathematics* program, 2019, 2020.