

Teena M Gerhardt

CURRICULUM VITAE

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.

RESEARCH INTERESTS:

Algebraic Topology and Algebraic K -theory

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.

Topological coHochschild homology and the homology of free loop spaces,
joint with A.M. Bohmann and B. Shipley
Mathematische Zeitschrift **301** (2022), 411-454.

Computational tools for twisted topological Hochschild homology of equivariant spectra,
joint with K. Adamyk, K. Hess, I. Klang, and H. Kong
Topology and its Applications **316** (2022).

Stable categories and structured ring spectra,
Co-edited with A. Blumberg and M. Hill,
MSRI Publications **69**, Cambridge University Press (2022).

A shadow perspective on equivariant Hochschild homologies,
joint with K. Adamyk, K. Hess, I. Klang, and H. Kong
To appear: *International Mathematics Research Notices (IMRN)* (2022).

Real topological Hochschild homology via the norm and Real Witt vectors,
joint with G. Angelini-Knoll and M. Hill
Submitted, arXiv:2111.06970 (2021).

GRANT FUNDING:

2022 - 2027: NSF Research Training Groups (RTG) Grant DMS-2135960, co-PI
2021 - 2024: NSF Research Grant DMS-2104233
2021 - 2024: NSF Focused Research Group (FRG) Grant DMS-2052042, co-PI
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.

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. 2021, 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.

AWARDS:

Michigan State University President's Distinguished Teaching Award, 2021.
 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.

VISITING POSITIONS:

SLMath, Research Member, Aug - Dec, 2022. *Floer Homotopy Theory* program
MSRI, Eisenbud Professor, Jan - June, 2020. *Higher Categories and Categorification* program
MSRI, Program Organizer, Jan - June, 2014. *Algebraic Topology* program

SELECTED INVITED LECTURES:

INVITED MINICOURSES:

Summer School on Motivic, Equivariant, and Non-commutative Homotopy Theory, 3 lectures, IHES, France (moved online due to COVID), 2020.
 Summer School on Trace Methods in Algebraic K-Theory, 3 lectures, Indiana Univ., 2017.

CONFERENCE TALKS:

Chromatic Homotopy, K-Theory, and Functors, CIRM, Luminy, France, 2023.
 (∞, n) -Categories, Factorization Homology, and Algebraic K-Theory, MSRI (online due to COVID), 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 COLLOQUIA:

Women in Mathematics Colloquium, University of Iowa, 2020.
 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:

Electronic Computational Homotopy Theory Seminar: 2022, 2017.
 MSRI: 2020.
 UCLA: 2020.
 University of Chicago: 2019, 2011, 2007, 2006.
 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, MSU Math Club, 2021.
Algebra in Topology and Topology in Algebra, REU guest lecture, University of Chicago, 2020.
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.

CONFERENCE AND SEMINAR TALKS ON CURRICULUM/TEACHING:

Sloan Equity and Inclusion in STEM Introductory Courses (SEISMIC) Showcase,
 University of Michigan (virtual), 2021.
 HHMI Gateway Summit at MSU, 2019.
 University Innovation Alliance Convening, 2018.
 Co-integrate Mathematics Seminar Series, MSU, 2018.
 MIT Electronic Math Education Seminar: 2017.

PANELIST:

Panelist - MSRI Diversity, Equity, and Inclusion professional development panel, 2021
 Panelist - UC Riverside AWM Student Chapter Internship and REU panel, 2020.
 Panelist - Connections for Women: Higher Categories and Categorification at MSRI, 2020.
 Panelist - Graduate Research Opportunities for Women conference at Univ. Michigan 2018.
 Panelist - Graduate Research Opportunities for Women conference at Northwestern Univ. 2016.
 Organizer and moderator - Connections for Women panel at MSRI, 2014.

Organizer and moderator - Academic Jobs panel at the Midwest Topology Seminar, 2012.

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 310 – ABSTRACT ALGEBRA I AND NUMBER THEORY
 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
 MTH 890 – DIRECTED STUDIES - HOMOTOPY THEORY
 MTH 960 – ALGEBRAIC TOPOLOGY I
 MTH 961 – ALGEBRAIC TOPOLOGY II

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.
 Leading a research team (with Anna Marie Bohmann) through the Women in Topology program, 2023.

POSTDOC:

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

GRADUATE STUDENTS:

PhD students:

Sarah Klanderma – 2014 - 2020.
 Chloe Lewis – 2018 - present.
 Danika Van Niel – 2018 - present.

Zhonghui Sun – 2019 - present.

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

UNDERGRADUATE STUDENTS:

Involved since 2012 in organizing 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, Xi'an Jiaotong University, Brown University, Georgia Tech, and Bowdoin College, as well as a high school student from Okemos High School.

OTHER MENTORSHIP:

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

Mentor - in Math Alliance Facilitated Graduate Applications Process (F-GAP), 2020-present.

Mentor - in Math Alliance Bolstering the Advancement of Masters in Mathematics (BAMM) program, 2020-present.

Mentor - at the Math Alliance *Taking our Place in Graduate School* event, 2020.

Speaker - Graduate Research Opportunities for Women conference at Northwestern Univ. 2016.

Speaker - MIT Women in Math lunch, 2016.

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

Organizer - Women in Topology lunches at MSRI semester on Algebraic Topology, 2014.

Organizer - Women in Mathematics dinners in the MSU Mathematics Department, 2012-2019.

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

OUTREACH:

Judge for the Association for Women in Mathematics Essay Contest: 2012-2014, 2017-2022.

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.

Featured in two mathematics videos for the MSRI-sponsored Numberphile youtube channel. Together they have 500,000 youtube views. 2014.

Featured in a video, "Sizes of Infinite Sets," for the Girls' Angle Women in Mathematics Video Series. Over 15,000 youtube views. 2012.

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

PROFESSIONAL SERVICE:

CONFERENCE AND PROGRAM ORGANIZATION:

- 2022:** Co-organizer of *Equivariant Techniques in Stable Homotopy* workshop at the American Institute of Mathematics (AIM).
- 2022:** Co-organizer of *Connections Workshop: Floer Homotopy Theory* workshop at Mathematical Sciences Research Institute (MSRI).
- 2021:** Co-organizer of *Equivariant Techniques in Stable Homotopy* workshop at the American Institute of Mathematics (AIM) - (online due to COVID).
- 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, REFEREEING AND EDITORIAL:

Advisory Board member for the *Cambridge Mathematical Textbooks Series* from Cambridge University Press.

Served on 8 NSF panels, including panels for the Topology program, the CAREER program, and the Mathematical Sciences Postdoctoral Research Fellowship (MSPRF).

Article referee or expert opinion for journals including: *Advances in Mathematics*, *Algebraic and Geometric Topology*, *AMS Contemporary Mathematics*, *Bulletin of the London Mathematical Society*, *Compositio Mathematica*, *Homology, Homotopy and Applications*, *Journal of the London Mathematical Society*, *Journal of Pure and Applied Algebra*, *Journal of Topology*, *Transactions of the American Mathematical Society*.

DEPARTMENT SERVICE:

Math department Advisory Committee member and DEI officer, 2022-2024.

Math department Hiring Committee member and DEI officer, 2021-2022.

Math department Reopening Committee: Instruction Subcommittee, 2020.

Math department Strategic Planning: Undergraduate Program Subcommittee, 2019.

Math department Chair Search Committee member and DEI officer, 2019.

Math department Undergraduate Studies Committee member and DEI 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.

UNIVERSITY SERVICE:

College of Natural Science: Faculty Annual Evaluation Committee, co-chair, 2021-2022.

MSU President's Distinguished Teaching Award Review Committee, 2021-2022.

College of Natural Science Awards Committee, 2021-2022.

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

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.

NATIONAL COMMITTEES:

American Mathematical Society (AMS) Birman Fellowship Selection Committee, 2022-2024.

American Mathematical Society (AMS) Mathematics Research Communities Advisory Board, 2022-2024.

Association for Women in Mathematics (AWM) Birman Research Prize Selection Committee, 2022-2025.

Mathematical Sciences Research Institute (MSRI) Broadening Participation Advisory Committee (BPAC), 2017-2022. Co-chair: 2020-2022.

Ex officio member of MSRI Steering Committee, 2020-2022.

Ex officio member of MSRI Board of Trustees, 2020-2022.

Member of MSRI Committee on Trustees, 2021-2022.

Selection committee for MSRI *Summer Research in Mathematics* program, 2019-2022.

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