

# Eric J. Malm

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## ACADEMIC EMPLOYMENT

**Research Assistant Professor** *September 2010 to present.*  
**Simons Center for Geometry and Physics, Stony Brook University, Stony Brook, NY.**

## RESEARCH INTERESTS

Algebraic topology, string topology, homological algebra, category theory, and topological field theories.

## EDUCATION

**Stanford University**, Stanford, CA.  
Ph.D., Mathematics, August 2010.  
Advisor: Ralph Cohen.  
Dissertation: "String Topology and the Based Loop Space."

**Harvey Mudd College**, Claremont, CA.  
B.S. with High Distinction, Mathematics, May 2005.  
Humanities/Social Sciences Concentration: History.

## TEACHING

**Stony Brook University**, Stony Brook, NY.

- *Spring 2013.* Instructor, Math 303, Calculus IV with Applications.
- *Fall 2011.* Instructor, Math 122, Overview of Calculus, with Applications.
- *Spring 2011.* Instructor, Math 125, Calculus A.

**Stanford University**, Stanford, CA.

- *Summer 2010.* Instructor, Math 19, Calculus.
- *Spring 2010.* Course Assistant, Math 210C, Modern Algebra: Representation Theory.
- *Winter 2010.* Teaching Assistant, Math 51, Linear Algebra and Differential Calculus of Several Variables.
- *Autumn 2009.* Teaching Assistant, Math 51 ACE, Linear Algebra and Differential Calculus of Several Variables, Accelerated Calculus for Engineers section.
- *Winter 2009.* Teaching Assistant, Math 51, Linear Algebra and Differential Calculus of Several Variables.
- *Autumn 2008.* Course Assistant, Math 115, Functions of a Real Variable.

## OTHER EMPLOYMENT

**Summer Research Intern, SCAMP Program** *Summers, 2004 & 2005.*

**Institute for Defense Analyses/Center for Computing Sciences**, Bowie, MD.

Worked in small teams on research problems in computer network security and applied graph theory. Implemented prototype solutions and presented results to research program community.

**Summer Research Student, Harvey Mudd College**, Claremont, CA. *Summer 2003.*

Collaborated with other undergraduates to develop and validate a partial differential equation model of tumor growth under chemotherapy and immune response. Implemented numerical solver for simulations of model.

**Math Tutor, Mathematics Department and Academic Excellence** *August 2002 to May 2005.*

**Harvey Mudd College**, Claremont, CA.

Tutored students in group problem sessions and in office hours. Facilitated student development of collaborative learning skills. Designed and ran workshops to improve student mathematical writing. Led skill development discussions with fellow tutors.

## AWARDS AND HONORS

- Stanford University Centennial Teaching Assistant Award, 2009.
- National Defense Science and Engineering Graduate Fellow, 2005–2008.
- Goldwater Scholar, 2004.
- HMC Departmental Awards, Mathematics, 2002, 2003, 2004.
- Mathematical Contest in Modeling, Outstanding, SIAM, INFORMS Awards, 2004; Meritorious Award, 2003, 2005.
- William Lowell Putnam Competition Top 200, 2001, 2003, 2004; Top 500, 2002.
- First Place, National Problem Solving Competition, MathFest 2004.
- Harvey S. Mudd Merit Scholar.
- United States Presidential Scholar, 2001.
- National Merit Scholar.

## PUBLICATIONS

- “String topology and the based loop space.” Preprint, condensed version of Ph.D. dissertation. Available at [arXiv:1103.6198](https://arxiv.org/abs/1103.6198).
- “String Topology and the Based Loop Space.” Ph.D. dissertation, Stanford University, 2010.
- “Decimation-in-frequency Fast Fourier Transforms for the Symmetric Group.” Senior Thesis, Department of Mathematics, Harvey Mudd College, 2005. Awarded Chavin Prize.
- James Colin Hill, Gail Nord, Eric Malm, John Nord. “How Do You Slice The Bread?” *CMJ*, Sep 2005, 36(4) 323–326.
- Steven Avery, Eric Harley, Eric Malm. “The Myth of ‘The Myth Of Fingerprints.’” *The UMAP Journal*, Fall 2004, 25(3) 215–230.
- Gail Nord, Eric J. Malm and John Nord. “Counting Pizzas: A Discovery Lesson Using Combinatorics.” *Mathematics Teacher*, Jan 2002, 95(1).
- Solutions to *CMJ* Problems #673, #675, #693, #694, #695, #768, #769, #770; *Math. Mag.* Problem #1682; *SSM* Problems #4794, #4795, #4956, #5016, #5018.

## PRESENTATIONS

- “Topological K-Theory.” Postdoc Seminar, Simons Center for Geometry and Physics, Stony Brook University, November 2012.
- “String Topology and Poincaré Duality.” Young Topologists Meeting, University of Copenhagen, July 2012.
- “Introduction to A-infinity Structures.” Postdoc Seminar, Simons Center for Geometry and Physics, Stony Brook University, March 2012.
- “String Topology and the Based Loop Space.” Topology Seminar, New Mexico State University, December 2011.
- “Unraveling String Topology.” Department Colloquium, New Mexico State University, December 2011.
- “String Topology and the Based Loop Space.” Structured Ring Spectra, TNG, University of Hamburg, August 2011.
- “String Topology and the Based Loop Space.” Young Topologists Meeting, EPFL, Switzerland, June 2011.
- “String Topology and the Based Loop Space.” Thesis defense, Stanford University, May 2010.
- “String Topology and the Based Loop Space.” Cascade Topology Seminar, Banff International Research Station, April 2010.
- “String Topology and the Based Loop Space.” Topology Seminar, Department of Mathematics, University of California–Berkeley, March 2010.
- “String Topology and the Based Loop Space.” Topology Seminar, Department of Mathematical Sciences, University of Copenhagen, January 2010.
- “Unraveling String Topology.” Student Research Colloquium, Stanford University Mathematics Department, December 2009.

- “String Topology and the Based Loop Space.” AMS Western Section Meeting, University of California at Riverside, November 2009.
- “String Topology via the Chains of the Based Loop Space.” International Conference on Loops, Strings, and Moduli Spaces, Nankai University, Tianjin, China, August 2009.
- “An Introduction to String Topology.” Graduate Student Topology Conference, University of Wisconsin-Madison, April 2009.
- “String Topology and Hochschild Homology.” Oral examination presentation, Stanford University Mathematics Department, August 2008.
- “Group Extensions and Group Cohomology.” Graduate Student Colloquium, Stanford University Mathematics Department, April 2008.
- “String Topology and Hochschild Homology.” Topology Progress Seminar, Stanford University Mathematics Department, February/March 2008.
- “Decimation-in-frequency Fast Fourier Transforms for the Symmetric Group.” AMS-MAA-SIAM Special Session on Research in Mathematics by Undergraduates, Joint Mathematics Meetings, Atlanta, January 2005.
- “Are Fingerprints Unique?” Joint work with S. Avery, E. Harley. SIAM Annual Meeting, July 2004.
- Presentation of a solution to *CMJ* Problem #675. Pacific Northwest Section MAA Meeting, Spring, 2001.

## CONFERENCES ATTENDED

- Joint Mathematics Meetings, San Diego, January 2013.
- Algebraic Topology: Applications and New Directions, Stanford University, July 2012.
- West Coast Algebraic Topology Summer School 2012: Advances in K-theory, Stanford University, July 2012.
- Young Topologists Meeting, University of Copenhagen, July 2012.
- Homotopical Algebra and Its Applications, LUMINY, June 2012.
- Midwest Topology Seminar, Northwestern University, March 2012.
- Joint Mathematics Meetings, Boston, January 2012.
- Structured Ring Spectra, University of Hamburg, August 2011.
- Young Topologists Meeting, EPFL, Switzerland, June 2011.
- Algebra, Topology, and Fjords Summer School, Sophus Lie Center, Nordfjordeid, Norway, June 2011.
- Midwest Topology Seminar, University of Chicago, April 2011.
- Workshop on Differential Cohomology, Simons Center for Geometry and Physics, Stony Brook, January 2011.
- Midwest Topology Seminar, Wayne State University, October 2010.
- Cascade Topology Seminar, Banff International Research Station, April 2010.
- AMS-MAA Joint Mathematics Meetings, San Francisco, CA, January 2010.
- Copenhagen Topology Conference, University of Copenhagen, January 2010.
- AMS Western Regional Meeting, University of California at Riverside, November 2009.
- International Conference on Loops, Strings, and Moduli Spaces, Nankai University, Tianjin, China, August 2009.
- Topological Field Theories Conference and Workshop, Northwestern University, May 2009.
- Graduate Student Topology Conference, University of Wisconsin-Madison, April 2009.
- Third Arolla Conference on Algebraic Topology, Arolla, Switzerland, August 2008.
- Young Persons Workshop on String Topology and the Topology of Moduli Spaces, Stanford University, March 2008.
- Abel Symposium on Algebraic Topology, University of Oslo, August 2007.
- Graduate Student Topology Conference, University of Chicago, April 2007.
- AMS-MAA Joint Mathematics Meetings, Atlanta, GA, January 2005.
- SIAM Annual Meeting, Portland, OR, July 2004.

## ACTIVITIES

- Membership in AMS, MAA, SIAM, and Sigma Xi.
- Teaching Assistant Mentor, Stanford Mathematics Department, September 2009 to May 2010.
- Student Research Colloquium co-organizer, September 2009 to May 2010.
- Faculty Areas of Research Seminar, organizer, 2006–07.

## SKILLS

Extensive experience with computing systems, including Mac OS X, Windows, Linux, MS Office, Mathematica, Matlab,  $\LaTeX$ .

Programming experience in PHP, Python, HTML/CSS, JavaScript, C++, Java, Matlab, Perl, Visual Basic.

Systems experience with Git, Subversion, Apache, MySQL.

Language skills: French (intermediate).

Strong organizational, communication, and presentation skills.

Clearance: DoD TS/SCI with polygraph.

## CITIZENSHIP

United States of America.

## REFERENCES

Available upon request.