

Melanie Pivarski

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Citizenship: United States

Education

Ph.D. Mathematics, Cornell University, August 2006, Advisor: Laurent Saloff-Coste

B.S. Mathematics, Minor Computer Science, Carnegie Mellon University, May 1999,
College and University Honors

Employment

Visiting Assistant Professor, Texas A&M University, 2006-present.

Teaching Experience

Instructor: Differential Equations (2 sections, engineers, MATLAB), Applied Calculus (2 sections, non-majors, graphing calculators), Calculus II (majors, supervised a teaching assistant, Maple), Finite Math for Business (graphing calculators), Texas A&M, 2006-present.

Instructor: Calculus I (3 semesters, non-majors, Good Questions, graphing calculators), Calculus II (non-majors), Finite Math (non-majors), Cornell, 2002-2005.

Co-organizer: Mentoring Program for New Teaching Assistants, Cornell, 2005.

Co-organizer: Graduate TA Training, Cornell, 2001, 2002, 2004, 2005.

Grader: Undergraduate Real Analysis II, Graduate Real Analysis, Cornell, 2003, 2005.

Mathematics Content Liaison: Academic Excellence Workshops, Cornell, Spring 2001.

Teaching Assistant: Cornell, 1999-2001. Carnegie Mellon, 1997-1999.

Awards and Fellowships

Graduate Student Teaching Award, Cornell University, Fall 2005.

Hutchinson Fellowship, Cornell University, Spring 2004.

Research Interests

Analysis on metric measure spaces, Heat kernels, Probability, Poincaré inequalities, Quantum graphs, Isoperimetry, Fractals, Interactions between geometry and analysis

Publications

Small Time Heat Kernel Behavior on Riemannian Complexes. with Laurent Saloff-Coste, New York Journal of Mathematics, Volume 14 (2008) 459-494.

Heat kernels on Euclidean complexes. Dissertation, Cornell University, Ithaca, NY, 2006. (<http://arxiv.org/abs/0801.3038>)

Experiences with Student Research

- Graduate Assistant: *Fractals REU* with Prof. R. Strichartz, Cornell, 2001.
- Teaching Assistant: *Euler's Formula* with Prof. J. Schaeffer, High school research project, Pennsylvania Governor's School for the Sciences, 1999.
- Participant: *Polynomial Knots REU* with Prof. A. Durfee, Mount Holyoke, 1998.
 - Speaker with E. Curry: AMS/MAA Joint Meetings, 1999.
- Participant: *Koteljanskii Matrices REU* with Dr. S. Fallat, William and Mary, 1997.

Research and Seminar Talks

- *Small Time Heat Kernel Behavior on Riemannian Polytopal Complexes*. AMS/MAA Joint Meetings, AMS Session on Geometry and Topology, I, 2008.
- *Small Time Heat Kernel Behavior on Riemannian Complexes*. Mathematical Physics and Harmonic Analysis Seminar, Texas A&M, 2007.
- *Small Time Heat Kernel Behavior for Riemannian Polytopal Complexes*. Postdoc Lunch Series, Texas A&M, 2007.
- *Heat Kernels, Random Walks, and Euclidean Complexes*. Postdoc Lunch Series, Texas A&M, 2006.
- *Heat Kernels on Euclidean Complexes*. Mathematical Physics and Harmonic Analysis Seminar, Texas A&M, 2006.
- *Mathematical Cousins*. with Kristin Camenga, Olivetti Club, Cornell, 2006.
- *Heat Kernel Asymptotics on Euclidean Polytopal Complexes*. AMS/MAA Joint Meetings, AMS Session on Analysis on Graphs, Polytopes, and Groups, 2006.
- *Heat Kernel Asymptotics on Euclidean Polytopal Complexes*. Analysis Seminar, Cornell, 2005.
- *Poincaré Inequalities: Pleasant, yet Informative*. Olivetti Club, Cornell, 2005.
- *Bounds and Boundaries: Relationships between Sobolev and Isoperimetric Inequalities*. MAA Seaway Section Meeting at Canisius College, 2004.
- *A Tale of N Cities*. Olivetti Club, Cornell, 2003.
- *Evolving Sets and Mixing*. Graduate Probability Seminar, Cornell, 2003.

Expository Talks

- *The Mathematics of Contra Dancing*. Undergrad Math Club, Texas A&M, April 2008.
- *Binary Numbers and Codes*. Newfield Middle School, May 2006.
- *Secret Keeper*. Lansing High School, April 2005.

- *Dance, Baby, Dance: Wandering in the Labyrinth of Permutation Groups*. Preparing Future Faculty Lecture, Hobart and William Smith College, February 2003.

Activities, Presentations, and Training in Mathematics Education

- Teaching as Research (faculty development group), Texas A&M, 2007-2008.
 - *Graphing and Describing Derivatives and Integrals*. [Poster] April, 2008.
- Peer Review Teaching Project, Texas A&M, 2006-2007.
 - *Business Mathematics I in a Large Lecture Format: A Peer Review Portfolio*. Peer Review of Teaching Project (www.courseportfolio.org), 2007.
- Teaching Seminar, Cornell, 2000-2006. Presentations given:
 - *Jobs in Mathematics*. Panel participant, 2006.
 - *How to Write Good Questions*. Panel organizer, 2006.
 - *Icebreakers*. 2005.
 - *Tips for Grading Homework*. with Mia Minnes and Kristin Camenga, 2005.
 - *Small Groups: Advantages and Disadvantages*. with Mia Minnes, 2005.
 - *Outreach: What's Appropriate, Useful, and Possible*. 2004.
 - *Day 1 – ϵ : How to Prepare*. 2003.
- *Origami imagirO: An Expanding Your Horizons workshop exposing middle school girls to concepts in symmetry and math*. [Poster] with A. Baldo, L. Gold, D. Goldberg, M. Slughter. 3rd Int. Meeting on Origami Sci., Math and Ed., March, 2001.
- Brazos Valley Math Teachers' Circle, 2008.
- Teaching development workshops: "Syllabus Workshop", Texas A&M, August 2008. "Facilitating a Discussion", "College Student's Cognitive Stages", Cornell, January 2005.
- "Educational Issues in Undergraduate Mathematics", Cornell, Spring 2002.
- Teaching Assistant Training, Carnegie Mellon, 1997. Cornell, 1999.

Outreach Activities

- Workshop Developer, Organizer, and Instructor: *Expanding Your Horizons*, Cornell, 2000-2006, Texas A&M, 2006-present.
- Senior Counselor: Summer Educational Experience in Math, Texas A&M, 2007-2008.
 - Workshop Developer and Instructor: "Dancing in Groups", 2008.
- Assistant: Math Mini Fair, Games and Exhibits, Texas A&M, 2008.
- Science and Rules Judge: Regional Science Bowl (Jr and Sr), Texas A&M, 2008.
- Grader: We've Got Your Number, Texas Science Olympiad, Texas A&M, 2007.
- Judge (Comp. Sci., Math): Texas Jr. Academy of Science, Texas A&M, 2007-2008.

Conferences

- Analysis and Probability on Fractals, Cornell, 2002, 2005, 2008.
- AMS/MAA Joint Meetings, 1999, 2003-2008.
- Analysis on Graphs and Fractals, Cardiff, Wales, May 2007.
- Random Walks on Groups at CIRM, Luminy, France, February 2007.
- Analysis on Graphs and its Applications, Gregynog, Wales, January 2007.
- Northeast Probability Seminar, New York, November 2005.
 - Informal contributed talk: *On Diagonal Heat Kernel Bounds on Complexes*.
- Analysis on Metric Measure Spaces, Bedlewo, Poland, July 2004.
- Seminar on Stochastic Processes, 2002, 2004, 2005.
- Seminar on Finite Markov Chains, Oberwolfach, May 2002.

Service

- Class Representative: Cornell, 2003-2004.
- Co-organizer: Cornell Mathematics first graduate student recruitment weekend, 2002.
- Organizer: Women in Mathematics Potlucks, Cornell, 2000-2005.

Computer Skills

- Teaching Experience in Programming Courses:
 - Course Assistant: Introductory parallel programming lab and Intro to Maple, Pennsylvania Governor's School for the Sciences, Summer 1999.
 - Course Assistant: Introductory programming in Mathematica, Carnegie Mellon, 1996-1997. Content includes arrays, linked lists, recursion, proof by induction.
- Teaching With Technology in Math Courses: MATLAB, MapleTA, Maple, Mathematica, TI graphing calculators, On-line homework systems, Interactive polling (clickers).
- Languages: Maple, MATLAB, Mathematica, HTML, LaTeX, C/C++, ML, OpenGL

Memberships

Mathematics Association of America, American Mathematics Society, Phi Beta Kappa