Matt Rathbun

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Education

Ph.D. Mathematics, University of California, Davis. June 2010.

Dissertation: Tunnel Number One, Fibered Links and High Distance Knots

Advisor: Abigail Thompson, Ph.D.

M.A. Mathematics, University of California, Davis. 2005.

B.A. Mathematics, University of California, Berkeley. 2004.

Papers

The visual boundary of $\mathbb{Z}^2$ (joint with Kyle Kitzmiller). (*submitted*). We show that the visual boundary of $\mathbb{Z}^2$ is an uncountable set with the trivial topology.

High distance knots in closed 3-manifolds (joint with Marion Moore). (*submitted*). We show that in any closed 3-manifold, one can find knots and Heegaard splittings of the knot exteriors of arbitrarily high distance, in the sense of Hempel. This is a generalization of results by Minsky, Moriah, and Schleimer who construct such knots in S^3.

Tunnel one fibered links. (*in preparation*). We show that an unknotting tunnel of a tunnel number one fibered link can be isotoped into the fiber.

Honors and Grants

University of California Dissertation Year Fellowship. The University of California Office of the President awards this fellowship annually to 52 students across all 10 UC campuses who show potential to become excellent faculty or researchers in institutions of higher education, as well as to foster multi-faceted diversity in graduate education at the University of California.

VIGRE Mini-Grant Awardee. Funded by the University of California, Davis Mathematics Department with NSF VIGRE funds to organize the Junior Topologists' Research Retreat in Davis, CA. June 26-29, 2009.

AMS Donation Recipient. Donation received from the AMS to organize the Junior Topologists' Research Retreat in Davis, CA. June 26-29, 2009.

VIGRE Summer Research Awardee. Funded by the University of California, Davis Mathematics Department with NSF VIGRE funds to support summer research. In 2004, I worked with Joel Hass on minimal surface theory and the solution to Plateau's problem. In 2008, I worked with Abigail Thompson and continued work on my dissertation.

VIGRE Fellowship. Funded by the NSF to promote vertical integration among different academic ranks.

GAANN Fellowship. Funded by the US Department of Education to assist graduate students with excellent records who demonstrate financial need.

Presentations and Talks

Low Dimensional Topology Seminar at Michigan State University, September 15 and 22, 2010.

AMS-SMM Eighth International Meeting, invited paper in the Special Session on Low Dimensional Topology, June 3, 2010.

Algebra/Geometry/Topology Seminar at the University of Melbourne, April 22, 2010.

Topology Seminar at University of California, Santa Barbara. April 6, 2010.

Geometric Group Theory Seminar at The Ohio State University. March 11, 2010.

Binghamton University Graduate Conference in Algebra and Topology. November 14-15, 2009.

Topology Seminar at Binghamton University. November 12, 2009.

Topology Seminar at Cornell University. November 10, 2009.

Topology Seminar at University of Michigan, Ann Arbor. October 29, 2009.

Mathematical Research Communities conference on 3-Manifolds and Teichmuller Space. Snowbird, Utah. June, 2008.

Academic Service

College of Natural Sciences Advisory Council on Diversity and Community Committee Member The committee's mission is to disseminate information, and sponsor and organize learning opportunities to encourage and maintain diversity in the College of Natural Resources and throughout Michigan State University. One year.

Conference Co-Organizer Co-organized the Junior Topologists' Research Retreat. Davis, CA. June 26-29, 2009. (http://www.math.ucdavis.edu/~mrathbun/JTRR)

Local Organizing Committee. Helped organize and coordinate local details for Geometric Topology in 3 and 4 Dimensions: A Conference In Honor of Martin Scharlemann. University of California, Davis. June 23-25, 2009. (http://www.math.yale.edu/~jj327/conference)

Graduate Program Committee Graduate Student Representative. Attended meetings of the GPC concerning the curriculum and policies for the Mathematics graduate program at UC Davis. Reported back to the Mathematics Graduate Student Organization. One year.

Graduate Student Assembly Graduate Student Representative. Attended meetings of the GSA, the university-wide graduate student government body. Represented the Mathematics Department, and voted on budgetary issues. One year.

Pure and Applied Math Student-Run Seminar Co-Organizer. Arranged speakers, food, and kept records for weekly seminar. This seminar is aimed at beginning graduate students to promote camaraderie between Pure and Applied mathematicians, and to introduce new students to the research being done in the department. $3\frac{1}{2}$ years.

Teaching Experience

RTG Postdoctoral Instructor. Abstract Algebra. Axiomatic Euclidean and Non-Euclidean Geometry. Michigan State University, 2010.

Instructor of record.

Lecturer. Introduction to Advanced Mathematics. University of California, Davis, Summer 2010.

Instructor of record.

Session Instructor. California State Summer School in Mathematics and Science (COSMOS), University of California, Davis. Summer 2009.

Lectured and reviewed homework for 4-week Problem Solving Session for high school students in the COSMOS program at UC Davis.

Research Experience for Undergraduates Supervisor. University of California, Davis. Spring 2009.

Supervised and mentored undergraduates in a research project about Knot Theory and DNA for the 10-week term.

Adjunct Professor. Workload Algebra Review. Sacramento City College. Fall 2008.

Instructor of record.

Associate Instructor. Partial Derivatives and Infinite Series. University of California, Davis. Summer 2008.

Instructor of record.

Research Experience for Undergraduates Supervisor. University of California, Davis. Summer 2006.

Supervised, lectured, and mentored undergraduates in various research projects for a 10-week session in the summer. Resulted in a joint paper with Kyle Kitzmiller (see Research).

Teaching Assistant. Differential Calculus; Integral Calculus; Partial Derivatives and Infinite Series; Advanced Calculus. Various quarters 2004-2009.

Led discussion sections, held office hours, graded exams.

Lead Teaching Assistant. Integral Calculus. Winter 2008.

Substitute lectured, wrote homework solutions, exam solutions, graded exams, acted as liason between professor and teaching assistants.

Reader. Differential Geometry (Upper Division). Winter 2006.

Substitute lectured, graded homework, graded exams.

Professional Memberships

American Mathematical Society

Mathematical Association of America

References

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http://www.math.msu.edu/~mrathbun/cv/CurrVitae.pdf