

Jessica S. Purcell

Department of Mathematics
Brigham Young University
Provo, UT 84602

Phone: (801) 422-7854
Fax: (801) 422-0504
Email: jpurcell@math.byu.edu
<http://www.math.byu.edu/~jpurcell>

Employment

Assistant Professor, Brigham Young University, Provo, Utah. June 2007 to present.

Postdoctoral Researcher, University of Oxford Mathematical Institute, Oxford, England. Fall 2007 to Fall 2008.

Instructor, University of Texas at Austin, Austin, Texas. Fall 2006 to Spring 2007.

VIGRE Postdoctoral Instructor, University of Texas at Austin, Austin, Texas. Fall 2004 to Summer 2006.

Education

Ph.D. in Mathematics, Stanford University, Stanford, California, June 2004.

Dissertation: *Cusp shapes of hyperbolic link complements and Dehn filling*.

Advisor: Steven Kerckhoff.

M.S. in Mathematics, University of Michigan, Ann Arbor, Michigan, May 1999.

B.A. in Mathematics, University of Utah, Salt Lake City, Utah, June 1998.

Summa cum laude, minor in Computer Science.

Publications

(with D. Futer) Links with no exceptional surgeries, *Commentarii Mathematici Helvetici*, Vol. 82, No. 3, (2007) 629–664. ArXiv:math.GT/0412307

Volumes of highly twisted knots and links. *Algebraic and Geometric Topology*, Vol. 7 (2007) 93–108. ArXiv:math.GT/0604476

(with D. Futer and E. Kalfagianni) Dehn filling, volume, and the Jones polynomial, *Journal of Differential Geometry*, Vol. 78, No. 3, (2008) 429–464. ArXiv:math.GT/0612138

Slope lengths and generalized augmented links, *Communications in Analysis and Geometry*, Vol. 16, No. 4, (2008) 883–905. ArXiv:math/0703638

Cusp shapes under cone deformation, *Journal of Differential Geometry*, Vol. 80, No. 3, (2008) 453–500. ArXiv:math.GT/0410233

(with D. Futer and E. Kalfagianni) Symmetric links and Conway sums: volume and Jones polynomial, *Mathematical Research Letters*, Vol. 16, No. 2, (2009) 233–253. ArXiv:0804.1542

(with Juan Souto) Geometric limits of knot complements, submitted 2009. ArXiv:0902.1662

(with D. Futer and E. Kalfagianni) On diagrammatic bounds of knot volumes and spectral invariants, submitted 2009. ArXiv:0901.0119

(with D. Cooper and M. Lackenby) The length of unknotting tunnels, submitted 2009. ArXiv:0812.0858

(with D. Futer and E. Kalfagianni) Cusp areas of Farey manifolds and applications to knot theory, submitted 2009. ArXiv:0808.2716

Hyperbolic geometry of multiply twisted knots, submitted 2009. ArXiv:0709.2919

On multiply twisted knots that are Seifert fibered or toroidal, submitted 2009. ArXiv:0906.4575

Selected Awards

NSF Conference Grant (PI), Moab Topology Conference; Moab, UT; May 2009.

NSF Research Grant (PI), Geometry and Topology of Knots and Links, award DMS-0704359, 2007 to 2010.

NSF VIGRE Postdoctoral Fellowship, University of Texas at Austin, 2004 to 2006.

Centennial Teaching Award, Stanford University, 2003.

ARCS Foundation Graduate Fellowship, 2002 to 2003.

NSF Graduate Fellowship, 1998 to 2001.

Alice Schafer Prize, from the Association for Women in Mathematics, 1998.

Barry Goldwater Scholarship, 1997 to 1998.

Phi Beta Kappa, 1997.

Academic Presentations

Invited seminar and colloquium talks

University of Michigan, Ann Arbor, topology seminar. March 2009.

Michigan State University, topology seminar. March 2009.

Brigham Young University, colloquium and topology seminar. October 2008.

Warwick University, topology seminar. March 2008.

University of Oxford, topology seminar. January 2008.
University of Liverpool, colloquium. November 2007.
Columbia University, topology seminar. May 2007.
Rice University, topology seminar. April 2007.
California State Channel Islands, mathematics colloquium. March 2007.
Vassar College, mathematics colloquium. February 2007.
University of Oklahoma, colloquium. February 2007.
Brigham Young University, topology seminar and colloquium. January 2007.
University of Texas at Austin, topology seminar. December 2006.
Michigan State University, topology seminar. October 2006.
Stanford University, topology seminar. May 2006.
University of Texas at Austin, topology seminar. February 2005.
University of California, Berkeley topology seminar. March 2004.
University of Texas at Austin, topology seminar. February 2004.
University of Utah, topology seminar. January 2004.
Stanford University, topology seminar. January 2004.

Invited conference and workshop talks

Geometry and dynamics in surfaces and 3-manifolds, Park City, Utah. August 2009.
Interactions between hyperbolic geometry, quantum topology, and number theory conference, Columbia University, New York. June 2009.
Interactions between hyperbolic geometry, quantum topology, and number theory workshop (three invited workshop talks), Columbia University, New York. June 2009.
Oberwolfach workshop in topology, Oberwolfach, Germany. September 2008.
Workshop in Geometric Topology, Park City, Utah. June 2008.
Wasatch Topology Conference, University of Utah, Salt Lake City, Utah. August 2007.
Workshop on 3-manifold geometry and topology, Warwick Mathematics Institute, University of Warwick, Coventry, England. July 2007.
A second time around the volume conjecture, Louisiana State University, Baton Rouge, Louisiana. June 2007.

Cascade Topology Seminar, Portland State University, Portland, Oregon. October 2006.

Workshop on the deformation theory of hyperbolic 3-manifolds, Ahlfors-Bers Colloquium, University of Michigan, Ann Arbor, Michigan. May 2005.

Special session on low-dimensional topology and Kleinian groups, AMS sectional meeting, Northwestern University, Evanston, Illinois. October 2004.

Special session on the geometry of hyperbolic manifolds, AMS sectional meeting, Vanderbilt University, Nashville, Tennessee. October 2004.

Georgia Topology Conference, University of Georgia, Athens, Georgia. August 2004.

General Audience Outreach Presentations

Geometry out of the Paper: An Introduction to Manifolds, Saturday Morning Math Group, University of Texas at Austin. September 2006.

Other

Poster presentation, *The shape of cusps of hyperbolic knot complements*, Spaces of Kleinian groups and hyperbolic 3-manifolds, Isaac Newton Institute Workshop, Cambridge, England. August 2003.

Teaching

Assistant Professor, Brigham Young University

Differential calculus (Fall 2009, Winter 2009, Fall 2008).

Algebraic topology, graduate level (Winter 2009).

Instructor, University of Texas at Austin

Single variable differential calculus (Fall 2006, Fall 2005).

Multivariable calculus (Spring 2005).

Linear algebra (Spring 2007).

Probability (Fall 2004).

Discrete math (Fall 2006, Spring 2006).

Hyperbolic geometry, graduate level (Spring 2007).

Graduate Student Instructor, Stanford University

Single variable differential calculus (Winter 2004, Summer 2002).

Teaching Assistant, Stanford University

Multivariable calculus (Fall 2003, Fall 2002, Fall 2001).

Service

Co-organizer, Moab topology conference, Moab, Utah, May 2009.

Co-organizer of teaching seminars, Brigham Young University, September 2008 to April 2009.

Co-organizer of topology seminars, Brigham Young University, September 2008 to April 2009.

Brigham Young University Committees:

Member, teaching committee, September 2008 to April 2009.

Advisor, undergraduate mathematics majors, September 2008 to April 2009.

Thesis committee member for Brian Rushton, Winter 2009; Natalie Bergin, Summer 2009.

Referee. *Geometry and Topology Monographs, Geometriae Dedicata, Communications in Analysis and Geometry*

Reviewer. Math Reviews.

Teaching Consultant, Stanford Center for Teaching and Learning, 2003 to 2004.

Facilitated small-group teaching evaluations and practice teaching sessions for graduate students from all departments, held two TA training sessions on office hours.

Teaching Liaison, Stanford Center for Teaching and Learning, 2002 to 2003.

Guided math graduate students to teaching events and resources.

Organizer, Teaching lunch seminars, Stanford mathematics department, 2002 to 2003.

References

Steven Kerckhoff
Professor of Mathematics
Stanford University
spk@math.stanford.edu

James Cannon
Professor of Mathematics
Brigham Young University
cannon@math.byu.edu

Marc Lackenby
Professor of Mathematics
University of Oxford
lackenby@maths.ox.ac.uk

Cameron Gordon
Professor of Mathematics
University of Texas at Austin
gordon@math.utexas.edu