

Jesse Johnson

Department of Mathematics
Oklahoma State University
Stillwater, OK 74078

jjohnson@math.okstate.edu
<http://www.math.okstate.edu/~jjohnson/>
Office phone: 405-744-7750

Education

University of California, Davis, CA
Ph.D. in Mathematics, June, 2006.
Dissertation: *Heegaard Splittings, the curve complex and the pants complex*
Advisor: Abigail Thompson
Middlebury College, Middlebury, VT
B.A. in Mathematics, June 2002.

Academic Appointments

Oklahoma State University, August 2009-present
Assistant Professor
Yale University, July 2006-June 2009
Lecturer/NSF Postdoctoral Fellow
University of Melbourne, August 2006-December 2006
Visiting Research Fellow

Mathematics Published and To-Appear

1. *Topological graph clustering with thin position*, to appear in *Geometriae Dedicata*, arXiv:1206.0771.
2. *Pinch Ratio Clustering from a Topologically Intrinsic Lexicographic Ordering* (with Doug Heisterkamp), *2013 SIAM International Conference on Data Mining (SDM13)*, Austin, Texas, U.S.A., May 2-4, 2013, 560-568.
3. *Extending pseudo-Anosov maps to compression bodies* (with I. Biringer and Y. Minsky), to appear in *Journal of Topology*, arXiv:1011.0021.
4. *The space of Heegaard splittings* (with D. McCullough), to appear in *Crelle*, arXiv:1011.0702.
5. *Mapping class groups of Heegaard splittings* (with H. Rubinstein), to appear in *Journal of Knot Theory and its Ramifications*, arXiv:math.GT/0701119.
6. *Automorphisms of the three-torus preserving a genus three Heegaard splitting*, *Pacific J. Math.* 253 (2011), no. 1, 75–94, arXiv:0708.2683.
7. *Layered models for 3-manifolds*, in *Topology and Geometry in Dimension Three*, Contemporary Mathematics, 565 (2011), 43–54, arXiv:1011.6343.
8. *Flipping bridge surfaces and bounds on the stable bridge number* (with M. Tomova), *Algebraic & Geometric Topology*, 11 (2011) 1987-2005, arXiv:0908.3690.
9. *On tunnel number one knots that are not $(1, n)$* (with A. Thompson), *Journal of Knot Theory and its Ramifications*, 20 (2011), no. 4, 609–615, arXiv:math.GT/0606226.

10. *Mapping class groups of medium distance Heegaard splittings*, *Proceedings of the American Mathematical Society*, 138 (2010), no. 12, 4529–4535, arXiv:0910.5190.
11. *Heegaard splittings with large subsurface distances* (with Y. Minsky and Y. Moriah), *Algebraic & Geometric Topology*, 10 (2010) 2251–2275, arXiv:1002.3095.
12. *Bounding the stable genera of Heegaard splittings from below*, *Journal of Topology*, 3(2010) no. 3, 668–690, arXiv:0807.2866.
13. *On the existence of high index topologically minimal surfaces* (with D. Bachman), *Math Research Letters*, 17(2010), no. 3, 389–394, arXiv:0909.2693.
14. *Horizontal Heegaard splittings of Seifert fibered spaces*, *Pacific Journal of Mathematics*, 245(2010), no. 1, 151–165, arXiv:0802.0856.
15. *Tunnel number one, genus one fibered knots* (with K. Baker and E. Kloginski), *Communications in Analysis and Geometry*, 17(2009) no. 1, 1–16, arXiv:math.GT/0606379.
16. *Stable functions and common stabilizations of Heegaard splittings*, *Transactions of the AMS*, 361(2009) no. 7, 3747–3765, arXiv:0705.3712.
17. *Surface bundles with genus two Heegaard splittings*, *Journal of Topology*, 1(2008), no. 3, 671–692, arXiv:math.GT/0607531.
18. *Generalized handlebody sets and non-Haken 3-manifolds* (with T. Patel), *Pacific Journal of Mathematics*, 235(2008), no. 1, 35–41, arXiv:0707.0518.
19. *Heegaard splittings and the pants complex*, *Algebraic and Geometric Topology*, 6(2006), 853–874, arXiv:math.GT/0509680.
20. *Locally unknotted spines of Heegaard splittings*, *Algebraic and Geometric Topology*, 5(2005), 1573–1584, arXiv:math.GT/0411065.

Mathematics Preprints

21. *Distance Two Links*, arXiv:1309.3787.
22. *Non-uniqueness of high-distance Heegaard splittings*, arXiv:1308.4599.
23. *Genus bounds bridge number for high distance knots* (with Ryan Blair, Marion Campisi, Scott Taylor and Maggy Tomova), arXiv:1209.0197.
24. *Bridge distance, Heegaard genus, and Exceptional Surgeries* (with Ryan Blair, Marion Campisi, Scott Taylor and Maggy Tomova), arXiv:1209.0197.
25. *The coarse geometry of the Kakimizu complex* (with Roberto Pelayo and Robin Wilson), arXiv:1204.0530.
26. *Mapping class groups of Heegaard splittings of surface bundles*, arXiv:1201.2628.
27. *One-sided and two-sided Heegaard splittings*, arXiv:1112.0471.
28. *Heegaard splittings and open books*, arXiv:1110.2142.
29. *Mapping class groups of once-stabilized Heegaard splittings*, arXiv:1108.5302.
30. *An upper bound on common stabilizations of Heegaard splittings*, arXiv:1107.2127.
31. *Computing isotopy classes of Heegaard splittings*, arXiv:1004.4669.

Other Publications

Proceedings of Jacofest: Triangulations, Invariants, and Geometric Structures (editor), Contemp. Math., 560, Amer. Math. Soc., Providence, RI, 2011.

Reading comprehension of series convergence proofs in Calculus II, to appear in *RUME XV Conference Proceedings*.

Conformal Spirals, *Math Horizons Magazine*, Nov. 2011, p.28-29.

Getting a handle on Poincaré, *Math Horizons Magazine*, Nov. 2009, p. 8–9.

Machine Learning Blog: The Shape of Data, <http://shapeofdata.wordpress.com/>

Topology Research Blog: Low Dimensional Topology, <http://ldtopology.wordpress.com/>

Awards and Grants

NSF Grant, DMS 1308767, “Embedded and Immersed Surfaces in Three-Dimensional Topology”, 2013-2016, \$194,385.

Sigma Xi Young Investigator Award (OSU Chapter), April 2013.

NSF Conference Grant, DMS-1148725, “Redbud Topology Conference”, (Co-PI), 2011-2012, \$25,623.

AIM Research in SQuaREs project, 2011-2013.

NSF Grant, DMS 1006369, “The geometry and topology of Heegaard splittings”, 2010-2013, \$116,357.

NSF Conference Grant, DMS 0602638, “Geometric Topology in Three and Four Dimensions”, (Co-PI), 2009, \$25,000.

NSF Mathematical Sciences Postdoctoral Research Fellowship, DMS 0602638, 2006-2009, \$108,000.

Referee for the following journals

Advances in Mathematics, Algebraic and Geometric Topology, American Journal of Mathematics, Bulletin of the Korean Mathematical Society, Crelle, Geometriae Dedicata, Geometry & Topology, Geometry & Topology Monographs, Glasgow Mathematical Journal, Journal of the American Mathematical Society, Journal of the London Mathematics Society, Journal of Knot Theory and its Ramifications, London Mathematical Society, Mathematical Proceedings of the Cambridge Philosophical Society, Mathematische Annalen, Mathematische Zeitschrift, Osaka Journal of Mathematics, Pacific Journal of Mathematics, Proceedings of the AMS, Proceedings of the Symposium on Computational Geometry 2013, Revista Matemática Complutense, Topology and its Applications, Transactions of the AMS.

Conferences co-organized

Special session on Knots and 3-Manifolds at the First Mathematical Congress of the Americas, Guanajuato, Mexico, August 2013.

Redbud Topology Conference, Stillwater, OK, March 2012.

Special Session on Thin position in Low Dimensional Topology, AMS Sectional Meeting in Iowa City, March 2011.

Conference on Triangulations, Invariants, and Geometric Structures, Stillwater, OK, June 2010.

Conference on Topology in Dimensions 3 and 4, Davis, CA, June 2009.

Special Session on Heegaard Splittings, Bridge Positions and Low Dimensional Topology, AMS National Meeting 2008.

Service

PhD student: Pengcheng Xu, expected 2015.

MA student: Nicholas Laurenti, expected 2014.

On PhD committees for Zhen-Yi Luo (PhD 2010), Melissa Mills (PhD 2013), Bo-Hyun Kwon (expected 2014), Lizhi Chen (expected 2014), Kedar Nepal (expected 2015), Sophia Xie (expected 2016), Michael Bilogliadov (expected 2016).

Curriculum development project (part of Math Ed. PhD) advisor for Melissa Mills (2013)

Department Representative to Arts & Sciences Faculty Council, Fall 2012-present.

Math Education Appointments Committee, Fall 2013-present.

Appointments Committee, Fall 2012-Spring 2013.

Colloquium Committee, Fall 2011-Spring 2012.

Undergraduate Committee, Fall 2010-Spring 2011, Fall 2012-Spring 2013.

Public Relations and Web Page Committee, Spring 2010-present.

Co-organizer, OSU Topology and Geometry Seminar, Fall 2009-present.

Advisor, Undergraduate summer research project on normal curves in triangulated surfaces, Yale University, 2008.

Organizer, Yale Topology and Geometry Seminar, Fall 2008-Spring 2009.

Reviewer for MathSciNet, beginning 2007.

Teaching

Undergraduate Geometry, Oklahoma State University: Fall 2013.

Embedded surfaces in three-manifolds (Graduate topics course), Oklahoma State University: Fall 2013.

History of Math, Oklahoma State University: Spring 2013.

Intro. to Modern Algebra, Oklahoma State University: Spring 2010, Spring 2012, Yale: Fall 2007.

Calculus 3, Oklahoma State University: Spring 2012, Fall 2011 (two sections).

Graduate Geometric Topology, Oklahoma State University: Fall 2010, Fall 2012.

Graduate Algebraic Topology, Oklahoma State University: Spring 2011, Spring 2013.

Calculus 2, Oklahoma State University: Fall 2010, Fall 2009 (two sections), Yale: Spring 2009.

Calculus 1, Yale: Fall 2008.

Graduate Topics in Three-dimensional Topology, Yale: Spring 2008.

Conference Talks

- Geometric Topology in New York, Columbia University, August 2013, *The structure of high distance Heegaard splittings*.
- The Topology of 3-dimensional Manifolds, Centre de Reserches Mathématiques, Montreal, May 2013, *The structure of high distance Heegaard splittings*.
- 3-manifolds: Heegaard Splittings, the Curve Complex and Hyperbolic Geometry, Rice University, April 2013, *The structure of high distance Heegaard splittings*.
- 3-manifolds: Heegaard Splittings, the Curve Complex and Hyperbolic Geometry, Rice University, April 2013, Graduate Student Workshop: *An Introduction to Heegaard splittings*.
- MAA Sectional Meeting, Oklahoma State University, April 2013: *The Shape of Data*.
- East Asian School of Knots, Tokyo University, January 2013, *Common stabilizations of Heegaard splittings and bridge surfaces*.
- BIRS Workshop on Topological data analysis and machine learning theory, October 2012, *Thin position and topological clustering of large data sets*.
- Summer Topology and its Applications, Minnesota State University, July 2012, Four-day workshop on topology and geometry of 3-manifolds.
- Georgia Topology Conference, University of Georgia, April 2012, *Uniqueness of high distance open book decompositions*.
- AMS National Meeting, Special Session on Hyperbolicity in groups and manifolds, January 2012, *Handlebody filling and the Heegaard Tree*.
- Redbud Topology Conference, University of Arkansas, November 2011, *Common stabilizations of Heegaard splittings*.
- Cascade Topology Conference, University of Victoria, May 2011, *Common stabilizations of Heegaard splittings*.
- AMS Sectional Meeting, Holy Cross College, April 2011, *Common stabilizations of Heegaard splittings*.
- Wasatch Topology Conference, Park City, Utah, December 2010, *Mapping class groups of Heegaard splittings*.
- Moab Topology Conference, Moab, Utah, May 2009, *Bounding the stable genera of Heegaard splittings from below*.
- AMS Mathematical Research Community Workshop in Teichmuller theory and low dimensional topology, Snowbird, Utah, Expository talks on Heegaard splittings, June 2008.
- Georgia Topology Conference, University of Georgia, May 2008, *Bounding the stable genera of Heegaard splittings from below*.
- AMS Sectional Meeting, Clairmont College, May 2008, *Flipping and stabilizing Heegaard splittings*.
- AIM Workshop on Triangulations, Heegaard splittings and Geometric Structures, December 2007, *Mapping Class Groups of Heegaard Splittings*.
- Spring Topology and Dynamics Conference, Rolla, MO, March 2007, *Mapping Class Groups of Heegaard Splittings*.
- AMS National Meeting, Special Session on Mapping Class Groups and Handlebodies, January 2007, *Mapping class groups of Heegaard splittings*.

AMS Sectional Meeting, UC Santa Barbara, April 2005, *Locally unknotted spines of Heegaard splittings*.

Colloquium and Seminar Talks

University of Georgia, November 2013, *Morse two-functions and Minsky Models of Hyperbolic Three-Manifolds*.

Georgia Tech, November 2013, *The structure of high distance Heegaard splittings*.

University of Sydney, June 2013, *The structure of high distance Heegaard splittings*.

LaToP joint seminar, CalTech, Fall 2012, *Uniqueness of high distance open book decompositions*.

Wesleyan University, Colloquium, Spring 2012, *The geometry and topology of Heegaard splittings*

Syracuse University, Colloquium, Spring 2012, *The geometry and topology of Heegaard splittings*

George Mason University, Colloquium, Spring 2012, *The geometry and topology of Heegaard splittings*

Princeton University, Fall 2011, *Mapping class groups of Heegaard splittings*.

Rice University, Fall 2011, *Common Stabilizations of Heegaard Splittings*.

UC Davis, Spring 2011, *An upper bound on stable genus*.

The Technion, Fall 2010, *An upper bound on stable genus*.

UC Santa Barbara, Fall 2010, *An upper bound on stable genus*.

University of Arkansas, Colloquium, Spring 2010, *Common stabilizations of Heegaard splittings*.

University of Arkansas, Spring 2010, *Axiomatic thin position*.

University of Miami, Spring 2010, *Axiomatic thin position*.

UC Berkeley, Spring 2009, *Bounding the stable genera of Heegaard splittings from below*.

Oklahoma State University, Colloquium, Spring 2009, *Common stabilizations of Heegaard splittings*.

Tulane University, Colloquium, Spring 2009, *Common stabilizations of Heegaard splittings*.

University of Iowa, Colloquium, Spring 2009, *Common stabilizations of Heegaard splittings*.

Columbia University, Spring 2009, *Common stabilizations of Heegaard splittings*.

Wesleyan University, Spring 2008, *Flipping and stabilizing Heegaard splittings*.

Emory/Georgia Tech/University of Georgia joint Topology seminar, Spring 2008, *Flipping and stabilizing Heegaard splittings*.

Oklahoma University, Colloquium, Spring 2008, *Mapping class groups of Heegaard splittings*.

Oklahoma State/Oklahoma University joint topology seminar, Spring 2008, *Flipping and stabilizing Heegaard splittings*.

Middlebury College, Spring 2008, *The historical development of topology*.

Boston College, Fall 2007, *Automorphisms of the 3-torus preserving a genus three Heegaard splitting.*

Georgia Institute of Technology, Spring 2007, *Mapping class groups of Heegaard splittings.*

Rutgers University, Spring 2007, *Surface bundles with genus two Heegaard splittings.*

Columbia University, Spring 2007, *Mapping class groups of Heegaard splittings.*

Princeton University, Spring 2007, *Mapping class groups of Heegaard splittings.*

Yale University, Spring 2007, *Mapping class groups of Heegaard splittings.*

University of Melbourne, Fall 2006, *Surface bundles with genus two Heegaard splittings.*

UC Davis, Spring 2006, *Bridge number and the curve complex.*

Clairmont Topology Seminar, Spring 2006, *Heegaard splittings and the pants complex.*

UC Santa Barbara, Winter 2006, *Heegaard splittings and the pants complex.*

UC Davis, Spring 2005, *Heegaard splittings and the pants complex.*