

Margaret Doig

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Education.

- 2010 Ph.D, Mathematics, Princeton University (with Zoltán Szabó).
- 2005 B.S., Mathematics, University of Notre Dame.
- 2005 B.A., Philosophy, University of Notre Dame.

Professional Appointments.

- 2013-16 Syracuse University, Philip T. Church Postdoctoral Fellow.
- 2010-13 Indiana University, Bloomington, Zorn Postdoctoral Fellow.

Publications and Preprints.

- *A combinatorial proof of the homology cobordism classification of lens spaces* (with Stephan Wehrli), submitted. [arXiv.org:1505.06970](https://arxiv.org/abs/1505.06970).
- *Obstructing finite surgery*. Proceedings of the American Mathematical Society, to appear. [arXiv:1302.6130](https://arxiv.org/abs/1302.6130).
- *On the intersection ring of graph manifolds* (with Peter Horn). Transactions of the American Mathematical Society, to appear. [arXiv:1412.3990](https://arxiv.org/abs/1412.3990).
- *Finite knot surgeries and Heegaard Floer homology*. Algebraic and Geometric Topology 15-2 (2015), 667-690. [arXiv:1201.4187](https://arxiv.org/abs/1201.4187).
- *Spherical Seifert fibered spaces, knot surgeries, and Heegaard Floer homology*. Thesis (Ph.D) – Princeton University 2010. 94 pp. ISBN:978-1124-23081-8, ProQuest LLC.
- *On braid groups and right-angled Artin groups* (with Francis Connolly). Geometriae Dedicata 172 (2014), 179-190. [arXiv:math.GT/0411368](https://arxiv.org/abs/math/0411368).
- *Stellar braid groups*. Thesis (B.S.) – University of Notre Dame 2005. [arXiv:math.GT/0412531](https://arxiv.org/abs/math/0412531).

Preprints in Preparation.

- *The mu-bar invariants of 1/s surgery on algebraic knots* (with Maciej Borodzik).
- *Knot Floer homology, grid diagrams, and combinatorial proofs.*
- *A note on half-integral finite surgeries.*
- *Heegaard Floer homology and branched double covers.*

Research in Progress.

- *The homology cobordism classification of spherical manifolds* (with Stephan Wehrli).
- *The tau invariant in branched double covers* (with Peter Horn).

Awards and Honors.

2008-10 National Science Foundation Graduate Research Fellowship.

2005-08 National Defense Science and Engineering Graduate Fellowship.

2005-10 President's Fellow, Princeton University.

2004-05 Goldwater Fellow.

2001-05 William F. Reilly Merit Scholarship, University of Notre Dame.

Departmental Service.

2016 Course Coordinator – Calculus II for Life Sciences, Syracuse University.

2015 Mentor – Graduate student reading group in topology, Syracuse University.

2013-- Putnam Coach – coach and mentor for undergraduates preparing for the Putnam Competition, Syracuse University.

2014 Faculty Address – *Pursuing polygonal privacy: the opaque square problem*, New York Regional Graduate Mathematics Conference, Syracuse University.

2013 Faculty Speaker – *Morse theory (or: where multivariable second derivative test comes from)*, Graduate Seminar, Syracuse University.

2012 Faculty Address – *An introduction to Heegaard Floer theory and its applications to knot surgery*, Graduate Student Topology Conference, University of Indiana, Bloomington.

2012 Faculty Speaker – *A gentle introduction to Heegaard Floer theory*, Graduate Topology and Geometry Seminar, Indiana University, Bloomington.

2010 Faculty Speaker – *Heegaard Floer homology and knot surgery*, Topology Seminar, Indiana University, Bloomington.

External Outreach and Other Activities.

- Misc-- Applicant for external funding opportunities, including grants and fellowships.
- 2009-14 Advisory Board Member – Glynn Family Honors Program, University of Notre Dame.
- 2012 Instructor – Undergraduate Summer School in Knot Theory, Center for Mathematics at the University of Notre Dame.
- 2005 Instructor – Research Experience for Teachers, University of Notre Dame; designed and taught three-credit course of math enrichment for high school teachers.
- 2005 Visiting Advisor – Research Experience for Undergraduates, University of Notre Dame.
- 2003 Participant – Research Experience for Undergraduates, University of Minnesota, Duluth.
- Misc-- Referee – *Geometry and Topology, Journal Knot Theory Ramifications*.
- 2006-- Volunteer Instructor and Pilot – Civil Air Patrol; includes teaching aerospace education, mentoring and providing orientation flights to high school students, and performing aviation-related emergency services work.

Invited Seminar Talks and Invited Conference Talks.

- 2015 *Combinatorial methods in Heegaard Floer theory*, Topology Seminar, Wesleyan University.
- 2015 *A combinatorial proof of the homology cobordism classification of lens spaces*, Moab Topology Conference, Utah State University.
- 2015 *A combinatorial proof of the homology cobordism classification of lens spaces*, Topology Seminar, Boston College.
- 2015 *A combinatorial proof of the homology cobordism classification of lens spaces*, Special Session on Low-dimensional Topology, AWM Research Symposium, University of Maryland-College Park.
- 2015 *Neumann-Siebenmann invariants and surgery on algebraic knots*, Special Session on Knot theory and Floer-type invariants, AMS Sectional, Michigan State University.
- 2014 *Rational homology cobordism classification of spherical manifolds*, Special Session on Knot Concordance and 4-Manifolds, AMS Sectional, University of Wisconsin, Eau Claire.
- 2014 *Finite surgeries - an application of Heegaard Floer homology to a traditional knot theory question*, Geometry and Topology Seminar, University of Buffalo.
- 2014 *Homology cobordism classification of lens spaces*, Special Session on Invariants in Low-Dimensional Topology, AMS Sectional, University of Maryland -Baltimore.
- 2013 *Surgery obstructions from Heegaard Floer theory*, Special Session on Homological Invariants in Low-Dimensional Topology, AMS Sectional, Boston College.

- 2013 *Obstructing finite surgery*, Virtual Topology Seminar, Louisiana State University.
- 2013 *Obstructing finite surgery*, Special Session on Low-Dimensional Topology, AWM Research Symposium, Santa Clara University.
- 2013 *Heegaard Floer homology and finite surgeries*, Special Session on Knots, Links, and Three-Manifolds, AMS/MAA Joint Meetings (San Diego, CA).
- 2012 *Applications of Heegaard Floer theory to knot surgery*, Seminar for Undergraduate Mathematical Research Reunion Conference (a conference honoring Frank Connolly), University of Notre Dame.
- 2012 *Finite Surgery*, Topology Seminar, University of Virginia.
- 2011 *Heegaard Floer homology and finite surgeries*, Geometry Seminar, California Institute of Technology.
- 2011 *Heegaard Floer homology and knot surgery*, Geometry Seminar, Purdue University.
- 2010 *Heegaard Floer homology and knot surgery*, Topology Seminar, University of Notre Dame.
- 2010 *Heegaard Floer homology and knot surgeries*, Geometry and Topology Seminar, University of Pennsylvania.
- 2010 *Heegaard Floer theory and surgery*, AMS/MAA Joint Meetings (San Francisco, CA).
- 2008 *The Jones polynomial*, Program for Women in Mathematics, Institute for Advanced Study.

Other Talks.

- 2015 *Knot Floer homology, grid diagrams, and combinatorial methods*. Topology and Geometry Seminar, Syracuse University.
- 2014 *A combinatorial investigation of the integral homology cobordism classification of spherical manifolds*, Topology and Geometry Seminar, Syracuse University.
- 2014 *On the intersection ring of graph manifolds*, Topology and Geometry Seminar, Syracuse University.
- 2014 *Eta invariants and ribbon obstructions*, Topology and Geometry Seminar, Syracuse University.
- 2013 *Heegaard Floer theory and surgery*, Topology and Geometry Seminar, Syracuse University.
- 2010 *Finite surgeries - applications of Heegaard Floer homology to a traditional knot theory question*, Topology Seminar, Indiana University, Bloomington.
- 2010 *Obstructing finite surgery*, Topology Seminar, Princeton University.
- 2008 *Fibered knots*, Graduate Seminar, Princeton University.

- 2007 *What everyone should know about topology (but I had to look up)*, Graduate Seminar, Princeton University.
- 2006 *The Jones polynomial (and other cool facts about knot theory)*, Graduate Seminar, Princeton University.
- 2006 *Braid groups*, Graduate Seminar, Princeton University.
- 2005 *Stellar braiding*, AMS/MAA Joint Meetings (Atlanta, GA).
- 2004 *Maximum run length in a toroidal grid graph*, AMS/MAA Joint Meetings (Phoenix, AZ).

Teaching Experience.

Syracuse University:

- Differential Equations (fall 2015).
- Calculus III (two sections fall 2013, two sections fall 2014, fall 2015).
- Calculus I for Life Sciences (two sections spring 2014).
- Calculus II for Life Sciences (two sections spring 2016).

University of Indiana, Bloomington:

- Calculus I (fall 2010, two sections fall 2011, fall 2012).
- Calculus II (spring 2012).
- Applied Calculus II (fall 2010, spring 2011).
- Finite Math (spring 2013).
- Graduate Topology I (fall 2012).

Princeton University:

- Calculus II (spring 2009).