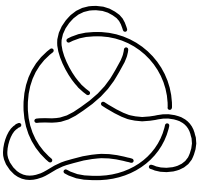
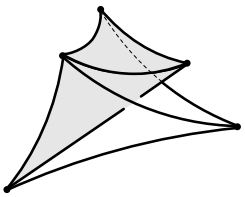


Nathan M. Dunfield

Dept. of Math., MC-382 · UIUC · Urbana, IL 61801
nathan@dunfield.info · http://dunfield.info
office: (217) 244-3892 · home: (217) 365-9625



Area: Topology and geometry of 3-manifolds and related topics.

Personal: Born January 1975 in Ann Arbor, Michigan. U.S. citizen.

Education:

University of Chicago: Ph.D. in Mathematics, 1999.
Advisors: Peter Shalen and Mel Rothenberg.

Oregon State University: B.S. in Mathematics, summa cum laude, 1994.

Employment:

University of Illinois at Urbana-Champaign: Associate Professor of Mathematics, August 2007–.

Caltech: Associate Professor of Mathematics, July 2003–July 2007.

Harvard: Benjamin Peirce Assistant Professor of Mathematics, July 1999–June 2003.

Awards and Grants:

NSF grant #DMS-0707136 (sole PI), $280,000, 2007–2010.

Alfred P. Sloan Fellow, 2004–2008.

NSF grant #DMS-0405491 (co-PI with D. Calegari), $258,000, 2004–2007.

Faculty Teaching Award from the Associated Students of Caltech, 2006.

NSF Mathematical Sciences Postdoctoral Fellow, 2000–2003.

Alfred P. Sloan Dissertation Fellow, 1998–1999.

NSF Graduate Fellow, 1995–1998.

Publications: Available on web page listed above, and at arXiv.org.

(with N. Brown and G. Perry) Colorings of the Plane, Parts I, II, and III, *Geombinatorics* **3** (1993), 24–31, **3** (1994), 64–74, **3** (1994), 110–114.

Examples of non-trivial roots of unity at ideal points of hyperbolic 3-manifolds, *Topology* **38** (1999), 457–465.

Cyclic surgery, degrees of maps of character curves, and volume rigidity of hyperbolic manifolds, *Invent. Math.* **136** (1999), 623–657.

A table of boundary slopes of Montesinos knots. *Topology*, **40** (2001), 309–315.

Alexander and Thurston norms of fibered 3-manifolds. *Pacific J. Math.* **200** (2001), 43–58.

(with Danny Calegari) Commensurability of 1-cusped hyperbolic 3-manifolds. *Trans. Amer. Math. Soc.* **354** (2002), 2921–2932.

(with Danny Calegari) Laminations and groups of homeomorphisms of the circle. *Invent. Math.* **152** (2003) 149–207.

(with William Thurston) The Virtual Haken Conjecture: Experiments and examples. *Geom. Topol.* **7** (2003) 399–441.

(with Stavros Garoufalidis) Non-triviality of the A-polynomial for knots in S^3. *Algebr. Geom. Topol.* **4** (2004) 1145–1153.

(with Danny Calegari) An ascending HNN extension of a free group inside $\mathrm{SL}(2,\mathbb{C})$. *Proc. Amer. Math. Soc.* **134** (2006) 3131–3136.

(with Sergei Gukov and Jacob Rasmussen) The superpolynomial for knot homologies. *Experimental Math.* **15** (2006), 129–159.

(with Frank Calegari) Automorphic forms and rational homology 3-spheres. *Geom. Topol.* **10** (2006) 295–329.

(with William Thurston) Finite covers of random 3-manifolds. *Invent. Math.* **166** (2006) 457–521.

(with Dylan Thurston) A random tunnel number one 3-manifold does not fiber over the circle. *Geom. Topol.* **10** (2006) 2431–2499.

Volume change under drilling: theory vs. experiment. 5 pages. Appendix to Agol, Storm, and W. Thurston, Lower bounds on volumes of hyperbolic Haken 3-manifolds. *J. Amer. Math. Soc.* **20** (2007), 1053-1077.

The Mahler measure of the A-polynomial of $m129(0,3)$. 9 pages. Appendix to D. Boyd and F. Rodriguez Villegas, Mahler's measure and the dilogarithm (II). Preprint, 2003.

(with S. Garoufalidis, A. Shumakovitch, and M. Thistlethwaite) Behavior of knot invariants under genus 2 mutation. 15 pages. Preprint, 2006.

(with Dinakar Ramakrishnan) Increasing the number of fibered faces of arithmetic hyperbolic 3-manifolds. 40 pages. Preprint 2007.

Talks:

Conferences:

Georgia Topology Conference, University of Georgia, August 1998.
Workshop on Computation in Low-dimensional Topology, Oklahoma State, March 1999.
Symposium on Computation in Group Theory and Geometry, University of Warwick, July 1999.
Weekend Topology Conference, UC Berkeley, April 2000.
3-manifolds workshop, Barnard College, November 2000.
Georgia Topology Conference, University of Georgia, May 2001.
Workshop on groups and 3-manifolds, CRM, Montréal, June 2001.
Topology in and around dimension three, Banff Research Station, September 2003.
Trends in 3-manifolds, Université du Québec à Montréal, May 2004.
Cornell Topology Festival, May 2004.
Knots in Vancouver, University of British Columbia, July 2004.
Low-dimensional topology, University of Virginia, December 2004.

Geometry and Topology of 3-Manifolds, ICTP, Trieste, Italy, June 2005.
Foundations of Computational Mathematics, Santander, Spain, July 2005.
Pacific Northwest Geometry Seminar (Oregon State), November, 2005.
3-manifold Topology in Honor of Peter Shalen's 60th Birthday, CRM, Montréal, June 2006.
IAS/Park City Mathematics Institute, June 2006.

Seminar Talks:

1999: Bay Area Topology Seminar (UC Davis), SUNY Stony Brook, SUNY Buffalo, Brown.
2000: Univ. of Michigan, Université du Québec à Montréal, SUNY Albany.
2001: Boston College, SUNY Buffalo.
2002: Univ. of Texas, Yale, Bay Area Topology Seminar (UC Davis), Caltech, Columbia.
2003: Stanford, Cornell, UC Santa Barbara, Univ. of British Columbia, Maryland, Univ. of Utah.
2004: UC Berkeley.
2005: Princeton, Columbia, Univ. of Southern California, UC Davis.
2006: UC Berkeley, UW Madison.
2007: Michigan State, UC Santa Barbara.
2008: Indiana University.

Departmental Colloquia:

2000: SUNY Albany.
2002: Caltech, Georgia Tech.
2003: UIC, Univ. of Utah, UC Davis, Univ. of British Columbia, Univ. of Toronto.
2005: Columbia, UIUC, Oregon State.
2006: UW Madison, UC San Diego, Northeastern.
2007: UCLA, Michigan State, UIUC, UC Santa Cruz, Univ. of Oregon, Brown, Bowdoin.
2008: Indiana University.

Public Lectures:

2007: The Dan E. Christie Mathematics Lecture at Bowdoin College.

Teaching:

I have a broad range of teaching experience, having taught more than 20 distinct courses ranging from a vector calculus class with 120 students to advanced graduate topics classes with only 5 students. My courses have been consistently well-received; for instance, I won a Faculty Teaching Award from the Associated Students of Caltech in 2006 and was on the *List of Instructors Rated as Excellent* at Illinois for a graduate class I taught in Fall of 2007.

Calculus and linear algebra: At Illinois, I am currently teaching a small vector calculus class for honors students. At Caltech, I twice taught a 120-student vector calculus class, aimed at science and engineering majors. At Harvard, I twice taught a one-semester multivariable calculus and linear algebra class aimed at social science students. I also taught a year-long single-variable calculus course at the University of Chicago.

Advanced undergraduate classes: I have taught classes aimed at students concentrating in math and related fields in a number of areas: elementary number theory, mathematical probability, topology, and differential geometry.

Graduate classes: At Caltech, I taught the first two quarters of the core first-year graduate class in algebraic and geometric topology. I have twice given a one-quarter introduction to Riemannian geometry. I have also given four graduate topics classes focusing on 3-manifolds and real and complex hyperbolic geometry.

Mentoring: I am currently the PhD thesis advisor for two graduate students. At Caltech, I mentored three undergraduate summer research projects, as well as three undergraduate honors theses when I was at Harvard. I have also done numerous reading courses with both undergraduate and graduate students on a variety of topics.

Service:

Committees:

Computing committee (Fall 2007–).

Colloquium committee (Fall 2007–).

Chair of mathematics graduate admissions (Caltech, Fall 2005–Spring 2007).

Organizer for:

Geometry and topology seminar at Caltech. 2004–2006.

$N+2$nd Southern California Topology Conference. April 2005.

Conference in Honor of Peter Shalen's 60th Birthday, CRM, Montreál. June 2006.

Referee for: Invent. Math., Jour. of the AMS, Duke Math. J., Geometry and Topology, IMRN, Trans. of the AMS, Experimental Math., Pacific J. Math, Math. Research Letters, Algebraic and Geometric Topology, and NSF grant applications.

References:

Francis Bonahon, University of Southern California
Cameron Gordon, University of Texas, Austin
William Jaco, Oklahoma State University
Steven Kerckhoff, Stanford University
Curtis McMullen, Harvard University
Peter Shalen, University of Illinois at Chicago
William Thurston, Cornell University
Gary Lorden (teaching), Caltech