

# Genevieve S. Walsh

Professor, Tufts Dept of Mathematics  
<https://gwalsh01.pages.tufts.edu/>

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## Education

Ph. D., University of California at Davis, Mathematics. June 2003.  
Dissertation Advisor: W. P. Thurston.  
M. S., Auburn University, Mathematics. June 1997.  
Thesis Advisor: K. Kuperberg.  
Budapest Semesters in Mathematics. Fall 1994 and Spring 1995.  
B. A., Oberlin College, Mathematics with Honors. June 1994.

## Positions

Professor, Tufts University Fall 2018-  
Chaire Jean-Morlet, CIRM Luminy. Spring 2018.  
Associate Professor, Tufts University. Fall 2013-Summer 2018  
Visitor, ICERM Providence. Fall 2013.  
Assistant Professor, Tufts University. Fall 2006-Spring 2013.  
Visitor, Harvard University. Spring-Fall 2010.  
Postdoctoral Researcher, Université du Québec à Montréal. Fall 2006.  
VIGRE Postdoctoral Instructor, University of Texas at Austin. Fall 2003-Spring 2006.  
Postdoctoral Associate, Cornell University. Summer 2003.

## Professional Affiliations

American Mathematical Society, Association for Women in Mathematics

## Grants and Fellowships

NSF Research Grant (PI) 2020-2023.  
NSF Research Grant (PI) 2017-2020. No-cost extension 2020-2021  
NSF Research Grant (PI) 2012- 2015. No-cost extension 2015-2016.  
NSF Research Grant (PI) 2008-2011. No-cost extension 2011- 2012.  
Bernstein Faculty Fellow. Tufts University, 2007-2009.  
VIGRE Postdoctoral Fellowship. University of Texas at Austin, 2003-2006.

## Papers

- G. C. Hruska and G. S. Walsh, *Planar boundaries and parabolic subgroups*, arXiv:2008.07639, Submitted.
- R. Kropholler, S. Vidussi, G. S. Walsh, *Incoherence of free-by-free and surface-by-free groups*, arXiv:2005.01202, Submitted.
- R. Kropholler, G. S. Walsh, *Incoherence and fibering of many free-by-free groups*, arXiv:1910.09601, To Appear, **Annales de l'Institut Fourier**.
- P. Dani, M. Haulmark, and G. S. Walsh, *Right-angled Coxeter groups with non-planar boundary*, arXiv:1902.01029, Submitted.
- S.-H. Kim and G. S. Walsh, *Some groups with planar boundaries*, To appear, **Journal of Differential Geometry**. (solicited paper) arXiv:1907.06898,
- B. Tshishiku and G. S. Walsh, *On groups with  $S^2$  Bowditch boundary*, To appear, **Groups, Geometry and Dynamics**. arXiv:1710.09018,
- P. Haïssinsky, L. Paoluzzi and G. S. Walsh, *Boundaries of Kleinian groups*, **Illinois Journal of Mathematics** Special Haken Issue, Vol. 60, no. 1 (2016) 353–364. arXiv:1609.02377.
- S.-H. Kim and G. S. Walsh, *Coxeter groups, hyperbolic cubes, and acute triangulations*, **Journal of Topology** Vol. 9 (2016) 117–142. arXiv:1306.6025.
- M. Boileau, S. Boyer, R. Cebanu and G. S. Walsh, *Knot complements, hidden symmetries, and reflection orbifolds*. **Annales de la Faculté des Sciences de Toulouse** Vol. 24 (2015) 1179–1201. arXiv:1501.02253.
- N. Hoffman and G. S. Walsh, *Big Dehn surgery space and the link of  $S^3$* , **Proceedings of the American Mathematical Society, Series B**. Vol 2. (2015) 17–34. arXiv:1311.3980.
- G. S. Walsh, *The bumping set and the characteristic submanifold*. **Algebraic and Geometric Topology** Vol. 14 (2014) 283–297. arXiv:1208.1700.
- M. Boileau, S. Boyer, R. Cebanu and G. S. Walsh, *Knot commensurability and the Berge conjecture*. **Geometry and Topology** Vol. 16 (2012) 625–664. arXiv:1008.1034.
- G. S. Walsh, *Orbifolds and commensurability*. In “Interactions Between Hyperbolic Geometry, Quantum Topology, and Number Theory”. **Contemporary Mathematics** Vol. 541 (2011) 221–231. arXiv:1003:1335.
- G. S. Walsh, *Incompressible surfaces and spinnormal form*. **Geometriae Dedicata** Vol 151 (2011) 221–231. arXiv:math/0503027.
- A. Piggott, K. Ruane and G. S. Walsh, *The automorphism group of the free group of rank two is a  $CAT(0)$  group*. **Michigan Mathematical Journal** Vol. 59 (2010) 297–302. arXiv:0809:2034.
- A. Reid and G. S. Walsh, *Commensurability classes of two-bridge knot complements*. **Algebraic and Geometric Topology** Vol. 8 (2008) 1031–1057. arXiv:math.GT/0612473.
- D. Cooper and G. S. Walsh, *Three-manifolds, virtual homology, and group determinants*. **Geometry and Topology** Vol. 10 (2006) 2247–2269. arXiv:math.GT/0603152.

D. Cooper and G. S. Walsh, *Virtually Haken fillings and semi-bundles*. **Geometry and Topology** Vol. 10 (2006) 2237-2245. arXiv:math.GT/0407328.

G. S. Walsh, *Great circle links and virtually fibered knots*. **Topology** Vol. 44 No. 5 (2005) 947-958. arXiv:math.GT/0407361.

M. Carrión Álvarez, J. Corneli, G. S. Walsh, and S. Beheshti. *Double bubbles in the three-torus*. **Experiment. Math.** Vol. 12 (2003), No. 1, 79-89. arXiv:math.DG/0208120.

## Research articles in progress

P. Haïssinsky, L. Pauluzzi and G. S. Walsh, *Relatively hyperbolic groups with Scottky set boundary*, Preprint.

R. Kropholler, S. Vidussi, and G. S. Walsh, *Virtual algebraic fibrations of surface-by-surface groups and orbits of the mapping class group*, Preprint.

D. Groves, P. Haïssinsky, J. F. Manning, D. Osajda, A. Sisto and G. S. Walsh, *Drilling hyperbolic groups*. Preprint.

## Non-refereed articles

G. S. Walsh, Review of “Mostly Surfaces”, by R. E. Schwartz, **American Mathematical Monthly**, Vol. 121 (2014) 954–956.

G. S. Walsh, *Surfaces in finite covers and the group determinant*. Part of the conference proceedings for *Low Dimensional Manifolds*. **Oberwolfach Reports** Vol. 2 (2005) 2 pages.

## Dissertation

*Great circle links in the three-sphere*. June 2003. Advisor: W. P. Thurston. math/0308048

## Books in progress

Co-edited with Luisa Paoluzzi: **Topics in Geometric Group Theory and Topology**, in progress.

## Research Projects Supervised

### Primary Advisor for:

-Burns Healy. Dissertation: “Non-positive Curvature in Groups” PhD (2018).

-Chris O’Donnell. Dissertation: “Decomposing CAT(0) Cube Complexes” PhD (2017).

-Emily Stark. Dissertation: “Abstract Commensurability and Quasi-isometric Classification of Hyperbolic Surface Group Amalgams” PhD (2015).

-Murphy Fields, Master’s Thesis: “An Introduction to Relatively Hyperbolic Groups” MS (2017)

Current PhD Students: Jiayi Lou, Chris Ratigan

Senior honors student: Natalie Bohm (2020) Summer Scholars Student: Samir Chowdhury (2011).

Thesis/Dissertation Committee member for: Maggie LaPlante (2007), Emily Grant (2008), Aaron Brown (2011), Andy Eisenberg (2015), Garrett LaForge (2017), Michael Ben-Zvi (2019), Rose Morris-Wright (2020), Rylee Lyman (2020), Mirjana Hotomski (Math Education, 2020) Bruno Robbio (University of the Basque Country, 2020)

## **Organization of Conferences, Seminars, Semesters**

2022 CIMPA School on Groups and Geometry, Kolkata India (Scientific Committee)

January 2021 (planned) AMS special session co-organizer (with Neil Hoffman, Christian Millichap, and Matt Stover)

March 2020 AMS Special Session Medford, MA (with Kim Ruane and Rob Kropholler) "Subgroups in non-positive curvature" (cancelled, to be rescheduled 2022)

May 2019 "Groups and Geometry at Tufts" (with Kim Ruane and Rob Kropholler)

March 2019 Institute of Advanced Study Emerging Topics: "Coherence and Quasi-convex subgroups" (with Daniel Groves and Alan Reid)

Spring semester 2018 CIRM (Luminy, France): Conferences on "Structure of 3-manifold groups" and "Boundaries of Groups", School on "3-manifolds and Geometric Group Theory" (Semester co-organized with Luisa Paoluzzi.)

January 2018: AMS Session "Spaces, boundaries, and groups" (with Joseph Mahler).

November 2016: AIM workshop: "Boundaries of Groups" (with Jean-Francois LaFont) .

Fall semester 2013: Co-organizer, ICERM Semester Program: "Computation, Experiment, and Algorithms in Topology and Geometry".

January 2012: AMS Session: "Hyperbolicity in Manifolds and Groups", (with Dave Futer)

June 2008: Co-organizer of Mathematical Research Communities Workshop: "Teichmüller Theory and Low-dimensional Topology", Snowbird Utah.

Summer 2008: Mini-course Lecturer and member of Scientific Committee, Women in Mathematics Program. (Hyperbolic Geometry) Institute for Advanced Studies, Princeton N.J.

2007: Session co-organizer (GGT) Spring Topology and Dynamical Systems Conference, University of Missouri Rolla.

2007 - present: Co-organizer of Tufts Geometric Group Theory and Topology seminar (GGTT)

## **Talks and Extended Research Visits**

2020 Vanderbilt University Geometry and Topology Seminar, Temple University Colloquium, Warwick Geometry and Topology Seminar (virtual), University of Chicago Geometry and Topology seminar (virtual), Virtual Geometric Group Theory in Luminy (CIRM, virtual) Australian Geometric Topology Webinar (virtual) AMS Special Session talk (virtual) Groups and Geometry in the South East (planned)

Research visits (planned August and September - Both postponed to 2021) AIM SQuaRE, San Jose Ca

2019 Louisiana State University Topology seminar, Spring Topology and Dynamical Systems conference Birmingham Al , Institute for Advanced Study, Harvard (Gender Inclusivity in Mathematics seminar), Warsaw, Poland (Seminar talk and conference talk), IHES (2-lecture course), ETH Zurich, AMS Special Session Binghamton NY, University of Utah (2 talks), NC State Triangle Topology Seminar.

Research visit: AIM SQuaRE, San Jose Ca

2018 Chaire Jean-Morlet (CIRM Luminy, France). See <http://www.chairejeanmorlet.com/2018-1-walsh-paoluzzi.html> for events.

Institut de Mathematiques de Toulouse. Université de Montpellier. IHES Paris. “Non-positively curved groups on the Mediterranean” Nahsolim, Israel. “Characters in Low-Dimensional Topology” Montreal, Canada. “Graphs, Surfaces and Cube Complexes” Warwick, England. AMS Special Session, Fayetteville Arkansas. Also speaker for the “Mathematical Frontiers” webinar, aimed at the broader scientific community, organized by the National Academies of Sciences, Engineering and Medicine.

Research Visit: AIM SQuaRE, San Jose Ca

2017 University of Wisconsin Milwaukee. Princeton University. Brown University. University of Illinois at Chicago. AMS conference: Buffalo, New York.

Research Visit: AIM SQuaRE, San Jose Ca.

2016 Distinguished Women in Mathematics Lecturer, University of Texas at Austin (2 talks). Conference/Seminar talks: Virginia Topology Conference. AMS conference Bowdoin. “Geometric Analysis, Metric Geometry and Topology” (Institut Fourier, Grenoble, France). ICERM workshop: “Effective and Algorithmic Methods in Hyperbolic Geometry and Free Groups”. PATCH seminar (2 talks), Philadelphia.  $L^2$  Geometry and Topology seminar: LaFayette College. Spring Topology and Dynamics Conference (Waco TX).

2015 Conference/Seminar talks: “Geometric Structures on 3-manifolds Workshop” (Institute for Advanced Study). “Groups, Geometry and 3-Manifolds”, Conference in Honor of Daryl Cooper. University of Michigan Ann Arbor, Temple University, Harvard University Reading Group Conference, Ohio State, AMS Special Session, NJ.

Research Visit: Research in Paris, CIRM Marseille, France.

2014 Joint AMS/MAA meetings, CUNY graduate center, AMS sectional meeting in Baltimore, Cornell University (seminar). Colloquium Speaker: Tufts University, Cornell University.

2013 “Topology, Geometry and Group Theory, Informed by Experiment ICERM, Providence RI. “Geometry and Groups after Thurston”, Dublin, Ireland. “Low-dimensional Topology and Geometry in Toulouse”, on the occasion of Michel Boileau’s 60th birthday, Toulouse, France. “The Topology of 3-dimensional Manifolds” Workshop, Montréal, Canada. Yale University, Boston College, Temple University, Harvard University (7 minute talk), AWM symposium in Santa Clara, AMS special session in Boston.

2011-2012 “Cannon” meeting at the Fourier Institute (Grenoble), Wellesley College, Dartmouth College Korea Advanced Institute of Science and Technology (4 talks). “Workshop on Dehn Surgery”, Austin, TX. Cornell University, Temple University, Association of Women in Mathematics 40th Anniversary Conference (Special Session in Geometric Group Theory). Invited Speaker and Conference Participant: “Geometry and Topology Down Under: A Conference in Honor of Hyam Rubinstein”, Melbourne, Australia.

Research Visit: Research in Pairs, Oberwolfach, Germany.

2010-2011 American Mathematical Society (AMS) Meetings: Worcester MA (2 special sessions), Newark, NJ (special session). City University of New York, University of Oklahoma, Oklahoma State (Colloquium), Harvard University, Boston College. CIRGET Reunion Conference, Montréal Canada.

- 2009-2010 American Mathematical Society (AMS) special session, Albuquerque, NM. Harvard University (twice). “Quasi-isometric rigidity in low-dimensional topology” workshop, BIRS.
- 2008-2009 Yale University, Wesleyan University, Colby College (Colloquium). Canada / France Congress. Special Session: “Low-dimensional topology”. Montréal, Canada. Moab Topology Conference. Moab, Utah. “Interactions between Hyperbolic Geometry, Quantum Topology and Number Theory” Workshop and Conference, Columbia University, New York, NY (3 lectures).
- 2007-2008 University of Texas at Austin. Williams College (Colloquium). Teichmüller Theory and Kleinian Groups: “Connections for Women” Conference. MSRI, Berkeley, CA Geometric Group Theory: “Connections for Women” Conference. MSRI, Berkeley, CA (2 lectures) “Three-manifold Geometry and Topology” Conference. Warwick, England. Special Session on Low-dimensional Topology, Joint meeting of the American Mathematical Society and the Sociedad Matemática Mexicana (SMM) Zacatecas, Mexico.
- 2006-2007 SUNY Buffalo. Columbia University. Cornell University. Brown University. Brandeis University. Michigan State University (2 Lectures). McGill University. Université du Québec à Montréal. Cascade Topology Seminar, Portland State University. Special Session on Low-dimensional Topology, Joint Meeting of the Canadian Math Society and the Sociedad Matemática Mexicana (SMM) Guanajuato, Mexico. “The Second William Rowan Hamilton Geometry and Topology Workshop” Dublin, Ireland. Institute for Advanced Study/Park City Math Institute Workshop, “Low-dimensional Topology” Park City, Utah.
- 2005-2006 University of California at Santa Barbara. Rice University. University of British Columbia. Special Session on Low-dimensional Topology, Canadian Math Society Meeting, Victoria, B. C. “Conference on Low-dimensional Manifolds”. Oberwolfach, Germany. “On Heegaard splittings of 3-manifolds” Conference, Technion, Haifa, Israel.
- 2004-2005 American Mathematical Society (AMS) special sessions: University of California at Santa Barbara, Vanderbilt University. Spring Topology and Dynamical Systems Conference (Semi-Plenary Talk) Berry College. Washington University in St. Louis, University of California at Davis. “Trends in three-manifolds” Conference Montréal, Canada.
- 2003-2004 Tulane University. Princeton University. Texas Geometry and Topology Conference, Rice University. Georgia Topology Conference, University of Georgia. Special Session on Low-Dimensional Topology, Sociedad Matemática Mexicana (SMM) and AMS joint meeting, Houston. Special session, University of North Carolina at Chapel Hill. Special Session, Phoenix, Arizona. Spring Topology and Dynamical Systems Conference. Birmingham, AL. “Topology in and around dimension three”. Banff, Canada.

## Teaching at Tufts University

Introduction to Calculus, Calculus I, Calculus II, Discrete Mathematics.

Linear Algebra, Honors Linear Algebra, Abstract Algebra.

Point Set Topology, Algebraic Topology (undergraduate).

Graduate: Geometry and Topology, Algebraic Topology, Topics in Hyperbolic Geometry, Topics in Geometric Group Theory, numerous seminar and reading courses.

## Other teaching

University of Texas at Austin: Single and Multi-variable Calculus, Number Theory, Point-set topology, Graduate Topics Course: “Surfaces in three-manifolds”.

## Service

Service on NSF grant-review panels NSF postdoctoral fellowship panels.

Prize Committees: Association of Women in Mathematics, Centennial Fellowship Committee (AMS) Chair (2019-2020)

Faculty Mentor, Tufts Association of Women in Math

Tufts Departmental Committees:

Hiring Committee, (Member 2007-2008) (Member 2009- 2010) (Member 2012-2013). (Chair 2010-2011), (Member 2015-2016), (Chair 2015-2016), (Member 2016-2017) Course Assignment Committee, (2015-2016) (2016-2017) Graduate Committee, (2008-2009) (2009 - 2010) (2011-2012) (Spring 2013) (Spring 2014) (2016-2017) (2017-2018)(2018-2019)(2019-2020) Curriculum Committee, (Spring 2007) (2020-2021)

Tufts University Committees:

Faculty Research Awards Committee (2018-2019) Work/Life Balance Committee (2014-2015)(2015-2016)(2016-2017)(2017-2018). Faculty Workload Committee (Spring 2014). Library Committee, (2012-2013) (2016-2017)(2019-2020) Committee on Information Technology, (2007-2008) (2009-2010) (2010-2011) (2011-2012) Cummings Building Committee (Art) (2019-2020)

Referee for: **Algebraic and Geometric Topology, American Mathematical Monthly, Communications in Analysis and Geometry, Duke Mathematical Journal, Geometriae Dedicata, Geometry and Topology, Journal of the American Mathematical Society, Journal of the London Mathematical Society, Journal of Topology, Journal of Topology and Analysis, Pacific Journal of Mathematics, Proceedings of the American Mathematical Society, Publicacions Matemàtiques**

Reviewer for Mathematical Reviews.