

Carolyn R. Abbott

Brandeis University
Department of Mathematics
Waltham, MA 02453

carolynabbott@brandeis.edu
www.carolynrabbott.com
Phone: (607) 342 - 4523

Appointments	Assistant Professor Brandeis University	July 2021 – present
	NSF Postdoctoral Fellow Columbia University	June 2019 – May 2021
	NSF Postdoctoral Fellow University of California, Berkeley	June 2018 – May 2019
	Morrey Visiting Assistant Professor University of California, Berkeley	August 2017 – June 2018
Education	University of Wisconsin-Madison , Madison, WI Ph.D. in Mathematics, Advisor: Tullia Dymarz	May 2017
	Cornell University , Ithaca, NY Master of Arts and Teaching in Secondary Mathematics Education, New York State Teaching Certificate in Mathematics 7–12	May 2007 June 2007
	Jagiellonian University , Krakow, Poland Diploma in Polish language	June 2005
	Tufts University , Medford, MA B.A. in Mathematics and Asian Studies, Magna Cum Laude	May 2004
Visiting Positions	Mathematical Sciences Research Institute <i>Program Associate in Geometric Group Theory Semester</i>	Fall 2016
	The Graduate Center at CUNY <i>Visiting Research Scholar</i>	Spring 2016, Spring 2017
Research Interests	Geometric group theory, including applications to hyperbolic geometry, computation, and random walks.	
Publications & Preprints	<ol style="list-style-type: none">Abbott, Carolyn R. <i>Not all finitely generated groups have universal acylindrical actions</i>, Proc. Amer. Math. Soc., 144(10):4151–4155, 2016.Abbott, C., Balasubramanya, S., and Osin, D., <i>Hyperbolic structures on groups</i>, Algebr. Geom. Topol., 19-4 (2019), 1747–1835.Abbott, C. and Dahmani, F. <i>Property P_{naive} for acylindrically hyperbolic groups</i>, Math. Z., 291(1-2):555-568, 2019.Abbott, C., Hume, D., and Osin, D. <i>Extending group actions on metric spaces</i>, J. Topol. Anal., 12(3): 625–665, 2020.	

5. Abbott, C. and Hume, D. *The geometry of generalized loxodromic elements.*, Ann. I. Fourier (Grenoble), 70(4): 1689–1713, 2020.
6. Abbott, C., Behrstock J., and Durham, M. *Largest acylindrical actions and stability in hierarchically hyperbolic groups*, Trans. Amer. Math. Soc. Ser. B, 8: 66–104, 2021.
7. Abbott, C. and Hume, D. *Actions of small cancellation groups on hyperbolic spaces*, Geom. Dedicata, 212(1), 325–363, 2021.
8. Abbott, C. and Behrstock, J. *Conjugator lengths in hierarchically hyperbolic groups*, Groups Geom. Dyn. **17**, no. 3, 805–838, 2023.
9. Abbott, C. and Rasmussen, A. *Actions of solvable Baumslag-Solitar groups on hyperbolic metric spaces*, Algebr. Geom. Topol. **23**, no. 4, 1641–1692, 2023.
10. Abbott, C., Manning, J. *Acylindrically hyperbolic groups and their quasi-isometrically embedded subgroups*, Accepted: to appear in Mich. Math. J.
11. Abbott, C. and Hull, M. *Random walks and quasi-convexity in acylindrically hyperbolic groups*, J. Topol. **14**, no. 3, 992–1026, 2021.
12. Abbott, C. and Rasmussen, A. *Largest hyperbolic actions and quasi-parabolic actions in groups*, arXiv:1910.14157. Accepted: to appear in J. Top. Anal.
13. Abbott, C., Balasubramanya, S., Rasmussen, A. *Higher rank confining subsets and hyperbolic actions of solvable groups*. Adv. Math. **424**, Paper No. 109045, 47pp, 2023.
14. Abbott, C., Behrstock, J., and Russell, J. *Structure invariant properties of the hierarchically hyperbolic boundary*. Accepted: to appear in J. Top. Anal.
15. Abbott, C., Ng, T., and Spriano, D. *Uniform exponential growth in hierarchically hyperbolic groups*, arXiv:1909.00439. Accepted: to appear in Math. Z.
16. Abbott, C., Miller, N., and Patel, P. *Infinite-type loxodromic isometries of the relative arc graph*. arXiv:2109.06106. Submitted.
17. Abbott, C., Miller, N., and Patel, P. *Shift maps are not type-preserving*. arXiv:2212.09156. Submitted.
18. Abbott, C., Hoganson, H., Loving, M., Patel, P., and Skipper, R. *A new construction of subgroups of big mapping class groups*. arXiv:2109.05976. Submitted.
19. Abbott, C. and Incerti-Medici, M. *Hyperbolic projections and topological invariance of sublinear Morse boundaries*. arXiv:2212.09539. Submitted.
20. Abbott, C., Nguyen, H.T., and Rasmussen, A. *Largest hyperbolic actions of 3-manifold groups*. arXiv:2305.07425. Submitted.
21. Abbott, C., Hagen, M., Petyt, H., and Zalloum, A. *Uniform undistortion from barycentres, and applications to hierarchically hyperbolic groups*. arXiv:2305.09742. Submitted.
22. Abbott, C., Behrstock, J., and Russell, J. *Relative hyperbolicity, thickness, and the hierarchically hyperbolic boundary*. arXiv:2305.16906. Submitted.
23. Abbott, C., Balasubramanya, S., and Rasmussen, A. *Valuations, completions, and hyperbolic actions of metabelian groups*. arXiv:2207.12945. Submitted.

**Invited Talks
(Conferences)**

Group Actions and Low Dimensional Topology	July 2023
Escuela de Teoría Geométrical de Grupos	June 2023
Interactions between Algebraic Topology and Geometric Group Theory, BIRS	May 2023
Geometry of Subgroups, CRM (minicourse)	May 2023
AMS Southeast Sectional Meeting, Georgia Tech <i>Geometric group theory</i>	March 2023
Spring Topology and Dynamics Conference	March 2023
Hyperbolic groups and their generalizations, IHP	June 2022
Women in Groups, Geometry, and Dynamics Retreat	August 2021
Charney Fest	July 2021
Beyond Hyperbolicity Conference	July 2021
Topics at the Interface of Low Dimensional Group Actions and Geometric Structures, IMS	January 2021
Geometric group theory: Non-positively curved groups, NCNGT	May 2020
Joint Math Meetings Special Session <i>Women in topology</i>	January 2020
Big Mapping Class Groups AIM Workshop	May 2019
Arches Topology Conference	April 2019
Spring Topology and Dynamics Conference, Semi-plenary speaker	March 2019
AMS Sectional Meeting Special Session, University of Arkansas <i>Groups in Low-dimensional Topology and Dynamics, I</i>	November 2018
Graphs, Surfaces, and Cube Complexes, Warwick	July 2018
Boundaries of Groups, CIRM-Luminy	June 2018
Workshop on Large Scale Geometry and Applications, Fields Institute	May 2018
AMS Sectional Meeting Special Session, Vanderbilt University <i>Non-positive curvature and boundaries</i>	April 2018
Joint Math Meetings Special Session <i>Boundaries for groups and spaces</i>	January 2018
Young Geometric Group Theorists Conference	March 2018
Virginia Topology Conference	November 2017
Geometric Groups on the Gulf Conference	March 2017
Spring Topology and Dynamics Conference	March 2017
Wasatch Topology Conference	August 2016
Beyond Hyperbolicity Conference, Cambridge University	June 2016
GAGTA Conference, Stevens Institute of Technology	June 2016
AMS Sectional Meeting Special Session, Loyola University <i>Metric Geometry</i>	October 2015

**Invited Talks
(Colloquia)**

University of Wisconsin, Madison	March 2023
Queens University, Ontario	January 2023
Bowdoin College	November 2021
University of Wisconsin, Milwaukee	October 2021
California State University, Chico	April 2019
St. Johns University	February 2019
Tufts University	November 2018
City College of New York	April 2016
Swarthmore College	March 2016

**Invited Talks
(Seminars)**

Boston College, Topology Seminar	March 2023
University of Wisconsin, Madison, Dynamics Seminar	March 2023
University of Texas, Austin, Topology Seminar	February 2022
Brandeis University, Topology Seminar	January 2022
Tufts University, Geometry and Geometric Group Theory Seminar	October 2021
University of Chicago, No Boundaries Seminar	April 2021
McGill University, Geometry/Topology Seminar	March 2021
Virtual Geometric Group Theory Seminar in Mexico	January 2021
Vanderbilt University, Group Theory and Geometry Seminar	March 2020
Columbia University, Geometry/Topology Seminar	April 2019
Temple University, Geometry Topology Seminar	March 2019
University of Florida, Geometry Topology Seminar	October 2018
Stanford University, Geometry/Topology Seminar	April 2018
University of California, Davis, Geometry Topology Seminar	April 2018
Yale University, Geometry Topology Seminar	March 2018
University of California, Irvine, Geometry Topology Seminar	February 2018
University of California, Santa Barbara, Geometry Topology Seminar	January 2018
University of California, Berkeley, Geometry Topology Seminar,	August 2017
University of Nice, Dynamics Seminar	April 2017
Columbia University, Geometry/Topology Seminar	February 2017
Institute Fourier, Grenoble Alps, Geometry/Topology Seminar	March 2017
Rice University, Geometry/Topology Seminar	March 2017
Boston College, Geometry/Topology Seminar	March 2017
University of Illinois - Chicago, Geometry Topology Seminar	February 2017
Cornell University, Geometry Topology Seminar	February 2017

	Temple University, Geometry Topology Seminar	February 2017
	MSRI, Postdoctoral seminar	December 2016
	Brandeis University, Seminar	March 2016
	The Graduate Center at CUNY, Hyperbolic Geometry Seminar	March 2016
	The Graduate Center at CUNY, Geometry and Topology Seminar	February 2016
	Temple University, Graduate Student Seminar	January 2016
	Vanderbilt University, Group Theory and Geometry Seminar	November 2015
Grants	NSF Grant DMS-2106906	2021 - 2024
Conferences Organized	Groups, Actions, and Geometry	August 2023
	Quotients of Hierarchically Hyperbolic Groups	August 2022
	JMM Special Session “Geometric group theory”	March 2022
	AMS Northeast Sectional Meeting special session “Geometric group theory”	March 2022
University Service	Diversity, Equity, Inclusion, and Social Justice (DEIS-J) Committee (Fall 2023 – current)	
Departmental Service	Undergraduate Advising Head II (Fall 2023 – current): responsible for transfer credits and study abroad credits	
	Undergraduate Committee (Fall 2022 – current)	
	Tenure-track Hiring Committee (2022 – 2023): for two positions	
Mentoring	Current graduate students: Kaitlyn Ragosta, Joshua Perlmutter, Rachmiel Klein	
	Current Postdocs: Assaf Bar-Natan, Thomas Ng	
	AWM Mentor (Summer 2023 – current): Meet regularly with and mentor several women early in their graduate studies.	
	Thesis committee member: Ian Montague (March 2023)	
	Oral exam committee member: mathematics graduate student at University of Utah (March 2023)	
Outreach	Member, MAA Committee on the T. Christine Stevens Award (2023 – current): Review nominations for this leadership development award	
	EDI Reviewer, BIRS Proposals (2021 – current)	
	Co-organizer, Brandeis Topology Seminar (Fall 2021 – current): Plan and organize the weekly Topology seminar.	
	Editor, AMS Blog on Teaching and Learning (Spring 2021 – present)	

Co-organizer, UC Berkeley Geometry-Topology Seminar (Fall 2017 – Spring 2019): Plan and organize the weekly Geometry/Topology seminar.

Organizer, UC Berkeley New Postdoc Talks (Fall 2017, Fall 2018): Organize session for new postdocs to introduce themselves and their work to the department.

Senior Thesis Advisor, UC Berkeley (Spring 2018): Advise undergraduate student writing a senior honors thesis defining train track splittings on orbifolds.

Referee Work (2018 – present): *J. Topol. Anal., Groups Geom. Dyn., J. Éc. polytech., Geom. Dedicata, IMRN, MMJ, Geom. Top., Ann. H. Lebesgue*

Organizer, MSRI Working Seminar on $\text{Out}(F_n)$ -complexes (Fall 2016): Plan and organize a seminar open to all members of MSRI.

Founder, Directed Reading Program (Fall 2015): Program pairs undergraduates with graduate student mentors for a semester-long independent study.

Member, CTAPP Committee (Fall 2014 – Fall 2015): Evaluate TAs in the math department, determine policies for TA responsibilities and pay structure.

Graduate Coordinator, Madison Math Circle (Spring 2014 – Fall 2015): Organized refreshments and supplies, and coordinated weekly talks by graduate students and faculty on various topics in mathematics for middle and high school students.

Mentor and Administrative Assistant, Instructional Excellence Program (Fall 2013 – Fall 2015): Mentor new TAs in the math department, plan and run training workshops on interactive teaching, facilitating group work, writing quizzes, and grading, observe new TAs and give feedback.

Fundraising Event (September 2015): Assistant to Jordan Ellenberg in UW-Madison fundraiser held in New York City.

Math Help Desk (Fall 2013 – Fall 2015): Advised undergraduate students on which math courses were most appropriate for them to take and helped them find a class that fit in their schedule.

Student Orientation, Advising, and Registration (January 2014, June 2014, August 2015): Advised new undergraduate students on which math courses were most appropriate for them to take, as well as helped students plan a course of study if their interest was mathematics.

Graduate Coordinator, Women in Math at Wisconsin (Fall 2014 – Fall 2015): Coordinate events for women in the math department, including inviting colloquium speakers and organizing social events.

Project Mentor, Women in Math at Wisconsin: High School Math Night (Fall 2013): Mentor for local high school women, with weekly work on an RSA encryption project, through the Women in Math at Wisconsin organization.

Awards

Nominated: **Dean's Mentoring Award (2023) Letters & Sciences Teaching Fellow Award (2015)**: a campus-wide award for TAs who have achieved outstanding success as students and teachers at UW-Madison

Elizabeth S. Hirschfelder Scholarship (2014): for exceptional work by a female Ph.D. student.

Department of Mathematics Teaching Award (2014): for first-rate teaching

University Housing's Honored Instructor Award (2012, 2014, and 2015): for excellent teaching, based on student nominations

Edward A. Sheldon Award (2007): for excellent female teachers, based on aca-

demic achievement

Robert Noyce Scholarship (2006): for superb teachers committed to working in high needs districts

Tufts University Maxine Gordon Award (2004): for an outstanding math major with a strong literary interest

Tufts University Class of 1942 Prize Award (2004): for the student most likely to become an outstanding university professor

Nominated: **Exceptional Service (2015):** a campus-wide award for outstanding TAs who perform exceptional service related to the educational mission of their department and our university

Nominated: **Early Excellence in Teaching Award (2013):** campus-wide award for outstanding and inspirational performance on the part of TAs with fewer than four semesters of teaching experience

Nominated: **Cornell University Mathematics Graduate Student Teaching Award (2006):** for excellent teaching, based on student nominations

Teaching Experience

Brandeis University

Instructor

Fall 2021

- Courses taught: Math 15a: Linear Algebra, Math 221: Graduate topics course titled “Hyperbolic groups,” Math 221A&B: Topology I & II, and Math 271: Graduate topic course titled “Mapping class groups”

Columbia University

Instructor

Spring 2020, Fall 2020

- Courses taught: Calculus III

University of California, Berkeley

Instructor

2017-2018

- Courses taught: Abstract Algebra and Honors Linear Algebra and Differential Equations
- Average Teaching Evaluation Score: 6.35/7.00

University of Wisconsin - Madison

Instructor

2012-2015

- Courses taught: Calculus 1, 2, and 3, and Problem Solving: Algebra, Probability, Statistics
- Selected as a TA coordinator in 2015 (overseeing first-year TAs)
- Selected for Wisconsin Emerging Scholars section in 2014-15 (sections that provide extra support for students from underprivileged backgrounds)
- Average Teaching Evaluation Score: 4.93/5.00

The Anderson School, New York, NY

March 2009 – June 2012

7th and 8th Grade Mathematics Teacher

- Taught Integrated Algebra and Integrated Geometry, founded an honors program for gifted students, Robotics Club advisor, MathCounts Coach

The Bronx High School of Science, Bronx, NY

August 2007 – January 2009

High School Mathematics Teacher

- Courses Taught: Algebra, Geometry, Trigonometry

Cornell University, Ithaca, NY

Instructor

- Courses Taught: Calculus 1, Calculus for Engineers, Calculus for Life and Social Sciences, Introduction to College Mathematics