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# Dan Margalit

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**CITIZENSHIP** Born March 6, 1976. U.S. Citizen.

## POSITIONS

- Professor, Georgia Tech, 2016–
- Associate Professor, Georgia Tech, 2012–2016.
- Assistant Professor, Georgia Tech, 2010–2012.
- Assistant Professor, Tufts U, 2008–2010.
- Assistant Professor (postdoctoral position), U of Utah, 2003–2008.

## EDUCATION

- Ph.D. in Mathematics, U of Chicago, June 2003.
  Thesis Advisor: Benson Farb.
- M.S. in Mathematics, U of Chicago, March 2000.
- Sc.B. in Mathematics, Brown University, May 1998.
  Magna Cum Laude, Phi Beta Kappa.

## RESEARCH INTERESTS

- Geometric group theory
- Low-dimensional geometry/topology

## AWARDS AND FELLOWSHIPS

*Research*

- Fellow of the American Mathematical Society, Class of 2019.
- Leddy Family Faculty Fellowship, GaTech, 2016–2018.
- Simons Fellowship, 2016.
- Invited address, Southeastern Section, AMS, 2015.
- National Science Foundation CAREER Award, 2010.
- Sloan Research Fellowship, 2009.
- National Science Foundation Postdoctoral Fellowship, 2004–2007.

*Teaching*

- Class of 1940 Course Survey Teaching Effectiveness Award, GaTech, 2013
- Outstanding Instructorship Award, Utah, April 2007.
- Lawrence and Josephine Graves Teaching Prize, Chicago, 2002.

**GRANTS**

· NSF RTG, Georgia Tech Geom. & Top., Co-PI, $2,400,000, 2018–2023.
· NSF, Mapping class groups & polynomials, $203,000, 2018–21.
· NSF, Topology Students Workshop, $40,000, 2018.
· NSF, No Boundaries Conference, $30,000, 2017.
· NSF, Group-theoretical, combinatorial... $225,000, 2015–18.
· NSF CAREER, Group-theoretical, dynamical... $427,000, 2010–15.
· NSF, Tech Topology Conference, $72,000 2015–17.
· NSF, Tech Topology Conference, $54,000, Co-PI, 2012–14.
· NSF, Tech Topology Conference, $7,000, Co-PI, 2011.
· NSF, Algebra & topology of Johnson filtration, $95,000 2007–10.
· NSF Postdoctoral Fellowship, $108,000 2004–2007.

**SELECTED PUBLICATIONS** (available at `http://www.math.gatech.edu/~margalit`)

*Research Articles*

1. Commensurations of the Johnson kernel, with Tara E. Brendle, *Geometry and Topology* 8: 1361–1384, 2004.
2. Automorphisms of the pants complex, *Duke Mathematical Journal* 121(3): 457–479, 2004.
3. Weil–Petersson isometries via the pants complex, with Jeffrey F. Brock, *Proceedings of the AMS* 135 (2007), 795–803.
4. Injections of Artin groups, with Robert W. Bell, *Commentarii Mathematici Helvetici*, 82 (2007), 725–751.
5. Dimension of the Torelli group for $\mathrm{Out}(F_n)$, with Mladen Bestvina and Kai-Uwe Bux, *Inventiones Mathematicae* 170 (2007), no. 1, 1–32.
6. Addendum to: Commensurations of the Johnson kernel, with Tara E. Brendle, *Geometry and Topology* 12, 97–101, 2008.
7. The lower central series and pseudo-Anosov dilatations, with Benson Farb and Christopher J. Leininger, *The American Journal of Mathematics*, 130(3): 799–827, 2008.
8. Dehn twists have roots, with Saul Schleimer, *Geometry and Topology* 13 (2009), 1495–1497.
9. The dimension of the Torelli group, with Mladen Bestvina and Kai-Uwe Bux, *Journal of the American Mathematical Society* 23 (2010), no. 1, 61–105.
10. Small dilatation pseudo-Anosovs and 3-manifolds, with Benson Farb and Chris Leininger, *Advances in Mathematics* 228(3): 1466-1502, 2011.
11. Generating the Torelli group, with Allen Hatcher, *L'Enseignement Mathématique* 58 (2012), 165-188.
12. Abstract commensurators of right-angled Artin groups and mapping class groups, with Matt Clay and Chris Leininger, *Mathematical Research Letters*, 21 (3) 461–467, 2014.

13. Generators for the hyperelliptic Torelli group and the kernel of the Burau representation at $t = -1$, with Tara Brendle and Andrew Putman, *Inventiones Mathematicae* 200 (1) 263–310, 2015.
14. The level four subgroup of the braid group, with Tara E. Brendle, *Journal für die reine und angewandte Mathematik*, 735, 249–264, 2018.
15. Efficient geodesics and an effective algorithm for distance in the complex of curves, with Joan Birman and Bill Menasco, *Mathematische Annalen* 366(3), 1253–1279, 2016.
16. Pseudo-Anosov stretch factors and homology, with Ian Agol and Christopher Leininger, *Journal of the London Mathematical Society* 93 (3), 664–682, 2016.

*Books*

17. A Primer on Mapping Class Groups, with Benson Farb, 472 pages, *Princeton Mathematical Series* 49, Princeton University Press, 2012.
18. Thurston's Work on Surfaces, with Djun Kim. English translation of "Travaux de Thurston sur les surfaces," edited by A. Fathi, F. Laudenbach, and V. Poénaru. *Mathematical Notes* 48, Princeton University Press, 2012.
19. Office Hours with a Geometric Group Theorist, edited with Matt Clay, 464 pages, to appear in Princeton University Press, July 2017.
20. Interactive Linear Algebra, with Joe Rabinoff, 456 pages, Jan 2018.

*Articles*

21. A Carnival of Calculus, *MAA FOCUS*, May 2008.
22. Review of "Thurston's Work on Surfaces," Bull. AMS 51 (1), Jan 2014.
23. The mathematics of Joan Birman, Notices of the AMS, to appear Feb 2019.

## ADVISING

*Postdoctoral advising*

· Saadet Őykü Yurttaş, Fall 2014–Spring 2015.
· Balázs Strenner, Fall 2016–present.
· Kevin Kordek, Fall 2017–present.

*Graduate advising*

· Hyunshik Shin, Ph.D. Spring 2014.
· Rebecca Winarski, Ph.D. Spring 2014.
· Shane Scott, Ph.D. student, Ph.D. Spring 2018.
· Justin Lanier, Ph.D. student, Fall 2015–present.
· Sarah Davis, Ph.D. student, Fall 2017–present.

*Undergraduate Advising*

- Directed Reading Program, Chicago, 2002.
- Advisor for Undergraduate Problem Solving Contest, Utah, 2004–6.
- Mohammad Adeel, Undergrad. Research Opportunities Program, 2007.
- Eric Platt, Undergraduate thesis, Utah, 2007.
- Tejas Shah, Independent Study, Tufts, 2009-10.
- Peter Woolfitt, REU, Summer 2012.
- Ryan Dickmann, Senior Project, Fall 2015.
- Undergraduate research cluster: Sarah Butchko (Indiana), Ryan Dickmann, Charles Wang, Summer 2016.
- Undergraduate research cluster: Santana Afton (William & Mary), Sarah Davis, Sam Freedman (Michigan), Ian Katz, Justin Lanier, Laura Stordy (Agnes Scott), Balàzs Strenner, Becca Winarski, Yandi Wu (Berkeley), Summer 2017.
- Libby Taylor, undergraduate research project, Fall 2017.
- Undergraduate research project, Shreyas Casturi, Jonathan Chen, Vignesh Raman, Kyle Xiao, co-advised with Balàzs Strenner, Fall 2017.
- Undergraduate research cluster: Santana Afton, Sarah Davis, Janet Huffman (Indiana Wesleyan), Justin Lanier, Xian Li (U San Francisco), Agniva Roy, Abby Saladin (Michigan State), Jacob Shulkin (Michigan), Balàzs Strenner, Logan White (Chicago), Becca Winarski, Ruotong Zhai (Agnes Scott), Summer 2018.

## CONFERENCES ORGANIZED

- Organizer, Topology Students Workshop, June 2012, 2014, 2016, 2018.
- Co-organizer, No Boundaries: Groups in Algebra, Geometry, and Topology, Chicago, October 2017.
- Co-organizer, Geometric Group Theory, Special Session at MCA, Montreal, July 2017.
- Co-organizer, Office Hours with a Geometric Group Theorist, JMM, Jan 2017.
- Co-organizer, Tech Topology Conference, Dec 2011–18.
- Co-organizer, Geometric group theory and topology, AMS Special Session, March 2015.
- Co-organizer, Combinatorial Link Homology Theories, Braids, and Contact Geometry, ICERM, August 2014.
- Co-organizer, Georgia Topology Conference, May 2014.
- Co-organizer, Mini-course, "Seven Crash Courses on Mapping Class Groups," Joint Mathematics Meetings, Baltimore, January 2014.
- Co-organizer, Mathematics Research Communities, Geometric Group Theory, Snowbird, June 2013.
- Organizer, Special Session, "An Invitation to Geometric Group Theory," MathFest, Pittsburgh, August 2010.

## REVIEWS AND EDITING

- Editor, Algebraic & Geometric Topology, 2016-present.
- NSF grants panelist and NSA grant reviewer, 2009, 2013, 2014, 2016.
- Referee for over 50 journals, including: Advances in Mathematics, American Journal of Mathematics, Commentarii Mathematici Helvetici, Duke Mathematical Journal, Geometric and Functional Analysis, Geometry and Topology, Inventiones Mathematicae, Journal of the American Mathematical Society, Journal of the European Mathematical Society, and Mathematics Research Letters.

## OUTREACH ACTIVITIES

- Academic Partner to Orr High School, 2001.
- Polk Bros./U of Chicago program for Chicago Public Schools, 2002–3.
- CNA Mathachievement program for Chicago Public Schools, 2002–3.
- SESAME program for Chicago Public Schools teachers, 2002–3.
- Co-organizer, Calculus Carnival, Utah, 2007.
- Math Circle program for Utah high school students, Utah, 2003–4.
- Presenter, GT Future Tech, Spring 2016.
- Family Science Night, Morningside Elementary School, 2016, 2017, 2018.
- EXPLORE undergraduate recruitment event, Spring 2017, 2018.
- Coach for Paideia School Odyssey of the Mind team, 2018–19.

## SELECTED CONFERENCE TALKS

- Georgia Topology Conference, June 2003.
- Braid groups, BIRS, October 2004.
- Braids, Links, and Mapping Class Groups: A Conference In Honor of Joan Birman, Columbia U, March 2005.
- Journées Peter Shalen, CRM, Montreal, June 2006.
- The Many Strands of the Braid Groups, BIRS, April 2007.
- Braids in Singapore, National U of Singapore, June 2007.
- Topics in Geometric Group Theory, MSRI, November 2007.
- Finite Type Invariants, Fat Graphs and Torelli–Johnson–Morita theory, CTQM, Aarhus, March 2008.
- Topology and Computer, Tokyo Institute of Technology, August 2008.
- Geometry of Outer Space, Clay Institute, October 2009.
- Subgroups of Mapping Class Groups, Hausdorff Inst., Bonn, May 2010.
- Cornell Topology Festival, Cornell U, May 2010.
- Interactions between contact symplectic topology and gauge theory in dimensions 3 and 4, Banff, March 2011.
- Arithmetic Groups vs. Mapping Class Groups: Similarities, Analogies and Differences, Oberwolfach, June 2011.
- Braids in Seville, June 2011.

- Geometric Group Theory, The Technion, June 2011.
- Mapping Class Groups and Quantum Topology, IRMA, June 2012.
- Mapping Class Groups and Categorification, Banff, April 2013.
- Mapping Class Groups and Teichmüller Theory, Israel, May 2014.
- Georgia Topology Conference, Athens, May 2014.
- Teichmüller modular groups, A Celebration of Nikolai Ivanov's 60th birthday, U Chicago, March 2015.
- Effective and Algorithmic Methods in Hyperbolic Geometry and Free Groups, ICERM, May 2016.
- Geometry of Mapping Class Groups and Out($F_n$), MSRI, October 2016.
- Surface Bundles, Oberwolfach, December 2016.
- Braids in Algebra, Geometry, and Topology, Edinburgh, May 2017.
- No Boundaries: Groups in Algebra, Geometry, and Topology, Chicago, October 2017.
- Geometry of Teichmüller space and mapping class groups, Warwick, April 2018.

**SEMINAR TALKS**

- 2004: Columbia (twice), Brown, Idaho State (Colloquium), Cornell (twice), Utah (twice), U Chicago, Northwestern, UIC, Rutgers.
- 2005: Urbana–Champaign, Utah (three times), Cornell, Rutgers, Ohio State, Brigham Young, Santa Barbara, UIC.
- 2006: Rutgers-Newark (Colloquium), Davis, Technion, Stony Brook, Utah, U Chicago.
- 2007: Johns Hopkins (Colloquium), Utah, Virginia, Georgia.
- 2008: Temple (Colloquium), Tufts (thrice), Michigan State (Colloquium), UC Davis (Colloquium), UIC (Colloquium), UNC (Colloquium), UC Riverside (Colloquium), CUNY Lehman (Colloquium), Brown (Topology Seminar and Undergraduate Seminar), Boston College (Colloquium), Brandeis–Harvard–MIT–Northeastern Colloquium.
- 2009: Harvard (twice).
- 2010: Georgia Tech (Colloquium), Brandeis, Georgia Tech (twice), Yale.
- 2011: Florida State (Colloquium), Oklahoma (Colloquium), Columbia, Georgia.
- 2012: Stanford, Berkeley, Chicago, Georgia Tech.
- 2013: Columbia, Rice (Colloquium), Indiana (Colloquium).
- 2014: Chicago.
- 2016: Temple (Colloquium), Berkeley (Topology Seminar, Graduate Seminar, and Colloquium), UNC Greensboro (Helen Barton Lecture Series in Computational Mathematics).
- 2017: Chicago, Vanderbilt (Seminar and Colloquium).
- 2018: Michigan (Colloquium).
- 2019: Oregon (Colloquium).