ASSAF BAR-NATAN

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EDUCATION

University of Toronto, Toronto, Canada   2017-2022 (expected)
PhD in Mathematics
Research interests: Hyperbolic geometry, Teichmuller theory, low dimensional topology and infinite-type surfaces.

McGill University, Montreal, Canada   2015-2017
MSc in Mathematics
Thesis: *Arcs on Punctured Disks Intersecting at Most Twice with Endpoints on the Boundary.*

Hebrew University of Jerusalem, Jerusalem, Israel   2011-2015
BSc in Mathematics and Physics.

SELECTED PUBLICATIONS AND PREPRINTS

- **Assaf Bar-Batan**, Yvon Verberne (2021), The grand arc graph, submitted to Compositio Mathematica.
- **Assaf Bar-Natan**, Lorenzo Najt & Zachary Schutzman (2020), The gerrymandering jumble: map projections permute districts' compactness scores, *Cartography and Geographic Information Science*, DOI: 10.1080/15230406.2020.1737575.
- **Assaf Bar-Natan**, Moon Duchin, Robert Kropholler (2020), *Conjugation curvature for Cayley graphs*[1], Accepted to Journal of Topology and Analysis.
- **Assaf Bar-Natan**, Arcs on Punctured Disks Intersecting at Most Twice with Endpoints on the Boundary (2017), to appear in Goemetry, Groups, and Dynamics.

SELECTED HONORS AND AWARDS

- **Queen Elizabeth II Award** (2021) CAD 15000 award to support thesis completion
- **NSERC PGS-D Award** (2019) CAD 42000 award to support thesis research over two years
- **University of Toronto Faculty of Arts and Science Tops (FAST) award** (2017) CAD 89000 award to support thesis research over four years (declined last two years)
- **University of Toronto Blyth Fellowship** (2018) CAD 5000 fellowship from the University of Toronto
- **GEAR Graduate Internship** (2017) CAD 9400 grant to support visiting research at Tufts university

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[1]Formerly: Medium-Scale Curvature for Cayley Graphs

SELECTED TALKS

- **Hyperbolic Lunch**, Toronto, Canada, March 2021.
- **Geometry Working Group**, Imperial College, London, March 2021.
- **Tufts University Geometric Group Theory Seminar**, Boston, USA. Winter 2017.
- **Young Geometric Group Theory 6**, Oxford, UK. Presented poster.
- **McGill Geometric Group Theory Seminar**, Montreal, Canada. May 2018 and April 2017.
- **University of Wroclaw**, Wroclaw, Poland. Summer 2016.
- **IMPAN (Warsaw)**, Wroclaw, Poland. Summer 2016.

LEADERSHIP EXPERIENCES

Canada/USA Mathcamp, Various college campuses   Summer 2016, 2019, 2021
Mentor (Tenured)
Independently designed and taught graduate-level lecture series in mathematics.

University of Toronto, Toronto, Canada   2019-2020, 2021-
Course Instructor

- Taught single-variable calculus courses (in-person and online) in an active-learning flipped classroom to 160-200 students.
- Developed questions, and administered the final exam for 2400 students

University of Toronto Department of Mathematics, Toronto, Canada   2017-
Teaching Assistant/Head Teaching Assistant/Lead Writing Teaching Assistant

- Led tutorials for 20-30 students in single-variable calculus and linear algebra.
- Worked on large course teams to develop curricula
- Co-ordinated, planned, and ran TA training sessions for over 200 TAs as lead writing TA.

OTHER WORK EXPERIENCES

Metric Geometry and Gerrymandering Group (MGGG), Boston, MA Summer 2017
Research Intern
Interpreted federal GIS census data into visuals to understand and quantify gerrymandering in the US.

Voting Rights and Data Institute, Boston, MA   Summer 2018
Graduate Mentor & Researcher

- Developed and implemented a data pipeline to compute novel gerrymandering detection metrics.
- Mathematically disproved long-standing principles related to compactness metrics and map projections