Ellis Buckminster

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EDUCATION

University of Pennsylvania Philadelphia, PA
Ph.D. Candidate in Mathematics 2022–current

- Thesis advisor: Samuel Taylor

Swarthmore College Swarthmore, PA
B.A. in Mathematics, minor in Linguistics 2018–2022

RESEARCH INTERESTS

Foliations on 3-manifolds, endperiodic maps, Anosov and pseudo-Anosov flows, mapping class groups, and hyperbolic 3-manifolds.

PAPERS AND PUBLICATIONS

Research publications and preprints

- *Periodic points of endperiodic maps.* 2025. 16 pages. Available at arXiv:2409.05963. Published online first in *Groups, Geometry, and Dynamics.*

- Appendix to *Littlewood–Richardson rules from quivers for two-step flag varieties* . Joint with L. Chen and E Kalashnikov. 2025. 4 pages. Available at arXiv:2502.15126.

- *Domains of Convergence for Polyhedral Packings.* Joint with N. Ahmed, W. Ball, E. Rivkin, D. Torrance, J. Viscusi, R. Wang, I. Whitehead, and S. Yang. 2021. 26 pages. Available at arXiv:2109.01289.

FELLOWSHIPS AND AWARDS

Academic and research

- Benjamin Franklin Fellowship Fall 2022–Spring 2027
  University of Pennsylvania

Teaching and pedagogy

- Master TA Fall 2024–current
  University of Pennsylvania, Mathematics Department
- Good Teaching Award, Math 5020 Fall 2023
  University of Pennsylvania, Mathematics Department
- Penn Emerging Scholars Program graduate student organizer Fall 2024–Spring 2025
  University of Pennsylvania, Mathematics Department

Teaching Experience

The University of Pennsylvania <div style="text-align: right">Philadelphia, PA</div>

Teaching Assistant

Math 1070: Mathematics of Change <div style="text-align: right">Fall 2024</div>
Math 2400: Calculus Part III <div style="text-align: right">Spring 2024</div>
Math 5020: Graduate Algebra <div style="text-align: right">Fall 2023</div>

Grader

Math 6090: Graduate Analysis <div style="text-align: right">Spring 2025</div>

Swarthmore College <div style="text-align: right">Swarthmore, PA</div>

Mathematics Clinician <div style="text-align: right">Fall 2021</div>

Drop-in help for students in any math course

Teaching Assistant <div style="text-align: right">Fall 2020</div>

Linguistics 045: Phonetics and Phonology

Other Experience and Service

Seminar and conference organization

- **GTA: Philadelphia** at Temple University <div style="text-align: right">Fall 2023–Summer 2025</div>
  GTA: Philadelphia 2024, 9th annual Graduate Student Conference in Algebra, Geometry, and Topology
  co-organizer with A. Clickard, D. Futer, R. Griebenow, J. Lang, A. Smith, M. Stover, and A. Sudarshan

  GTA: Philadelphia 2025, 10th annual Graduate Student Conference in Algebra, Geometry, and Topology
  co-organizer with A. Clickard, D. Futer, C. Kondasinghe, J. Lang, S. Liu, A. Pasles, A. Sarma Phukon, A. Smith, and M. Stover

- **Graduate Geometry/Topology Seminar** at the University of Pennsylvania, <div style="text-align: right">Fall 2023–Spring 2024</div>
  co-organizer with F. Espino

- **Interactive Mathematics Colloquia** at Swarthmore College <div style="text-align: right">Fall 2021–Spring 2022</div>
  co-founder and co-organizer with N. Ahmed and J. Zhang

Community building, outreach, and mentorship

- **Directed Reading Program** at the University of Pennsylvania, <div style="text-align: right">Spring 2024–current</div>
  mentor for the following projects:

  - Sophia Sczcepek, *The Shape of Space* <div style="text-align: right">Spring 2024</div>
  - Angela Cai, *A Primer on Mapping Class Groups* <div style="text-align: right">Fall 2024</div>
  - Daphne Glatter, *Wallpaper groups* <div style="text-align: right">Spring 2025</div>
  - Darren Zheng, *A Primer on Mapping Class Groups* <div style="text-align: right">Spring 2025</div>

- **Gender Minorities in Math** at the University of Pennsylvania, <div style="text-align: right">Fall 2024–current</div>
  coordinator with M. Calle and A. Mock

- **Penn Emerging Scholars Program** *graduate student organizer* <div style="text-align: right">Fall 2024–current</div>

Workshops

- **CMO Workshop** at the Casa Matemática Oaxaca <div style="text-align: right">June 2025</div>
  Invited participant in "Blooming Beasts: A Conference on the Geometry, Topology, and <div style="text-align: right">Oaxaca (Mexico)</div>
  Dynamics of Infinite-Type Surfaces"

- **Foliations on 3-manifolds** <div style="text-align: right">January 2025</div>

Log cabin workshop   St George, UT
- **Topology Students Workshop**   June 2024
  at Vanderbilt University   Nashville, TN

TALKS AND PRESENTATIONS

Research conference Talks

CMO Workshop: Blooming Beasts   Oaxaca, Mexico
Periodic points of endperiodic maps   June 2025

Recent Development in Geometric Group Theory   Knoxville, TN
Universal circles for Anosov flows (lightning talk)   May 2025

AMS Spring Western Sectional Meeting: Huge Groups from a Geometric Viewpoint   San Luis Obispo, CA
Periodic points of endperiodic maps   May 2025

Invited Seminar Talks

Temple Geometry and Topology Seminar   Philadelphia, PA
Periodic points of endperiodic maps   January 2025

Expository Talks

Temple Junior Groups, Geometry, and Topology Seminar   Philadelphia, PA
Universal circles from pseudo-Anosov flows   February 2025

Foliations on 3-manifolds log cabin workshop   St George, UT
Fibered faces of the Thurston norm unit ball   January 2025

Penn Graduate Geometry/Topology Seminar   Philadelphia, PA
Hyperbolic geometry and homeomorphisms of surfaces   March 2024
The Milnor–Schwarz Lemma   September 2023

Penn Graduate Pizza Seminar   Philadelphia, PA
A trip to the $\mathrm{SL}_2(\mathbb{Z}oo)$ November 2024
Mapping class groups   April 2023

Temple Graduate Pizza Seminar   Philadelphia, PA
A trip to the $\mathrm{SL}_2(\mathbb{Z}oo)$ December 2024

Talks for Undergraduates

Penn Directed Reading Program Mentor Talks   Philadelphia, PA
A two-sided Möbius band (short talk)   April 2025