

Adam Simon Levine

Duke University Mathematics Department
211 Physics Building, 120 Physics Drive
Durham, NC 27708

(919) 660-2802 (office)
alevine@math.duke.edu
<http://www.math.duke.edu/~alevine>

Academic Positions

- **Duke University**
 - Associate Professor 2020–present
 - Assistant Professor 2017–2020
- **Princeton University**, Assistant Professor 2013–17
- **Brandeis University**, NSF Postdoctoral Research Fellow 2010–13

Education

- **Columbia University**
 - Ph.D. with distinction, Mathematics 2010
Advisor: Peter Ozsváth
Thesis: *Applications of Heegaard Floer homology to knot and link concordance*
 - M.Phil., Mathematics 2008
 - M.A., Mathematics 2006
- **Harvard University**
 - A.B. *magna cum laude*, Mathematics 2005
Advisor: Dylan Thurston
Thesis: *Quasiconvexity in word-hyperbolic Coxeter groups*
Phi Beta Kappa

Fellowships and Awards

- NSF Topology grant DMS-2203860 2022–present
- NSF Topology grant DMS-1806437 2017–22
- NSF Topology grant DMS-1405378 2014–17
- Princeton Mathematics Junior Faculty Teaching Award 2015

Research Interests

Topics in low-dimensional topology including 3-manifolds, 4-manifolds, and knot theory, primarily using tools coming from Heegaard Floer homology and Khovanov homology.

Publications and Preprints

1. (With Tye Lidman and Lisa Piccirillo) *New constructions and invariants of closed exotic 4-manifolds*, preprint, arXiv:2307.08130.
2. *A note on rationally slice knots*, preprint, arXiv:2212.12951.
3. (With Onkar Singh Gujral) *Khovanov homology and cobordisms between split links*, Journal of Topology **15** (2022), no. 3, 973–1016, arXiv:2009.03406.
4. (With John A. Baldwin, Nathan Dowlin, Tye Lidman, and Radmila Sazdanovic) *Khovanov homology detects the figure-eight knot*, Bulletin of the London Mathematical Society **53** (2021), no. 3, 871–876, arXiv:2007.01269.
5. (With Ian Zemke) *Khovanov homology and ribbon concordance*, Bulletin of the London Mathematical Society **51** (2019), no. 6, 1099–1103, arXiv:1903.01546.
6. (With Matthew Hedden) *A surgery formula for knot Floer homology*, preprint, arXiv:1901.02488.
7. (With Marco Golla and Daniele Celoria) Appendix to *Heegaard Floer homology and concordance bounds on the Thurston norm*, Transactions of the American Mathematical Society, **373** (2020), no. 1, 295–318, arXiv:1806.10562.
8. (With Tye Lidman) *Simply-connected, spineless 4-manifolds*, Forum of Mathematics, Sigma **7** (2019), e14, 11 pp., arXiv:1803.01765.
9. (With Jennifer Hom and Tye Lidman) *Knot concordance in homology cobordisms*, Duke Mathematical Journal. **171** (2022), no. 15, 3089–3131, arXiv:1801.07770.
10. (With Daniel Ruberman) *Heegaard Floer invariants in codimension one*, Transactions of the American Mathematical Society **371** (2019), no. 5, 3049–81, arXiv:1610.03353.
11. (With John A. Baldwin and Sucharit Sarkar) *Khovanov homology and knot Floer homology for pointed links*, Journal of Knot Theory and its Ramifications **26** (2017), no. 2, arXiv:1512.05422.
12. (With Joshua Greene) *Strong Heegaard diagrams and strong L-spaces*, Algebraic & Geometric Topology **16** (2016), 3167–3208, arXiv:1411.6329.
13. *Non-surjective satellite operators and piecewise-linear concordance*, Forum of Mathematics, Sigma, **4** (2016) e34, 47 pp., arXiv:1405.1125.
14. (With Daniel Ruberman) *Generalized Heegaard Floer correction terms*, Proceedings of Gökova Geometry-Topology Conference 2013, 76–96, arXiv:1403.2464.
15. (With Daniel Ruberman and Sašo Strle, and with an appendix by Ira M. Gessel) *Non-orientable surfaces in homology cobordisms*, Geometry & Topology, **19** (2015), no. 1, 439–494, arXiv:1310.8516.
16. (With Matthew Hedden) *Splicing knot complements and bordered Floer homology*, Journal für die reine und angewandte Mathematik **720** (2016), 129–154, arXiv:1210.7055.
17. (With Sam Lewallen) *Strong L-spaces and left-orderability*, Mathematical Research Letters **19** (2012), no. 6, 1237–1244, arXiv:1110.0563.
18. (With John A. Baldwin) *A combinatorial spanning tree model for knot Floer homology*, Advances in Mathematics **231** (2012), 1886–1939, arXiv:1105.5199.

19. *Slicing mixed Bing-Whitehead doubles*, Journal of Topology **5** (2012), 713–726, arXiv:0912.5222.
20. *Knot doubling operators and bordered Heegaard Floer homology*, Journal of Topology **5** (2012), 651–712, arXiv:1008.3349.
21. *On knots with infinite smooth concordance order*, Journal of Knot Theory and its Ramifications **21** (2012), no. 2, arXiv:0805.2410.
22. *Computing knot Floer homology in cyclic branched covers*, Algebraic & Geometric Topology **8** (2008), 1163–1190, arXiv:0709.1427.

Teaching Experience

Duke University

- Math 222: Vector Calculus Spring 2023
- Math 411: Topology Spring 2022
- Math 401: Abstract Algebra Fall 2021
- Math 612: Algebraic Topology II (graduate) Spring 2021
- Math 620: Smooth Manifolds (graduate) Fall 2020
- Math 612: Algebraic Topology II (graduate) Spring 2020
- Math 221: Linear Algebra Fall 2019
- Math 411: Topology Spring 2019
- Math 611: Algebraic Topology I (graduate) Fall 2018
- Math 221: Linear Algebra Fall 2017
- Math 690: Topics in Topology (graduate) Fall 2017

Princeton University

- Linear Algebra Spring 2017
- Knot Theory (student-taught seminar) Fall 2016
- Calculus II Fall 2014, Spring 2015, Spring 2016
- Differentiable Manifolds Fall 2015
- Algebraic Topology (graduate) Spring 2014
- Calculus I Fall 2013

Brandeis University

- Applied Linear Algebra Fall 2011, Spring 2012
- Algebraic Topology (graduate) Fall 2011, Spring 2012
- Graduate reading courses 2011–13

Columbia University

- Linear Algebra Summer 2008

- Calculus II Summer 2007
- Teaching assistant for undergraduate and graduate courses 2006–09
- Mathematics Help Room tutor 2005–09

Advising Experience

Ph.D. students

- Seppo Niemi-Colvin 2022
Thesis: *Invariance of Knot Lattice Homology and Homotopy*

Undergraduate students

- Onkar Singh Gujral 2020
Thesis: *The Khovanov functor and cobordisms with split boundary*

Invited Talks (2016–present)

Conferences

- Using Quantum Invariants to Do Interesting Topology October 2022
Casa Matemática Oaxaca, Oaxaca, Mexico
- Georgia Topology Conference May 2022
University of Georgia
- Knots, Links, 3-Manifolds, and 4-Manifolds April 2022
Joint Mathematics Meetings (virtual)
- Clay Mathematics Institute Low-Dimensional Topology Workshop January 2020
Oxford University
- Topology of Manifolds: Interactions Between High- and Low-Dimensional Topology, MATRIX Institute, Creswick, Australia January 2019
- TQFT and Categorification Conference April 2018
Institut d'Études Scientifiques de Cargèse, Cargèse, France
- UCLA Topology Workshop January 2018
- Low-Dimensional Topology on Skye June 2017
Sabhal Mòr Ostaig, Sleat, Scotland
- Graduate Student Geometry Topology Conference April 2017
Michigan State University
- Invariants of Knots, Links, and 3-manifolds March 2017
AMS Eastern Sectional Meeting, New York, NY
- Winter School on Homology Theories in Low-Dimensional Topology January 2017
Isaac Newton Institute, Cambridge, England (7 lectures)
- Algebraic Structures Motivated by and Applied to Knot Theory November 2016
AMS Southeastern Sectional Meeting, Raleigh, NC

- Four-Manifolds and Knot Concordance October 2016
Max-Planck-Institut für Mathematik, Bonn, Germany
- Topology in Dimension 3.5: Conference in Memory of Tim Cochran June 2016
Rice University
- Workshop on Flavors of Gauge Theory May 2016
Fields Institute, Toronto, Ontario
- Synchronizing Smooth and Topological 4-Manifolds February 2016
Banff International Research Station, Banff, Alberta

Departmental seminars

- Stanford Topology Seminar May 2023
- UCLA Topology Seminar (online) April 2021
- University of Nevada, Reno Topology Seminar (online) October 2020
- Columbia Categorification Learning Seminar (online) June 2020
- Georgia Tech/University of Georgia Joint Topology Seminar April 2019
- University of Nebraska, Lincoln Topology Seminar March 2019
- University of Nebraska, Omaha Undergraduate Math Colloquium March 2019
- Princeton Topology Seminar March 2019
- University of Virginia Colloquium October 2018
- Caltech Geometry and Topology Seminar June 2018
- UCLA Topology Seminar May 2018
- Louisiana State University Topology Seminar March 2018
- Boston College Geometry/Topology Seminar February 2018
- Dartmouth College Topology Seminar October 2017
- North Carolina State University Topology Seminar September 2017
- University of Cambridge Topology Seminar June 2017
- University of Massachusetts Boston Colloquium January 2017
- Triangle Topology Seminar (Duke University) November 2016
- University of Glasgow Topology Seminar June 2016
- University of Southern California Colloquium January 2016

Service and Synergistic Activities

Duke University

- Director of Undergraduate Studies 2023–present
- Director of Diversity and Inclusion 2020–23
- Graduate admissions committee 2019, 2023
- Sloan Scholarship selection committee 2019–23
- Triangle Topology Seminar organizer 2017–present

Princeton University

- Mathematics Colloquium organizer 2014–17
- Topology Seminar organizer 2013–17
- Department website committee 2016
- Graduate admissions committee 2014

Service to the profession

- Referee, approximately 6 papers per year 2010–present
Algebraic & Geometric Topology, American Journal of Mathematics, Annals of Mathematics, Bulletin of the London Mathematical Society, Communications in Analysis and Geometry, Compositio Mathematica, Geometry & Topology, Journal für die reine und angewandte Mathematik, Journal of Knot Theory and its Ramifications, Journal of Symplectic Geometry, Journal of the American Mathematical Society, Journal of the London Mathematical Society, Journal of Topology, Mathematical Research Letters, Proceedings of the American Mathematical Society, Quantum Topology, etc.
- Conference organizer
 - Low-Dimensional Topology and Gauge Theory Workshop August 2017
Casa Matemática Oaxaca, Mexico
 - Princeton Low-Dimensional Topology Workshop June 2015

Last updated: August 2, 2023