

Hannah K. Larson

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EMPLOYMENT

2023 – Assistant Professor, University of California, Berkeley
2022 – 2027 Clay Research Fellow
2022 – 2023 Junior Fellow, Harvard Society of Fellows

EDUCATION

2017 – 2022 Ph.D. Mathematics, Stanford University. Advisor: Ravi Vakil
2013 – 2017 B.A. Mathematics, Harvard University, summa cum laude

RESEARCH INTERESTS

Algebraic geometry: moduli spaces, intersection theory, Brill–Noether theory

AWARDS AND GRANTS

2024 Maryam Mirzakhani New Frontiers Prize, \$50,000
2023 Hertz Thesis Prize, \$5,000
2022 – 2027 Clay Research Fellowship
2017 – 2022 Hertz Foundation Graduate Fellowship
2017 – 2022 NSF Graduate Research Fellowship
2017 – 2022 Stanford Graduate Fellowship
2019 – 2020 Maryam Mirzakhani Graduate Fellow
2017 AWM Alice T. Schafer Prize
2017 Mumford Prize, Harvard University
2017 Harvard Friends of Math Thesis Prize
2017 Robert Fletcher Rogers Prize, Harvard Math Table
2015 – 2016 Harvard University Certificate of Distinction in Teaching (2 times)
2015 Barry M. Goldwater Scholarship, \$15,000
2013 Davidson Fellow Laureate, \$50,000
2013 Intel Science Talent Search, National 4th Place, \$40,000

PREPRINTS

31. Moduli spaces of curves with polynomial point counts (with S. Canning, S. Payne, and T. Willwacher), [arXiv:2410.19913](https://arxiv.org/abs/2410.19913)

30. Brill–Noether theory of smooth curves in the plane and on Hirzebruch surfaces (with S. Vemulapalli), [arXiv:2408.12678](#)
29. The Chow ring of the universal Picard stack over the hyperelliptic locus, [arXiv:2404.12607](#)
28. The embedding theorem in Hurwitz–Brill–Noether theory (with K. Cook–Powell, D. Jensen, E. Larson, and I. Vogt), [arXiv:2303.15189](#)

ACCEPTED FOR PUBLICATION

27. Maximal Brill–Noether loci via the gonality stratification (with A. Auel and R. Haburcak), to appear in *Michigan Math Journal*, [arXiv:2310.09954](#)
26. Extensions of tautological rings and motivic structures in the cohomology of $\overline{\mathcal{M}}_{g,n}$ (with S. Canning and S. Payne), to appear in *Forum of Math, Pi*, [arxiv:2307.08830](#).
25. On the Chow and cohomology rings of moduli spaces of stable curves (with S. Canning), to appear in *Journal of the European Math Society*, [arXiv:2208.02357](#).
24. Global Brill–Noether theory over the Hurwitz space (with E. Larson and I. Vogt), to appear in *Geometry and Topology*, [arXiv:2008.10765](#).
23. The rational Chow rings of moduli spaces of hyperelliptic curves with marked points (with S. Canning), to appear in *Annali della Scuola Norm. Sup.*, [arXiv:2207.10873](#).
22. On an equivalence of divisors on $\overline{M}_{0,n}$ from Gromov–Witten theory and conformal blocks (with L. Chen et. al.), to appear in *Transformation Groups*, [arXiv:2107.00174](#).
21. The bielliptic locus in genus 11 (with S. Canning), to appear in *Michigan Math Journal*, [arXiv:2209.09715](#).

PUBLISHED PAPERS

20. The Chow rings of the moduli spaces of curves of genus 7, 8 and 9 (with S. Canning), *Journal of Algebraic Geometry*, **33**, (2024), no. 1, 55–116 [arXiv:2104.05820](#).
19. Tautological classes on low-degree Hurwitz spaces (with S. Canning), *Int. Math. Res. Not.* (2024), no. 1, 1 – 46, [arXiv:2103.09902](#).
18. The eleventh cohomology group of $\overline{\mathcal{M}}_{g,n}$ (with S. Canning and S. Payne), *Forum of Math., Sigma* **11** (2023), Paper No. e62, 18pp, [arXiv:2209.03113](#).
17. The intersection theory of the moduli stack of vector bundles on \mathbb{P}^1 , *Canadian Math. Bulletin* **66** (2023), no. 2, 359–379 [arXiv:2104.14642](#).
16. The integral Picard groups of low-degree Hurwitz spaces (with S. Canning), *Math. Zeitschrift* **303** (2023), no. 3, Paper No. 61, 22pp. [arXiv:2110.14727](#).
15. Chow rings of low-degree Hurwitz spaces (with S. Canning) *J. Reine Angew. Math.*, **789** (2022), 103–152, [arXiv:2110.01059](#)
14. Refined Brill–Noether theory for all trigonal curves, *European Journal of Math.* **7** (2021) 1524–1536, [arXiv:2002.00142](#).

13. A refined Brill-Noether theory over Hurwitz spaces, *Inventiones Mathematicae*, **224** (2021), no. 3, 767–790, [arXiv:1907.08597](#).
12. Universal degeneracy classes for vector bundles on \mathbb{P}^1 bundles, *Advances in Mathematics*, **380** (2021), 107563, 20 pages, [arXiv:1906.10290](#).
11. An enriched count of the bitangents to a smooth plane quartic curve (with I. Vogt) *Research in the Mathematical Sciences* **8** (2021), no. 2, Paper No. 26, 21 pages, [arXiv:1909.05945](#).
10. Normal bundles of lines on hypersurfaces, *Michigan Math Journal* **70** (2021) no. 1, 115–131, [arXiv:1705.01972](#).
9. Hyperbolicity of partition Jensen polynomials (with I. Wagner) *Research in Number Theory* **5** (2019) no. 19, 12 pages, [arXiv:1904.12727](#).
8. Shifted distinct-part partition identities in arithmetic progressions (with E. Alwaise et al.) *Annals of Combinatorics*, **21** (2017) no. 4, 479–494, [arXiv:1507.07943](#).
7. Coefficients of McKay-Thompson series and distributions of the moonshine module, *Proc. of the Amer. Math. Soc.* **144** (2016), no. 10, 4183–4197, [arXiv:1508.03742](#).
6. Modular units from quotients of Rogers-Ramanujan type q -series, *Proc. of the Amer. Math. Soc.*, **144** (2016), no. 10- 4169–4182, [arXiv:1506.08313](#).
5. Proof of conjecture regarding the level of Rose’s generalized sum-of-divisor functions, *Research in Number Theory*, **1** (2015), no. 16, 8 pages, [arXiv:1507.02671](#).
4. Andrews-Gordon style identities, *Research in Number Theory*, **1** (2015) no. 13, [arXiv:1506.05063](#).
3. Traces of singular values of Hauptmoduln (with L. Beneish) *Int. J. Number Theory*, **11** (2015), no. 3, 1027–1048, [arXiv:1407.4479](#).
2. Congruence properties of Taylor coefficients of modular forms (with G. Smith), *Int. J. Number Theory*, **10** (2014) no. 6, 1501–1518, [arXiv:1406.2999](#).
1. Pseudo-unitary non-self-dual fusion categories of rank 4, *Journal of Algebra*, **415** (2014) 184–213, [arXiv:1401.1879](#).

INVITED CONFERENCE TALKS

- 2024 Invited Address, AMS Western Sectional, UC Riverside
 $\text{Spec}(\overline{\mathbb{Q}}(2\pi i))$, The Fields Institute
 Boston Algebraic Geometry Day, Tufts University
 Texas Algebraic Geometry Symposium (TAGS)
- 2023 Oberwolfach Workshop on Recent Trends in Algebraic Geometry
 Helvetic Algebraic Geometry Seminar, Les Diablerets, Switzerland
 Moduli and Algebraic Cycles, Institut Mittag-Leffler, Sweden
 Kentucky–Ohio ALgebra Alliance (KOALA), Ohio State University
- 2022 $\text{Spec}(\overline{\mathbb{Q}})$, The Fields Institute
 Algebraic Geometry Northeastern Series (AGNES) at Rutgers

- AMS–AWM Special Session on Women in Algebraic Geometry
- 2021 Canadian Math Society Winter Meeting
 Boston College Algebraic Geometry Northeast Series (AGNES) Showcase
 Oberwolfach Workshop on Classical Algebraic Geometry
 Degeneracy Loci and Applications Workshop at Ohio State
- 2020 FRG Workshop on Moduli Spaces and Stability
 Western Algebraic Geometry Symposium (WAGS)
 Bi-annual Algebraic & Tropical Meetings of Brown & Yale (BATMOBYLE)

INVITED SEMINAR TALKS

- 2024 UC Berkeley, Department Colloquium
 UC Davis Algebraic Geometry Seminar
 Stanford Algebraic Geometry Seminar
 Yormark Distinguished Lecture at Stanford
 Brown Algebraic Geometry Seminar
 Harvard/MIT Algebraic Geometry Seminar
 University of North Texas, Department Colloquium
 Michigan State University, Algebra Seminar
 University of Illinois, Chicago, Algebraic Geometry Seminar
 University of Chicago, Department Colloquium
- 2023 University of Washington, Department Colloquium
 San Francisco State University Algebra Seminar
 Berkeley Commutative Algebra and Algebraic Geometry Seminar
 ETH Zürich Algebraic Geometry Seminar
 Stanford Algebraic Geometry Seminar
 Northeastern University Geometry, Physics, and Representation Theory Seminar
- 2022 University of Colorado, Boulder Algebraic Geometry Seminar
 Dartmouth Algebra and Number Theory Seminar
 Webinar on Brill–Noether theory
 University of Texas, Austin Geometry Seminar
 Mexico National Algebraic Geometry Seminar
 Princeton Algebraic Geometry Seminar
 Zoom Algebraic Geometry (ZAG) Seminar
- 2021 Berkeley Commutative Algebra and Algebraic Geometry Seminar
 Brown University Algebraic Geometry Seminar
 Harvard/MIT Algebraic Geometry Seminar
 Stony Brook Algebraic Geometry Seminar
 ETH Zürich Algebraic Geometry and Moduli Seminar
 Berlin Algebraic Geometry Seminar
 University of Illinois–Chicago Algebraic Geometry Seminar
 University of Wisconsin Algebra and Algebraic Geometry Seminar

- Derived Seminar
- 2020 University of Georgia Algebraic Geometry Seminar
 University of Washington Algebraic Geometry Seminar
 Michigan – Arithmetic Geometry Initiative – Columbia (MAGIC)
 Moduli Across the Pandemic (MAP)
 Stanford Algebraic Geometry Seminar
 Goethe University Frankfurt Algebraic Geometry Seminar
- 2019 University of California–Davis Algebraic Geometry Seminar
 Emory University Algebraic Geometry Seminar
 Virginia Tech Algebraic Geometry Seminar
 San Francisco State University Algebraic Geometry Seminar
 University of Kentucky Algebraic Geometry Seminar
 University of Illinois–Chicago Algebraic Geometry Seminar
 Berkeley Commutative Algebra and Algebraic Geometry Seminar
 University of Wisconsin Algebra and Algebraic Geometry Seminar
- 2018 Indiana University Algebra Seminar
- 2017 Stanford Algebraic Geometry Seminar

TEACHING

- UNIVERSITY OF CALIFORNIA, BERKELEY**, Professor
- Fall 2023 Math 143: Undergraduate Algebraic Geometry (Overall evaluation: 6.85/7)
- STANFORD UNIVERSITY**, Teaching Assistant
- Wint. 2017 Math 51: Linear Algebra and Multivariable Calculus (Overall evaluation: 4.62/5)
- HARVARD UNIVERSITY**, Course Assistant
- Spr. 2016 Math 137: Algebraic Geometry (Overall evaluation: 4.91/5)
- Spr. 2015 Math 129: Algebraic Number Theory (Overall evaluation: 4.88/5)

ADVISING

- 2023 Co-advisor to Feiyang Lin (PhD Candidate, UC Berkeley)
 Topics: Limit linear series, admissible covers, Hurwitz–Brill–Noether theory
- 2023 Undergraduate Research Advisor to Dhruv Goel (B.A. Candidate, Harvard)
 Project: *Varieties of Secant and Tangent Lines*
- 2017 Instructor, Emory Number Theory Research Experience for Undergraduates

CONFERENCE ORGANIZATION AND LEADERSHIP

- 2024 Project Co-leader (with Emily Clader), *Women in Algebraic Geometry II*
 Institute for Advanced Study, Princeton, NJ
- 2024 Organizer, *Combinatorial Perspectives on Algebraic Curves and Their Moduli*
 AMS Special Session, Joint Math Meetings, San Francisco, CA
 Co-organizers: Melody Chan, Siddarth Kannan, and Sam Payne

- 2023 Lecturer and Project Co-leader (with Juliette Bruce), *AGNES Summer School on Intersection Theory on Moduli Spaces*, Brown University, Providence, RI
- 2023 – Co-organizer, *Berkeley Commutative Algebra and Algebraic Geometry Seminar*
- 2022 – 2023 Co-organizer, *Harvard/MIT Algebraic Geometry Seminar*
- 2019 Organizer, *Modular Forms, Arithmetic, and Women in Mathematics*
Emory University, Decatur, GA
Co-organizers: Lea Beneish and David Zureick–Brown

SERVICE AND OUTREACH

- 2024 Speaker, Bay Area Math Adventures (for high school math circles)
Speaker, Math on Tap, UC Berkeley
Keynote Speaker, Expanding Your Horizons (workshop for middle school girls)
- 2023 Member, Berkeley Department Committee on Equity and Inclusion
- 2023 Panelist, Berkeley Connect “Meet the Faculty”
- 2023 Speaker, Berkeley Math Undergraduate Student Association, “Math Mondays”
- 2018 – 2019 Board Member, Stanford Women in Math Mentoring Program
- 2017 – 2020 Mentor, Stanford Women in Math Mentoring Program
- 2018 – 2019 Instructor, Stanford Elementary Math Circle
- 2014 – 2017 Mentor, Girl’s Angle: a Math Club for Girls, Cambridge, MA