

Benjy Firester

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Education

- 2023– **Ph.D. in Mathematics**, *MIT*, Levinson fellow, Mathworks fellow 2023–2026
Geometric Analysis, PDE, Complex Geometry advised by [Toby Colding](#) and [Tristan Collins](#)
Simons Dissertation Fellowship in Mathematics, Citadel GQS Math/Statistics fellowship 2026–2027,
Levinson Fellowship 2024, Mathworks Fellowship 2023–2027
- 2023 **A.B. & A.M. in Mathematics**, *Harvard University*, *Summa Cum Laude*
Honors thesis advised by [Curt McMullen](#)

Research & Expository

- [1] Benjy Firester and Raphael Tsiamis. On Chern’s conjecture for minimal submanifolds of the sphere. *arXiv:2608.18074*, 2026.
- [2] Benjy Firester and Raphael Tsiamis. Topology of minimal surfaces in the sphere from capillarity. *arxiv:2604.04928*, 2026.
- [3] Benjy Firester and Raphael Tsiamis. New minimal surfaces in the sphere from capillary minimal cones. *arxiv:2602.20124*, 2026.
- [4] Benjy Firester, Raphael Tsiamis, and Yipeng Wang. Area-minimizing capillary cones. *arxiv:2601.18794*, 2026.
- [5] Benjy Firester, Raphael Tsiamis, and Yipeng Wang. Stability inequalities for one-phase cones. *arxiv:2601.16966*, 2026.
- [6] Tristan C. Collins, Benjy Firester, and Freid Tong. Homogeneous optimal transport maps between oblique cones. *arXiv:2511.01692*, 2025.
- [7] Tristan C. Collins and Benjy Firester. On a general class of free bounday Monge-Ampère equations. *arXiv:2508.05551*, 2025.
- [8] Benjy Firester, Raphael Tsiamis, and Yipeng Wang. Uniqueness of cylindrical tangent cones $C_{p,q} \times \mathbb{R}$. *Calculus of Variations & PDE*, 65(165), 2026.
- [9] Benjy Firester and Raphael Tsiamis. Cohomogeneity two Ricci solitons with sub-Euclidean volume. *Journal of Geometric Analysis*, 35(407), 2025.
- [10] Benjy Firester. Mostow rigidity and hyperbolic 3-manifolds, 2023. benjyjf.com/thesis.pdf.
- [11] Benjy Firester. Complete Calabi–Yau metrics from smoothing Calabi–Yau complete intersections. *Geometriae Dedicata*, 218(2):46, Feb 2024.

- [12] L. Becker, S. Elliott, B. Firester, S. Gonen Cohen, Michal Pnueli, and Vered Rom-Kedar. *Impact Hamiltonian systems and polygonal billiards*, page 29–66. Mathematical Sciences Research Institute Publications. Cambridge University Press, 2024.

Grants & Awards

- 2026 **Simons Dissertation Fellowship, \$38,400**
Research fellowship for excellent graduate students in the final years of their Ph.D. studies: simonsfoundation.org/grant/simons-dissertation-fellowship-in-mathematics/
- 2026 **Citadel GQS Fellowship, \$100,000**
Research fellowship to advance PhD candidates' research in mathematics and statistics given annually to one fellow: citadel.com/..gqs-phd-fellowship/
- 2023-2027 **MathWorks Fellowship, \$428,000**
Research fellowship to provide support to graduate students within the School of Science, received four times: science.mit.edu/resource/mathworks-fellowship/
- 2026 **AMS ICM 2026 Travel Grant, \$2,400**
Grant from the American Mathematical Society to attend the 2026 ICM.
- 2024 **Levinson Fellowship, \$15,000**
Fellowship received upon admission chosen by department.
- 2023 **Mumford Prize, Harvard's "most promising senior concentrator in mathematics"**
math.harvard.edu/undergraduate-prizes-and-awards-2022-2023
- 2023 **Friends Prize, Top two theses present to The Friends of the Harvard Math Department**
Presented senior thesis [10] see: math.harvard.edu/event/special-lecture... and interviewed in the [2023 Harvard Math Newsletter](#)
- 2023 **Hoopes Prize, \$5,000**
Awarded for my senior thesis [10] see: prizes.fas.harvard.edu/.../2022-2023_hoopes...
- 2022 **Phi Beta Kappa, Member of Senior 48**
National academic honor society see: thecrimson.com/article/2022/11/15/harvard-pbk-senior-48
- 2022 **Goldwater Scholar, \$7,500**
For my work [11] see: goldwaterscholarship.gov/2022-goldwater-scholars...
- 2022 **Herchel-Smith Fellow, "A competitive and generous award" for Harvard research**
Research funding for [10] see: uraf.harvard.edu/.../herchel-smith-summer-fellowship
- 2022 **PRISE Fellow, Harvard summer research community for science**
Research funding for [10] see: uraf.harvard.edu/uraf-opportunities/prise
- 2022 **John Harvard Scholar, Harvard College Scholar (2019)**
[Dean's list](#)
- 2018 **Winner of Regeneron Science Talent Search, \$250,000**
Formerly Westinghouse/Intel STS see: societyforscience.org/...regeneron-science-talent-search-2018
- 2017 **Davidson Fellow, \$25,000**
Scientific scholarship winner from the Davidson Institute see: davidsongifted.org/.../2017-fellows

Presentations

- 6/15–19/2026 **Regularity Theory for Free Boundary and Geometric Variational Problems VI, Cervia, Italy**
Presenting [4, 3, 2] on Regularity theory for capillary surfaces see: <http://www.velichkov.it/workshop-FBGVP-2026.html>

- 5/18–22/2026 **Workshop on Calabi-Yau metrics and optimal transport**, *Harvard CMSA*
Presenting [6, 7] on free boundary Monge-Ampère and optimal transport equations see: cmsa.fas.harvard.edu/event/cymetrics/
- 4/20/2026 **Analysis Seminar**, *Cornell University*
Boundary regularity of capillary surfaces and one-phase Bernoulli [3, 4, 5] see: pi.math.cornell.edu/m/event-list-p/analysis
- 3/28/2026 **Special section on Geometric Flows**, *AMS Sectional Meeting at Boston College*
Boundary regularity of capillary surfaces and one-phase Bernoulli [4, 5] see: ams.org/meetings/sectional/2331_progfull.html
- 12/19/2025 **Conference on Mathematical Analysis**, *National Technical University of Athens*
Uniqueness of cylindrical tangent cones $C_{p,q} \times \mathbb{R}$ [8]
- 12/05/2025 **Geometric Analysis and Topology Seminar**, *NYU Courant*
Boundary regularity of capillary surfaces [4] see: math.nyu.edu/.../seminars/geometric-analysis-and-topology-seminar/4338/
- 11/18/2025 **Informal Geometric Analysis Seminar**, *University of Maryland*
Free boundary Monge-Ampère equations and boundary regularity of optimal transport [6, 7] see: <https://www.math.umd.edu/~tdarvas/IGA.html>
- 11/07/2025 **Geometric Analysis Seminar**, *Columbia University*
Free boundary Monge-Ampère equations and boundary regularity of optimal transport [6, 7] Click: "Geometric Analysis Seminar" Tab
- 9/25/2025 **Workshop on Geometry and PDEs**, *University of Copenhagen (GeoTop)*
Presented On a general class of free boundary Monge-Ampère equations [7] see: math.ku.dk/.../workshop_on_geometry_and_pdes_sep_2025
- 6/11/2025 **Workshop on Topics in Differential Geometry**, *Brown University*
Presented On a general class of free boundary Monge-Ampère equations [7] see: brown.edu/christine-breiner-brown/workshop-2025
- 5/02/2025 **Pure math graduate student seminar (PUMAGRASS)**, *MIT*
Presented On a general class of free boundary Monge-Ampère equations [7] see: <https://math.mit.edu/pumagrass/>
- 4/22/2025 **Geometric Analysis Seminar**, *Rutgers University*
Presented On a general class of free boundary Monge-Ampère equations [7] see: math.rutgers.edu/.../free-boundary-monge-ampere-and-optimal-transport-equations
- 4/19/2025 **AMS New England Grad Student Conference (PDE)**, *Brown University*
Presented On a general class of free boundary Monge-Ampère equations [7] see: sites.google.com/brown.edu/amsgradconference/talks
- 1/22/2025 **Calculus of Variations and PDE's in Geometric Analysis**, *Sapienza Università di Roma*
Poster presentation of Cohomogeneity two Ricci solitons with sub-Euclidean volume [9] see: sites.google.com/uniroma1.it/cvga2025
- 1/16/2025 **Geometry and Topology Seminar**, *Hebrew University*
Presented Cohomogeneity two Ricci solitons with sub-Euclidean volume [9] see: mathematics.huji.ac.il.../firester...cohomogeneity-two-ricci-solitons...
- 1/14/2025 **PDE and Applied Mathematics Seminar**, *Technion University*
Presented Cohomogeneity two Ricci solitons with sub-Euclidean volume [9]
- 7/8/2024 **Seminario de geometría**, *University of Granada*
Presented Cohomogeneity two Ricci solitons with sub-Euclidean volume [9] see: wpd.ugr.es/.../collapsing-cohomogeneity-two-ricci-solitons/
- 4/1/2023 **Harvard Special Lecture for Friends Prize Recipient**, *Harvard University*
Presented senior thesis [10] see: math.harvard.edu/event/special-lecture...

- 3/29/2023 **Harvard Math Table**, *Harvard University*
Non-compact Calabi-Yau manifolds [11] see: sites.google.com/.../mathtable...
- 2/23/2023 **Stanford Special Geometry Seminar**, *Stanford University*
Complete CY metrics from smoothing CY complete intersections
see: mathematics.stanford.edu/...geometry-seminar-complete-calabi-yau-metrics...
- 1/5/2023 **Joint Mathematics Meeting**, *AMS Contributed Papers in Geometry*
Complete CY metrics from smoothing CY complete intersections
see: meetings.ams.org/math/jmm2023/meetingapp.cgi/Paper/19585
- 11/18/2022 **RTG Partial Differential Equations on Manifolds**, *Undergraduate Analysis and PDE Seminar*, with **T. C. Collins**
Complete CY metrics from smoothing CY complete intersections
see: tarheels.live/waves/activities/undergraduate-online-seminar-fall-2022

Teaching

- Spring 2023 **Harvard Math 123**, *Course Assistant*, taught by **Curt McMullen**
Rings, Fields, Galois theory
- Fall 2022 **Harvard Math 101**, *Course Assistant*, taught by **Curt McMullen**
Sets, Groups, and Knots
- Spring 2022 **Harvard Math 123**, *Course Assistant*, taught by **Mark Kisin**
Rings, Fields, Galois theory
- Fall 2021 **Harvard Math 114**, *Course Assistant*, taught by **Dennis Gaitsgory**
Measure, Integration, Banach spaces, Duality, and Fourier analysis
- Spring 2020 **Harvard Math 55b**, *Course Assistant*, taught by **Joe Harris**
Topology and Real/Complex analysis
- Fall 2019 **Harvard Math 55a**, *Course Assistant*, taught by **Joe Harris**
Group theory, Linear algebra, Representation theory

Service

- 2025 **Co-organizer**, *MIT Geometric Analysis Reading group*
<https://benjyjf.com/GeometricAnalysisReadingGroup/>
- 2025 **UROP mentor**, *MIT Math department*
Graduate mentor for prestigious Undergraduate Research Opportunity urop.mit.edu/
- 2023-2024 **PRIMES mentor**, *MIT Math department*
Graduate mentor for prestigious high school mathematics research program see: <https://math.mit.edu/research/highschool/primes/program/>
- 2024– **Referee**
Acta Mathematica, Journal of Differential Geometry, Communications in Analysis & Geometry
- 2023– **GUMMI mentor**, *MIT Math department*
Graduate mentor for MIT mathematics undergraduates interested in graduate school see: <https://math.mit.edu/gummi/>
- 2023– **Non-resident tutor**, *Winthrop House*
Advisor for undergraduates specializing in STEM and pre-career related disciplines winthrop.harvard.edu/people/benji-firester
- 2023 **Math community undergraduate mentor for GIIM**, *Harvard GIIM*
Gender Inclusivity In Mathematics see: harvardgiim.org

2019–2022 **Volunteer at JF&CS**
Volunteered helping Holocaust survivors at the [Jewish Family and Children's Service](#)

Affiliations

2023– **MIT Mathematics Department**, *PhD Student*
Geometric Analysis & Complex Geometry

2023– **University of Toronto Mathematics Department**, *Co-advised by Tristan Collins*
Geometric Analysis & Complex Geometry

2018–2023 **Harvard Mathematics Department**, *Bachelors (Summa Cum Laude) and Masters, Course Assistant*
Advised by Curt McMullen, Joe Harris, Cliff Taubes, Peter Kronheimer

2019–2023 **The Harvard Advocate**, *Technology editor 2019–2020*
theharvardadvocate.com/

2019–2023 **The Harvard Political Review**, *Technology board member*
harvardpolitics.com/

2019–2022 **MIT Mathematics Department**, *Research with Tristan Collins*
Funded by [HCRP](#)

2020 **D. E. Shaw**, *Systematic Equities*
Quantitative research intern

2019 **Microsoft**, *Excel Alpha Team*
Software engineering intern

2018 **Weizmann Institute**, *Advised by Vered Rom-Kedar*
International Summer Science Institute research program ([ISSI](#))

2012–2018 **Hunter College High School**

2017 **Rockefeller University**, *Krueger Group*
Summer Science Research Program ([SSRP](#))

2015–2016 **The Agricultural Research Organization (Volcani)**, *Research advised by Lior Blank and Dani Shtienberg*

Languages

Hebrew **Advanced**
Citation in Modern Hebrew from Harvard

Spanish **Proficient**

Other Scientific Papers and Presentations

2020 **The MIT Undergraduate Journal of Economics**, *with Andrew Komo*
[Resource allocation with externalities](#) second best paper award

2020 **Journal of Biomedical Optics**, *Gareau et al.*
[Deep learning-level melanoma detection by interpretable machine learning and imaging biomarker cues](#)

2018 **Plant Pathology**, *with Dani Shtienberg & Lior Blank*
[Modelling the spatiotemporal dynamics of Phytophthora infestans at a regional scale](#)
doi:10.1111/ppa.12860

2018 **The Concord Review**, *Volume 28, No. 3*, Emerson Prize
Mail-Order

2017 **Euroblight**, *International conference*

Presentation by Lior Blank on our paper in Plant Pathology see: [Euroblight programme](#)