

Naomi Gendler

Curriculum Vitae

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Research Interests

I am focused on what consequences string theory has for low energy physics and experiment. To make progress in this endeavor, my research comprises understanding axion physics in the string theory landscape; determining quantum gravity constraints on effective field theories; and developing new methods for the geometric study of Calabi-Yau manifolds.

Education

- 2017–2023 **Ph.D. Physics - Cornell University, Ithaca, NY.**
Supervisor: Professor Liam McAllister
Thesis Title: String Theory in the Infrared: Phenomenology and Constraints
- 2016–2017 **M.Sc. Applied Mathematics, University of Auckland, New Zealand.**
Thesis Title: Pulse Dynamics in Lasers with Saturable Absorbers
Graduation grade: first class honours
- 2012–2016 **B.A. Physics, Reed College, Portland, OR.**
Thesis Title: Dark Matter Corrections to the Anomalous Magnetic Moment of the Muon

Research Positions

- 2023–present **Postdoctoral Fellow - Harvard University, Cambridge, MA.**

Awards and scholarships

- 2022 **First Place Gong Show Award, Strings 2022, Vienna, Austria.**
- 2021 **Boochever Fellowship.**
- 2017 **Hartman Memorial Scholarship.**
- 2017 **Honorable Mention: National Science Foundation Graduate Research Fellowship.**
- 2016 **Aitken Award for Best Student Presentation, NZMS, Wellington, New Zealand.**

Publications

- July 2025 **Universality in the Axiverse, J. Cheng, N. Gendler, [arXiv: 2507.12516 [hep-th]].**
- July 2025 **Constraining the axiverse with reionization, Z. Yin, H. Cheng, E. Di Valentino, N. Gendler, D. J. E. Marsh, [arXiv: 2507.03535 [hep-ph]].**
- December 2024 **Fuzzy Axions and Associated Relics, E. Sheridan, F. Carta, N. Gendler, M. Jain, D. J. E. Marsh, L. McAllister, K. Rogers, N. Riggi, A. Schachner, [arXiv: 2412.12012 [hep-th]].**

- July 2024 **Possible Implications of QCD Axion Dark Matter Constraints from Helioscopes and Haloscopes for the String Theory Landscape**, *N. Gendler, D. J. E. Marsh*, Phys. Rev. Lett. 134 (2025) 8, 081602.
- April 2024 **Axions in the Dark Dimension**, *N. Gendler, C. Vafa*, JHEP 12 (2024) 127.
- October 2023 **Counting Calabi-Yau Threefolds**, *N. Gendler, N. MacFadden, L. McAllister, J. Moritz, R. Nally, A. Schachner*, [arXiv: 2309.01831 [hep-th]].
- September 2023 **Glimmers from the Axiverse**, *N. Gendler, D.J.E. Marsh, L. McAllister, J. Moritz*, JCAP 09 (2024) 071.
- September 2023 **Axion minima in string theory**, *N. Gendler, O. Janssen, M. Kleban, J. de la Madrid, V. Mehta*, JHEP 02 (2025) 134.
- December 2022 **Weak Gravity and Moduli Space Reconstruction**, *N. Gendler, B. Heidenreich, L. McAllister, J. Moritz, T. Rudelius*, JHEP 12 (2023) 134.
- April 2022 **Superpotentials from Singular Divisors**, *N. Gendler, M. Kim, L. McAllister, J. Moritz, M. Stillman*, JHEP 11 (2022) 142.
- December 2021 **PQ Axiverse**, *M. Demirtas, N. Gendler, C. Long, L. McAllister, J. Moritz*, JHEP 06 (2023) 092.
- April 2020 **Merging the weak gravity and distance conjectures using BPS extremal black holes**, *N. Gendler and I. Valenzuela*, JHEP 01 (2021) 176.

Conference and workshop talks

- August 2025 **The String Theory Axiverse**, *Plenary talk*, 22nd Simons Physics Summer Workshop: Future pathways for fundamental physics, Simons Center for Geometry and Physics.
- July 2025 **QCD Axion Dark Matter and Hierarchies in the Axiverse**, *Plenary talk*, String Phenomenology 2025, Northeastern University.
- May 2025 **QCD Axion Dark Matter in String Theory**, *Contributed talk*, Enabling Discovery of QCD Axion Dark Matter at the GUT Scale, University of California, Berkeley.
- April 7, 2025 **Fuzzy Axion Dark Matter in String Theory**, *Plenary talk*, Dark Matter Beyond the Weak Scale III (canceled due to illness), Oxford University.
- January 2025 **Hierarchies in the String Axiverse**, *Plenary talk*, Workshop on Symmetries and Gravity, Center of Mathematical Sciences and Applications.
- January 2025 **String Cosmology**, *Plenary panel*, Strings 2025, NYU Abu Dhabi, United Arab Emirates.
- November 2024 **QCD Axion Dark Matter in String Theory**, *Plenary talk*, Dark World to Swamp-land: The 9th IBS-IFT Workshop, Daejeon, South Korea.
- October 22, 2024 **QCD Axion Dark Matter in String Theory**, *Plenary talk*, MADMAX Collaboration Meeting, Munich, Germany.
- May 27, 2024 **Axions in the Dark Dimension**, *Plenary talk*, Swamplandia 2024, Abbey Seeon, Bavaria.
- April 2, 2024 **The String Axiverse: Axion-photon couplings and universality**, *Plenary talk*, KITP Conference: Spacetime and String Theory, University of California, Santa Barbara.

- March 14, 2024 **The Hierarchical Axiverse**, *Plenary talk*, KITP Workshop: What is String Theory?, University of California, Santa Barbara.
- September 15, 2023 **The (in-)visible Axiverse**, *Plenary talk*, Swamplandia 2023, Madrid, Spain.
- July 26, 2023 **The (in-)visible Axiverse**, *Plenary talk*, Axion 2023, Beijing, China.
- July 3, 2023 **Axion-Photon Couplings in String Theory**, *Parallel talk*, String Phenomenology 2023, Daejeon, South Korea.
- June 8, 2023 **Axion-photon couplings and axion dark matter in string theory**, *Plenary talk*, Ending Inflation and the Hot Big Bang, Simons Center.
- April 8, 2023 **Axion-Photon Couplings in String Theory**, *Plenary talk*, String theory regional meeting 2023, Virginia Tech.
- July 21, 2022 **PQ Axiverse**, *Gong show*, Strings 2022, Vienna, Austria.
- July 7, 2022 **Superpotentials from Singular Divisors**, *Parallel talk*, String Phenomenology 2022, Liverpool, UK.
- January 26, 2022 **Flops, Topological Invariants, and the Weak Gravity Conjecture**, *Plenary talk*, Geometry and Swampland Workshop, Banff International Research Station.
- October 12, 2021 **PQ Axiverse**, *Contributed talk*, Seminar Series on String Phenomenology, Online.
- July 23, 2020 **Merging the weak gravity and distance conjectures using BPS extremal black holes**, *Gong show*, QFT and Geometry Summer School, Online.
- July 7, 2020 **BPS States and Extremal Black Holes at Infinite Distance**, *Contributed talk*, Seminar Series on String Phenomenology, Online.

Invited seminars

- May 12, 2025 **Fuzzy Axion Dark Matter in String Theory**, *Invited seminar*, Stanford University.
- April 16, 2025 **Fuzzy Axion Dark Matter in String Theory (canceled due to illness)**, *Invited seminar*, University of Wisconsin, Madison.
- December 4, 2024 **QCD Axion Dark Matter in String Theory**, *Invited seminar*, Harvard University.
- November 6, 2024 **QCD Axion Dark Matter in String Theory**, *Invited seminar*, University of California Berkeley.
- October 31, 2024 **QCD Axion Dark Matter in String Theory**, *Invited seminar*, Brandeis University.
- February 23, 2024 **Glimmers from the Axiverse**, *Invited seminar*, Harvard University.
- September 27, 2023 **Glimmers from the Axiverse**, *Invited seminar*, Massachusetts Institute of Technology.
- September 26, 2023 **Glimmers from the Axiverse**, *Invited seminar*, Northeastern University.
- September 20, 2023 **Moduli Space Reconstruction and Weak Gravity**, *Invited seminar*, Dual Mystery Channel, IIT Madras.

- April 3, 2023 **Moduli Space Reconstruction and Weak Gravity**, *Invited seminar*, SwampLand Seminar Series.
- March 15, 2023 **Moduli Space Reconstruction and Weak Gravity**, *Invited seminar*, Virginia Tech.
- March 1, 2023 **Axions in String Theory**, *Invited seminar*, Reed College.
- November 16, 2022 **Moduli Space Reconstruction and Weak Gravity**, *Invited seminar*, California Institute of Technology.
- June 30, 2022 **Calabi-Yau Flops and the Weak Gravity Conjecture**, *Invited seminar*, LMU, Munich.
- April 29, 2022 **PQ Axiverse**, *Invited seminar*, Cornell University.
- April 5, 2022 **PQ Axiverse**, *Invited seminar*, Massachusetts Institute of Technology.
- March 25, 2022 **PQ Axiverse**, *Invited seminar*, Harvard University.
- March 24, 2022 **PQ Axiverse**, *Invited seminar*, Northeastern University.
- February 8, 2022 **PQ Axiverse**, *Invited seminar*, University of Liverpool.

Invited colloquia

- April 30, 2024 **Axions: a bridge between string theory and the real world**, *Colloquium*, Max Planck Institute Munich.

Conferences organized

- 2026 **String Theory and the Observable Universe**, Aspen Center for Physics.
- 2025 **Prospects for the String Axiverse**, *lead organizer*, Banff International Research Station.
- 2024 **Surveying the Landscape**, University of Massachusetts, Amherst.
- 2023 **Theoretical Tests of the Landscape**, University of Massachusetts, Amherst.

Outreach

- Fall 2024 **Teacher**, *Cambridge Math Circle*.
Taught math enrichment courses for elementary school children
- August 2023 **Podcast guest**, *People behind Physics*.
- April 2022 **Fireside chat Q & A**, *Society for Physics Students*.
Cornell University
Answered questions from undergraduates about graduate school and being a woman in physics
- May 2022 **Judge**, *Cornell Undergraduate Research Symposium*.
Cornell University
Judged the poster competition for undergraduate research projects

- November 2021 **Invited talk, "Axions in String Theory"**, *Society for Physics Students*.
Cornell University
Spoke about axions and string theory at the introductory level and talked about latest research
- October 2020 **Judge**, *Cornell Undergraduate Research Fall Forum*.
Cornell University
Judged the poster competition for undergraduate research projects
- 2019 **Expanding Your Horizons Workshop Leader**.
Helped design and lead workshops on the physics of bubbles for middle school girls.
- 2018-2019 **GRASSHOPR fellowship**.
Designed and taught a quantum mechanics and optics mini-course for a local high school physics class
- 2018 **Physics tutor**.
Met weekly with high school physics students to tutor them in AP physics
- 2018 **Upward Bound Workshop Leader**.
Helped design and lead workshops for under-privileged high school students on superconductivity
- 2018 **Graduate panelist**.
Cornell University
Sat on multiple graduate panels informing undergraduates on best practices for applying to graduate school
- 2016 **New Zealand Math Crafts Festival Leader**, *Auckland Museum*.
Ran workshops for elementary school children
- 2013 **Education Intern**, *Oregon Museum of Science and Industry*.
Designed, built, and explained physics demos to individuals and groups

Teaching Experience

- 2026 Axions in String Theory (declined due to maternity leave), *CERN Winter School*
- 2022, 2020 Introductory Mechanics, *teaching assistant*
- 2021, 2018 Quantum Mechanics, *teaching assistant*
- 2020 Statistical Mechanics, *teaching assistant*
- 2019, 2017 Electrodynamics, *teaching assistant*
- 2019 Oscillations and Waves, *teaching assistant*
- 2018 General Relativity, *teaching assistant*
- 2019 Introductory Mechanics, *laboratory assistant*
- 2015, 2014 Oscillations and Waves, *grader*
- 2016, 2015 Modern Physics, *grader*