

Cailin Plunkett

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Research Interests

Probing black hole properties and binary star evolution using gravitational-wave data. Emphasis on both data-driven and simulation-based methods.

Education

Massachusetts Institute of Technology <i>Ph.D. candidate in Physics</i> (advisor: Salvatore Vitale)	Cambridge, MA <i>Aug. 2023 – May 2028 (exp.)</i>
Amherst College <i>B.A. in Physics and Mathematics</i> Summa cum laude with distinction (GPA: 4.0/4.0)	Amherst, MA <i>Sept. 2019 – May 2023</i>

Awards, Fellowships, and Honors

National

Graduate Research Fellowship, <i>National Science Foundation</i>	2025–8
LeRoy Apker Award, <i>American Physical Society</i>	2023
Phi Beta Kappa Membership	2023
Barry M. Goldwater Scholarship	2022

Institutional

Kellogg Fellowship (\$130,000 over three years), <i>Amherst College</i>	2025–8
Three Minute Thesis, People’s Choice Award, <i>Amherst College</i>	2023
Bancroft Prize in Public Speaking, <i>Amherst College</i>	2023
William Warren Stifler Prize in Physics, <i>Amherst College</i>	2023
Mary Dailey Irvine Outstanding Thesis, <i>Five College Astronomy Dept.</i>	2023
Summer Research Fellowship, <i>University of Michigan</i>	2022
LIGO Summer Research Fellowship, <i>Caltech</i>	2021
Porter Prize in Astronomy, <i>Amherst College</i>	2020

Publications

6. **C. Plunkett**, T. Callister, M. Zevin, S. Vitale. “Signatures of a subpopulation of hierarchical mergers in the GWTC-4 gravitational-wave dataset” *Phys. Rev. Lett.* 137, 021404 (2026).

This work was highlighted as a *Phys. Rev. Lett.* Editors’ Suggestion, covered in a [Physics Viewpoint](#), and written up in [Astrobites](#).

5. M. Mould, J. Heinzl, S. Álvarez-López, **C. Plunkett**, N. Wolfe, S. Vitale. “Measurement prospects for the pair-instability mass cutoff with gravitational waves” *Phys. Rev. D* 113, 103021 (2026).

4. **C. Plunkett**, M. Mould, S. Vitale. “Constraining Population III stellar populations with next-generation gravitational-wave observatories.” *Phys. Rev. D* 112, 023039 (2025).
3. **C. Plunkett**, K. Follette, G.-D. Marleau, E. Nielsen. “Accreting companion occurrence rates using a new method to compute emission-line survey sensitivity.” *Astronomical Journal* 169 262 (2025).
2. **C. Plunkett**, S. Hourihane, K. Chatziioannou. “Concurrent estimation of noise and compact-binary signal parameters in gravitational-wave data.” *Phys. Rev. D* 106, 104021 (2022).
1. S. Betti et al., incl. **C. Plunkett**. “The Comprehensive Archive of Substellar and Planetary Accretion Rates.” *Astronomical Journal* 166 262 (2023).

Presentations

AAS 248 Summer Meeting (invited talk, special session) <i>Next-generation gravitational-wave observatories: astrophysics with compact binaries across cosmic time</i>	Pasadena, CA <i>June 2026</i>
Caltech LIGO Seminar <i>Black hole formation histories with gravitational waves across cosmic time</i>	Pasadena, CA <i>June 2026</i>
APS Global Physics Summit (contributed talk) <i>What we talk about when we talk about hierarchical mergers</i>	Denver, CO <i>Mar. 2026</i>
WPI Physics <i>Panelist, Women and Gender Minorities in Physics</i>	Worcester, MA <i>Feb. 2026</i>
University of Tokyo RESCEU Seminar <i>Black hole populations with gravitational waves: then, now, and the future</i>	Tokyo, JP <i>Jan. 2026</i>
APS Global Physics Summit (contributed talk) <i>Unveiling the stellar origins of high-redshift black hole mergers with next-generation gravitational-wave observatories</i>	Anaheim, CA <i>Mar. 2025</i>
APS April Meeting (invited talk) <i>Protoplanet population properties: a new method to compute survey sensitivity</i>	Sacramento, CA <i>Apr. 2024</i>
APS April Meeting (contributed talk) <i>Marginalizing over noise uncertainty in gravitational-wave parameter estimation</i>	New York, NY <i>Apr. 2022</i>

Leadership, Outreach, and Engagement

<i>MIT Physics Graduate Admissions Advisory Council</i>	<i>Jan. 2024 – present</i>
■ Co-chair (since Aug. 2025) of advisory council aiming to improve equity in admissions and ensure all talented students receive due consideration. Organize and mentor for an application assistance program, through which I have individually supported 8+ students.	
<i>MIT Summer Research Program</i>	<i>Jan. 2024 – present</i>
■ Serve on admissions committee for summer program that targets students with limited access to research. Improve access to career preparation and networking resources.	
<i>Climate and Community Committee</i>	<i>Oct. 2020 – May 2023</i>

- Co-chair of Physics and Astronomy Dept. committee charged with addressing systemic access issues and institutional barriers to success in physics and astronomy, both in and beyond the Department.

Spectra Phys. & Astro. Club

Sept. 2021 – May 2023

- Ran a club to support physics students. Designed and led mentorship program and research internship symposium for two years. Developed application peer-review workshop.

Amherst Observatory

Sept. 2022 – May 2023

- Student manager of the observatory, which hosts five telescopes for teaching and recreation. Led training sessions and programmed middle school outreach events.