

Catherine Petretti

Center for Astrophysics | Harvard & Smithsonian
60 Garden St, Cambridge, MA, 02138

Email: catherine.petretti@cfa.harvard.edu
Website: cpetretti.github.io

| | | |
|---------------------|--|---------------------|
| EDUCATION | Harvard University | Cambridge, MA |
| | Ph.D. Candidate, Astronomy | Aug 2022 – Present |
| | Advisor: Dr. Xingang Chen | |
| | A.M., Astronomy | Aug 2022 – Feb 2025 |
| | Villanova University | Villanova, PA |
| | B.S., Astronomy & Astrophysics | Aug 2018 – May 2022 |
| HONORS AND AWARDS | Minors: Physics, Mathematics, Classical Studies | |
| | <i>Summa Cum Laude</i> – GPA: 3.97/4.0 | |
| | Member, Sigma Xi Scientific Research Honor Society | 2025 |
| | Nominee, K. Patricia Cross Award, Harvard University | 2024 |
| | Special Teaching Recognition, Harvard University | 2023 |
| | Graduate Prize Fellowship, Harvard University | 2022 |
| | Member, Phi Beta Kappa Honor Society, Villanova University | 2022 |
| | Jason A. Cardelli Memorial Award, Villanova University | 2022 |
| | Edward F. Jenkins OSA Medallion, Villanova University | 2022 |
| | Member, Sigma Pi Sigma Physics Honor Society, Villanova University | 2022 |
| | NEROC Symposium Award, Haystack Observatory | 2022 |
| | Edward F. Jenkins, OSA Scholarship, Villanova University | 2021 |
| | Barry Goldwater Scholarship | 2021 |
| RESEARCH EXPERIENCE | National Hispanic Scholarship | 2020 |
| | NSF REU, Haystack Observatory | 2020 |
| | Undergraduate Research Fellowship, Villanova University | 2019 |
| | Match Research Program, Villanova University | 2019 |
| | COMPACT Collaboration | 2025 – Present |
| | Advisor: Dr. Glenn Starkman | |
| | Harvard University | 2023 – Present |
| | Advisor: Dr. Xingang Chen | |
| | MIT Haystack Observatory | 2021, 2023 |
| | Advisors: Dr. Kazunori Akiyama & Dr. Lynn D. Matthews | |
| | Villanova University | 2019 – 2023 |
| | Advisor: Dr. Joey Nielsen | |
| | Villanova University | 2021 |
| | Advisor: Dr. Edward Guinan | |
| | MIT Haystack Observatory | 2020 |
| | Advisors: Dr. Vincent Fish & Dr. Kazunori Akiyama | |

| | | |
|-------------------------|--|----------------------|
| TEACHING EXPERIENCE | Teaching Assistant, IRIS Intensive Research Program, <i>Astrophysics</i> (virtual, for high school students) | Summer 2025 |
| | Teaching Fellow, Harvard University, <i>AY 130: Cosmology</i> | Fall 2024 |
| | Teaching Fellow, Harvard University, <i>AY 140: General Relativity</i> | Fall 2023, Fall 2024 |
| | Teaching Assistant, Villanova University, <i>MSE 2151: Astronomy Lab - Stars</i> | Spring 2022 |
| | Teaching Assistant, Villanova University, <i>AST 2133-2134: Observational Lab II</i> | Spring 2021 |
| | Teaching Assistant, Villanova University, <i>AST 2133: Observational Lab I</i> | Fall 2020 |
| | Teaching Assistant, Villanova University, <i>PHY 1101: General Physics Lab</i> | Fall 2019 |
| LEADERSHIP AND OUTREACH | Editor, <i>Science in the News</i> , Graduate Student Led Blog, Harvard University | 2025 – Present |
| | Public Lecture, “Cosmic Inflation: The Solution to the Big Bang’s Problems.” Earth & Space Reports. Virtual | May 2025 |
| | Student Editorial Board, <i>Veritas: Villanova Undergraduate Research Journal</i> | 2021 – 2022 |
| | Secretary, Villanova Astronomical Society | 2020 – 2021 |
| | Public Observatory Attendant, Villanova University | 2018 – 2019 |
| PUBLICATIONS | Petretti, C. , Braglia, M., Chen, X., Hazra, D., & Paban, S. (2024) “Investigating the Origin of CMB Large-Scale Features Using LiteBIRD and CMB-S4.” <i>Journal of Cosmology and Astroparticle Physics</i> , 2025, 6, 35 . | |
| | Petretti, C. , Neilsen, J., & Homan, J. (2023) “Determining the Orbital Period and Wind Geometry in GRO J1655–40.” <i>The Astrophysical Journal</i> , 957, 44 . | |
| | Petretti, C. , & Guinan, E. (2021) “Analysis of High-Precision TESS Photometry of the Black-Hole X-Ray Binary Cygnus X-1: Evidence of Intrinsic Variability of the Luminous Blue Supergiant Component.” <i>Research Notes of the AAS</i> , 5, 263 . | |
| | Petretti, C. , Akiyama, K., & Matthews L. D. (2021) “Next Generation Very Large Array: Evaluation of the Revision D Array Configuration for Stellar Imaging.” arXiv:2110.01625 . | |
| INVITED TALKS | Investigating the Origin of CMB Large-Scale Features Using LiteBIRD | Feb 2026 |
| | Physics Department Seminar. Case Western Reserve University. | |

| | | |
|-------------------------------------|--|----------|
| | Next Generation Very Large Array: Evaluation of the Revision D Array Configuration for Stellar Imaging | Mar 2022 |
| | 6th Annual NEROC Symposium. MIT Haystack Observatory. | |
| | Mapping a Black Hole Wind: Determining the Orbital Period and Wind Geometry in GRO J1655–40 | Apr 2021 |
| | President's Advisory Council Meeting. Villanova University. | |
| CONTRIBUTED TALKS AND POSTERS | Investigating the Origin of CMB Large-Scale Features Using LiteBIRD and CMB-S4 | Dec 2025 |
| | 33rd Texas Symposium on Relativistic Astrophysics, Tempe, AZ. Contributed Talk | |
| | Investigating the Origin of CMB Large-Scale Features Using LiteBIRD and CMB-S4 | Jun 2026 |
| | 246th Meeting of the American Astronomical Society, Anchorage, AK. Contributed Talk | |
| | Unlocking the Hidden Potential of the CMB: A Forecast Analysis for LiteBIRD Measurements to Distinguish between Inflationary Models | Jun 2023 |
| | Tri-Institute Summer School on Elementary Particles. Perimeter Institute for Theoretical Physics. Poster | |
| | Next Generation Very Large Array: Evaluation of the Revision D Array Configuration for Stellar Imaging | Jun 2022 |
| | AAS 240th Meeting. Virtual. Poster | |
| | Next Generation Very Large Array: Evaluation of the Revision D Array Configuration for Stellar Imaging | Nov 2021 |
| | Student Research Symposium. Villanova University. Poster | |
| | Simulating Observations of M87 with the Event Horizon Telescope and Space VLBI | Jan 2021 |
| | APS Conference for Undergraduate Women in Physics. Virtual. Contributed Talk | |
| | Simulating Observations of M87 with the Event Horizon Telescope and Space VLBI | Jan 2021 |
| | 237th Meeting. of the American Astronomical Society. Virtual. Poster | |
| | Mapping a Black Hole Wind: Determining the Orbital Period and Wind Geometry in GRO J1655–40 | Sep 2019 |

Student Research Symposium. Villanova University. Poster

OTHER TALKS

**Investigating the Origin of CMB Large-Scale Features Nov 2024
Using LiteBIRD and CMB-S4**

Institute for Theory and Computation (ITC), Harvard University. Lunch Talk

Simulating Observations of M87 with the Event Aug 2020

Horizon Telescope and Space VLBI

REU/UROP Research Symposium. MIT Haystack Observatory. Talk