Catherine Petretti

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EDUCATION

Harvard University — Cambridge, MA
Ph.D. Candidate, Astronomy — Aug 2022 – Present
Advisor: Dr. Xingang Chen
AM, Astronomy – Feb 2025

Villanova University — Villanova, PA
BS, Astronomy & Astrophysics — Aug 2018 – May 2022
Minors: Physics, Mathematics, Classical Studies
Summa Cum Laude – GPA: 3.97/4.0

HONORS AND AWARDS

Special Teaching Recognition, Harvard University	2023
Graduate Prize Fellowship, Harvard University	2022
Phi Beta Kappa Honor Society, Villanova University	2022
Jason A. Cardelli Memorial Award, Villanova University	2022
Edward F. Jenkins OSA Medallion, Villanova University	2022
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
National Hispanic Scholarship	2020
NSF REU, Haystack Observatory	2020
Undergraduate Research Fellowship, Villanova University	2019
Match Research Program, Villanova University	2019

RESEARCH EXPERIENCE

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 Neilsen

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, *Astrophysics* (virtual, for high school students) — Summer 2025

	Teaching Fellow, Harvard University, *AY 130: Cosmology*	Fall 2024
	Teaching Fellow, Harvard University, *AY 140: General Relativity*	Fall 2023, Fall 2024
	Teaching Assistant, Villanova University, *MSE 2151: Astronomy Lab - Stars*	Spring 2022
	Teaching Assistant, Villanova University, *AST 2133-2134: Observational Lab II*	Spring 2021
	Teaching Assistant, Villanova University, *AST 2133: Observational Lab I*	Fall 2020
	Teaching Assistant, Villanova University, *PHY 1101: General Physics Lab*	Fall 2019

LEADERSHIP AND OUTREACH

Public Lecture, "Cosmic Inflation: The Solution to the Big Bang's Problems." Earth & Space Reports. Virtual	May 2025
Student Editorial Board, *Veritas: Villanova Undergraduate Research Journal*	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." arXiv:2411.03459.

Petretti, C., Neilsen, J., & Homan, J. (2023) "Determining the Orbital Period and Wind Geometry in GRO J1655–40." *The Astrophysical Journal*, 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." *Research Notes of the AAS*, 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

Next Generation Very Large Array: Evaluation of the Revision D Array Configuration for Stellar Imaging — Mar 2022
6th Annual NEROC Symposium. MIT Haystack Observatory. Invited Talk.

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. Invited Talk.

CONTRIBUTED TALKS AND POSTERS

Investigating the Origin of CMB Large-Scale Features Using LiteBIRD and CMB-S4 June 2025
AAS 246th Meeting, 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
AAS 237th Meeting. 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 Using LiteBIRD and CMB-S4 Nov 2024
Institute for Theory and Computation (ITC), Harvard University. Lunch Talk.

Simulating Observations of M87 with the Event Horizon Telescope and Space VLBI Aug 2020
REU/UROP Research Symposium. MIT Haystack Observatory. Talk.