

EDUCATION**Yale University**, New Haven, CT Expected Graduation 2025

- Bachelor of Science in Astrophysics and Mathematics, Certificate in Japanese; Cumulative GPA 4.00
- *Relevant Coursework* († - Graduate Level/Cross-listed, ‡ - In Progress):
 - *Astronomy*: Interstellar Matter and Star Formation[†], Astrophysical Flows[†], The Evolving Universe[†], Radio Astronomy[†], Research Methods in Astrophysics, Stars and Their Evolution, Expanding Ideas of Time and Space
 - *Physics*: Relativistic Astrophysics and General Relativity^{†‡}, Nuclear and Particle Physics[†], Quantum Mechanics, Electromagnetic Fields and Optics, Classical Mechanics, Quantum Information Processing and Communication, Modern Physical Measurement Laboratory, Intensive Introductory Physics
 - *Mathematics*: Senior Seminar in Math Education Topics[‡], Complex Analysis[‡], Classical Statistical Thermodynamics^{†‡}, Fields and Galois Theory, Ordinary Differential Equations, Abstract Algebra, Advanced Probability, Discrete Mathematics, Vector Calculus and Linear Algebra
- *Honors*: Phi Beta Kappa Junior Inductee, Richard U. Light Fellow

International Christian University, Mitaka, Tokyo, Japan August 2023 – June 2024

- One-year study abroad program (Middlebury in Japan), funded by The Richard U. Light Fellowship for Language Study in East Asia
- *Relevant Coursework*:
 - 天文学 (Astronomy), データサイエンス概念 (Data Science Concepts), 数値解析入門 (Numerical Methods in Science)

RESEARCH EXPERIENCE**National Astronomical Observatory of Japan**, Mitaka, Tokyo, Japan August 2023 – June 2024

- Massachusetts Institute of Technology Haystack Observatory**, Westford, MA June 2024 – Present
Research Assistant, Advisors: Drs. Kazunori Akiyama (MIT), Shiro Ikeda (ISM), Mareki Honma (NAOJ), Kotaro Moriyama (ITP)
- Developing a Julia-based software suite of regularized maximum likelihood (RML) methods for the Event Horizon Telescope (EHT)
 - Investigating the effectiveness of the optimal transport distance as a regularizer for RML reconstruction of EHT movie data

National Radio Astronomy Observatory, Socorro, NM May 2023 – Present

- NRAO NSF REU Intern*, Advisors: Drs. Juergen Ott (NRAO), Brian Svoboda (NRAO), and David Meier (NMT)
- Measuring the physical and kinematic properties of molecular clouds Milky Way Galactic bar region with ALMA

Berkeley SETI Research Center, Berkeley, CA June 2022 – July 2023

- Breakthrough Listen NSF REU Intern*, Advisors: Drs. James Davenport (UW) and Steve Croft (UCB)
- Constrained technosignature candidate searches in scheduled observations and archival data using geometric signaling and receiving frameworks, utilizing high-precision astrometric and photometric data from Gaia Data Release 3
 - Working on a classification algorithm to process alerts from LSST, with current testing based on the ELAsTiCC light curve simulations

Breakthrough Listen Intern, Advisor: Dr. Clement Vidal

- Studying potential close encounters between spider pulsars and nearby stars as a possible technosignature in the form of goal-directed activity

Yale Department of Physics, New Haven, CT November 2020 – Present

- Research Assistant*, Advisor: Dr. Nikhil Padmanabhan
- Analyzed quasar data from the SDSS eBOSS catalogue using the quadratic maximum likelihood estimator to provide a measurement of the 1D Ly- α forest power spectrum that aligns well with previous power spectrum results
 - Using a neural network to learn the evolution of the linear point of the BAO feature in the two-point correlation function

University of Arizona Department of Astronomy, Tucson, AZ May 2019 – March 2020

- Research Assistant*, Advisor: Dr. Daniel Apai
- Developed a program to calculate which TESS Earthlike exoplanet candidates were observable during their projected transits from nine different telescopes in order to perform follow-up analyses

University of California, San Diego Physics Department, San Diego, CA May 2018 – March 2020

- Research Assistant*, Advisor: Dr. Brian Keating
- Helped design and construct affordable and easily reproducible linear and circular polarimeters

PUBLICATIONS

- Nilipour, A., Ott, J., Meier, D., Svoboda, B., Sormani, M., Ginsburg, A., Gramze, S., Butterfield, N., Klessen, R. “Turbulent Pressure Heats Gas and Suppresses Star Formation in Galactic Bar Molecular Clouds.” Submitted to *The Astrophysical Journal*
- Nilipour, A., Davenport, J., Croft, S., & Siemion, A. “Signal Synchronization Strategies and Time Domain SETI with Gaia DR3.” *The Astronomical Journal* 166, 79 (2023)
- Davenport, J., Sheikh, S., Farah, W., Nilipour, A., Cabrales, B., Croft, S., Pollak, A., Siemion, A. “Real-time Technosignature Strategies with SN 2023ixf.” *Research Notes of the AAS* 7, 120 (2023)

TALKS

- **Penn State Extraterrestrial Intelligence Center Seminar (April 2024, Centre County, PA):** “Signal Synchronization Strategies and Time Domain SETI”
- **National Astronomical Observatory of Japan VLBI Colloquium (February 2024, Mitaka, Tokyo, Japan):** “Feeding the CMZ: Gas Accretion Flows in the Galactic Bar”
- **National Radio Astronomy Observatory Research Symposium (August 2023, Socorro, NM):** “Feeding the Central Molecular Zone”
- **241st Meeting of the American Astronomical Society (January 2023, Seattle, WA):** “Signal Synchronization Strategies and Time Domain SETI with Gaia DR3”
- **Berkeley SETI Research Center Symposium (August 2022, Berkeley, CA):** “Signal Synchronization Strategies and Time Domain SETI with Gaia DR3”

POSTER PRESENTATIONS

- **Black Hole Explorer Japan Workshop (June 2024, Mitaka, Tokyo, Japan):** “Optimal Transport Regularized Black Hole Movie Reconstruction”
- **242nd Meeting of the American Astronomical Society (June 2023, Albuquerque, NM):** “Linear Point Standard Ruler Estimation with Neural Networks”
- **NASA CT Space Grant Consortium Fall Grants Expo (November 2022, Hartford, CT):** “Bouchet Low-Earth Alpha/Beta Space Telescope (BLAST)”
- **240th Meeting of the American Astronomical Society (June 2022, Pasadena, CA):** “One-dimensional Lyman- α forest power spectrum estimate from eBOSS”

ACTIVITIES

- NAOJ Mitaka Open House Day Volunteer** August 2023 – September 2023
- Assisting with the development and presentation of an interactive Milky Way 21cm line exhibit in Japanese, including the construction of a simple horn antenna
- Yale Undergraduate Aerospace Association (YUAA), Team Leader** September 2021 – June 2023
- Leader of the cosmic ray detector team of the YUAA CubeSat project, which has a projected launch date in spring 2025 and will detect variations in the Van Allen radiation belt, with the primary objective of mapping the boundaries of the South Atlantic Anomaly

WORK EXPERIENCE

- Teaching Fellow** for Elementary Japanese II January 2023 – June 2023
- Teaching Fellow** for Intermediate Japanese I August 2024 – Present
- Grader** for Discrete Mathematics August 2022 – June 2023
- Grader** for Ordinary Differential Equations August 2024 – Present

SKILLS

- **Data Analysis Experience:** Event Horizon Telescope (EHT), Atacama Large Millimeter/sub-millimeter Array (ALMA)
- **Astronomical Data Software:** Comrade, eht-imaging, CASA, CARTA, GNU Radio, Astropy
- **Computational:** Python, Julia, PyTorch, Git, Qiskit, MATLAB, C#
- **High Performance Computing Cluster Allocations:** Yale Grace, Breakthrough Listen blpc0, NRAO NMASC, MIT Engaging, EHT Cloud, NAOJ Sparse 2

MEMBERSHIP

- **Event Horizon Telescope Collaboration** 2023 – Present
- **Phi Beta Kappa** 2022 – Present
- **American Astronomical Society** 2021 – Present

PRESS

- **The Economist:** [Ideas for finding ET are getting more inventive](#) 18 January 2023
- **YaleNews:** [Searching for extraterrestrial life – by keeping an eye on exploding stars](#) 31 July 2023

REFERENCES

Nikhil Padmanabhan, Associate Professor of Physics and Astronomy, Yale University, nikhil.padmanabhan@yale.edu

Héctor Arce, Professor of Astronomy, Yale University, hector.arce@yale.edu

James Davenport, Research Assistant Professor of Astronomy, University of Washington, jrad@uw.edu

Juergen Ott, Research Scientist, National Radio Astronomy Observatory, jott@nrao.edu

Kazunori Akiyama, Research Scientist, Massachusetts Institute of Technology Haystack Observatory, kakiyama@mit.edu

