Andy Nilipour

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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*:
  - *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*: 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*: 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

RESEARCH EXPERIENCE

National Astronomical Observatory of Japan, Mitaka, Tokyo, Japan — August 2023 – Present

Research Assistant, Advisors: Drs. Kazunori Akiyama (MIT), Shiro Ikeda (ISM), Mareki Honma (NAOJ)

- Developing regularized maximum likelihood methods for movie reconstruction of Event Horizon Telescope 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)

- Utilizing ALMA data to measure the physical and kinematic properties of molecular gas potentially feeding the Central Molecular Zone

Berkeley SETI Research Center, Berkeley, CA — June 2022 – Present

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.**, 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

- **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

- **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, 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 2024 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

- Held weekly one-on-one sessions with students in the second semester of first-year Japanese to work on grammar, vocabulary, pronunciation, and conversational skills

Grader for Discrete Mathematics September 2022 – June 2023

SKILLS

- **Data Analysis Experience:** Event Horizon Telescope (EHT), Atacama Large Millimeter/sub-millimeter Array (ALMA)
- **Astronomical Packages:** CASA, CARTA, GNU Radio
- **Computational**: Python, Julia, PyTorch, Git, Qiskit, MATLAB, C#, LaTeX

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, Scientist, National Radio Astronomy Observatory

- jott@nrao.edu