Anya Phillips

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Education

Harvard University Expected: 2030
Ph.D., Astronomy

The Ohio State University May 2024
B.S., Physics and Astronomy; Minor in Mathematics *GPA: 3.99*

Columbus State Community College Fall 2018 - Spring 2020
Transient Student Program *GPA: 4.0*

Research Experience

Center for Astrophysics | Harvard & Smithsonian; *REU Intern* Summer, 2023 – Spring, 2024
Advisors: Cecilia Garraffo, Joshua Wing, Phillip Cargile

- Implementing transfer learning in a hierarchical Bayesian model of deep neural networks for stellar parameter estimation to improve its performance on observational data
- Automating transfer learning and model evaluation routines in Python to allow future researchers to modify the transfer learning dataset and implement it in their own models
- Altering the model to make parameter estimates directly from photometry rather than from surface temperature and luminosity
- Associated GitHub repository: anya-m-phillips/StelNet_Transfer_Learning

Department of Astronomy | OSU; *Undergraduate Researcher* Summer 2022 – Present
Advisor: Christopher Kochanek

- Explored period, luminosity, binarity, rotation speed, and starspot coverage in order to categorize spotted rotational variable stars in the ASAS-SN catalog
- Found orbital solutions for active red giant rotational variables in binary systems using APOGEE radial velocities and ASAS-SN rotation periods, then statistically determined their binary properties by applying Monte Carlo fitting methods to their binary mass function distributions
- Development of data analysis code in Python
- Associated first-author publications (see below)

Publications

Statistical Estimates of the Binary Properties of Rotational Variables
Phillips, A. and Kochanek, C.S.
2024, submitted to MNRAS. arXiv:2407.20328

Seven Classes of Rotational Variables From a Study of 50,000 Spotted Stars with ASAS-SN, Gaia, and APOGEE
Phillips, A., Kochanek, C.S., Jayasinghe, T., Cao, L., Christy, C.T., Rowan, D.M., Pinsonneault, M.H.
Monthly Notices of the Royal Astronomical Society, Volume 527, Issue 3, January 2024, Pages 5588–5602,
https://doi.org/10.1093/mnras/stad3564

Awards

NSF Graduate Research Fellowship 2024
L. Earl Slusher Scholarship | OSU Department of Astronomy 2024
Physics Senior Award | OSU Department of Physics 2024
Goldwater Scholarship 2023

Technical Skills

Proficient in: Python (Relevant libraries: Pandas, NumPy, SciPy, Astropy, Matplotlib, PyTorch, Scikit-Learn), LaTeX
Experience with: Git/GitHub, TOPCAT, Linux, MATLAB, Mathematica

Presentations

American Astronomical Society, 243rd meeting, New Orleans, LA — January 10, 2024
"Transfer Learning for Improved Stellar Parameter Estimation"
iPoster Presentaiton

IAIFI Summer Workshop, Northeastern University — August 13, 2023
"Transfer Learning for Improved Stellar Parameter Estimation"
Poster Presentation

REU Symposium, Center for Astrophysics | Harvard & Smithsonian — August 10, 2023
"Transfer Learning for Improved Stellar Parameter Estimation"
Live-streamed Oral Presentation, available here

Spring Undergraduate Research Festival, OSU — April 6, 2023
"Understanding the ASAS-SN Rotational Variables"
Poster Presentation

Conference for Undergraduate Women in Physics, Brown University — January 21, 2023
"Understanding the ASAS-SN Rotational Variables"
Poster Presentation

Summer Undergraduate Research Symposium, Department of Astronomy, OSU — July 25, 2022
"Categorizing ASAS-SN Rotational Variables"
Oral Presentation

Teaching Experience

Department of Astronomy | OSU; *Teaching Assistant* — Fall, 2021 – Spring, 2024
Facilitating lab sessions, guiding discussions, preparing class materials, and grading assignments in general education astronomy courses (ASTRON 1101: From Planets to the Cosmos, ASTRON 1141: Life in the Universe, ASTRON 2140: Planets & the Solar System, ASTRON 2292: Stellar, Galactic, and Extragalactic Astrophysics)

Math and Statistics Learning Center | OSU; *Student Tutor* — Fall, 2021 – Spring, 2022
Tutored undergraduates in College Algebra, Calculus I, Ordinary and Partial Differential Equations, and Linear Algebra

Leadership

Astronomical Society at OSU | *Secretary* — Spring, 2022 – Spring, 2023

- Collaborated with other leadership to plan and organize club meetings and activities, including a weekend trip to Green Bank Observatory in March, 2023
- Lead the club media committee, which involved compiling, producing articles for, and distributing a monthly club newsletter

Polaris Mentoring Program | *Leadership member, Access Network Fellow* — Fall, 2023 – Summer, 2024

- Gathering undergraduate alumni testimonials to secure continued funding from program stake holders
- Collaborating with other leadership to plan weekly mentorship course lessons and activities
- Acting as a liason to the broader Access Network as Polaris' Network Fellow (NF), including collaborating with NFs from other Access sites to develop an inter-site mentorship matching program