

Patrick Newman

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Projects/Experience

George Mason University FAIRFAX, VIRGINIA
NASA-NSF EPRV Initiative Nov '19 – Jul '21

A collaboration within the EPRV community to develop methods and facilities for measuring the masses of temperate terrestrial planets orbiting Sun-like stars. If implemented, this would also provide planets with known orbits and masses to ease the characterization by direct imaging missions, such as HWO (Habitable Worlds Observatory). My technical report lead to a paper.

ORCAS Oct '20 – Feb '22

Currently the precision of absolute photometry lags behind that of relative photometry, and an orbiting light source with known properties would help with instrument calibration. I performed basic simulations on the brightness/observability of LED and black-body sources at varying collimations and distances (as dictated by orbit considerations). This lead into the design choices for ORCASat, which flew in 2022.

Observatory Operations Jan '18 – Dec '23

Operated the campus 0.8 m telescope. Duties included: a lab section for intro to astronomy students, doing tours/outreach to the general public, gathering data for ground-based transit follow-up of Kepler and TESS candidate planets, maintaining/updating documentation on capabilities and operation procedures, and testing/bug reports for the observation automation software that was being developed at the time.

George Mason University and Missouri State University
Teaching Assistant Aug '16 – May '17, Jan '21 – May '21, Aug '22 – May '23

My duties included preparing and presenting lectures, grading assignments/tests, and assisting students directly with understanding lab concepts, processes, and goals.

Education

George Mason University FAIRFAX, VIRGINIA
PhD in Physics & Astronomy 2017 – 2025
Focused on Exoplanets, especially radial velocity survey simulations.

Missouri State University SPRINGFIELD, MISSOURI
Transferred to GMU 2016 – 2017

University of Missouri – Kansas City KANSAS CITY, MISSOURI
BSc in Physics 2012 – 2015
Astronomy emphasis. Interacted with SDSS datasets for modeling interacting galaxies.

Relevant Skills

Literature searches for assembling theoretical frameworks.

Data cleaning and collation, including using database queries in SQL, shell scripts in bash, and converting graphs to numeric data.

Numerical analysis and displaying data, primarily with Python. Libraries include pandas, numpy, matplotlib, and astropy, with scripts being both written in vim/run from bash and as Jupyter notebooks.

Writing reports in L^AT_EX (including collaboratively in Overleaf) and giving presentations on what was learned.
