Paul Bonney

Research Statement

A key point in the search for extraterrestrial life is the detection and categorization of exoplanet atmospheres. My primary research interests are creating and utilizing models of potential atmospheres to aid in the detection and characterization of exoplanets. **I am using these models along with current data to constrain the nature of detected exoplanets and assist in prioritizing follow up observations with *JWST*.**

Education

2016-2022; Ph.D. Physics, Conc. Astrophysics; University of Arkansas, Fayetteville, AR. Dissertation: *Probing the Atmospheric Composition and Structure of Terrestrial Exoplanets and Exploring Their Potential Habitability*. Dissertation Advisor: Julia Kennefick

2012-2016; B.S. Mathematics, Minor: Physics; Millsaps College, Jackson, MS. Undergraduate Thesis: *Analysis of a 1-Dimenional Risk Board Using Markov Chains*

Fellowships & Grants

Raymond J. Hughes Fellowship 2022

Awarded to a high achieving Physics graduate student at the University of Arkansas in the final stages of their dissertation.

FINESST Research Grant 2020-2022

Title: *Constraining the Habitability of High Priority TESS Candidates with 1D and 3D Global Climate Models*. PI: Dr. Julia Kennefick, University of Arkansas; Collaborator: Knicole Colon, NASA Goddard Space Flight Center.

Arkansas Space Grant Consortium Grant 2019

Granted to conduct research related to prioritizing *TESS* planets of interest according to their habitability and Earth-likeness.

University of Arkansas Doctoral Academy Fellowship 2016-2020

Competitive merit-based fellowship designed to provide financial support to outstanding incoming doctoral students.

Academic Publications and Presentations

On The Hydrosphere Stability of TESS Targets: Applications to 700 d, 256 b, and 203 b

Bonney & Kennefick, *The Planetary Science Journal* , vol. 3, no. 8, 2022. doi:10.3847/PSJ/ac8669.

238th Meeting of the American Astronomical Society:

Bonney & Kennefick, 2021. "*Potential Hydrosphere Stability of TESS Objects of Interest 700, 256, and 203*". *AAS 238*, 53, 6. Bibcode: 2021AAS...23810807B

EPSC-DPS Joint Meeting 2019:

Bonney & Kennefick, 2019. "*Probability of Earth Similarity for the Current TESS Planet Candidates*". *EPSC-DPS Joint Meeting 2019*, EPSC-DPS2019-1090. Bibcode: 2019EPSC...13.1090B

234th Meeting of the American Astronomical Society:

Bonney, 2019. "*A Survey of the Habitability of TESS Planet Candidates*". *AAS 234*, 51, 4. Bibcode: 2019AAS...23410502B

Experience

Research Scientist (SETI Institute):

2023. Overseeing development of SOC-MOC interface including developing scheduling software for the Pandora Mission. Assisting in assorted mission readiness tasks and research for the Pandora Mission. Pursuing research related to the detection and characterization of exoplanet atmospheres.

Research Assistant (University of Arkansas):

2020 – 2022. Executed the research plan proposed in the FINESST award received in 2020; the reduction and analysis of *TESS* data for the purposes of atmospheric modeling of the target planets. Planning, executive decision making, and execution of the research.

Teaching Assistant (University of Arkansas):

2016 – 2020. Supported instruction through test administration, curriculum development, lab creation and implementation, and grading.

Programming Languages/Proficiency

C and Fortran 90	Intermediate
Python	Advanced
High Performance Computing	Advanced

Service and Leadership

Space Hogs Outreach

Community science outreach through astronomy education to school children and the general public across Northwest Arkansas.

(2018 - 2022) Taught children and adults about astronomy through hands-on activities, telescope observing sessions, and planetarium shows; participated in a fundraising activity to purchase a new planetarium for outreach events.

Graduate & Professional Student Congress

Graduate student government and advocacy group at the University of Arkansas.

(2019 – 2020) Representative for The Organization of Physics Graduate Students. Attended GPSC meetings; wrote and debated legislation; served on the Graduate Life Committee; assessed constituents' concerns and condensed information to present at GPSC meetings.

(2020 – 2021) Treasurer for GPSC. Controlled over $150,000 in funds; met with other leaders and University officials; wrote and debated legislation in the GPSC for the allocation and dispensing of funds; chaired the Finance Committee and led meetings thereof; created an application for a professional development grant, oversaw the collection, review; and allocation of travel awards and professional development grants.

The Organization of Physics Graduate Students

Professional and advocacy group for graduate students in the Physics department at the University of Arkansas.

(2019) Founder of the Organization.
(2019 – 2020) Representative and leader of the Organization. Represented the Organization and Physics graduate students to the GPSC; organized and conducted regular meetings of the Organization to discuss GPSC legislation and draw constituent opinions.

Awards

Outstanding Leadership in Student Government & Advocacy 2020-2021

In recognition of service to the graduate and professional students of the University through actions taken as Treasurer.

SOOIE Outstanding Service Project Award 2020

Given for contributing service and expertise to the University and State of Arkansas through outreach, engagement, and collaboration.

Samuel R. Knox Senior Mathematics Award 2016

Honor given to the most outstanding graduate in the Millsaps College Mathematics department.