ALISON DUCK

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Exoplanets
Planet Hosting Stars
Transit Photometry

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EDUCATION

The Ohio State University, Columbus OH *August 2019 - Present*
Doctor of Philosophy, Astronomy, 2025 (Expected)
Master of Science, 2022
Thesis: Systematic Errors in Transiting Planets and Their Host Stars advised by Prof. B. Scott Gaudi
Astronomy Graduate Program GPA 3.959

University of Maryland, College Park MD *August 2015 - May 2019*
Bachelor of Science: Physics, Astronomy - High Honors
Honors Thesis: Kepler and Spitzer Joint Transit Characterization advised by Prof. Drake Deming

HONORS AND AWARDS

OSU Ann S. Tuttle Citizenship, Engagement, and Outreach Prize - 2024
NASA ExoExplorer - 2023
National Science Foundation Graduate Research Fellowship Program Honorable Mention - 2021
George A. Snow Women in Physics Award - 2018
Full Banneker Key Scholar at the University of Maryland, College Park 2015 - 2019

FIRST AUTHOR PUBLICATIONS

1. "Exploring systematic errors in the inferred parameters of the transiting planet KELT-15b and its host star" **Duck, A.**, Gaudi, B. S., Eastman, J D., Rodriguez, J E. 2025, MNRAS
2. "The EBLM project X. Benchmark masses, radii and temperatures for two fully convective M-dwarfs using K2" **Duck, A.**, Martin, D V., and 24 co-authors 2023, MNRAS
3. "K2, Spitzer, and TESS Transits of Four Sub-Neptune Exoplanets" **Duck, A.**, Harada, C. K., Harrell, J.,and 5 co-authors. 2021, AJ, 162,136

CO- AUTHOR PUBLICATIONS

1. "PEPSI Investigation, Retrieval, and Atlas of Numerous Giant Atmospheres (PIRANGA). I. The Ubiquity of Fe I Emission and Inversions in Ultrahot Jupiter Atmospheres" S. Petz, 6 co-authors including **Duck, Alison** 2025, AJ
2. "PEPSI Investigation, Retrieval, and Atlas of Numerous Giant Atmospheres (PIRANGA). III. Composition and winds in the atmosphere of TOI-1518 b" C. Basinger, 8 co-authors including **Duck, Alison** 2025, AJ (Submitted), eprint arXiv:2503.07723
3. "PEPSI Investigation, Retrieval, and Atlas of Numerous Giant Atmospheres (PIRANGA). II. Phase-Resolved Cross-Correlation Transmission Spectroscopy of KELT-20b" C. Lenhart, 7 co-authors including **Duck, Alison** 2025, AJ (Submitted), eprint arXiv:2503.07719
4. "The EBLM project - XIV. TESS light curves for eclipsing binaries with very low mass companions" J. Fitzpatrick, 5 co-authors including **Duck, Alison** 2025, MNRAS

5. "Revised Temperatures For Two Benchmark M-dwarfs – Outliers No More" Martin, D V., Armitage T., **Duck, A.**, and 7 co-authors. 2024, MNRAS
6. "Fundamental effective temperature measurements for eclipsing binary stars – V. The circumbinary planet system EBLM J0608–59" P. F. L. Maxted et al. 5 co-authors including **Duck, Alison**. 2024, MNRAS
7. "BEBOP V. Homogeneous stellar analysis of potential circumbinary planet hosts" Alix V. Freckelton, et al. 31 co-authors including **Duck, Alison**. 2024, MNRAS
8. "The EBLM Project XII. An eccentric, long-period eclipsing binary with a companion near the hydrogen-burning limit" Yasmin T Davis et al. 19 co-authors including **Duck, Alison**, 2024, MNRAS
9. "The EBLM Project– XI. Mass, radius, and effective temperature measurements for 23 M-dwarf companions to solar-type stars observed with CHEOPS" M. I. Swayne et al. 105 co-authors including **Duck, Alison**, et al. 2024, MNRAS 2024, MNRAS
10. "PEPSI Investigation, Retrieval, and Atlas of Numerous Giant Atmospheres (PIRANGA). I. The Ubiquity of Fe I Emission and Inversions in Ultra Hot Jupiter Atmospheres" Petz, Sydney et al. 6 co-authors including **Duck, Alison**. 2024, AAS Journals, Submitted

ACCEPTED TELESCOPE PROPOSALS

Contributed to **8** successful proposals resulting in **$210,000** of funding.

1. CHEOPS, *Characterizing Albedos and Eccentricities of 3 Ultra Hot Jupiters with Multi-bandpass Observations*, **Principal Investigator**, 14 orbits, AO-5, Fall 2024
2. TESS, *Using Eclipsing Binaries to Dramatically Improve the M-Dwarf Mass-Radius-Metallicity-Temperature Relation*, Co-I, Cycle 7, Fall 2024, $70,000 awarded
3. Large Binocular Telescope (PEPSI), *Constraining the Abundances of Solar-Type (FGK) Host Stars of Brown Dwarfs in the Solar Neighborhood*, 10 hours awarded, Co-I, 2023B
4. TESS, *Albedo And Atmospheric Variability Of Hot Jupiters*, Co-I, Cycle 6, Fall 2023, $70,000 awarded
5. TESS, *Using Eclipsing Binaries to Dramatically Improve the M-Dwarf Mass-Radius-Metallicity-Temperature Relation*, Co-I, Cycle 6, Fall 2023
6. TESS, *Uniform Analysis of Systematic Errors in 83 Hot Jupiters*, **Principal Investigator**, Cycle 6, Fall 2023
7. TESS, *Using Eclipsing Binaries to Dramatically Improve the M-Dwarf Mass-Radius-Metallicity-Temperature Relation*, Co-I, Cycle 5, Fall 2022, $70,000 awarded
8. TESS, *Uniform Analysis of Systematic Errors in 84 Hot Jupiters*, **Principal Investigator**, Cycle 5, Fall 2022

SELECTED PRESENTATIONS

Summary: **8** invited talks · **6** conference posters

- Goddard Scientific Colloquium, September 2024
- University of California, Santa Cruz Planet Lunch Seminar April 2024
- Tufts Special Colloquium, Feb 2024

- Harvard Smithsonian Center for Astrophysics Planet Lunch, Feb 2024
- Harvard Smithsonian Center for Astrophysics Seminar, Feb 2024
- Great Lakes Exoplanet Area Meeting at Indiana University, Nov 2023
- NASA ExoExplorers Research Showcase, Virtual, Feb 2023
- Great Lakes Exoplanet Area Meeting at The Ohio State University, Nov 2022
- Michigan State University Invited Seminar, Nov 2022

OBSERVING EXPERIENCE

Large Binocular Telescope

- Co-observer during 10 day observing run at University of Arizona, February 2020

SELECTED TEACHING, MENTORSHIP, LEADERSHIP

Summary: **1** student directly advised · **80**+ students served through mentorship program · **5** Conference Organizing Committees

- Research mentor for undergraduate Shelby Summers at OSU, Summer 2023 to Present
- NASA ExoPAG SIG #2 Exoplanet Demographics Member, 2023 to present
- Instructor of Record for full year the OSU Polaris Mentorship Course (PHYS2050.01/.02) which pairs underrepresented Physics and Astronomy freshmen with graduate student mentors to complete a research project, 2021-2022, 2022-2023, 2023-2024
- Served on the local organizing committee for the ACCESS Network national conference for improving diversity in physics, The Ohio State University, Summer 2023
- Member of the Science Organizing Committee for the Great Lakes Area Exoplanet Meeting, The Ohio State University, Nov. 2022
- Taught and designed the inaugural curriculum for an early arrival program for underrepresented incoming freshman Physics and Astronomy Majors at The Ohio State University, Summer 2020

SELECTED OUTREACH ACTIVITIES

- Guest speaker for NexGen Scholars at Salisbury Middle School, Salisbury, MD, Summer 2024, 2025
- Guest speaker for the Ohio Department of Natural Resources, Virtual, Spring 2024
- Guest speaker for NASA's Universe of Learning, Virtual, Winter 2024
- Volunteer Astronomy coordinator for the COSI Children's Museum Science Festival, Columbus, OH, Spring 2023
- Guest speaker for Modern Physics at the University of Maryland, Virtual, Spring 2022
- Guest speaker for First Light - Science class for under-served Washington DC middle-schoolers, Carnegie Academy for Science Education, Virtual, Spring 2022
- Guest speaker for rural Mardela High School AP and Honors Chemistry, Virtual, September 2021
- Panelist at the Conference for Undergraduate Women in Physics, University of Maryland College Park, January 2020