Benjamin K. Capistrant

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Education

University of Florida 2022 - present

Ph.D. in Astronomy

University of Wisconsin-Madison 2017 - 2021

Bachelor of Science in Physics, Bachelor of Science in Astronomy-Physics, & Certificate (Minor) in Mathematics

Publications

Capistrant, B.; Soares-Furtado, M.; Vanderburg, A.; Jankowski, A.; Mann, A.; Ross, G.; Srdoc, G.; Hinkel, N.; Becker, J.; Magliano, C.; Limbach, M.; Stephan, A.; Nine, A.; Tofflemire, B.; Kraus, A.; Giacalone, S.; Winn, J.; Bieryla, A.; Bouma, L.; Ciardi, D.; Collins, K.; Covone, G.; de Beurs, Z.; Huang, C.; Jenkins, J.; Kreidberg, L.; Latham, D.; Quinn, S.; Seager, S.; Shporer, A.; Twicken, J.; Wohler, B.; Vanderspek, R.; Yarza, R.; Ziegler, C. *TESS Hunt for Young and Maturing Exoplanets (THYME) XI: An Earth-sized Planet Orbiting a Nearby, Solar-like Host in the 400 Myr Ursa Major Moving Group*, 2024, The Astronomical Journal, 167, 2 [ADS].

Capistrant, B.; Soares-Furtado, M.; Vanderburg, A.; Kounkel, M. Rappaport, S.*A Population of Dipper Stars from the Transiting Exoplanet Survey Satellite Mission*, 2022, The Astrophysical Journal Supplement Series, 263, 1. [ADS]

Research Experience

Graduate Student Research Assistant Aug 2022 - present

Dr. Jason Dittmann, University of Florida

- Detecting and characterizing stellar flares in the *TESS* light curves of planet-hosting stars.
- Performing this analysis on targets scheduled for *JWST* follow-up observations to explore the impact of stellar activity on planet atmospheres.
- Experience with *TESS* data reduction, machine learning, high-performance computing, oral presentation skills.

Research Assistant May 2021 - Aug 2022

Professor Andrew Vanderburg & Dr. Melinda Soares-Furtado,
Massachusetts Institute of Technology & University of Wisconsin-Madison

- Discovered the nearest young (<500 Myr) Earth-sized planet to date. I was first-author on the paper detailing this planet detection, **published to The Astronomical Journal in Jan 2024.**
- Created a Monte Carlo Markov Chain (MCMC) algorithm to simultaneously fit the transit signals of this triple-planetary system, characterized the newly detected planet HD 63433 d and updated the characteristics of the two previously discovered planets.
- Cataloged and characterized the light curve morphology and periodicity of more than 400 dipper stars—young stellar objects observed to dim in brightness by 10-50%. I led a first-author publication that summarizes these findings **published to ApJS in Nov 2022.**
- Created a pipeline to generate light curves from each variable star's *TESS* target pixel file using custom apertures, and investigated the stellar properties of the resulting sample using the Gaia DR2 catalog and available cluster membership catalogs.
- Experience with *TESS* and Gaia data analysis, the transit detection method, MCMC algorithms, paper writing.

Research Assistant Sep 2020 - Sep 2021

Professor Ke Zhang, University of Wisconsin-Madison

- Investigated enhanced mid-plane CO, as evidence of icy pebble drift in the HD 163296 protoplanetary disk, using the radiative transfer code, RADMC-3D, to improve agreement between the CO abundance in disk models with ALMA observations.
- Applied scale factors to CO isotopologue line models to investigate the CO abundance vertically offset from the disk mid-plane.
- Experience with radiative transfer codes (RADMC-3D), protoplanetary disks, ALMA data interpretation.