Isabela G. Huckabee

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Education

Cornell University *Expected 2030*
PhD in Astronomy and Space Sciences *Ithaca, NY*

Arizona State University *2023*
B.S. Astrophysics, minor in Physics, certificate in Cross-Sector Leadership *Tempe, AZ*

Skills

Python, Unix, IDL, Git, LaTeX, Keras/TensorFlow, Arduino, MATLAB

Selected Research

Directly Imaged Exoplanets 2024 –
Cornell University, Advised by Dmitry Savransky and Nikole Lewis *Ithaca, NY*
Creating planetary atmosphere models of Roman Space Telescope Coronagraph targets, focused on Jupiter analogs. Using PICASO to investigate atmospheric profile assumptions using recently updated stellar and planetary parameters.

Ice Giant Watchdog: A CubeSat Concept to Monitor Weather on Neptune 2024 –
Cornell University, Advised by Nikole Lewis and Don Banfield *Ithaca, NY*
Conceptualizing a 6U CubeSat mission to observe Neptune's clouds and tropospheric dynamics. Developing 3D atmospheric models of Neptune in PICASO to show achievable time-series precisions.

Characterizing Atmospheres of T-dwarfs and Low-Gravity M-dwarfs 2020 – 2023
Arizona State University, Advised by Michael Line *Tempe, AZ*
Created grid models of cloud-free T-dwarfs and cloudy, low-gravity M-dwarfs to understand the role of clouds and disequilibrium chemistry in their atmosphere. Integrated those models with Gaussian processes using *Starfish* to run gridtrievals on benchmark targets get a comprehensive account of error within models and data.

ULF Wave-driven Relativistic Electron Flux Oscillations in the Outer Radiation Belt 2020
University of Colorado Boulder, Advised by Hong Zhao *Boulder, CO*
Developed an algorithm in IDL to identify ultrarelativistic electron flux oscillations in data from the Van Allen Probes' Relativistic. Electron-Proton Telescope. Identified correlations between electron flux oscillation events and solar wind and geomagnetic parameters, confirming that electron flux oscillation events can be used as indicators of radial diffusion in the outer radiation belt.

SKYSURF 2020 – 2021
Arizona State University, Advised by Rogier Windhorst *Tempe, AZ*
Built data reduction pipelines in contribution to Project SKYSURF, a Hubble archival legacy project to constrain all sky surface brightness and categorize it into components based on origin. Categorized large sets of images as usable or unusable for measuring sky brightness.

Publications

Huckabee, I., et al.(2026) Ice Giant Watchdog: CubeSat Concept to Monitor Weather on Neptune (submitted, PSJ)

Noguer, F., et al. (incl. **Huckabee, I.**) (2024) Enhancing Exoplanet Ephemerides by Leveraging Professional and Citizen Science Data: A Test Case with WASP-77A b (accepted, PASP).

O'Brien, R., et al. (incl. **Huckabee, I.**) (2023) SKYSURF-4: Panchromatic Full Sky Surface Brightness Measurement Methods and Results. AJ, 165, 237.

Windhorst, R., et al. (incl. **Huckabee, I.**) (2022) SKYSURF: Constraints on Zodiacal Light and Extragalactic Background Light through Panchromatic HST All-sky Surface-brightness Measurements. I. Survey Overview and Methods. AJ, 164, 141.

Zhao, H., et al. (incl. **Huckabee, I.**) (2022). Statistics of multi-MeV electron drift-periodic flux oscillations using Van Allen Probes observations. Geophysical Research Letters, 49, e2022GL097995.

Zhao, H., et al. (incl. **Huckabee, I.**) (2021). Van Allen Probes observations of multi-MeV electron drift-periodic flux oscillations in Earth's outer radiation belt during the March 2017 event. Journal of Geophysical Research: Space Physics, 126, e2021JA029284.

Selected Research Talks

Huckabee, I., Zellem, R., Pearson, K. "Exoplanet Watch: Inviting Citizen Scientists to Observe Transiting Exoplanets". 13th Southeast Asian Astronomy Network Meeting. Nov 2023.

Huckabee, I., Iyer, A., Line, M. "C/O and Disequilibrium in cloud-free T-dwarfs". 241st meeting of the American Astronomical Society. Jan 2023. 2022.

Huckabee, I. and Deshmukh, S. "Stellar Spectral Line Fitting with Machine Learning Techniques". Virtual RISE Meeting 2021. Aug 2021.

Selected Research Posters

Huckabee, I., Iyer, A., Line, M. "Characterizing the atmospheres of cloud-free T-dwarfs using Gaussian processes". 240th Meeting of the American Astronomical Society. June 2022.

Huckabee, I. and Zhao, H. "A Statistical Study on the ULF-Wave Driven Ultrarelativistic Electron Flux Oscillations in the Outer Radiation Belt". 2020 American Geophysical Union Fall Meeting. Dec 2020.

Selected Outreach

Inclusive Community Committee 2022 - 2023

Worked with faculty, research staff, and graduate students to create an accessible website for undergraduate research opportunity listings in our department.

Arizona State Exoplanet Research Group 2020 - 2023

Created an exoplanet transit diorama with a live-plotted light-curve using Python and Arduino. With the research group, used the diorama to explain exoplanet transit detection and transmission spectroscopy at public outreach events.

Access Network 2021 - 2023

Represented Arizona State in the nationwide NSF-supported Access Network, which supports a more equitable and inclusive STEM community. Created an Access Network wide newsletter.

Selected Outreach Talks

"Creating Astrophysics Courses to Improve Philippine Space Education and the State of Philippine Astronomy". Philippine Space Agency. May 2024.

"What's the Deal with Exoplanets?". Philippine Atmospheric, Geophysical, and Astronomical Services Administration Women and Girls in Astronomy Seminar. March 2024.

Mentoring

SEDS-PH Upskill Group Mentor 2024 -

Mentoring a group of 15 undergraduate students to update the transit times and orbital parameters of exoplanets with Exoplanet Watch.

Barcelona Zero-G Challenge 2024 Mentor 2024

Mentored a group of four students that won the Barcelona Zero-G Challenge hosted by Universitat Politècnica de Catalunya in their project "Exploring Non-newtonian Fluids in Zero-G Environments for Cushioning Aerospace Gear"

Sundial Mentoring Program 2019 - 2023

Mentored freshmen students in the physical sciences and helping them with coding projects and adjustment to college life. Ran geosystems demonstrations to educate the public about global warming at outreach events. Organized No-Jargon talk schedules and lab tours for mentees.

Selected Awards and Honors

Fulbright Fellowship - Philippines 2023-2024

Goldwater Scholarship 2021

DAAD-RISE Fellowship 2021

Access Network Fellowship 2021 - 2022

ASU/NASA Space Grant Scholarship 2020 - 2022

Public Service Academy Commitment Award 2019 - 2023

Proposals

Exploring Non-newtonian Fluids in Zero-G Environments for Cushioning Aerospace Gear Awarded Jul 2024

- Mentored a team of Filipino high school and undergraduate students in submitting a winning proposal to the Barcelona Zero-G Challenge, which flew in Fall 2024