Isabela G. Huckabee

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Education

Arizona State University May 2023
Astrophysics BS, minor in Physics, certificate in Cross-Sector Leadership *Tempe, AZ*
Will begin PhD at Cornell University in 2024

Skills

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

Research

Exoplanet Watch 2022 –
Jet Propulsion Laboratory, Advised by Robert Zellem *Pasadena, CA*
Combined TESS and citizen science exoplanet transit observations together to better constraint mid-transit times Created pipelines to run a Bayesian transit timing variations analysis in citizen science and professional data. Added stellar variability monitoring abilities to the light curve reduction code EXOTIC. Publication in prep.

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.

Stellar Spectral Line Fitting with Machine Learning Techniques 2021
Landessternwarte Heidelberg-Königstuhl, Advised by Siddhant Deshkmukh *Heidelberg, Germany*
Developed a simulated linelist data creation pipeline. Created a convolutional neural network to detect the locations of lines and estimate their equivalent widths.

ULF Wave-driven Relativistic Electron Flux Oscillations in the Outer Radiation Belt 2020
Laboratory for Atmospheric and Space Physics, 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.

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.

Astronomy Club 2022 - 2023
Managed social media for the astronomy club by regularly posting information and memes on Twitter and Instagram. Held bi-weekly meetings to teach other students about amateur astronomy.

Exoplanet Research Group 2020 - 2023
Created an exoplanet transit diorama with a live-plotted light-curve using Python and Arduino. Explained exoplanet transits and transmission spectroscopy to the public at 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.

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.

Next Generation Service Corps 2019 - 2023

Led the Recycling and Emissions squad as part of Arizona States's New Generation Service Corps program. Facilitated relevant science and business discussions in weekly squad meetings to prepare a spread in the program wide magazine. Published short articles in the biweekly newsletter sent out to the program.

Teaching

Introductory Astronomy Labs Fall 2020 - Fall 2021

Taught astronomy labs for both majors and non-majors by independently giving lectures, facilitating labs, and grading assignments and papers.

Introduction to Extragalactic Astrophysics and Cosmology Spring 2022

Graded homeworks and answered questions in class and office hours.

Exploration of the Universe Spring 2023

Independently held problem solving sessions to prepare astrophysics majors for upper division classes. Graded homeworks and answered questions in class and office hours.

Private Tutor Summer 2019 -

Tutoring students through an online whiteboard with drawing and digital note taking capabilities. Specializing in physics, writing, college entrance exam prep, and math topics ranging from geometry to calculus.

Publications

Huckabee, I., et al. (in prep) Evidence of Long-Period Perturbations in the Exoplanet Watch Priority Target List.

O'Brien, R., et al. (incl. **Huckabee, I.**) (2022) SKYSURF-4: Panchromatic Full Sky Surface Brightness Measurement Methods and Results. (in review, AJ).

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 Talks

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

Huckabee, I., Zellem, R., Pearson, K. "Exoplanet Watch: The TESS Edition". Second Annual School of Earth and Space Exploration Symposium. Aug 2022.

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

Huckabee, I., Iyer, A., Line, M. "Characterizing the Atmospheres of Low Surface Gravity M-dwarfs". 2021 American Physical Society Conference for Undergraduate Women in Physics. Jan 2021.

Selected 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 Awards and Honors

Fulbright Fellowship - Philippines 2023-202

Goldwater Scholarship 2021

DAAD-RISE Scholarship 2021

Access Network Fellowship 2021 -

ASU/NASA Space Grant Scholarship 2020 - 2022

Public Service Academy Commitment Award 2019 -

Proposals

Creation and Maintenance of an Undergraduate Research Opportunity Database Awarded Jan 2023

- Awarded two years of funding for the maintenance an up-to-date website announcing research opportunities within ASU's School of Earth and Space Exploration
- Intended to offer often neglected information on undergraduate research opportunities such as skills that will be taught on the job, if the position is paid, and the potential to turn the project into a senior thesis

Biannual Physical Scientists of Color Networking Dinner Awarded Jan 2023

- Awarded two years of funding to cater dinners in conjunction with ASU's Sundial program and physics department
- Designed to promote community among scientists of color and create a food-oriented space to foster mentor-mentee relationships