

# ISABELA G. HUCKABEE

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## EDUCATION

### ARIZONA STATE UNIVERSITY

*Astrophysics, minor in Physics*

Expected May 2023

Tempe, AZ

## SKILLS

Python, Unix, IDL, Git, L<sup>A</sup>T<sub>E</sub>X, Keras/TensorFlow, Arduino, MATLAB, NX

## RESEARCH

### CHARACTERIZING ATMOSPHERES OF T-DWARFS AND LOW-GRAVITY M-DWARFS

Aug 2020 –

*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 atmospheres
- Integrating Gaussian processes with *Starfish* to get a comprehensive account of error within models and data
- Publication in prep.

### EXOPLANET WATCH

May 2022 –

*Jet Propulsion Laboratory, Advised by Robert Zellem*

Pasadena, CA

- Combining TESS and citizen science exoplanet transit observations together to better constraint mid-transit times
- Creating scripts to analyze transit timing variations
- Adding stellar variability monitoring abilities to the light curve reduction code EXOTIC
- Publication in prep.

### STELLAR SPECTRAL LINE FITTING WITH MACHINE LEARNING TECHNIQUES

May 2021 – Aug 2021

*Landessternwarte Heidelberg-Königstuhl, Advised by Siddhant Deshmukh*

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

May 2020 – Aug 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

Jan 2020 – Aug 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 –

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

### ASTRONOMY CLUB

2022 –

- Managing social media for the astronomy club by regularly posting information and memes on Twitter and Instagram
- Holding bi-weekly meetings to teach other students about amateur astronomy

### EXOPLANET RESEARCH GROUP

2020 –

- 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 –

- Represents ASU 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 -

- Mentoring 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
- Organizing No-Jargon talk schedules and lab tours for mentees

## NEXT GENERATION SERVICE CORPS

2019 -

- Led the Recycling and Emissions squad as part of ASU'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

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### 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 teaching problem solving sessions to prepare astrophysics majors for upper division classes
- Grading homeworks and answering 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

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**Huckabee, I.**, et al. (in prep) Characterizing the atmospheres of cloud-free T-dwarfs using Gaussian processes.

**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

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**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

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**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

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### 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