# Kiersten M. Boley

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## Research Interests

Planet formation and habitability, Influences of stellar abundances on planet formation, Exoplanet detection and characterization using the transit method, Evolution of terrestrial planet interiors and plate tectonics

## Education

**The Ohio State University** — Columbus, OH
**Ph.D.** in **Astronomy** — expected May 2024
**Master's** in **Astronomy** — August 2021
Advisors: Wendy Panero & Ji Wang

**Georgia Institute of Technology** — Atlanta, GA
**Bachelor of Science** in **Physics** — May 2019
Concentration in Astrophysics
Minor in German

**Georgia Highlands College** — Rome, GA
**Associate of Science** in **Physics** — May 2015

## Research Experience

**NSF Graduate Research Fellow** — August 2021 – present
The Ohio State University — Columbus, OH
*Advisors: Wendy Panero & Jessie Christiansen*

**IPAC Visiting Graduate Student Fellow** — January 2022 – August 2022
California Institute of Technology, IPAC — Pasadena, CA
*Advisor: Jessie Christiansen*

**Dean's Distinguished Graduate Research Fellow** — August 2019 – August 2021
The Ohio State University — Columbus, OH
*Advisors: Ji Wang*

**Student Researcher** — May 2018–August 2019
Lawrence Livermore National Laboratory — Livermore, CA
*Advisors: William Dawson*

**Student Research Intern** — January 2018–May 2018
Georgia Tech Research Institute — Atlanta, GA

**Research and Development Intern** — January 2015– May 2015
Mohawk Industries — Lyerly, GA

## Honors & Awards

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|---|---|
| 3rd Black Space Week Graduate Research Showcase ($500) | June 2023 |
| Army Achievement Medal | March 2023 |
| Geochemical Society Travel Grant ($2000) | March 2023 |
| Beth Brown Memorial Poster Award ($1000) | November 2022 |
| $2^{nd}$ Place Black in Physics Poster Competition ($100) | October 2022 |

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| LSSTC Data Science Fellowship 2022 Program | July 2022 |
| ExoExplorers 2022 Program ($1000) | January 2022 |
| IPAC Visiting Graduate Student Fellowship ($20k) | January 2022 |
| Beth Brown Memorial Award ($1000) | November 2021 |
| Gaudi-Stanek Award ($2000) | August 2021 |
| NSF Graduate Research Fellowship($105k) | March 2021 |
| Two Sigma PhD Research Grant ($2000) | March 2021 |
| Two Sigma Diversity Fellowship Finalist | March 2021 |
| Dean's Distinguished Graduate Fellowship ($90k) | May 2019 |
| National Defense Committee Medal | May 2019 |
| James F. Towers Scholarship ($2000) | August 2018 |
| Lawrence Livermore National Laboratory, Deputy Director's coin | August 2018 |
| Segal Americorps Educational Award ($2500) | June 2018 |
| The Armed Forces Communications and Electronics Association, Honor Award | May 2018 |
| Army ROTC Scholarship ($75K) | September 2016 |
| Hope Scholarship ($48K) | August 2014 |

## Publications

**Summary: 4 First Author, 5 Contributing Author**

### First Author:

4. **Boley, K.**, Wang, J., et al., "Searching For Transiting Planets Around Halo Stars. III. Constraining Small Planet Occurrence Rates", 2023, *in preparation*

3. **Boley, K.**, Christiansen, J., et al., "The First Evidence of a Host Star Metallicity Cut-off In The Formation of Super-Earth Planets", 2023, *submitted to Nature*

2. **Boley, K.**, Panero, W., Unterborn, C., et al., "Fizzy Super-Earths: Impacts of Magma Composition on the Bulk Density of Lava Worlds", 2023, ApJ, 952, 202

1. **Boley, K.**, Wang, J., Zinn, J., et al., "Searching For Transiting Planets Around Halo Stars. II. Constraining the Occurrence Rate of Hot Jupiters", 2021, AJ, 162, 85

### Contributing Author:

5. Christiansen, J., Zink, J., Hardegree-Ullman, K., Fernandez, R., **Boley, K.**, et al. "Scaling K2 VII: Evidence for an increase in the occurrence rate of hot sub-Neptunes at intermediate", 2023, *Submitted to AJ*

4. Rodríguez Martínez, R., Gaudi, B.S.,..., **Boley, K.**, et al. "A Comparison of the Composition of Planets in Single and Multiple Systems Orbiting M dwarfs", 2023, Accepted to AJ

3. Zink,J., Hardegree-Ullman, K., Christiansen, J., ..., **Boley, K.**, et al. "Scaling K2. VI. Reduced Small Planet Occurrence in High Galactic Amplitude Stars", 2023, AJ, 165, 262

2. Rodríguez Martínez, R., Gaudi, B.S., ..., **Boley, K.**, et al. "A Reanalysis of the Composition of K2-106b: an Ultra-short Period Super-Mercury Candidate", 2023, AJ, 165, 97

1. Fitzmaurice, E., Martin, D., ..., **Boley, K.**, et al. "Spectroscopy of TOI-1259B - an unpolluted white dwarf companion to an inflated warm Saturn", 2022, MNRAS, 518, 636-641

## Invited Talks & Colloquia

"Influence of Metallicity on Planet Formation" — November 2023
Carnegie Observatories, Lunch Seminar Series — Pasadena,CA

"Lava Worlds or Solid Planets: Impact of Magma on Planet Characterization" — October 2023
NASA Goddard, Exoplanet Seminar Series — Baltimore, MD

"Influence of Metallicity on Planet Formation" — October 2023
Carnegie EPL, Astronomy Seminar Series — Washington, DC

"Impacts of Magma Composition on the Bulk Density of Lava Worlds" — April 2023
ExoPAG, JPL Exoplanet Lecture Series — Virtual

"Planet Formation to Characterization: The Impact of Elemental Abundances on Exoplanets " — March 2023
University of Michigan, Colloquium — Ann Arbor, MI

"Building Blocks of Planets: Effects of metals on Planet Formation " — May 2022
ExoPAG, ExoExplorer Science Series — Virtual

"Hot Jupiter Occurrence within the Metal-Poor Regime" — February 2021
Two Sigma, Finalist Reception — Virtual due to COVID-19

## Presentations & Posters

"The Metallicity Cliff: An Abrupt Drop in Super-Earth Occurrence" — July 2023
Towards Other Earths III — Porto, Portugal

"Fizzy Super-Earths: Impacts of Magma Composition on the Bulk Density of Lava Worlds" — July 2023
Goldschmidt 2023 — Lyon, France

"The Metallicity Cliff: Planet Occurrence Rates around Metal-Poor Stars" — January 2023
American Astronomical Society, 241st Meeting — Seattle, WA

"Fizzy Super-Earths: Impacts of Magma Composition on the Bulk Density of Lava Worlds" — November 2022
Great Lakes Exoplanet Area Meeting 2022 — Columbus, OH

"The Metallicity Cliff: Planet Occurrence Rates around Metal-Poor Stars" — November 2022
National Society of Black Physicist 2022 — Charlottesville, VA

"Impacts on Planet Formation: Planet Occurrence rates in the Metal-Poor Regime" — August 2022
Greater IPAC Science Symposium, 22nd Meeting — Pasadena, CA

"Fizzy Planets: Mass-Radius Relationships for Magma Oceans" — June 2022
American Astronomical Society, 240th Meeting — Pasadena, CA

"Impacts on Planet Formation: Planet Occurrence rates in the Metal-Poor Regime" — May 2022
Exoplanets IV Conference — Las Vegas, NV

"Impacts on Planet Formation: Hot Jupiter Occurrence around Metal-Poor Stars" — November 2021
Great Lakes Exoplanet Area Meeting 2021 — Ann Arbor, MI

"Constraining Hot Jupiter Occurrence around Metal-Poor Stars" — November 2021
National Society of Black Physicist 2021 — Virtual due to COVID-19

"Hot Jupiter Occurrence around Halo Stars" — July 2021
Sagan Exoplanet Workshop 2021 — Virtual due to COVID-19

"Constraining the Metallicity required for Planet Formation" — May 2021
Emerging Researchers in Exoplanet Science 2021 — Virtual due to COVID-19

"Hot Jupiter Occurrence within the Metal-Poor Regime revisited by TESS" — April 2021
Space Telescope Science Institute, 2021 Spring Symposium — Virtual due to COVID-19

"The Occurrence of Hot Jupiters in the Metal-Poor Regime revisited by TESS" — January 2021
American Astronomical Society, 237th Meeting — Virtual due to COVID-19

"Raiders of Lost Arcs: Faint Galaxy Detection" — August 2018
Lawrence Livermore National Laboratory, 2018 Summer Symposium — Livermore,CA

## Observing Experience

LBT, MODS/LBC, Mount Graham International Observatory, (Queue Observing) — 2 nights

## Academic Service

Undergraduate Research Showcase Judge, Black Space Week — 2023
Chambliss Judge, American Astronomical Society 241st Meeting — 2023
Reviewer, NASA Astrophysics Review Panel — 2022

## Advising & Mentoring

Brendan Kirsh, The Ohio State University, Undergraduate — 2023- present
Hannah Eggenschwiler, The Ohio State University, Undergraduate — 2021-2022
Monica Dahm, The Ohio State University, Undergraduate — 2020-2021
Noah Weinstein, SciAccess Zenith Mentorship Program, Middle School — 2020-2021

## Employment

**Commander** | *U.S. Army* — May 2019 – Present
- Responsible for planning and scheduling all training for the entire $676^{th}$ Ground Ambulance Company (∼100 soldiers)
- Responsible for ∼24 million dollars worth of equipment

**Dance Instructor** | *Baird Ballet* — July 2011 –December 2017
- Created and implemented ballet, jazz, and contemporary dance curriculum for students between the ages of 3-16 years old

**Office Manager** | *Techwood Consulting* — July 2015 – December 2015
- Performed administrative and office management duties necessary to support corporate officers

**Lead Teller** | *Suntrust* — June 2014 – January 2015
- Accurately processed customer cash, check, transfer, and statement transactions, with a balanced or reconciled drawers

## Invited Outreach & Service Talks

**Supporting First-Gen Minority Students at all Stages** — March 2023
University of Michigan, Department of Astronomy, Conversations on Inclusion and Equity

**The Flooding Pipeline: Diversity, Equity, and Inclusion begins before University** — January 2023
AAS 241, ExoExplorers Special Session

**Exoplanets: Beyond the Solar System** — January 2023
Open Science Talk Series

**Exoplanets and the Search for Life** — October 2022
Friends of Ohio State Astronomy & Astrophysics

## Select Outreach & Service

**Co-Host** | *Astro [Sound] Bites Podcast* April 2022 – Present

*The official audio spinoff of the Astrobites blog. Three graduate students discuss recently published astronomy research results and life in academia. Episodes released bi-weekly*

**Astronomy Instructor** | *Be Wise Summer Camp* May 2023–June 2023

*Developed and taught astronomy lessons to K-6th grade students from low- income neighborhoods*

**Panelist** | *NSF GRFP Panel* June 2023

*Served as a panelist for the Emergent Materials REU Program workshop on NSF GRFP*

**Panelist** | *AAS 241 Workshop: How To Give Great Presentations* January 2023

*Served as a panelist for the AAS 241 workshop on "A Scientist's Guide to Effective Communication"*

**Panelist** | *Monthly Movie Nights - Science Fiction vs Science Fact* November 2022

*Served as a panelist for the Q&A for the movie "Space Balls"*

**Guest Host** | *OutSciders Classroom* September 2022

*OutSciders is a web-based video series that teaches students science and environmental stewardship through our National Parks. Guest Hosted 2 episodes*

**Academic Facilitator** | *URSA Program* March 2021 – September 2022

*Creates Astronomy and Physics Curriculum and teaches incoming undergraduate students from under-represented groups*

**Interviewee** | *Astronomy in Color* February 2022

*Interviewed for Black History Month sharing my perspective as a black woman in astronomy ( Article)*

**Mentor** | *Polaris Mentorship Program* August 2020 – May 2022

*Provides mentorship to under-represented undergraduates in Physics and Astronomy*

**Invited Speaker** | *NPR-The Short Wave podcast* August 2021

*Discussed the constellation Canis Major, Sirius, and the summer night sky*

**Graduate Representative** | *AIP TEAM-UP Workshop* December 2020 – January 2022

*Represented the OSU Astronomy Department at this workshop that educates on strategies to recruit and retain African-American undergraduate students in Astronomy and Physics by creating an inclusive environment*

**Mentor** | *SciAccess Zenith Mentorship Program* February 2021 – April 2021

*Provides mentorship for blind and visually impaired high-school students that are interested in astronomy*

**Panelist** | *Monthly Movie Nights - Science Fiction vs Science Fact* February 2021

*Served as a panelist for the Q&A webinar for the movie "2001: A Space Odyssey"*

**Volunteer Coordinator** | *Jumpstart* August 2017 – May 2019

*Recruited, managed, and trained 190 recruited volunteers to serve 2 preschools for assorted Jumpstart service projects*

**Team Leader** | *Jumpstart* August 2016–August 2017

*Led 5 peers to provide developmentally appropriate educational activities, with a focus on language and literacy, to young children*

**Corps Member** | *Jumpstart* August 2015–August 2016

*Implemented early childhood curriculum, supported family involvement, promoted children's language and literacy skills through ongoing relationships with 20 children, and increased adult support in the learning environment*

**Volunteer** | *Mission is Possible* August 2013–May 2015

*Served in various roles from working with disabled children to cleaning elderly couple's homes to improve the community in Rome,GA*

## Computational Skills

Python, MATLAB, HTML/CSS, LaTeX

## Scholarly Memberships

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|---|---|
| American Astronomical Society | Junior Member |
| National Society of Black Physicists | Full Member |
| Phi Theta Kappa | Member |