

The Ohio State University  
Department of Astronomy  
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## RESEARCH INTERESTS

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I am interested in brown dwarf and exoplanet atmospheric characterization, direct imaging techniques, high resolution spectroscopy of substellar objects, and stellar abundance measurements. My main research goals are to explore planetary formation through atmospheric retrievals of brown dwarfs and directly imaged exoplanets. Along with this, I am interested in detecting biosignatures and the habitability of temperate exoplanets.

## EDUCATION

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- **The Ohio State University** Columbus, OH  
*Ph.D. Astronomy* *Expected 2025*  
*M.S. Astronomy* *August 2022*  
Thesis Topic: *Searching for Biosignatures in the Atmospheres of Gas Dwarf Planets*  
*Graduate Certificate In College and University Teaching (In Progress)*
- **The University of Texas at Austin** Austin, TX  
*M.A. Astronomy* *May 2019*  
Thesis Title: *2M0443+3723 B: A Young Companion at the Substellar Boundary with Potential Membership in the  $\beta$  Pictoris Moving Group*
- **University of Arkansas at Little Rock** Little Rock, AR  
*B.S. Physics; Minor: Mathematics* *December 2015*

## RESEARCH POSITIONS

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- **Graduate Student Researcher & Visiting Scientist, Advisor: Dr. Jackie Faherty** 2022-present  
*The Ohio State University & American Museum of Natural History*
  - Exploring atmospheric properties of substellar companions to probe planetary formation mechanisms
  - Using *Brewster* to robustly decouple temperature, gravity, composition, and cloud properties for planetary mass brown companions
- **Graduate Student Researcher, Advisor: Dr. Ji Wang** Columbus, OH  
*Department of Astronomy, The Ohio State University* *2022-present*
  - Combining photometry, low-to-medium resolution and high resolution spectroscopy of directly imaged exoplanets and brown dwarfs from KPIC to constrain carbon-to-oxygen ratios to explore if metal enrichment in atmospheres is universal
- **Graduate Student Researcher, Advisor: Dr. Ji Wang** Columbus, OH  
*Department of Astronomy, The Ohio State University* *2019–2022*
  - Investigated whether biosignatures on gas dwarfs are detectable with the MIRI, NIRSpec, and NIRISS instruments aboard *JWST* mission
  - Investigated whether biosignatures on temperate gas dwarfs/terrestrial-like planets are detectable with the upcoming *Twinkle* space mission
  - Determined suitable targets for observations for *Twinkle* and *JWST*

• **Graduate Student Researcher, Advisor: Dr. Brendan Bowler**

Austin, TX

2017–2019

Department of Astronomy, The University of Texas at Austin

- Characterized the physical and empirical properties of a candidate benchmark brown dwarf companion in the  $\beta$  Pictoris Moving Group

## REFEREED PUBLICATIONS

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**Phillips, C.**, Wang, J., Kendrew, S., Greene, T., Hu, R., Valenti, J., Panero, W., Schulze, J., 2021, The Astrophysical Journal, 923, 144, *Detecting Biosignatures in the Atmospheres of Gas Dwarf Planets with the James Webb Space Telescope*

**Phillips, C.**, Bowler, B., Mace, G., Liu, M., Sokal, K., 2020, The Astrophysical Journal, 896, 173, *2MASS J04435686+3723033 B: A Young Companion at the Substellar Boundary with Potential Membership in the  $\beta$  Pictoris Moving Group*

## NON-REFEREED PUBLICATIONS

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**Phillips, C.**, Wang, J., Edwards, B., Rodriguez Martinez, R., Pai Asnodkar, A., BS, Gaudi, *Is LTT 1445 Ab a Hycean World or a cold Haber World? Exploring the Potential of Twinkle to Unveil Its Nature*, in review

Stotesbury, I., Edwards, B., ABB, et al., incl **Phillips, C.**, 2022, *Twinkle - a small satellite spectroscopy mission for the next phase of exoplanet science*

## GRANTS & DISTINCTIONS

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|  |      |
|--|------|
| • University of California Santa Cruz Other Worlds Laboratory Mini Grant (\$3150)  | 2023 |
| • AAS International Travel Grant   | 2022 |
| • Underrepresented Minority Communities in Planetary Science Travel Grant (\$2200) | 2022 |
| • Forming and Exploring Worlds Bursary Award (£500)                                | 2022 |
| • Sigma Xi Grant-In-Aid of Research (\$3426)                                       | 2022 |
| • AAS FAMOUS Travel Grant (\$1000)   | 2022 |
| • Two Sigma Diversity PhD Research Grant (\$2000)                                  | 2021 |
| • Inclusive Graduate Education Network Travel Award                                | 2019 |

## PROFESSIONAL SERVICE GRANTS

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→ **Heising-Simons Foundation Grant (\$100,000, PI)** #BlackSpaceWeek: A week dedicated to celebrating and amplifying Black scientists and engineers within the space community. Funding to support 2023 and 2024 #BlackSpaceWeek programming.

→ **The Ohio State University, College of Arts & Sciences Graduate Student Success Grant (\$2500, PI)** Funding to support inaugural Black In Astro undergraduate research competition and travel grants to the American Astronomical Society conference

## AWARDS & HONORS

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|  |      |
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| • Kavli Fellow   | 2023 |
| • Royal Astronomical Society Annie Maunder Medal for Outreach to #BlackInAstro team    | 2023 |
| • Beth Brown Memorial Award for Best Oral Presentation (NSBP/AAS)                      | 2022 |
| • Ann S. Tuttle Citizenship, Engagement, and Outreach Prize (OSU)                      | 2022 |
| • Ford Foundation Predoctoral Fellowship – Honorable Mention                           | 2022 |
| • 2 <sup>nd</sup> place BlackInX Interdisciplinary Twitter Research Poster Competition | 2021 |
| • Hayes Graduate Research Forum Mathematical and Physical Sciences -Third Place (OSU)  | 2021 |

|  |           |
|--|-----------|
| • Two Sigma Diversity PhD Fellowship Finalist  | 2021      |
| • ExoExplorers Program (ExoPAG Executive Committee/NASA Exoplanet Exploration Program) | 2021      |
| • 3 <sup>rd</sup> place BlackInPhysics 3MT competition                                 | 2020      |
| • LSSTC Data Science Fellowship (Large Synoptic Survey Telescope Corporation)          | 2018      |
| • Dean's Strategic Fellowship (UT Austin)  | 2016      |
| • Astronomy Graduate Excellence Fellowship (UT Austin)                                 | 2016      |
| • Outstanding Senior Award (McNair Scholars Program)                                   | 2016      |
| • Ronald E. McNair Scholars Program (UALR)   | 2014-2016 |

## WORKSHOPS & SUMMER SCHOOLS

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|---|-------------|
| Cloud Academy III ( <i>Les Houches, France</i> )  | March 2023  |
| Other Worlds Laboratory Exoplanet Summer Program ( <i>UC Santa Cruz, Santa Cruz, CA</i> ) | Summer 2022 |
| NYC Gaia DR3 Fête ( <i>Flatiron Institute, NYC</i> )                                      | June 2022   |
| International High Performance Computing Summer School ( <i>Athens, Greece</i> )          | June 2022   |

## OBSERVING EXPERIENCE

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| Keck II, KPIC, Mauna Kea Observatory (remote observing)                  | 1 night  |
| LBT, MODS/LBC, Mount Graham International Observatory, (queue observing) | 8 nights |
| Keck II, NIRC2, LGS, Mauna Kea Observatory, (P.I. B. Bowler)             | 1 night  |

## TELESCOPE PROPOSALS

Large Binocular Telescope (PEPSI), *Constraining the Abundances of Solar-Type (FGK) Host Stars of Brown Dwarfs in the Solar Neighborhood - Pilot Study*, 5 hours awarded (PI), 2023A

## SEMINARS & COLLOQUIA

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|--|----------------|
| UC Berkeley Theoretical Astrophysics Center (TAC) Seminar Series ( <i>webinar</i> )      | April 2023     |
| UC Santa Cruz PLUNCH Seminar ( <i>webinar</i> )  | March 2023     |
| Case Western Reserve University Particle/Astro CERCA Seminar Series ( <i>webinar</i> )   | November 2022  |
| NASA GSFC Exoplanet Seminar Series ( <i>webinar</i> )                                    | June 2022      |
| University of Delaware Astro Seminar ( <i>webinar</i> )                                  | May 2022       |
| CCA Astronomical Data Meeting (New York City, New York)                                  | March 2022     |
| University of Kansas Astronomy and Space Physics Seminar ( <i>webinar</i> )              | January 2022   |
| STScI Exoplanet, Star, and Planet Formation Seminar Series ( <i>webinar</i> )            | January 2022   |
| The Pennsylvania State University CEHW Astronomy Seminar ( <i>webinar</i> )              | November 2021  |
| National Society of Black Physicists Innovate Seminar Series ( <i>webinar</i> )          | September 2021 |
| American Physical Society: "Quarks to Cosmos" ( <i>webinar</i> )                         | April 2021     |
| NASA JPL Exoplanet Seminar ( <i>webinar</i> )  | March 2021     |
| Exoplanet Explorers (ExoExplorers) Science Series ( <i>webinar</i> )                     | February 2021  |
| College of Charleston, Department of Physics and Astronomy Colloquium ( <i>webinar</i> ) | October 2020   |

## CONFERENCE RESEARCH TALKS (\*INVITED)

\*Astrobiology/JWST Session, National Academy of Sciences Kavli Frontiers in Science Symposium, 2023, Irvine, California

The Atmospheric Retrieval of a Planetary-Mass Companion (contributed talk), *Great Lakes Exoplanet Area Meeting (GLEAM)*, November 2022, Columbus, Ohio

Is LTT 1445 Ab a Cold Habitable World or a Hycean World?: An Exploration with Twinkle (contributed talk), *National Society of Black Physicists Meeting*, November 2022, Charlottesville, Virginia

Is LTT 1445 Ab a Cold Habitable World or a Hycean World?: An Exploration with Twinkle (contributed talk), # 54<sup>th</sup> *Division of Planetary Science Meeting*, October 2022, London, Ontario

Is LTT 1445 Ab a Cold Habitable World or a Hycean World?: An Exploration with Twinkle (contributed talk), *Emerging Researchers in Exoplanet Science (ERES) Conference VII*, August 2022, Pennsylvania State University

\*Detectability of Biosignatures in Temperate Gas Dwarfs with Twinkle (contributed talk), *Twinkle and the Next Generation of Exoplanet Scientists Conference*, September 2021

Detecting Biosignatures in the Atmospheres of Gas Dwarf Planets with the James Webb Space Telescope (contributed talk), *AbGradCon*, September 2021

Constraining Detection Limits for Potential Biosignatures in super-Earth Atmospheres with JWST (contributed talk), *ExoPAG 23*, January 2021, virtual due to COVID-19

Detecting Biosignatures in the Atmospheres of Gas Dwarf Planets with the James Webb Space Telescope (contributed talk), *Bay Area Exoplanet Meeting*, June 2021, virtual due to COVID-19

Constraining Detection Limits for Potential Biosignatures in super-Earth Atmospheres with JWST (contributed talk), *National Society of Black Physicists*, November 2020, virtual due to COVID-19

2M0443+3723 B: A Young Companion at the Substellar Boundary with Potential Membership in the  $\beta$  Pictoris Moving Group (contributed talk), *National Society of Black Physicists*, November 2019, Providence, RI

Detecting Biosignatures in the Atmospheres of Gas Dwarf Planets with the James Webb Space Telescope, *Edward F. Hayes Graduate Research Forum*, April 2021

Can We Detect Ammonia in the Atmospheres of super-Earths with the James Webb Space Telescope?, *Black In Physics 3MT Competition*, October 2020

## RESEARCH POSTERS

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**“Retrieval of the BD+60 1417 B system: A nearby planetary-mass companion”**, *American Astronomical Society, AAS Meeting #241*, January 2023

**“Is LTT 1445 Ab a Hycean World or a cold Habitable World? Exploring the Potential of Twinkle to Unveil its Nature”**, *Black In Physics Poster Session*, October 2022

**“Exploring the Lower Boundary of the Radius Valley with Twinkle: Studying Atmospheric Composition and Detecting Biosignatures of a Terrestrial-like planet LTT 1445 Ab”**, *Forming and Exploring Habitable Worlds*, November 2022 (virtual)

**“A Data Driven Approach to Unlocking Planet Formation: The Atmospheric Retrieval of the BD+60 1417 System”** (Toulouse, France) - Cool Stars Conference, July 2022

**“A Data Driven Approach to Unlocking Planet Formation: The Atmospheric Retrieval of the BD+60 1417 System”** (Athens, Greece) - International High Performance Computing Summer School, June 2022

**“Detecting Biosignatures in the Atmospheres of Gas Dwarf Planets with the James Webb Space Telescope”** (Virtual) - BlackInX Conference, July 2021

**“Characterizing a New Candidate Benchmark Brown Dwarf Companion in the  $\beta$  Pic Moving Group”** (National Harbor, Maryland) - American Astronomical Society, AAS Meeting #231, January 2018

## DEI & OUTREACH CONFERENCE CONTRIBUTIONS

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**#AbolishQuals: Barriers to Success for Graduate Students of Color in Astronomy** (Seattle, Washington), American Astronomical Society #241<sup>th</sup> Meeting - special session, January 2023

**The ExoExplorers: Early-Career Perspectives on the Intersection of Exoplanet Science and DEIA in Astronomy** (Seattle, Washington), American Astronomical Society #241<sup>th</sup> Meeting - special session, January 2023

**The Impact of Grassroot Organizations: A Tale of the Retention through the Black Space Community** (Ashley L. Walker, **Phillips, C**, Ronald S. Gamble Jr., Bryne Hadnott, KeShawn Ivory, Dakotah Tyler, Robert Washington III), (Seattle, Washington), American Astronomical Society #241<sup>th</sup> Meeting, iPoster, January 2023

**Black In Astro: A Grassroots Organization to Celebrate and Amplify the Black Experience in Space-Related Fields** (Columbus, Ohio), Great Lakes Exoplanet Area Meeting (GLEAM), November 2022

**"Equity & Inclusivity Efforts of the Department of Astronomy at The University of Texas at Austin"** (Austin, Texas) - Women in Astronomy IV Conference, July 2017

## TEACHING APPOINTMENTS

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- **Academic Facilitator, URSA Program** Columbus, OH  
*Polaris Program, The Ohio State University* Summer 2021 & Summer 2022  
⇒ Created and implemented physics and astronomy curriculum, along with teaching and leading discussions during daily courses focused on exoplanets for incoming underrepresented first-year undergraduates to OSU
- **Teaching Assistant, ASTR 1141, "Life in the Universe"** Columbus, OH  
*Department of Astronomy, The Ohio State University* Fall 2020 & Spring 2021  
⇒ Introductory course with focus on astrobiology and nature of life in the universe
- **Teaching Assistant, ASTR 3350, "Astronomical Observation and Data Analysis"** Columbus, OH  
*Department of Astronomy, The Ohio State University* Fall 2020  
⇒ Undergraduate course with focus on modern astronomy with contemporary data analysis methods implemented in the Python programming language
- **Teaching Assistant, ASTR 309N, "Lives and Deaths of Stars"** Austin, TX  
*Department of Astronomy, The University of Texas at Austin* Spring 2019  
⇒ Undergraduate course on supernovas, white dwarfs, neutron stars, and black holes
- **Teaching Assistant, ASTR 321, "The Future of Humanity"** Austin, TX  
*Department of Astronomy, The University of Texas at Austin* Spring & Fall 2018  
⇒ Upper-division undergraduate writing astronomy course based on technological advancement. Graded and provided constructive feedback on written assignments
- **Teaching Assistant, ASTR 309C, "Birth of Stars & Planets"** Austin, TX  
*Department of Astronomy, The University of Texas at Austin* Fall 2017  
⇒ Undergraduate astronomy course focused on star & planet formation

## ADVISING & MENTORING

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- **Simons-NSBP Scholars Program** New York, NY  
*Graduate Fellow— informal mentor to undergraduate scholars* Summer 2022
- **The SciAccess Zenith Mentorship Program** Columbus, OH  
*Informal graduate student mentor for high school student in Space Science Mentoring Program* Fall 2020

- **TAURUS Summer Research Program** Austin, TX
- *Informal graduate student mentor and developed imposter syndrome graduate student panel seminar* 2017-2018

## PROFESSIONAL SERVICE

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- **Black In Astro** 2020 - Present
- *Vice-president of [BlackInAstro](#)*
- **Executive Secretary** 2021, 2022
- *NASA Review Panel*
- **Black In Physics** 2021, 2022
- *Documentation lead for Black In Physics Week*
- **The Ohio State University Department of Astronomy Diversity Committee** 2019 - Present
- *Graduate student representative*

## PRESS/MEDIA COVERAGE

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- Royal Astronomical Society Unviels 2023 Award Winners ([Link](#)) 2023
- The Representation of Blackness in Astronomy - Nature Astronomy Q&A ([Link](#)) 2022
- Beth Brown Memorial Award Winners for 2022 ([Link](#)) 2022
- Astrobits: It's #BlackSpaceWeek 2022 ([Link](#)) 2022
- AAS NOVA: Atmospheres of Small Planets Through a Big Telescope ([Link](#)) 2022
- Astrobits: Atmospheres of Small Planets Through a Big Telescope ([Link](#)) 2021
- Popular Science Magazine Interview* ([Link](#)) 2021
- Exploring Potential Biosignatures with Twinkle* ([Link](#)) 2021
- 'Twinkle' satellite to scan for potentially habitable worlds* ([Link](#)) 2021
- Scientists May Detect Signs of Extraterrestrial Life in the Next 5 to 10 Years* ([Link](#)) 2021
- Astrobits: #BlackInAstro Experiences - Caprice Phillips ([Link](#)) 2021
- AAS Journal Author Series ([Youtube Video](#)) 2020

## INVITED OUTREACH

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- **Panelist for Space Balls Monthly Movie Nights - Science Fiction vs Science Fact** Virtual
- *Invited panelist guest to discuss Space Balls movie and exoplanets* November 2022
- **Black In Science Podcast** Virtual
- *Guest on podcast about being Black In Astronomy* November 2022
- **Friends of Ohio State Astronomy and Astrophysics (FOSAA) event** Virtual
- *"Detecting Potential Biosignatures in the Atmospheres of Gas Dwarfs with JWST"* October 2021
- **Columbus School for Girls** Virtual
- *Speaker on research and journey in astronomy* April 2021
- **The Big Fib Podcast** Virtual
- *Podcast featuring stars & planets* June 2021
- **Science Around Cincy** Columbus, OH
- *Invited Guest for YouTube series* June 2021
- **Dear Grad Student Podcast** Virtual
- *Guest on podcast discussing graduate school general experiences* September 2020
- **Space Draft: Tucson's Flavor of Astronomy on Tap** Virtual
- *Virtual public talk: "Super-Earths to Brown Dwarfs: Mysterious In-between Objects"* July 2020
- **Making Space for All Webinar Series** Virtual
- *Talk on exoplanets and habitability for inclusive and accessible astronomy webinar series* May 2020



- **Movement Consulting** Virtual  
Invited speaker for discussion of unspoken rules of academia July 2020

## INVITED PANELS

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- **Disney STRANGE WORLD Stem and Sci Fi Panel** Virtual  
Panelist on chat about the intersections between science fact and fiction November 2022
- **American Geological Union** Virtual  
Invited panelist for exoplanet science with JWST October 2021
- **APS Public Engagement Webinar Series** Virtual  
Invited panelist for talk on social media July 2021
- **Committee on the Status of Minorities in Astronomy AAS Panel** Columbus, OH  
Virtual Panelist for Anti-Blackness in Astronomy January 2021
- **BlackInPhysics Panel** Columbus, OH  
Virtual panelist for undergraduate discussion: "How to be a Successful Student" October 2020
- **Women in Space Panel** Virtual  
Live Q&A about astronomy careers for elementary, middle and high school students September 2020

## SELECTED OUTREACH

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- **Case Western University - Physics Underrepresented Minority Students Group** Virtual  
Online Q&A for undergraduates and graduate students about graduate school journey and experiences October 2022
- **Black In Astro Undergraduate Research Competition** Virtual  
Co-organized & moderated undergraduate research competition November 2021
- **StriveHigher Inc** Virtual  
Women's Herstory month: meet an astrophysicist and astronomer March 2021
- **Girls in STEM Program: Sponsored by the Museum of Discovery** Virtual  
Presented a mentoring talk with girls aged 12-15 March 2021
- **Q&A Session with JWST** Virtual  
Instagram outreach for JWST February 2021
- **Westview High School** Virtual  
Discussed with high school physics class about astronomy career February 2021
- **The Women+ of Color Project** Virtual  
Volunteer statement of purpose reading/feedback for program attendees October 2020
- **The Columbus Astronomical Society** Virtual  
Presented a virtual talk with graduate students on the history of women in astronomy March 2020
- **Sequoia and Kings Canyon National Park** Mineral King, CA  
Designed evening program on natural skies & pop-up activities on natural skies & natural sounds Summer 2019
- **UT Austin College of Natural Sciences** Austin, TX  
Presented a poster on Black Women in Astronomy for the Black Excellence in STEM Festival 2019
- **Capital of Texas Undergraduate Research Conference** Austin, TX  
Graduate student judge 2018

## SCIENTIFIC COLLABORATIONS

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Twinkle Science Consortium, The Keck Planet Imager and Characterizer (KPIC) Team

# PROFESSIONAL SOCIETIES

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| American Astronomical Society        | Junior Member |
| National Society of Black Physicists | Full Member   |
| Division of Planetary Sciences       | Junior member |