

Caprice L. Phillips

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RESEARCH INTERESTS

I am interested in brown dwarf and exoplanet atmosphere characterization. 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

- **The Ohio State University** Columbus, OH
Ph.D. Astronomy *Expected 2025*
- *Graduate Certificate In College Education and University Teaching (In Progress)*
M.S. Astronomy *August 2022*
- **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 β Pictoris Moving Group*
- **University of Arkansas at Little Rock** Little Rock, AR
B.S. Physics; Minor: Mathematics *December 2015*

RESEARCH POSITIONS

- **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 dwarfs
- **Graduate Student Researcher, Advisor: Dr. Ji Wang** Columbus, OH
Department of Astronomy, The Ohio State University *2021–Present*
 - Investigating whether biosignatures on temperate gas dwarfs/terrestrial-like planets are detectable with the upcoming *Twinkle* space mission
 - Determining suitable targets for observations for *Twinkle*
- **Graduate Student Researcher, Advisor: Dr. Ji Wang** Columbus, OH
Department of Astronomy, The Ohio State University *2019–2021*
 - Investigated whether biosignatures on gas dwarfs are detectable with the MIRI, NIRSpec, and NIRISS instruments on the upcoming *JWST* mission
- **Graduate Student Researcher, Advisor: Dr. Brendan Bowler** Austin, TX
Department of Astronomy, The University of Texas at Austin *2017–2019*
 - Characterized the physical and empirical properties of a candidate benchmark brown dwarf companion in the β Pictoris Moving Group

GRANTS & DISTINCTIONS

◦ 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
◦ OSU College of Arts & Sciences, ASC Graduate Student Success Grant (\$2500)	2021
◦ Two Sigma Diversity PhD Research Grant (\$2000)	2021
◦ Inclusive Graduate Education Network Travel Award	2019

AWARDS & HONORS

◦ Ford Foundation Predoctoral Fellowship – Honorable Mention	2022
◦ 2 nd 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 rd 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

International HPC Summer School (<i>Athens, Greece</i>)	June 2022
Other Worlds Laboratory Exoplanet Summer Program (<i>UC Santa Cruz, Santa Cruz, CA</i>)	Summer 2022

OBSERVING EXPERIENCE

Keck II, NIRC2, LGS, Mauna Kea Observatory, (P.I. B. Bowler)	1 night
LBT, MODS/LBC, Mount Graham International Observatory, (Queue Observing)	8 nights

REFEREED PUBLICATIONS

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

Phillips, C., Wang, J., Edwards, B., Rodriguez Martinez, R., BS, Gaudi, Is LTT 1445 Ab a Hycean World or a Cold Haber World?: An Exploration with Twinkle, in prep

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

Walker, Ashley and Woods, Paul, 2022, Nature Astronomy, *The Representation of Blackness in Astronomy* – part of Q&A featuring Black In Astro leadership team

SEMINARS & COLLOQUIA

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)

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

Is LTT 1445 Ab a Cold Habitable World or a Hycean World?: An Exploration with Twinkle (contributed talk), # 54th 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 β 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

“A Data Driven Approach to Unlocking Planet Formation: The Atmospheric Retrieval of the BD+60 1417 System” (Toulouse, France) - Cool Stars 21, 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 β Pic Moving Group” (National Harbor, Maryland) - American Astronomical Society, AAS Meeting #231, January 2018

DEI & OUTREACH CONFERENCE CONTRIBUTIONS

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

“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

- **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

- **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

- **BlackInAstro**
Vice-president of [BlackInAstro](#) 2020 - Present
- **Executive Secretary**
NASA Review Panel 2021, 2022
- **American Physical Society**
Steering committee for Joint Network for Informal Physics Education and Research 2021 - Present
- **Black In Physics**
Documentation lead for Black In Physics Week 2021 - Present
- **The Ohio State University Department of Astronomy Diversity Committee**
Graduate student representative 2019 - Present

PRESS/MEDIA COVERAGE

- AAS NOVA: Atmospheres of Small Planets Through a Big Telescope ([Link](#)) 2022
- Astrobites: 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
- Astrobites: #BlackInAstro Experiences - Caprice Phillips ([Link](#)) 2021

INVITED OUTREACH

- **Black In Science Podcast** Virtual
Invited guest July 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
Invited speaker at the Columbus School for Girls April 2021
- **The Big Fib Podcast** Virtual
Invited guest on podcast featuring stars & planets June 2021
- **Science Around Cincy** Columbus, OH
Invited Guest for YouTube series June 2021
- **Dear Grad Student Podcast** Virtual
Invited guest on podcast discussing graduate school general experiences September 2020
- **Space Draft: Tucson's Flavor of Astronomy on Tap** Virtual
Invited speaker: Virtual public talk: "Super-Earths to Brown Dwarfs: Mysterious In-between Objects" July 2020

- **Making Space for All Webinar Series** Virtual
Invited for 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

- **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

- **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 James Webb Space Telescope 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
- **American Astronomical Society Journal Author Series** Virtual
Discussion of paper published by the American Astronomical Society Journals September 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

PROFESSIONAL SOCIETIES

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