

Caprice L. Phillips

Curriculum Vitae

The Ohio State University
Department of Astronomy
140 W. 18th Ave
McPherson Laboratory 4029
Columbus, OH, 43210

Email: phillips.1622@buckeyemail.osu.edu

Website: capricephillips.github.io

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 planetary - mass brown dwarfs and explore biosignatures and 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 March 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**
The Ohio State University & American Museum of Natural History 2022-present
 - Using *Brewster* to robustly decouple temperature, gravity, composition, and cloud properties for planetary mass brown dwarfs
 - Exploring atmospheric properties of substellar companions to probe planetary formation mechanisms
- **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*
 - Exploring properties of clouds and/or hazes on Sub-Neptunes and how they change with temperature
- **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
◦ College of Arts, Letters, and Sciences Ambassador (UALR)	2014-2015
◦ Friday Fellows Scholarship Program for Leadership and Service (UALR)	2012-2014
◦ Shepherd Poverty Studies Intern (UALR)	2013

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 β 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*

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>virtual</i>)	October 2022
NASA GSFC Exoplanet Seminar Series (<i>virtual</i>)	June 2022
University of Delaware Astro Seminar (<i>virtual</i>)	May 2022
CCA Astronomical Data Meeting (New York City, New York)	March 2022
University of Kansas Astronomy and Space Physics Seminar (<i>virtual</i>)	January 2022
STScI Exoplanet, Star, and Planet Formation Seminar Series (<i>virtual</i>)	January 2022
The Pennsylvania State University CEHW Astronomy Seminar (<i>virtual</i>)	November 2021
National Society of Black Physicists Innovate Seminar Series (<i>virtual</i>)	September 2021
American Physical Society: “Quarks to Cosmos” (<i>virtual</i>)	April 2021
NASA JPL Exoplanet Seminar (<i>virtual</i>)	March 2021
Exoplanet Explorers (ExoExplorers) Science Series (<i>virtual</i>)	February 2021
College of Charleston, Department of Physics and Astronomy Colloquium (<i>virtual</i>)	October 2020

CONFERENCE RESEARCH TALKS (*INVITED)

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

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, Edinburgh, UK

Is LTT 1445 Ab a Cold Haber 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 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
 - Graduate TA for undergraduate 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
 - Graduate TA for 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
 - Graduate TA for undergraduate course on supernovas, white dwarfs, neutron stars, and black holes

Teaching Assistant, ASTR 321, “The Future of Humanity”

Department of Astronomy, The University of Texas at Austin

Austin, TX

Spring & Fall 2018

- Graduate TA for 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

Fall 2017

Department of Astronomy, The University of Texas at Austin

- Graduate TA for undergraduate astronomy course focused on star & planet formation

ADVISING & MENTORING

• Simons-NSBP Scholars Program

New York, NY

Summer 2022

Graduate Fellow—informal mentor to undergraduate scholars

• The SciAccess Zenith Mentorship Program

Columbus, OH

Fall 2020

Informal graduate student mentor for high school student in Space Science Mentoring Program

• TAURUS Summer Research Program

Austin, TX

Informal graduate student mentor and developed imposter syndrome graduate student panel seminar 2017-2018

PROFESSIONAL SERVICE

• BlackInAstro

2020 - Present

Vice-president of [BlackInAstro](#)

• Executive Secretary

2021, 2022

NASA Review Panel

• American Physical Society

2021 - Present

Steering committee for Joint Network for Informal Physics Education and Research

• Black In Physics

2021 - Present

Documentation lead organizer for Black In Physics Week 2021

• The Ohio State University Department of Astronomy Diversity Committee

2019 - 2022

Graduate student representative

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

REFERENCES

Ji Wang (email: wang.12220@osu.edu)
 Department of Astronomy
 The Ohio State University
 McPherson Laboratory 140 West 18th Avenue
 Columbus OH, 43210-1173

Jackie Faherty (email: jfaherty17@gmail.com)
 American Museum of Natural History
 Department of Astrophysics
 79th Street and Central Park West
 New York, NY 10023