

# Jonathan Brande

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PhD Candidate, Department of Physics and Astronomy, University of Kansas

## Education

2020 – (**Expected 2025**): PhD Physics, Dept. of Physics & Astronomy, University of Kansas

2020 – (**Expected 2024**): MS Computational Physics, Dept. of Physics & Astronomy,  
University of Kansas

2013 – 2017: BS Astronomy, Minor Computer Science, Dept. of Astronomy, University of  
Maryland, College Park

## Research and Employment

### 2020 – Present: PhD Research - KU Dept. of Physics & Astronomy

Characterization of transiting planets in the Neptune Desert with transmission spectroscopy from ground and space. Discovered evidence of water vapor on warm Neptune TOI-674 b. Contributing to Eureka!, a JWST time-series spectroscopic reduction/analysis pipeline and applying it to JWST data through the Transit-ERS team. Advisor - Prof. Ian Crossfield

### Fall 2020: Graduate TA - KU Dept. of Physics & Astronomy

Taught, graded three sections of introductory physics labs. Supervisor - Prof. Jennifer Delgado

### 2018 – 2020: Faculty Research Asst. - NASA Goddard, UMD Dept. of Astronomy

Exoplanet tool development and validation for the [Exoplanet Modeling and Analysis Center](#). Advisor - Dr. Avi Mandell

Simulated the feasibility of using JWST/MIRI for direct imaging of gaseous planets around nearby M-dwarfs. Advisors - Dr. Thomas Barclay, Dr. Elisa Quintana

TESS planet discovery and characterization with lightcurve modeling and transit timing variation analyses of TESS targets, including the L98-59 system. Advisors - Dr. Thomas Barclay, Dr. Elisa Quintana

### 2017 – 2018: Undergraduate Research - UMD Dept. of Astronomy

Efficient algorithms for representing the complex gravity fields of asteroids using analytic evaluations of the gravity of cubic mass elements. Advisor - Prof. Doug Hamilton

Astronomy Education Tools - Also produced a 3-D orbital visualization tool for the Department's Astronomy Workshop website, to support Dr. Hamilton's astronomy education efforts.

### 2017: Undergraduate Tutoring Coordinator - UMD Dept. of Astronomy

4 hours/wk tutoring, acting tutor/faculty liaison, scheduled student tutoring hours.

### 2016: NASA Space Grant Intern, Harvard/Smithsonian CfA, Chandra X-Ray Center

Developed 3D telemetry display to allow at-a-glance health and status diagnostics of Chandra spacecraft. - Supervisor - Mark Baski

### 2013 – 2015: Summer Intern, Engineering and Innovative Technology Development Lab, Univ. Alabama at Birmingham

Developed telemetry monitoring software to support UAB-developed "Polar" cold stowage hardware. Supervisor - Dr. Lee Moradi

## Publications

refereed: 16 / first author: 2 / citations: 268 / h-index: 8 (2023-04-04)

### First-Author Publications

**Brande, Jonathan**; Crossfield, Ian J. M.; Kreidberg, Laura; Oklopčić, Antonija; *et al.*, 2022, [A Mirage or an Oasis? Water Vapor in the Atmosphere of the Warm Neptune TOI-674 b](#), The Astronomical Journal, **164**, 197 (arXiv:2201.04197) [5 citations]

**Brande, Jonathan**; Barclay, Thomas; Schlieder, Joshua E.; Lopez, Eric D.; & Quintana, Elisa V., 2020, [The Feasibility of Directly Imaging Nearby Cold Jovian Planets with MIRI/JWST](#), The Astronomical Journal, **159**, 18 (arXiv:1911.02022) [7 citations]

### Refereed Publications

JWST Transiting Exoplanet Community Early Release Science Team; Ahrer, Eva-Maria;

Alderson, Lili; Batalha, Natalie M.; *et al.* (incl. **Brande, J.**), 2023, [Identification of carbon dioxide in an exoplanet atmosphere](#), Nature, **614**, 649 (arXiv:2208.11692) [30 citations]

Rustamkulov, Z.; Sing, D. K.; Mukherjee, S.; May, E. M.; *et al.* (incl. **Brande, J.**), 2023, [Early Release Science of the exoplanet WASP-39b with JWST NIRSpec PRISM](#), Nature, **614**, 659 (arXiv:2211.10487) [17 citations]

Feinstein, Adina D.; Radica, Michael; Welbanks, Luis; Murray, Catriona Anne; *et al.* (incl. **Brande, J.**), 2023, [Early Release Science of the exoplanet WASP-39b with JWST NIRISS](#), Nature, **614**, 670 (arXiv:2211.10493) [9 citations]

Alderson, Lili; Wakeford, Hannah R.; Alam, Munazza K.; Batalha, Natasha E.; *et al.* (incl. **Brande, J.**), 2023, [Early Release Science of the exoplanet WASP-39b with JWST NIRSpec G395H](#), Nature, **614**, 664 (arXiv:2211.10488) [14 citations]

Ahrer, Eva-Maria; Stevenson, Kevin B.; Mansfield, Megan; Moran, Sarah E.; *et al.* (incl. **Brande, J.**), 2023, [Early Release Science of the exoplanet WASP-39b with JWST NIRCам](#), Nature, **614**, 653 (arXiv:2211.10489) [13 citations]

Bell, Taylor; Ahrer, Eva-Maria; **Brande, Jonathan**; Carter, Aarynn; *et al.*, 2022, [Eureka!: An End-to-End Pipeline for JWST Time-Series Observations](#), The Journal of Open Source Software, **7**, 4503 (arXiv:2207.03585) [6 citations]

Damiano, Mario; Hu, Renyu; Barclay, Thomas; Zieba, Sebastian; *et al.* (incl. **Brande, J.**), 2022, [A Transmission Spectrum of the Sub-Earth Planet L98-59 b in 1.1-1.7  \$\mu\$ m](#), The Astronomical Journal, **164**, 225 (arXiv:2210.10008) [3 citations]

**Brande, Jonathan**; Crossfield, Ian J. M.; Kreidberg, Laura; Oklopčić, Antonija; *et al.*, 2022, [A Mirage or an Oasis? Water Vapor in the Atmosphere of the Warm Neptune TOI-674 b](#), The Astronomical Journal, **164**, 197 (arXiv:2201.04197) [6 citations]

Crossfield, Ian J. M.; Malik, Matej; Hill, Michelle L.; Kane, Stephen R.; *et al.* (incl. **Brande, J.**), 2022, [GJ 1252b: A Hot Terrestrial Super-Earth with No Atmosphere](#), The Astrophysical Journal, **937** (arXiv:2208.09479) [3 citations]

Renaud, Joe P.; Lopez, Eric; **Brande, Jonathan**; Cruz-Arce, Carlos E.; *et al.*, 2022, [The Exoplanet Modeling and Analysis Center at NASA Goddard](#), Research Notes of the American Astronomical Society, **6**, 185 (arXiv:2209.04005)

Caciapuoti, Luca; Kostov, Veselin B.; Kuchner, Marc; Quintana, Elisa V.; *et al.* (incl. **Brande, J.**), 2022, [The TESS Triple-9 Catalog: 999 uniformly vetted exoplanet candidates](#), Monthly

- Notices of the Royal Astronomical Society, **513**, 102 ([arXiv:2203.15826](#)) [5 citations]
- Kostov, Veselin B.; Kuchner, Marc J.; Caciapuoti, Luca; Acharya, Sovan; *et al.* (incl. **Brande, J.**), 2022, *Planet Patrol: Vetting Transiting Exoplanet Candidates with Citizen Science*, Publications of the Astronomical Society of the Pacific, **134**, 44401 [2 citations]
- Gilbert, Emily A.; Barclay, Thomas; Schlieder, Joshua E.; Quintana, Elisa V.; *et al.* (incl. **Brande, J.**), 2020, *The First Habitable-zone Earth-sized Planet from TESS. I. Validation of the TOI-700 System*, The Astronomical Journal, **160**, 116 ([arXiv:2001.00952](#)) [70 citations]
- Vidaurri, Monica; Wofford, Alia; **Brande, Jonathan**; Black-Planas, Gabriel; *et al.*, 2020, *Absolute Prioritization of Planetary Protection, Safety, and Avoiding Imperialism in All Future Science Missions: A Policy Perspective*, Space Policy, **51**, 101345 ([arXiv:1907.05834](#))
- Brande, Jonathan**; Barclay, Thomas; Schlieder, Joshua E.; Lopez, Eric D.; & Quintana, Elisa V., 2020, *The Feasibility of Directly Imaging Nearby Cold Jovian Planets with MIRI/JWST*, The Astronomical Journal, **159**, 18 ([arXiv:1911.02022](#)) [7 citations]
- Kostov, Veselin B.; Schlieder, Joshua E.; Barclay, Thomas; Quintana, Elisa V.; *et al.* (incl. **Brande, J.**), 2019, *The L 98-59 System: Three Transiting, Terrestrial-size Planets Orbiting a Nearby M Dwarf*, The Astronomical Journal, **158**, 32 ([arXiv:1903.08017](#)) [81 citations]

## Preprints & White Papers

- Barclay, Thomas; Sheppard, Kyle B.; Latouf, Natasha; Mandell, Avi M.; *et al.* (incl. **Brande, J.**), 2023, *The transmission spectrum of the potentially rocky planet L 98-59 c*, ArXiv ([arXiv:2301.10866](#))

## Invited Talks

### *JWST's First Year of Science*

2023, Astronomical Society of Kansas City, March General Meeting.

### *Planets and Stars from Ground and Space: Research at the KU ExoLab*

2022, Exoplanet Seminar, Carnegie Institution for Science, Earth and Planets Laboratory.

### *Water Vapor in the Atmosphere of TOI-674 b*

2022, ExoCoffee, Atmospheric Physics of Exoplanets Dept., MPIA Heidelberg

### *Exoplanet Science With JWST*,

2021, Nebraska Physics & Astronomy Summit, University of Nebraska, Lincoln

### *The Invisible Sky With JWST*,

2021, Ruckman Public Lecture, University of Nebraska, Lincoln

### *Exploring Exoplanets*,

2021, At-Home Planetarium Series, Fernbank Science Center

### *Exoplanets @ NASA*,

2020, Terrapin Astronomical Society, University of Maryland, College Park

### *The Feasibility of Directly Imaging Cold Planets with MIRI/JWST*,

2019, Sciences and Exploration Directorate Director's Seminar, NASA Goddard Space Flight Center

### *Planet Hunting with the James Webb Space Telescope*,

2019, University of Maryland Observatory Open House, University of Maryland, College Park

## Proposals Awarded Time

IRTF 2021A027 (PI: Crossfield) *The Helium Exosphere of a TESS-Discovered Warm Neptune* - 3 half-nights

HST Cycle 27, GO 15856 (PI: Barclay), *Searching for Secondary Atmospheres in a System of Benchmark Worlds* - 28 orbits

## Professional Service & Outreach Efforts

[Astrobites Science Writer](#), 2022 – Present

Letters to a Pre-Scientist Pen Pal, 2022 – Present

KU Astronomy Nights, Public Telescope Observing and Planetarium Shows, 2021 – Present

Referee: The Astronomical Journal

Graduate Student Representative, Dept. of Physics & Astronomy Department Assembly, 2021 – Present

Executive Secretary: TESS GI Program, NASA-ROSES XRP

LOC, NASA GSFC SEEC Symposium 2019: “Rocky Exoplanets in the Era of JWST: Theory and Observation”

International Observe the Moon Night, NASA GSFC, 2019

Apollo 50 Festival, National Mall, NASA GSFC, 2019

Great American Eclipse, Camp Ramah Darom, GA, 2017