Jonathan Brande

jbrande@ku.edu, jbrande.github.io

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

Education

2020 – Present: PhD Physics, University of Kansas, Dept. of Physics & Astronomy

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

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. Developing `Eureka!`, a JWST time-series spectroscopic reduction/analysis pipeline and applying it to JWST data through the Transit-ERS team. Advisor - Dr. Ian Crossfield

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

Taught, graded three sections of introductory physics labs.

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 L 98-59 and TOI-700 systems. 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 - Lee Moradi

Publications

refereed: 11 / first author: 2 / citations: 203 / h-index: 6 (2023-01-31)

Refereed publications

11 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 μm*, The Astronomical Journal, **164**, 225 (arXiv:2210.10008) [3 citations]

10 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) [4 citations]

9 **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]

8 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) [2 citations]

7 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)

6 Cacciapuoti, 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) [2 citations]

5 Kostov, Veselin B.; Kuchner, Marc J.; Cacciapuoti, 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

4 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) [67 citations]

3 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)

2 **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]

1 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) [78 citations]

Preprints & white papers

7 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)

6 Feinstein, Adina D.; Radica, Michael; Welbanks, Luis; Murray, Catriona Anne; *et al.* (incl. **Brande, J.**), 2022, *Early Release Science of the exoplanet WASP-39b with JWST NIRISS*, ArXiv (arXiv:2211.10493) [3 citations]

5 Rustamkulov, Z.; Sing, D. K.; Mukherjee, S.; May, E. M.; *et al.* (incl. **Brande, J.**), 2022, *Early Release Science of the exoplanet WASP-39b with JWST NIRSpec PRISM*, ArXiv

(arXiv:2211.10487) [6 citations]

4 Alderson, Lili; Wakeford, Hannah R.; Alam, Munazza K.; Batalha, Natasha E.; *et al.* (incl. **Brande, J.**), 2022, *Early Release Science of the Exoplanet WASP-39b with JWST NIRSpec G395H*, ArXiv (arXiv:2211.10488) [5 citations]

3 Ahrer, Eva-Maria; Stevenson, Kevin B.; Mansfield, Megan; Moran, Sarah E.; *et al.* (incl. **Brande, J.**), 2022, *Early Release Science of the exoplanet WASP-39b with JWST NIRCam*, ArXiv (arXiv:2211.10489) [5 citations]

2 The JWST Transiting Exoplanet Community Early Release Science Team; Ahrer, Eva-Maria; Alderson, Lili; Batalha, Natalie M.; *et al.* (incl. **Brande, J.**), 2022, *Identification of carbon dioxide in an exoplanet atmosphere*, ArXiv (arXiv:2208.11692) [15 citations]

Invited Talks

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

KU Public Astronomy Nights, 2021 – Present

Referee: The Astronomical Journal

Graduate Student Representative, Dept. of Physics & Astronomy Department Assembly, 2021 – 2022

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