Jonathan (Yoni) 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

2013 – 2017: BS Astronomy (w/ minor in Computer Science), Dept. of Astronomy, University of Maryland, College Park

Teaching

January 2024: Guest Lecturer - ASTR 391 - Introductory Astronomy
Kepler's Laws, planetary systems, and exoplanets.

November 2022: Guest Lecturer - ASTR 391 - Introductory Astronomy
Galaxies and the Milky Way.

Fall 2020: Graduate TA - KU Dept. of Physics & Astronomy
Taught, graded three sections of introductory physics labs. Supervisor - Prof. Jennifer Delgado

Mentorship

Curtis McLennan, KU Graduate Student, Phys/Astro Peer Mentor Program, Fall 2023 – Spring 2024

Benjamin Lofland, KU Undergraduate, *Transit Fitting Codes for TESS Planet Candidates*, Spring 2023

Kate Wienke, KU Undergraduate, *JWST/MIRI Exoplanet Phase Curves with `Eureka!`*, Fall 2022

Byron Morales-Maldonado, KU Graduate Student, Phys/Astro Peer Mentor Program, Fall 2021

Research and Employment

2020 – Present: PhD Research - KU Dept. of Physics & Astronomy
Characterization of transiting exo-Neptune atmospheres with transmission spectroscopy from *HST* and *JWST* and aerosol modeling. Developing `ExoHaze`, to allow for direct aerosol modeling in atmospheric retrievals. Contributing to `Eureka!`, the open-source *JWST* time-series reduction and analysis pipeline. Advisor - Prof. Ian Crossfield

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. Joshua Schlieder
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

Outreach Efforts

Earth Day, Kansas Geological Survey, April 27, 2024
Great American Eclipse, University of Kansas, April 8, 2024
Astrobites Science Writer, 2022 – 2024
Letters to a Pre-Scientist Pen Pal, 2022 – 2023
KU Astronomy Nights, Public Telescope Observing and Planetarium Shows, 2021 – Present
International Observe the Moon Night, NASA GSFC, 2019
Apollo 50 Festival, National Mall, NASA GSFC, 2019
Great American Eclipse, Camp Ramah Darom, GA, August 21, 2017

Professional Service

Astrobites Recruitment Committee Co-Chair, 2023 – 2024
Astrobites DEI Committee, 2023 – 2024
LOC, Physics and Astronomy Locally Organized Assembly (PALOOZA), University of Kansas, 2022
Referee: AAS Journals, Astronomy & Astrophysics
Officer, Graduate Student Organization, Dept. of Physics & Astronomy, 2021 – 2023
Graduate Student Representative, Dept. of Physics & Astronomy Department Assembly, 2021 – 2023
TAC Executive Secretary: TESS GI Program, NASA-ROSES XRP
LOC, NASA Goddard SEEC Symposium 2019: "Rocky Exoplanets in the Era of JWST: Theory and Observation"

Awards and Honors

Graduate Student Travel Award, Department of Physics & Astronomy, University of Kansas, 2024 - *$750*
Summer Graduate Research Scholarship, University of Kansas, 2023 - *$6,000*

Proposals Awarded Time

Keck/KPF 2024B-R306 (**PI: Brande**), *The Spin-Orbit Alignment of a Bright sub-Neptune System* - 0.5 nights

Keck/KPF NASA Key Strategic Mission Support - 2024A-N080 (PI: Crossfield), *A3C RVs: Atmospheres, Activity, Architectures, & Compositions of Sub-Neptunes with KPF* - 10 nights

WIYN/NEID 2024A-635910 (PI: Crossfield), *A3C RVs: Atmospheres, Activity, Architectures, & Compositions of Sub-Neptunes* - 1.24 nights

JWST Cycle 3, GO 5959 (PI: Feinstein), *KRONOS: Keys to Revealing the Origin and Nature Of sub-neptune Systems* - 130 hours

JWST Cycle 2, AR 3273 (PI: Stevenson), *Eureka!: An Open-Source Pipeline for JWST Time-Series Observations*

JWST Cycle 2, GO 3231 (PI: Crossfield), *Panchromatic Phase Curve of the Highest-S/N Hot Neptune* - 25 hours

JWST Cycle 2, AR 3207 (PI: Gao), *Lifting the Veil: An Open Source Haze Model for Exoplanet Atmospheric Characterization*

HST Cycle 28, GO 16448 (PI: Barclay), *Confirming a tentative detection of an atmosphere around a potentially rocky planet* - 8 orbits

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

IRTF 2021A027 (PI: Crossfield), *The Helium Exosphere of a TESS-Discovered Warm Neptune* - 1.5 nights

Observing Experience

Keck/KPF - 6 nights

Keck/NIRC2 - 2 nights

IRTF/iSHELL - 1.5 nights

Invited Talks

Aerosols and Observational Diversity
January 2025, ExoPAG 31

Aerosols and Observational Diversity
November 2024, UMD Astronomy Planet Lunch Seminar

Aerosols and Observational Diversity
September 2024, UT Austin Stars, Planets and ISM Seminar

Clouds and Clarity: Revisiting Atmospheric Feature Trends in Neptune-size Exoplanets
July 2024, Challenge Accepted: Linking Planet Formation with Present-Day Atmospheres, MPIA Heidelberg

Clouds and Clarity: Revisiting Atmospheric Feature Trends in Neptune-size Exoplanets
November 2023, `petitRADTRANS` Atmospheric Retrieval Workshop, MPIA Heidelberg.

Clouds and Clarity: Revisiting Atmospheric Feature Trends in Neptune-size Exoplanets
August 2023, JPL Virtual Exoplanet Lecture Series.

Clouds and Clarity: Revisiting Atmospheric Feature Trends in Neptune-size Exoplanets

May 2023, American Museum of Natural History, Astro-Seminar.

JWST's First Year of Science
March 2023, Astronomical Society of Kansas City, March General Meeting.

Planets and Stars from Ground and Space: Research at the KU ExoLab
December 2022, Exoplanet Seminar, Carnegie Institution for Science, Earth and Planets Laboratory.

Water Vapor in the Atmosphere of TOI-674 b
January 2022, ExoCoffee, Atmospheric Physics of Exoplanets Dept., MPIA Heidelberg

Exoplanet Science With JWST,
October 2021, Nebraska Physics & Astronomy Summit, University of Nebraska, Lincoln

The Invisible Sky With JWST,
October 2021, Ruckman Public Lecture, University of Nebraska, Lincoln

Exploring Exoplanets,
June 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

Conference Presentations

Brande, J, 2025, *Aerosols and Observational Diversity* (dissertation talk), AAS 245, 213.01D

Brande, J, 2024, *Aerosols and Observational Diversity*, Mid-America Regional Astronomy Conference

Brande, J; Crossfield, I; Kreidberg, L; *et al.*, 2024, *Clouds and Clarity: Revisiting Atmospheric Feature Trends in Neptune-size Exoplanets*, AAS 243, 230.02

Brande, J; Crossfield, I, 2023, *Clouds and Clarity: Revisiting Atmospheric Feature Trends in Neptune-size Exoplanets*, AAS 241, 151.06

Brande, J; Crossfield, I; Kreidberg, L; *et al.*, 2022, *A Mirage or an Oasis? Water Vapor in the Atmosphere of the Warm Neptune TOI-674 b*, AAS 240, 403.15

Brande, J; Barclay, T, 2020, *Constraining TESS Planet Masses with Transit-Timing Variations*, AAS 235, 174.06

Brande, J; Barclay, T; Lopez, E; Quintana, E, 2019, *The Feasibility of Directly Imaging Cold Planets with MIRI/JWST*, AAS 233, 402.02

Brande, J; Barclay, T; Lopez, E; Quintana, E, 2018, *The Feasibility of Directly Imaging Cold Planets with MIRI/JWST*, AGU Fall Meeting, P41E-3774

Publications

refereed: 22 / first author: 3 / citations: 1,207 / h-index: 14 (2025-01-20)

First-Author Publications [3]

1. **Brande, Jonathan**; Crossfield, Ian J. M.; Kreidberg, Laura; Morley, Caroline V.; *et al.*, 2024, *Clouds and Clarity: Revisiting Atmospheric Feature Trends in Neptune-size Exoplanets*, The Astrophysical Journal, **961** (arXiv:2310.07714)

2. **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]

3. **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 [18]

1. Hejazi, Neda; Crossfield, Ian J. M.; Souto, Diogo; **Brande, Jonathan**; *et al.*, 2024, *High-resolution Elemental Abundance Measurements of Cool JWST Planet Hosts Using AutoSpecFit: An Application to the Sub-Neptune K2-18b's Host M Dwarf*, The Astrophysical Journal, **973**, 31 (arXiv:2407.07869) [2 citations]

2. Carter, A. L.; May, E. M.; Espinoza, N.; Welbanks, L.; *et al.* (incl. **Brande, J.**), 2024, *A benchmark JWST near-infrared spectrum for the exoplanet WASP-39 b*, Nature Astronomy, **8**, 1008 (arXiv:2407.13893) [10 citations]

3. Powell, Diana; Feinstein, Adina D.; Lee, Elspeth K. H.; Zhang, Michael; *et al.* (incl. **Brande, J.**), 2024, *Sulfur dioxide in the mid-infrared transmission spectrum of WASP-39b*, Nature, **626**, 979 (arXiv:2407.07965) [22 citations]

4. Roy, Pierre-Alexis; Benneke, Björn; Piaulet, Caroline; Gully-Santiago, Michael A.; *et al.* (incl. **Brande, J.**), 2023, *Water Absorption in the Transmission Spectrum of the Water World Candidate GJ 9827 d*, The Astrophysical Journal, **954** (arXiv:2309.10845) [13 citations]

5. Hejazi, Neda; Crossfield, Ian J. M.; Nordlander, Thomas; Mansfield, Megan; *et al.* (incl. **Brande, J.**), 2023, *Elemental Abundances of the Super-Neptune WASP-107b's Host Star Using High-resolution, Near-infrared Spectroscopy*, The Astrophysical Journal, **949**, 79 (arXiv:2304.03808) [14 citations]

6. 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) [178 citations]

7. 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) [159 citations]

8. 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) [163 citations]

9. 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) [130 citations]

10. 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 NIRCam*, Nature, **614**, 653 (arXiv:2211.10489) [112 citations]

11. 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) [66 citations]

12. 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) [13 citations]

13. 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) [39 citations]

14. 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) [2 citations]

15. 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) [11 citations]

16. 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 [3 citations]

17. 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) [102 citations]

18. 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) [110 citations]

Preprints & White Papers

Kroft, Maxwell A.; Beatty, Thomas G.; Crossfield, Ian J. M.; Livesey, Joseph R.; *et al.* (incl. **Brande, J.**), 2025, A Pair of Dynamically Interacting Sub-Neptunes Around TOI-6054, ArXiv (arXiv:2501.09095)

Crossfield, Ian J. M.; Polanski, Alex S.; Robertson, Paul; Akana Murphy, Joseph; *et al.* (incl. **Brande, J.**), 2024, *OrCAS: Origins, Compositions, and Atmospheres of Sub-neptunes. I. Survey Definition*, ArXiv (arXiv:2411.16836)

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) [12 citations]