

# Dr. Joshua D. Lothringer

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Space Telescope Science Institute

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Last updated October 30, 2025

## Research Interests

Observing, modeling, and retrieving planetary, exoplanetary,  
brown dwarf, and stellar atmospheres.

## Positions

### Assistant Astronomer

01/2024 - Present

Space Telescope Science Institute  
Baltimore, MD

### Assistant Research Scientist

01/2025 - Present

William H. Miller III Department of Physics and Astronomy  
Johns Hopkins University  
Baltimore, MD

### Assistant Professor

08/2021-12/2023

Department of Physics  
Utah Valley University  
Orem, UT

### Postdoctoral Fellow

08/2019-08/2021

Department of Physics and Astronomy  
Johns Hopkins University  
Baltimore, MD

### Graduate Assistant/Associate

08/2014-08/2019

Lunar and Planetary Laboratory  
University of Arizona  
Tucson, AZ

### Command Controller

05/2012-08/2014

Mission Operations and Data Systems,  
Laboratory for Atmospheric and Space Physics  
University of Colorado at Boulder  
Boulder, CO

## Education

*Doctor of Philosophy*, Planetary Science

08/2014-08/2019

*Master of Science*, Planetary Science

12/2016

University of Arizona, Tucson, AZ

Advisor: Prof. Travis Barman

Dissertation: *Characterizing the Atmospheres of Planet Populations:  
From Sub-Jovian to Ultra-hot Jupiter Exoplanets*

Bachelor of Arts, Astronomy  
University of Colorado, Boulder CO  
Concentration: Astrophysics  
Minor: Philosophy

08/2010-12/2013

**Publications**  
*incl. submitted*

1. **Lothringer, J. D.**, Lowson, N., Fu, G. “The Library of Exoplanet Atmospheric Composition Measurements: Population Level Trends in Exoplanet Composition with ExoComp”, 2025, AJ, Accepted.
2. **Lothringer, J. D.**, Bennett, K. A., Sing, D. K., et al., “Refractory and Volatile Species in the UV-to-IR Transmission Spectrum of Ultra-hot Jupiter WASP-178b with HST and JWST”, 2025, AJ, 169, 274.
3. **Lothringer, J. D.**, Zhou, Y., Apai, D., et al., “Atmospheric Retrievals of the Phase-resolved Spectra of Irradiated Brown Dwarfs WD-0137B and EPIC-2122B”, 2024, ApJ, 968, 126.
4. **Lothringer, J.D.**, Sing, D. K., Rustamkulov, Z., et al. “UV absorption by silicate cloud precursors in ultra-hot Jupiter WASP-178b”, 2022, *Nature*, 604, 49.
5. **Lothringer, J.D.**, Rustamkulov, Z., Sing, D. K., et al. “A New Window into Planet Formation and Migration: Refractory-to-Volatile Elemental Ratios in Ultra-hot Jupiters”, 2021, ApJ, 914, 12.
6. **Lothringer, J.D.**, & Casewell, S. L. “Atmosphere Models of Brown Dwarfs Irradiated by White Dwarfs: Analogs for Hot and Ultrahot Jupiters”, 2020, ApJ, 905, 163.
7. **Lothringer, J.D.**, Fu, G., Sing, D. K., & Barman, T. S. “UV Exoplanet Transmission Spectral Features as Probes of Metals and Rainout”, 2020, ApJL, 898, L14.
8. **Lothringer, J.D.**, & Barman, T. S. “The PHOENIX Exoplanet Retrieval Algorithm and Using  $H^-$  Opacity as a Probe in Ultrahot Jupiters”, 2020, AJ, 159, 289.
9. **Lothringer, J.D.**, & Barman, T. “The Influence of Host Star Spectral Type on Ultra-hot Jupiter Atmospheres”, 2019, ApJ, 876, 69.
10. **Lothringer, J.D.**, Barman, T., & Koskinen, T. “Extremely Irradiated Hot Jupiters: Non-oxide Inversions,  $H^-$  Opacity, and Thermal Dissociation of Molecules”, 2018, ApJ, 866, 27.
11. **Lothringer, J.D.**, Benneke, B., Crossfield, I. J. M., et al. “An HST/STIS Optical Transmission Spectrum of Warm Neptune GJ 436b”, 2018, AJ, 155, 66.
12. Ashtari, R., Collins, S., Splinter, J., et al., “Heat Reveals What Clouds Conceal: Global Carbon & Longitudinally Asymmetric Chemistry on LTT 9779 b”, 2025, arXiv e-prints, arXiv:2510.04863.
13. Crossfield, I. J. M., Ahrer, E.-M., Brande, J., et al., “Mapping the SO<sub>2</sub> Shoreline in Gas Giant Exoplanets”, 2025, arXiv e-prints, arXiv:2509.14318.

14. Chachan, Y., **Lothringer, J.D.**, Inglis, J., et al., “Strong NUV Refractory Absorption and Dissociated Water in the Hubble Transmission Spectrum of the Ultra Hot Jupiter KELT-20 b”, 2025, *AJ*, 170, 234.
15. Bennett, K. A., MacDonald, R. J., Peacock, S., et al., “Additional JWST/NIRSpec Transits of the Rocky M Dwarf Exoplanet GJ 1132 b Reveal a Featureless Spectrum”, 2025, *AJ*, 170, 205.
16. Fu, G., Mukherjee, S., Stevenson, K. B., et al., “Overcast Mornings and Clear Evenings in Hot Jupiter Exoplanet Atmospheres”, 2025, *ApJL*, 989, L17.
17. Evans-Soma, T. M., Sing, D. K., Barstow, J. K., et al., “SiO and a super-stellar C/O ratio in the atmosphere of the giant exoplanet WASP-121 b”, 2025, *Nature Astronomy*, 9, 845.
18. Fu, G., Stevenson, K. B., Sing, D. K., et al., “Statistical Trends in JWST Transiting Exoplanet Atmospheres”, 2025, *ApJ*, 986, 1.
19. Gapp, C., Evans-Soma, T. M., Barstow, J. K., et al., “WASP-121 b’s Transmission Spectrum Observed with JWST/NIRSpec G395H Reveals Thermal Dissociation and SiO in the Atmosphere”, 2025, *AJ*, 169, 341.
20. Balmer, W. O., Kammerer, J., Pueyo, L., et al., “JWST-TST High Contrast: Living on the Wedge, or, NIRCarn Bar Coronagraphy Reveals CO<sub>2</sub> in the HR 8799 and 51 Eri Exoplanets’ Atmospheres”, 2025, *AJ*, 169, 209.
21. Amaro, R. C., Apai, D., Zhou, Y., et al., “Phase-resolved Hubble Space Telescope WFC3 Spectroscopy of the Weakly Irradiated Brown Dwarf GD 1400 and Energy Redistribution–Irradiation Trends in Six White Dwarf–Brown Dwarf Binaries”, 2025, *ApJ*, 979, 231.
22. Bennett, K. A., Sing, D. K., Stevenson, K. B., et al., “An HST Transmission Spectrum of the Closest M Dwarf Transiting Rocky Planet LTT 1445Ab”, 2025, *AJ*, 169, 111.
23. Pelletier, S., Benneke, B., Chachan, Y., et al., “CRIRES<sup>+</sup> and ESPRESSO Reveal an Atmosphere Enriched in Volatiles Relative to Refractories on the Ultrahot Jupiter WASP-121b”, 2025, *AJ*, 169, 10.
24. Sing, D. K., Evans-Soma, T. M., Rustamkulov, Z., et al., “An Absolute Mass, Precise Age, and Hints of Planetary Winds for WASP-121A and b from a JWST NIRSpec Phase Curve”, 2024, *AJ*, 168, 231.
25. Iskandarli, L., Farihi, J., **Lothringer, J. D.**, et al., “Novel constraints on companions to the Helix nebula central star”, 2024, *MNRAS*, 534, 3498.
26. French, J. R., Casewell, S. L., Amaro, R. C., et al., “The only inflated brown dwarf in an eclipsing white dwarf-brown dwarf binary: WD1032+011B”, 2024, *MNRAS*, 534, 2244.
27. Fu, G., Welbanks, L., Deming, D., et al., “Hydrogen sulfide and metal-enriched atmosphere for a Jupiter-mass exoplanet”, 2024, *Nature*, 632, 752.

28. Carter, A. L., May, E. M., Espinoza, N., et al., “A benchmark JWST near-infrared spectrum for the exoplanet WASP-39 b”, 2024, *Nature Astronomy*, 8, 1008.
29. Bell, T. J., Crouzet, N., Cubillos, P. E., et al., “Nightside clouds and disequilibrium chemistry on the hot Jupiter WASP-43b”, 2024, *Nature Astronomy*, 8, 879.
30. Amaro, R. C., Apai, D., Lew, B. W. P., et al., “Time-resolved Hubble Space Telescope Wide Field Camera 3 Spectrophotometry Reveals Inefficient Day-to-night Heat Redistribution in the Highly Irradiated Brown Dwarf SDSS 1557B”, 2024, *ApJ*, 966, 4.
31. Kirk, J., Stevenson, K. B., Fu, G., et al., “JWST/NIRCam Transmission Spectroscopy of the Nearby Sub-Earth GJ 341b”, 2024, *AJ*, 167, 90.
32. Powell, D., Feinstein, A. D., Lee, E. K. H., et al., “Sulfur dioxide in the mid-infrared transmission spectrum of WASP-39b”, 2024, *Nature*, 626, 979.
33. Brande, J., Crossfield, I. J. M., Kreidberg, L., et al., “Clouds and Clarity: Revisiting Atmospheric Feature Trends in Neptune-size Exoplanets”, 2024, *ApJL*, 961, L23.
34. Reggiani, H., Galarza, J. Y., Schlaufman, K. C., et al., “Insight into the Formation of  $\beta$  Pic b through the Composition of Its Parent Protoplanetary Disk as Revealed by the  $\beta$  Pic Moving Group Member HD 181327”, 2024, *AJ*, 167, 45.
35. May, E. M., MacDonald, R. J., Bennett, K. A., et al., “Double Trouble: Two Transits of the Super-Earth GJ 1132 b Observed with JWST NIRSpec G395H”, 2023, *ApJL*, 959, L9.
36. Lustig-Yaeger, J., Fu, G., May, E. M., et al., “A JWST transmission spectrum of the nearby Earth-sized exoplanet LHS 475 b”, 2023, *Nature Astronomy*, 7, 1317.
37. Roy, P.-A., Benneke, B., Piaulet, C., et al., “Water Absorption in the Transmission Spectrum of the Water World Candidate GJ 9827 d”, 2023, *ApJL*, 954, L52.
38. Coria, D. R., Crossfield, I. J. M., **Lothringer, J.D.**, et al. “The Missing Link: Testing Galactic Chemical Evolution Models with the First Multi-isotopic Abundances in Solar Twin Stars”, 2023, *ApJ*, 954, 121.
39. Coulombe, L.-P., Benneke, B., Challener, R., et al. “A broadband thermal emission spectrum of the ultra-hot Jupiter WASP-18b”, 2023, *Nature*, 620, 292.
40. van Sluijs, L., Birkby, J. L., **Lothringer, J.D.**, et al., “Carbon monoxide emission lines reveal an inverted atmosphere in the ultra hot Jupiter WASP-33 b consistent with an eastward hot spot”, 2023, *MNRAS*, 522, 2145.
41. Tsai, S.-M., Lee, E. K. H., Powell, D., et al., “Photochemically produced SO<sub>2</sub> in the atmosphere of WASP-39b”, 2023, *Nature*, 617, 483.

42. Grant, D., **Lothringer, J.D.**, Wakeford, H. R., et al., “Detection of Carbon Monoxide’s 4.6 Micron Fundamental Band Structure in WASP-39b’s Atmosphere with JWST NIRSpec G395H”, 2023, *ApJL*, 949, L15.
43. Moran, S. E., Stevenson, K. B., Sing, D. K., et al., “High Tide or Riptide on the Cosmic Shoreline? A Water-rich Atmosphere or Stellar Contamination for the Warm Super-Earth GJ 486b from JWST Observations”, 2023, *ApJL*, 948, L11.
44. Amaro, R. C., Apai, D., Zhou, Y., et al., “Hotter than Expected: Hubble Space Telescope (HST)/WFC3 Phase-resolved Spectroscopy of a Rare Irradiated Brown Dwarf with Strong Internal Heat Flux”, 2023, *ApJ*, 948, 129.
45. Gressier, A., Lecavelier des Etangs, A., Sing, D. K., et al., “The Hubble PanCET program: The near-ultraviolet transmission spectrum of WASP-79b”, 2023, *A&A*, 672, A34.
46. Feinstein, A. D., Radica, M., Welbanks, L., (**Lothringer, J.D. 1st tier**) et al., “Early Release Science of the exoplanet WASP-39b with JWST NIRISS”, 2023, *Nature*, 614, 670.
47. Alderson, L., Wakeford, H. R., Alam, M. K., (**Lothringer, J.D. 1st tier**) et al., “Early Release Science of the exoplanet WASP-39b with JWST NIRSpec G395H”, 2023, *Nature*, 614, 664.
48. Rustamkulov, Z., Sing, D. K., Mukherjee, S., (**Lothringer, J.D. 1st tier**) et al., “Early Release Science of the exoplanet WASP-39b with JWST NIRSpec PRISM”, 2023, *Nature*, 614, 659.
49. Ahrer, E.-M., Stevenson, K. B., Mansfield, M., et al., “Early Release Science of the exoplanet WASP-39b with JWST NIRCам”, 2023, *Nature*, 614, 653.
50. JWST Transiting Exoplanet Community Early Release Science Team, Ahrer, E.-M., Alderson, L., (**Lothringer, J.D. 1st tier**) et al., “Identification of carbon dioxide in an exoplanet atmosphere”, 2023, *Nature*, 614, 649.
51. Mikal-Evans, T., Sing, D. K., Dong, J., et al. “A JWST NIRSpec Phase Curve for WASP-121b: Dayside Emission Strongest Eastward of the Substellar Point and Nightside Conditions Conducive to Cloud Formation”, 2023, *ApJL*, 943, L17.
52. Chachan, Y., Knutson, H. A., **Lothringer, J.D.**, & Blake, G. A. “Breaking Degeneracies in Formation Histories by Measuring Refractory Content in Gas Giants”, 2023, *ApJ*, 943, 112.
53. Kasper, D., Bean, J. L., Line, M. R., et al., “Unifying High- and Low-resolution Observations to Constrain the Dayside Atmosphere of KELT-20b/MASCARA-2b”, 2023, *AJ*, 165, 7.
54. Fu, G., Espinoza, N., Sing, D. K., et al., “Water and an Escaping Helium Tail Detected in the Hazy and Methane-depleted Atmosphere of HAT-P-18b from JWST NIRISS/SOSS”, 2022, *ApJL*, 940, L35.

55. Brande, J., Crossfield, I. J. M., Kreidberg, L., et al., “A Mirage or an Oasis? Water Vapor in the Atmosphere of the Warm Neptune TOI-674 b”, 2022, *AJ*, 164, 197.
56. Kreidberg, L., Mollière, P., Crossfield, I. J. M., et al., “Tentative Evidence for Water Vapor in the Atmosphere of the Neptune-sized Exoplanet HD 106315c”, 2022, *AJ*, 164, 124.
57. Buzard, C., Casewell, S. L., **Lothringer, J.D.**, & Blake, G. A., “Near-infrared Spectra of the Inflated Post-common Envelope Brown Dwarf NLT 5306 B”, 2022, *AJ*, 163, 262.
58. Gibson, N. P., Nugroho, S. K., **Lothringer, J.D.**, Maguire, C., & Sing, D. K., “Relative abundance constraints from high-resolution optical transmission spectroscopy of WASP-121b, and a fast model-filtering technique for accelerating retrievals”, 2022, *MNRAS*, 512, 4618.
59. Fu, G., Sing, D. K., Deming, D., et al., “The Hubble PanCET Program: Emission Spectrum of Hot Jupiter HAT-P-41b”, 2022, *AJ*, 163, 190.
60. Reggiani, H., Schlaufman, K. C., Healy, B. F., **Lothringer, J.D.**, & Sing, D. K., “Evidence that the Hot Jupiter WASP-77 A b Formed Beyond Its Parent Protoplanetary Disk’s H<sub>2</sub>O Ice Line”, 2022, *AJ*, 163, 159.
61. Bruno, G., Lewis, N. K., Valenti, J. A., et al., “Hiding in plain sight: observing planet-starspot crossings with the James Webb Space Telescope”, 2022, *MNRAS*, 509, 5030.
62. Fu, G., Sing, D. K., **Lothringer, J.D.**, et al., “Strong H<sub>2</sub>O and CO Emission Features in the Spectrum of KELT-20b Driven by Stellar UV Irradiation”, 2022, *ApJL*, 925, L3.
63. Zhou, Y., Apai, D., Tan, X., et al., “HST/WFC3 Complete Phase-resolved Spectroscopy of White-dwarf-brown-dwarf Binaries WD 0137 and EPIC 2122”, 2022, *AJ*, 163, 17.
64. Fu, G., Deming, D., May, E., et al., “The Hubble PanCET program: Transit and Eclipse Spectroscopy of the Hot-Jupiter WASP-74b”, 2021, *AJ*, 162, 271.
65. Sainsbury-Martinez, F., Casewell, S. L., **Lothringer, J.D.**, Phillips, M. W., & Tremblin, P., “Exploring deep and hot adiabats as a potential solution to the radius inflation problem in brown dwarfs. Long-timescale models of the deep atmospheres of KELT-1b, Kepler-13Ab, and SDSS1411B”, 2021, *A&A*, 656, A128.
66. Merritt, S. R., Gibson, N. P., Nugroho, S. K., et al., “An inventory of atomic species in the atmosphere of WASP-121b using UVES high-resolution spectroscopy”, 2021, *MNRAS*, 506, 3853.
67. Fu, G., Deming, D., **Lothringer, J.D.**, et al., “The Hubble PanCET Program: Transit and Eclipse Spectroscopy of the Strongly Irradiated Giant Exoplanet WASP-76b”, 2021, *AJ*, 162, 108.
68. Wilson, J., Gibson, N. P., **Lothringer, J.D.**, et al., “Gemini/GMOS optical transmission spectroscopy of WASP-121b: signs of variability in an ultra-hot Jupiter?”, 2021, *MNRAS*, 503, 4787.

69. Mikal-Evans, T., Crossfield, I. J. M., Benneke, B., et al., “Transmission Spectroscopy for the Warm Sub-Neptune HD 3167c: Evidence for Molecular Absorption and a Possible High-metallicity Atmosphere”, 2021, *AJ*, 161, 18.
70. Guo, X., Crossfield, I. J. M., Dragomir, D., et al., “Updated Parameters and a New Transmission Spectrum of HD 97658b”, 2020, *AJ*, 159, 239.
71. Gibson, N. P., Merritt, S., Nugroho, S. K., et al., “Detection of Fe I in the atmosphere of the ultra-hot Jupiter WASP-121b, and a new likelihood-based approach for Doppler-resolved spectroscopy”, 2020, *MNRAS*, 493, 2215.
72. Turner, J. D., de Mooij, E. J. W., Jayawardhana, R., et al., “Detection of Ionized Calcium in the Atmosphere of the Ultra-hot Jupiter KELT-9b”, 2020, *ApJL*, 888, L13.
73. Benneke, B., Wong, I., Piaulet, C., et al., “Water Vapor and Clouds on the Habitable-zone Sub-Neptune Exoplanet K2-18b”, 2019, *ApJL*, 887, L14.
74. Benneke, B., Knutson, H. A., **Lothringer, J.D.**, et al., “A sub-Neptune exoplanet with a low-metallicity methane-depleted atmosphere and Mie-scattering clouds”, 2019, *Nature Astronomy*, 3, 813.
75. Steinrueck, M. E., Parmentier, V., Showman, A. P., **Lothringer, J.D.**, & Lupu, R. E., “The Effect of 3D Transport-induced Disequilibrium Carbon Chemistry on the Atmospheric Structure, Phase Curves, and Emission Spectra of Hot Jupiter HD 189733b”, 2019, *ApJ*, 880, 14.
76. Crossfield, I. J. M., **Lothringer, J.D.**, Flores, B., et al., “Unusual Isotopic Abundances in a Fully Convective Stellar Binary”, 2019, *ApJL*, 871, L3.
77. Fossati, L., Koskinen, T., **Lothringer, J.D.**, et al., “Extreme-ultraviolet Radiation from A-stars: Implications for Ultra-hot Jupiters”, 2018, *ApJL*, 868, L30.
78. Bean, J. L., Stevenson, K. B., Batalha, N. M., et al., “The Transiting Exoplanet Community Early Release Science Program for JWST”, 2018, *PASP*, 130, 114402.
79. Kilpatrick, B. M., Cubillos, P. E., Stevenson, K. B., et al., “Community Targets of JWST’s Early Release Science Program: Evaluation of WASP-63b”, 2018, *AJ*, 156, 103.
80. Bell, T. J., Nikolov, N., Cowan, N. B., et al., “The Very Low Albedo of WASP-12b from Spectral Eclipse Observations with Hubble, 2017, *ApJL*, 847, L2.
81. Stevenson, K. B., Lewis, N. K., Bean, J. L., et al., “Transiting Exoplanet Studies and Community Targets for JWST’s Early Release Science Program”, 2016, *PASP*, 128, 094401.
82. Crossfield, I. J. M., Ciardi, D. R., Petigura, E. A., et al., “197 Candidates and 104 Validated Planets in K2’s First Five Fields”, 2016, *ApJS*, 226, 7.

**Proceedings and  
Other  
Publications**

1. Ardila, D. R., et al. “The UV-SCOPE Mission: Ultraviolet Spectroscopic Characterization Of Planets and their Environments”, Proceedings of the SPIE. id. 1218104. arXiv:2208.09547.
2. **Lothringer, J. D.** “Stellar specific intensity models used in ‘Hiding in plain sight: observing planet-starspot crossings with the James Webb Space Telescope’”, 2021, Zenodo Software package, id. 5609421.
3. **Lothringer, J. D.** et al. “Uncertainties in Low-Count STIS Spectra”, 2025, HST STIS Instrument Science Report 2025-04.
4. Alam, M., et al. “HST Notebooks First Release”, Zenodo. Version v1.0.0. 10.5281/zenodo.17179608

**Invited Talks  
and Seminars**

1. Exocoffee Seminar on Lothringer et al. 2025, Max Planck Institute for Astronomy, Heidelberg, Germany. May. 2025.
2. “Ultra-hot Jupiters as Unique Windows into Formation through the UV-IR Transit Spectrum of WASP-178b”, The Great Link Workshop, Max Planck Institute for Astronomy, Heidelberg, Germany. Jul. 2024.
3. “Talk with Tuminez”, University-wide Town Hall with University President Astrid Tuminez, Utah Valley University, Orem, UT. Sep. 2023.
4. Convocation Lecture Series & Science Division Seminar, Snow College, Ephraim, UT. Aug. 2023.
5. Astronomy Colloquium, Anton Pannekoek Institute for Astronomy, University of Amsterdam. Nov. 2022.
6. Physics and Astronomy Colloquium, Brigham Young University, Provo, UT. Oct. 2022.
7. The Brown Dwarf to Exoplanet Connection in the Era of JWST Splinter Session at Exoplanets IV. Las Vegas. May 2022.
8. Physics Colloquium. Department of Physics, Utah Valley University, Orem, UT. Sep. 2021.
9. HotSci. Space Telescope Science Institute. Virtual. Jul. 2021.
10. Exoplanet Lunch. Center for Astrophysics, Harvard University. Virtual. Jan. 2021.
11. Exoplanet Journal Club. Jet Propulsion Laboratory. Virtual. Jan. 2021.
12. Star and Planet Seminar. Imperial College London. Virtual. Oct. 2020.
13. Exocoffee. Max Planck Institute for Astronomy. Virtual. May. 2020.
14. Exoplanet Tea. Massachusetts Institute of Technology. Cambridge, MA. Oct. 2019.
15. Exoplanet Lunch. Center for Astrophysics, Harvard University. Cambridge, MA. Oct. 2019.
16. Wine & Cheese Seminar. Center for Astrophysical Sciences, Johns Hopkins University, Baltimore, MD. Sep. 2019.



17. Theoretical Astrophysics Program Graduate Research Prize Talk. University of Arizona. Tucson, AZ. Apr. 2019.
18. Exoplanet Seminar. DTU Space. Lyngby, Denmark. Feb. 2019.
19. Star and Planet Formation Seminar. Max Planck Institute for Astronomy. Heidelberg, Germany. Jul. 2016.

**Select  
Conference  
Presentations**

1. “The UVOIR Transit Spectrum of Ultra-hot Jupiter WASP-178b with HST and JWST.” 245th AAS Winter Meeting. National Harbor, MD. Jan. 2025. Oral Presentation.
2. “Atmospheric Retrievals of the Phase-resolved Spectra of Two Hot and Ultra-hot Jupiter Analogs.” 241st AAS Winter Meeting. Seattle, WA. Jan. 2023. Oral Presentation.
3. “The UV Transmission Spectrum of Ultra-hot Jupiter WASP-178b.” Exoplanets IV. Las Vegas. May 2022. Oral Presentation.
4. “The Importance of UV Opacity in Extremely Irradiated Objects.” Stars and Planets in the UV. Virtual. May. 2021. Oral Presentation.
5. “Re-Interpreting UV-Optical Transmission Spectra of Hot and Ultra-Hot Jupiters.” 237th AAS Winter Meeting. Virtual. Jan. 2021. Oral Presentation.
6. “Understanding Ultra-hot Jupiters Through Irradiated Brown Dwarfs.” 235th AAS Winter Meeting. Honolulu, HI. Jan. 2020. Oral Presentation.
7. “Highly Irradiated Brown Dwarfs as High-mass Ultra-hot Jupiters.” BDExoCon. University of Delaware. Newark, DE. Oct. 2019. Oral Presentation.
8. “Characterizing the Atmospheres of Exoplanet Populations: From Sub-Jovian to Ultra-hot Jupiter Exoplanets.” American Astronomical Society Winter Meeting. Seattle, WA. Jan. 2019. Oral Presentation.
9. “Modeling the Most Extreme Jovian Atmospheres.” Exoplanets Around Hot Stars. Vanderbilt University, Nashville, TN. Jun. 2018. Oral Presentation.
10. “Self-Consistent Atmosphere Models of the Most Extreme Hot Jupiters.” American Astronomical Society Winter Meeting. Washington D.C. Jan. 2018. Oral Presentation.

**Honors,  
Awards,  
and Grants  
+\$2,300,000**

- **PI, NSF S-STEM Program** *2022–2023*  
*“Pro-STEM: Promoting Engagement in Chemistry, Physics, and Earth Sciences”*  
 A six-year, \$1.5M scholarship, mentorship, and research program, awarding scholarships to 25+ students in Chemistry, Physics, and Earth Sciences.
- **PI/Co-PI, *James Webb Space Telescope* Programs**

- Program 2055 (\$100,211) 9.1 hours  
*“Tracing Hot Jupiter Formation and Migration with Volatile and Refractory Element Ratios”*
- Program 2288 (\$113,998) 7.4 hours  
 Co-PI: Jeff Valenti  
*“Formation and Impact of Silicate Clouds on L Dwarfs”*
- Program 7255 (\$308,468) 52.3 hours  
 PI: Kevin Stevenson  
*“A Day In The Life of KELT-9b”*

• **PI, *Hubble Space Telescope* Programs**

- Program 16086 (\$86,995) 10 orbits  
*“Comparing Escaping Metals and Heat Deposition in Ultra-hot Jupiters”*
- Program 16142 (\$99,319) AR Theory  
*“The First Grid of White-Dwarf-Irradiated Brown Dwarf Atmosphere Models”*
- Program 16270 (\$63,530) 20 orbits  
*“Heavy Metal Bands: A Study of Escaping Ions from the Hottest Jovian Atmospheres”*
- Program 16450 (\$45,465) 10 orbits  
*“Measuring the Rock-to-Ice Ratio in an Exoplanet”*

PI of 3 Calibration <i>Hubble Space Telescope</i> Programs	
Co-I on 11 <i>James Webb Space Telescope</i> Programs	500+ hours
Co-I on 21 <i>Hubble Space Telescope</i> Programs	300+ orbits
Co-I on 1 <i>Spitzer Space Telescope</i> Program	61 hours
Co-I on 1 NASA XRP Program (PI: Schlaufman)	2022-2025
Director’s Discretionary Research Funds: CHEXO Funding (\$3,400)	2024
College of Science Dean’s Award of Excellence for Scholarship (\$2,750)	2023
Scholarly Activities Committee Dissemination Grant (\$1,344)	2022
Theoretical Astrophysics Program Graduate Research Prize (\$500)	2019
Galileo Circle Scholar (\$2,000)	2019
Galileo Circle Scholar (\$1,000)	2016
1st Place - The Art of Planetary Science - Data Art Category	2015
Graduate and Professional Student Council Travel Grant (\$250)	2015
2015 Sagan Workshop Travel Grant (\$700)	2015
Science Phoenix Award - SORCE Mission Operations	2014

**Technical  
Experience**

HST/STIS Instrument Team	2024-Present
• Pipeline Block Lead	
• Exposure Time Calculator Working Group	
• Contact Scientist	
• PI/co-I for 5 calibration programs	
JWST+HST Rocky Worlds DDT Core Implementaiton Team	2025-Present
JWST Science Policy Group Panel Manager	2024-2025

<b>Observing Experience</b>	James Webb Space Telescope - NIRSpec, NIRCам, and MIRI	300+ hours
	Hubble Space Telescope - STIS and WFC3	300+ orbits
	MMT - SWIRC and ARIES	12 nights
	Sommers-Bausch Observatory (CU-Boulder) - Optical CCD	9 nights
	W.M. Keck Observatory - OSIRIS	2 nights
	Large Binocular Telescope - LMIRCам	1 night
	Morris W. Offit Telescope (JHU) - Optical CCD	1 night
<b>Mentorship</b>	Post-Baccalaureate Mentor:	
	• <b>Seti Norris</b> - STScI SASP+Intern	2024-Present
	- <i>Co-Author on Lothringer et al. 2024</i>	
	Undergraduate Research Mentor:	
	• <b>Ja’Heim Goodwin</b> - STScI SASP+NAC	2024-Present
	• <b>Brian Kehoe-Seamons</b> - Utah Valley University	2022-Present
	- <i>Utah Space Grant Recipient</i>	
	- <i>Co-Author on Lothringer et al. 2024</i>	
	• <b>Austin Baldwin</b> - Utah Valley University	2021-Present
	- <i>UVU URSCA Grant Recipient</i>	
	- <i>Utah Space Grant Recipient</i>	
	• <b>Audrey Elison</b> - Utah Valley University	2023
	• <b>Brayden Roberts</b> - Utah Valley University	2022-2024
	- <i>Utah Space Grant Recipient</i>	
	• <b>Autumn Winch</b> - Bryn Mawr College	2020-2022
	- <i>Senior Thesis</i>	
	- <i>Co-Author on Lothringer et al. 2022</i>	
	- <i>Clinical Research Coordinator, University of Pennsylvania</i>	
	Dissertation Committee Member	
	• Rachael Amaro (University of Arizona)	08/2024
	• Jegug Ih (University of Maryland)	06/2024
<b>Teaching (UVU)</b>	Instructor - ASTR-4100 - Exoplanets and Brown Dwarfs	Fall 2023
	Instructor - ASTR-1080 - Life in the Universe (3 sections)	2022-2023
	Instructor - PHSC-1000 - Survey of Physical Science	Spring 2022
	Instructor - PHYS-489R - Undergraduate Research (6 sections)	2022-2023
	Instructor - ASTR-1040 - Elementary Astronomy (12 Sections)	2021-2023
<b>Other Teaching Experience</b>	Guest Instructor - Exoplanetary Astrophysics (UMD)	2024
	Guest Instructor - Planets, Life, and the Universe (JHU)	2020
	Co-Instructor - Exoplanets & Their Atmospheres (JHU)	2020
	JHU Teaching Academy Certificate	2020
	JHU Summer Teaching Institute Workshop	2020
	LPL Incoming Graduate Student Mentor	2017-2019
	Pima Community College GED Prep Math Tutor	2015-2016
<b>Service and Other Experience</b>	Graduate Teaching Assistant and Guest Lecturer — PTYS 170B2	Fall 2014
	AAS Journals Reviewer	
	Astronomy & Astrophysics Reviewer	
	<i>Nature Astronomy</i> Reviewer	

<i>Nature</i> Reviewer	
Canada Innovation Fund Expert Reviewer	
Hubble Space Telescope Proposal Reviewer	
Canadian Time Allocation Committee Reviewer	
NSF Review Panelist	
NASA Review Panel Executive Secretary	
STScI Science Evaluation Committee	2025
STScI Atmospheric Escape Workshop Co-Organizer	2025
UVU Physics Department Advisory Board	2023-Present
STARGATE Collaboration Executive Committee	2023-Present
Aspen CfP JWST Thermal Emission Organizing Committee	Spring 2025
STScI-JHU ExoJamboree Organizing Committee	Fall 2024
Chesapeake Bay Area Exoplanet Meeting Organizer	Spring 2024
UV-SCOPE MIDEX Mission Concept Science Team	2020-2023
JWST ERS Working Group	2017-2024
JHU/STScI Undergraduate Summer Program Organizer	2020, 2021
AAS Chambliss Poster Award Judge	2019, 2020
LPL Men's Diversity and Inclusion Auxiliary	2016-2019
LPL Conference Organizing Committee	2015-2017
Visiting Student - Max Planck Institute for Astronomy	06-07/2016
Graduate and Professional Student Council Travel Grant Judge	2015

## Select Press Coverage & Interviews

- The (Unofficial) Exoplanet Dashboard
  - Space.com
- JWST Transiting Exoplanet Community Early Release Science
  - UVU Press Release
  - Fox 31 News Good Day Utah at 6AM
  - KUER 90.1, Utah NPR
- Lothringer & Sing et al. 2022
  - NASA/Hubble Press Release
  - Sky & Telescope
  - The Bad Astronomer, SyFy Wire
  - The Miami Herald
- Benneke et al. 2019
  - SkyMania
  - IndiaTV News
- In the Community
  - UVU Wins \$1.5M NSF S-STEM Scholarship Program
  - Hutchings Museum Institute JWST First Images Event
  - Hutchings Museum Institute JWST Launch Celebration
  - MAVEN Mission to Mars Launch
  - No Man's Sky Video Game

## Outreach

JWST Subject Matter Expert	2021-Present
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	- Salt Lake County Library Lecture Series (x2)	
	- UVU Colloquium (x2)	
	- Clarke Planetarium JWST Program	
	- Utah Valley Astronomy Club (x2)	
	- Hutchings Museum Institute First Image Event	
	- Hutchings Museum Institute Launch Celebration	
	Latinos of Tomorrow Panelist	2023
	Guest Consultant - Ranger Rick Magazine	2022
	STScI Outreach Program	2019-2021
	-Space Astronomy Summer Program Presenter and Organizer	
	-Easy as Pi - Society of American Military Engineers	
	Reddit /r/AskScience Panel Member	2015-2018
	LPL Outreach Program	2014-2019
	-Summer Science Saturdays	
	-Tucson Festival of Books	
	-Art of Planetary Science	
	-Bennuval: An Evening of Space, Art, and Music	
	Exoplanet Lecture Series, Flandrau Planetarium, Tucson, AZ	Apr. 2018
	Tucson Amateur Astronomy Association	Mar. 2018
	The American International School of Muscat Science Expert	2018, 2019
	Chaparral High School Career Expert	2018
	The American International School of Muscat, Muscat, Oman	Jan. 2014
	LASP MAVEN Launch Outreach	2014
<b>Professional Affiliations</b>	International Astronomical Union	Since 2025
	American Astronomical Society	Since 2014
	Phi Beta Kappa Member	Since 2014
	Planetary Society Member	Since 2011
<b>Skills</b>	IDL, Python, Fortran, Perl, Bash, Matlab, and Mathematica	