

Dr. Ryan C. Challener

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Research Positions

Postdoctoral Researcher, Cornell University, Ithaca, New York, 2023 – present

Postdoctoral Researcher, University of Michigan (UM), Ann Arbor, Michigan, 2020 – 2023

Education

University of Central Florida (UCF), PhD Physics, 2020

University of Rochester (UR), BS Physics & Astronomy and BA Mathematics, 2014

Publications (Full List)

Challener, R. C., Z. Rustamkulov, E. K. H. Lee, *et al.*, Latitudinal Asymmetry in the Dayside Atmosphere of WASP-43b, *ApJ* **969**, 2, L32, 2024.

Challener, R. C., L. Welbanks, and P. McGill, Bringing 2D Eclipse Mapping out of the Shadows with Leave-one-out Cross Validation, *AJ* **166**, 6, 251, 2023.

Challener, R. C. and E. Rauscher, The eclipse-mapping null space: Comparing theoretical predictions with observed maps, *AJ* **166**, 4, 176, 2023.

Challener, R. C. and E. Rauscher, ThERESA: Three-dimensional Eclipse Mapping with Application to Synthetic JWST Data, *AJ* **163**, 3, 117, 2022.

Challener, R. C., J. Harrington, P. E. Cubillos, J. Blecic, and B. Smalley, Spitzer Dayside Emission of WASP-34b, *PSJ* **3**, 4, 86, 2022.

Challener, R. C., J. Harrington, J. Jenkins, *et al.*, Identification and Mitigation of a Vibrational Telescope Systematic with Application to Spitzer, *PSJ* **2**, 1, 9, 2021.

Jacobs, B., J.-M. Désert, N. Lewis, R. C. **Challener**, *et al.*, Spectroscopically resolved partial phase curve of the rapid heating and cooling of the highly-eccentric Hot Jupiter HAT-P-2b with WFC3, *arXiv e-prints* p. arXiv:2410.11643, 2024.

Gressier, A. *et al.*, JWST-TST DREAMS: A Super-Solar Metallicity in WASP-17 b Dayside Atmosphere from NIRISS SOSS Eclipse Spectroscopy, *arXiv e-prints* p. arXiv:2410.08149, 2024b.

Valentine, D., H. R. Wakeford, R. C. **Challener**, *et al.*, JWST-TST DREAMS: Nonuniform Dayside Emission for WASP-17b from MIRI/LRS, *AJ* **168**, 3, 123, 2024.

Schlawin, E. *et al.*, Multiple Clues for Dayside Aerosols and Temperature Gradients in WASP-69 b from a Panchromatic JWST Emission Spectrum, *AJ* **168**, 3, 104, 2024.

Banerjee, A. *et al.*, Atmospheric retrievals suggest the presence of a secondary atmosphere and possible sulfur species on L 98-59 d from JWST NIRSpec G395H transmission spectroscopy, *arXiv e-prints* p. arXiv:2408.15707, 2024.

Gressier, A. *et al.*, Hints of a sulfur-rich atmosphere around the 1.6 R_{\oplus} Super-Earth L98-59 d from JWST NIRSpec G395H transmission spectroscopy, *arXiv e-prints* p. arXiv:2408.15855, 2024a.

Sing, D. K. *et al.*, A warm Neptune’s methane reveals core mass and vigorous atmospheric mixing, *Nature* **630**, 8018, 831–835, 2024.

Hammond, M., T. J. Bell, R. C. **Challener**, *et al.*, Two-dimensional Eclipse Mapping of the Hot-Jupiter WASP-43b with JWST MIRI/LRS, *AJ* **168**, 1, 4, 2024.

- Bell, T. J. *et al.*, Nightside clouds and disequilibrium chemistry on the hot Jupiter WASP-43b, *Nature Astronomy* **8**, 879–898, 2024.
- Coulombe, L.-P., B. Benneke, R. **Challener**, *et al.*, A broadband thermal emission spectrum of the ultra-hot Jupiter WASP-18b, *Nature* **620**, 7973, 292–298, 2023.
- Schlawin, E., R. **Challener**, *et al.*, Planet Eclipse Mapping with Long-term Baseline Drifts, *AJ* **165**, 5, 210, 2023.
- Harrington, J. *et al.*, An Open-source Bayesian Atmospheric Radiative Transfer (BART) Code. I. Design, Tests, and Application to Exoplanet HD 189733b, *PSJ* **3**, 4, 80, 2022.
- Cubillos, P. E. *et al.*, An Open-source Bayesian Atmospheric Radiative Transfer (BART) Code. II. The TRANSIT Radiative Transfer Module and Retrieval of HAT-P-11b, *PSJ* **3**, 4, 81, 2022.
- Blecic, J. *et al.*, An Open-source Bayesian Atmospheric Radiative Transfer (BART) Code. III. Initialization, Atmospheric Profile Generator, Post-processing Routines, *PSJ* **3**, 4, 82, 2022.
- Jenkins, J. S., J. Harrington, R. C. **Challener**, *et al.*, Proxima Centauri b is not a transiting exoplanet, *MNRAS* **487**, 1, 268–274, 2019.
- Hardy, R. A., J. Harrington, M. R. Hardin, N. Madhusudhan, T. J. Lored, R. C. **Challener**, *et al.*, Secondary Eclipses of HAT-P-13b, *ApJ* **836**, 1, 143, 2017.

Awarded Grants and Observing Time

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| Spitzer Space Telescope (Co-I) | 85 hours |
| James Webb Space Telescope (Co-I) | 26 hours |
| 2024 NASA Exoplanet Research Program (PI) | \$453,767 |
| Member of JWST GTO collaborations: NIRSpec, TST-DREAMS, and MANATEE | |

Selected Talks

University of Michigan Department of Astronomy Colloquium, Fall 2020
 University of Rochester Department of Physics & Astronomy Colloquium, Fall 2023
 Cornell University Department of Astronomy Colloquium, Fall 2024

Teaching, Mentoring, Service, and Outreach

UCF, 2015 - 2020. Volunteer for an outreach program at the UCF observatory.

UCF, 2018 - 2020. Volunteer mentor for 1st year graduate students.

UCF, 2019 - 2020. Assisted with planning and executing the UCF JWST Master Class workshop.

UM, 2021 - 2022. Mentor for two undergraduate research projects.

UM, 2021 - 2022. UM Department of Astronomy colloquium series organizer.

UM, Spring 2022. Participant in a postdoctoral course on teaching in higher education.

UM, 2022 - 2023. UM Exoplanet Journal Club organizer.

UM/Cornell, 2022 - 2024. Research mentor to a graduate student at Penn State University.

Cornell, 2023 - 2024. Research mentor to a graduate and an undergraduate student.

Cornell, 2024. Participant in a postdoctoral course on becoming an effective leader.

UM/Cornell, 2022 - 2024. Volunteer guest lecturer for undergrad- and grad-level courses.