Miles H. Currie

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Education

PhD in Astronomy and Astrobiology (dual-title) 2018–2024
MS in Astronomy (2020)
University of Washington, Seattle, WA
Thesis: Searching for Signs of Habitability and Life in the Era of Extremely Large Observatories
Advisor: Prof. Victoria S. Meadows

BS in Physics & Astrophysics, *magna cum laude* 2013–2017
Florida State University, Tallahassee, FL

Research Experience

NASA Postdoctoral Program Fellow: NASA Goddard Space Flight Center
2024–present
Terrestrial exoplanet atmospheres, ground-based high-res spectroscopy, space-based exoplanet characterization, astrobiology, debris disks, coronagraphy, direct imaging, exozodiacal dust

Graduate Research Assistant: Virtual Planetary Laboratory
2018–2024
Terrestrial exoplanet atmospheres, ground-based high-res spectroscopy, space-based exoplanet characterization, astrobiology

Post-baccalaureate Research Assistant: Space Telescope Science Institute
2017–2018
Type 1a supernova cosmology, WFIRST science precursor study (advisors David Rubin, Susana Deustua, Andy Fruchter)

Post-baccalaureate Research Assistant: Geophysical Fluid Dynamics Institute
2017
Forest fire simulations (advisors Kevin Speer and Bryan Quaife)

Undergraduate Research Assistant: Florida State University, SETI Institute
2013–2017
Type 1a supernova cosmology (advisor David Rubin), Kepler/K2 exoplanet detection (advisors Susan Mullally and Fergal Mullally), particle physics collision simulations (advisor Todd Adams)

Honors and Awards

- NASA Postdoctoral Program Fellowship, 2024–present
- The UW Astronomy Department Graduate Student Research Prize, 2023

Teaching Experience

Research Mentor: Department of Astronomy, University of Washington
2020–2022
Advised undergraduate students in exoplanet astronomy and astrobiology research

Teaching Assistant: Department of Astronomy, University of Washington
2018–2020
General Astronomy (ASTR 101) and The Solar System (ASTR 150)

Observing Experience

Co-I: McDonald Observatory Observing Time Request McD22-c, "An Ancient Box of Chocolates: Follow-up of High-Priority Metal-Poor Stars Identified from S-PLUS Photometry" (50 hrs)

Publications

First-authored

8. **Currie, M.H.**, V.S. Meadows, and J. Lustig-Yaeger. "There's more to O_2 than life: Biosignature assessment via O_2 retrieval in simulated ELT spectroscopy" 2024. In prep.
7. **Currie, M.H.** and V.S. Meadows. "There's more to life in reflected light: Simulating the detectability of a range of molecules for high-contrast, high-resolution observations of non-transiting terrestrial exoplanets" 2024. Accepted in PSJ.
6. **Currie, M.H.**, C.C. Stark, J. Kammerer, R. Juanola-Parramon, V.S. Meadows. "Mitigating Worst-Case Exozodiacal Dust Structure in Direct Images of Earth-like Exoplanets." 2023. The Astronomical Journal. 166 197.
5. Rasmussen, K.C. & **Currie, M.H.** (co-first author), C. Hagee, C. van Buchem, M. Malik et al. "A Non-Detection of Iron in the First High-Resolution Emission Study of the Lava Planet 55 Cnc e." 2023. The Astronomical Journal 166 155
4. **Currie, M.H.**, V.S. Meadows, and K.C. Rasmussen. "There's more to life than O_2: Simulating the detectability of a range of molecules for ground-based high-resolution spectroscopy of transiting terrestrial exoplanets." 2023. The Planetary Science Journal 4 83
3. **Currie, M.H.**, D. Rubin, G. Aldering, S. Deustua, A. Fruchter, S. Perlmutter. "Evaluating the Calibration of SN Ia Anchor Datasets with a Bayesian Hierarchical Model." 2020.
2. **Currie, M.H.**, K. Speer, J. K. Hiers, J. J. O'Brien, S. Goodrick, and B. Quaife. 2019. "Pixel-Level Statistical Analyses of Prescribed Fire Spread." Canadian Journal of Forest Research. Journal Canadien de La Recherche Forestiere 49 (1): 18–26.
1. **Currie, M.H.** and D. Rubin. 2018. "Characterization of Unstable Pixels Using a Mixture Model: Application to HST WFC3 IR." Research Notes of the AAS 2 (3): 141.

Co-authored

6. Ahmed, Z., S. Shaklan, **M.H. Currie**, S.D'Amico. 2025. "Ultraviolet Starshade Capabilities for Exo-Earth Imaging." Submitted to JATIS.
5. Deming, D., **M.H. Currie**, V.S. Meadows, S. Peacock. 2025. "Minimizing Star Spot Contamination of Exoplanet Transit Spectroscopy Using Alternate Normalization." Submitted to Astronomical Journal.
4. Rasmussen, K.C., M. Brogi, F. Rahman, H. Beltz, **M. Currie**, E. Rauscher, and A.P. Ji. 2022. "SPORK That Spectrum: Increasing Detection Signif-

icances from High-Resolution Exoplanet Spectroscopy with Novel Smoothing Algorithms." Astronomical Journal, 164 35.

3. V.S. Meadows, H. Graham et al. including **M. Currie**. "Community Report from the Biosignatures Standards of Evidence Workshop" 2023.
2. Hayden, B., D. Rubin, K. Boone, G. Aldering, J. Nordin, M. Brodwin, S. Deustua, et al. including **M. Currie** 2021. "The HST See Change Program. I. Survey Design, Pipeline, and Supernova Discoveries*." The Astrophysical Journal 912 (2): 87.
1. Rubin, D., G. Aldering, K. Barbary, K. Boone, G. Chappell, **M. Currie**, S. Deustua, et al. 2015. "UNITY: CONFRONTING SUPERNOVA COSMOLOGY'S STATISTICAL AND SYSTEMATIC UNCERTAINTIES IN A UNIFIED BAYESIAN FRAMEWORK." The Astrophysical Journal 813 (2): 137.

Presentations

Invited Talks

7. Pennsylvania State University, Center for Exoplants and Habitable Worlds Seminar, November 2024. "Detecting and Characterizing Terrestrial Exoplanets with Future Observatories"
6. Tokyo Institute of Technology, Earth-Life Science Institute, Tokyo, Japan, April 2024. "The Prospects for Characterizing Terrestrial Exoplanets with the ELTs"
5. National Astronomical Observatory of Japan, Astrobiology Center, Mitaka, Japan, April 2024. "Characterizing Earth-like Exoplanets in the Era of Extremely Large Telescopes."
4. NASA Goddard Space Flight Center, Exoplanet Seminar, October 2023. "Detecting and Characterizing Earth-like Exoplanets in the Era of Next-Generation Observatories"
3. University of Maryland, Exoplanets Journal Club, October 2023. "Detecting and Characterizing Earth-like Exoplanets in the Era of Next-Generation Observatories"
2. University of Washington, Astrobiology Colloquium. October 2023. "There's more to life than O_2"
1. University of Washington, Astrobiology Seminar, May 2022. "Mitigating Worst-case Exozodiacal Structure in High-contrast Images of Earth-like Exoplanets."

Contributed Talks

6. National Capital Area Disk Meeting 8, Carnegie EPL, 2025. "Catching a cat by the tail: New MIRI Images of the Beta Pictoris Debris Disk"
5. Astrobiology Science Conference, Providence, 2024. "Placing O2 in its environmental context with the extremely large telescopes"
4. ExoPAG SAG 23 Workshop, STScI. 2023. "Mitigating Worst-case Exozodiacal Structure in High-contrast Images of Earth-like Exoplanets."
3. AAS 241 Winter Meeting, Seattle. 2023. "There's more to life than O2: Assessing the detectability of biosignatures and environmental context for high-resolution spectroscopy of terrestrial exoplanets"
2. High-resolution spectroscopy thinkshop. Leibniz Institute for Astrophysics Potsdam, Germany. 2022. "There's more to life than O2: Assessing the detectability of biosignatures and environmental context for high-resolution spectroscopy of terrestrial exoplanets"

1. Astrobiology Science Conference, Atlanta, 2022. "Simulating ELT capabilities for terrestrial exoplanet characterization and biosignature detection and assessment."

Posters

9. Habitable Worlds Observatory START/TAG F2F, Rochester, 2024 "Mitigating Worst-Case Exozodiacal Dust Structure in Direct Images of Earth-like Exoplanets."
8. Extreme Solar Systems V, Christchurch, NZ. 2024. "Searching for signs of habitability and life on M-dwarf planets with next-generation ELTs." Extreme Solar Systems V, Christchurch, NZ. 2024.
7. Currie, M.H., C.C. Stark, J. Kammerer, R. Juanola-Parramon, V.S. Meadows. "Mitigating Worst-Case Exozodiacal Dust Structure in Direct Images of Earth-like Exoplanets." Science with the Habitable Worlds Observatory and Beyond, Baltimore. 2023.
6. Currie, M., and V. Meadows. 2021. "There's More to Life than O2: Simulating the Detectability of a Range of Molecules for Ground-Based High-Resolution Spectroscopy of Transiting Terrestrial Exoplanets." Habitable Worlds 2021, id. 1237. Bulletin of the American Astronomical Society, Vol. 53, No. 3 e-id 2021n3i1237
5. Currie, M., V.S. Meadows, and J. Lustig-Yaeger. "Detecting False Positives with O2: A Feasibility Study." In 2019 Astrobiology Science Conference. AGU, 2019.
4. Currie, M., and D. Rubin. 2019. "Automated Recognition of Transients with a Convolutional Neural Network." American Astronomical Society, AAS Meeting #233, id.349.05
3. Currie, M., and D. Rubin. 2018. "Improving the Calibration of the SN Ia Anchor Datasets with a Bayesian Hierarchal Model." AAS Meeting #231, id. 153.20
2. Currie, M., F. Mullally, and S.E. Thompson. 2017. "Finding Planets in K2: A New Method of Cleaning the Data." AAS Meeting #229, id.146.13
1. Currie, M., D. Rubin, G. Scott Aldering, C. Baltay, P. Fagrelius, D.R. Law, S. Perlmutter, and K. Pontoppidan. 2016. "Estimating the Supernova Cosmological Constraints Possible With the Wide-Field Infrared Survey Telescope." AAS Meeting #227, id.139.17

Service and Outreach

Service

- Member of Advisory Committee, NASA Habitable Worlds Observatory START/TAG Exoplanet Science Yield sub-Working Group, 2024–present
- Member, NASA ExoPAG SAG 26: Exoplanet Reflectance Spectroscopy for the Habitable Worlds Observatory, 2024–present
- Member, NASA ExoPAG SAG 23: Theory of Exozodi Sources and Dust Evolution, 2022–present
- Co-chair for NExSS Science Communication Working Group, 2020–2024
- Executive secretary for NASA ROSES panel, 2023
- Organizer/graphic designer for Astronomy on Tap Seattle, 2019–2022
- Graphic designer for Astronomy at Home public lecture series (University of Washington), 2020-2022

Public Talks

- "Searching for Life in a Pixel: The Challenge of Exoplanet Astrobiology", June 27, 2022, Science On Tap, Third Place Books, Seattle, WA
- "All About Venus", 2020, Pacific Crest School, Virtual, Seattle, WA