

# Miles H. Currie

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**Office Address** Department of Astronomy, University of Washington  
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**Education** PhD in Astronomy and Astrobiology (dual-title) 2018–present  
MS in Astronomy (2020)  
University of Washington, Seattle, WA  
*Thesis:* The Search for Life Outside the Solar System in the Era of Extremely Large Ground-based Telescopes  
*Advisor:* Victoria Meadows

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

**Research Experience** *Graduate Research Assistant:* Virtual Planetary Laboratory  
**2018–present**  
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)

**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*

7. Currie, M.H. and V.S. Meadows. “Simulating the detectability of a range of molecules for high-contrast, high-resolution observations of non-transiting terrestrial exoplanets”. 2023 In prep.
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. In review at the Astrophysical Journal.
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. In review at the Astronomical Journal.
4. Currie, M.H., V.S. Meadows, and K.C. Rasmussen. “There’s more to life than O<sub>2</sub>: 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., 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., 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. 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. Wong, M., V. S. Meadows, P. Gao, H. Delgado Diaz, M. Currie, C. J. Bierson, X. Zhang “Abiotic oxygen in the atmospheres of Venus-like exoplanets” in prep.
5. Rasmussen, K.C., F. Rahman, H. Beltz, A. Savel, E. Rauscher, et al. including **M. Currie** “Simulating the Performance of the WINERED Spectrograph for Phase-Resolved High-Resolution Emission Spectroscopy of Hot Jupiters.” in prep.
4. Rasmussen, K.C., M. Brogi, F. Rahman, H. Beltz, **M. Currie**, E. Rauscher, and A.P. Ji. 2022. “SPORK That Spectrum: Increasing Detection Significances from High-Resolution Exoplanet Spectroscopy with Novel Smoothing Algorithms.” Astronomical Journal, 164 35.
3. V.S. Meadows, H. Graham et al. “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

### *Contributed Talks*

3. Currie, M., V. Meadows, and K. Rasmussen. AAS 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. Currie, M., V. Meadows, and K. Rasmussen. High-resolution spectroscopy thinkshop. 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. Currie, M., V. Meadows, and K. Rasmussen. 2022. ["Simulating ELT capabilities for terrestrial exoplanet characterization and biosignature detection and assessment."](#) 2022 Astrobiology Science Conference. AGU, 2022.

### *Posters*

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 Hierarchical 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. Fagrelus, 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, ExoPAG SAG 23: Theory of Exozodi Sources and Dust Evolution
- Co-chair for NExSS Science Communication Working Group, 2020–present
- 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