

EDWARD W. SCHWIETERMAN, UNIVERSITY OF CALIFORNIA, RIVERSIDE ESCHWIET@UCR.EDU

EDUCATION AND PROFESSIONAL TRAINING:

Ph.D. Astronomy, University of Washington, 2016
M.S. Astronomy & Astrobiology, University of Washington, 2011
B.S. Physics & Astrophysics, Florida Institute of Technology, 2010

RELEVANT PROFESSIONAL POSITIONS:

2020-Present	Assistant Professor	University of California, Riverside
2019-2020	Postdoctoral Fellow	Georgia Institute of Technology
2017-2019	NASA Postdoctoral Fellow	University of California, Riverside

RELEVANT PROFESSIONAL EXPERIENCE: E. Schwieterman is an expert on computational modeling of terrestrial planetary atmospheres with an integrated approach using spectral, photochemical, and climate models. Schwieterman is a subject matter expert on exoplanetary biosignatures and their potential false positives and false negatives. He is a contributing developer of the coupled climate-photochemical model *Atmos* and has extensive experience using the radiative transfer model SMART and instrument models for assessing the detectability of atmospheric and surface features on exoplanets. Schwieterman has influential publications on the topics of planetary habitability, exoplanetary biosignatures, early and modern Earth as an exoplanet, and the photochemistry of terrestrial planetary atmospheres.

SELECTED PEER-REVIEW WORKS

(Google Scholar h-index=29; N_{cite}=2903; *includes a (co-)advised student (co-)author)

Schwieterman, E. W., Olson, S. L., *Pidhorodetska, D., Reinhard, C. T., Ganti, A., Fauchez, T. J., Bastelberger, S. T., Crouse, J. S., Ridgwell, A., & Lyons, T. W., 2022. Evaluating the Plausible Range of N₂O Biosignatures on Exo-Earths: An Integrated Biogeochemical, Photochemical, and Spectral Modeling Approach. *The Astrophysical Journal*, 937(2), 109. <https://doi.org/10.3847/1538-4357/ac8cfb>

*Leung, M., **Schwieterman, E. W.**, Parenteau, M. N., & Fauchez, T. J. (2022). Alternative Methylated Biosignatures. I. Methyl Bromide, a Capstone Biosignature. *The Astrophysical Journal*, 938(1), 6. <https://doi.org/10.3847/1538-4357/ac8799>

Haqq-Misra, J., **Schwieterman, E. W.**, Socas-Navarro, H., Kopparapu, R., Angerhausen, D., Beatty, T. G., Berdyugina, S., Felton, R., Sharma, S., De la Torre, G. G., & Apai, D. (2022). Searching for technosignatures in exoplanetary systems with current and future missions. *Acta Astronautica*, 198, 194–207.

*Pidhorodetska, D., Moran, S. E., **Schwieterman, E. W.**, Barclay, T., Fauchez, T. J., Lewis, N. K., Quintana, E. V., Villanueva, G. L., Domagal-Goldman, S. D., Schlieder, J. E., Gilbert, E. A., Kane, S. R., & Kostov, V. B. (2021). L 98-59: A Benchmark System of Small Planets for Future Atmospheric Characterization. *The Astronomical Journal*, 162(4), 169. <https://doi.org/10.3847/1538-3881/ac1171>

Ranjan, S., Schwieterman, E. W., Harman, C., Fateev, A., Sousa-Silva, C., Seager, S., & Hu, R. (2020). Photochemistry of Anoxic Abiotic Habitable Planet Atmospheres: Impact of New H₂O Cross Sections. *The Astrophysical Journal*, 896(2), 148.

Fauchez, T. J., Villanueva, G. L. G. L., **Schwieterman, E. W.**, Turbet, M., Arney, G., *Pidhorodetska, D., Kopparapu, R. K. R. K., Mandell, A., & Domagal-Goldman, S. D. S. D. (2020). Sensitive probing of exoplanetary oxygen via mid-infrared collisional absorption. *Nature Astronomy*, 4(4), 372–376. <https://doi.org/10.1038/s41550-019-0977-7>

Schwieterman, E. W., Reinhard, C. T., *Olson, S. L., Harman, C. E., & Lyons, T. W. (2019). A Limited Habitable Zone for Complex Life. *The Astrophysical Journal*, 878(1), 19. <https://doi.org/10.3847/1538-4357/ab1d52>

- Schwieterman, E. W.**, Reinhard, C. T., *Olson, S. L., Ozaki, K., Harman, C. E., Hong, P. K., & Lyons, T. W. (2019). Rethinking CO Antibiosignatures in the Search for Life Beyond the Solar System. *The Astrophysical Journal*, 874(1), 9. <https://doi.org/10.3847/1538-4357/ab05e1>
- Glenar, D. A., Stubbs, T. J., **Schwieterman, E. W.**, Robinson, T. D., & Livengood, T. A. (2019). Earthshine as an illumination source at the Moon. *Icarus*, 321. <https://doi.org/10.1016/j.icarus.2018.12.025>
- *Lustig-Yaeger, J., Meadows, V., Tovar, G., **Schwieterman, E.**, et al. 2018. Detecting Ocean Glint on Exoplanets by Phase-Dependent Mapping. *The Astronomical Journal*, 156, 301.
- Schwieterman, E. W.**, Kiang, N. Y., Parenteau, M. N., Harman, C. E., DasSarma, S., Fisher, T. M., Arney, G. N., Hartnett, H. E., Reinhard, C. T., Olson, S. L., Meadows, V. S., Cockell, C. S., Walker, S. I., Grenfell, J. L., Hegde, S., Rugheimer, S., Hu, R., & Lyons, T. W. (2018). Exoplanet Biosignatures: A Review of Remotely Detectable Signs of Life. *Astrobiology*, 18(6), 663–708. <https://doi.org/10.1089/ast.2017.1729>
- Schwieterman E.W.** (2018) Surface and Temporal Biosignatures. In: Deeg H., Belmonte J. (eds) Handbook of Exoplanets. Springer, Cham. doi: [10.1007/978-3-319-30648-3_69-1](https://doi.org/10.1007/978-3-319-30648-3_69-1)
- *Olson, S. L., **Schwieterman, E. W.**, Reinhard, C. T., Ridgwell, A., Kane, S. R., Meadows, V. S., & Lyons, T. W. (2018). Atmospheric Seasonality as an Exoplanet Biosignature. *The Astrophysical Journal Letters*, 858(2), L14. <https://doi.org/10.3847/2041-8213/aac171>
- *Reinhard, C.T., Olson, S.L., **Schwieterman, E.W.**, Lyons, T.W., 2017. False Negatives for Remote Life Detection on Ocean-Bearing Planets: Lessons from the Early Earth. *Astrobiology* 17, 287–297.
- Schwieterman, E. W.**, Meadows, V. S., Domagal-Goldman, S. D., Deming, D., Arney, G. N., Luger, R., Harman, C. E., Misra, A., & Barnes, R. (2016). Identifying Planetary Biosignature Impostors: Spectral Features of CO And O4 Resulting From Abiotic O2/O3 Production. *The Astrophysical Journal*, 819(1), L13. <https://doi.org/10.3847/2041-8205/819/1/L13>
- Krissansen-Totton, J., **Schwieterman, E. W.**, Charnay, B., Arney, G., Robinson, T. D., Meadows, V., & Catling, D. C. (2016). Is the Pale Blue Dot Unique? Optimized Photometric Bands for Identifying Earth-Like Exoplanets. *The Astrophysical Journal*, 817(1), 31. <https://doi.org/10.3847/0004-637X/817/1/31>
- Schwieterman, E. W.**, Robinson, T. D., Meadows, V. S., Misra, A., & Domagal-Goldman, S. (2015). Detecting and Constraining N2 Abundances in Planetary Atmospheres Using Collisional Pairs. *The Astrophysical Journal*, 810(1), 57. <https://doi.org/10.1088/0004-637X/810/1/57>
- Harman, C. E., **Schwieterman, E. W.**, Schottelkotte, J. C., & Kasting, J. F. (2015). Abiotic O2 Levels on Planets Around F, G, K, and M Stars: Possible False Positives for Life? *The Astrophysical Journal*, 812(2), 137.
- Schwieterman, E. W.**, Cockell, C. S., & Meadows, V. S. (2015). Nonphotosynthetic Pigments as Potential Biosignatures. *Astrobiology*, 15(5), 341–361.
- Robinson, T.D., et al. (incl. **Schwieterman, E.W.**). 2014. Detection of Ocean Glint and Ozone Absorption Using LCROSS Earth Observations. *The Astrophysical Journal* 787, 171.
- Knight, M.M., et al. (incl. **Schwieterman, E.W.**) 2012. A Quarter-Century of Observations of Comet 10P/Tempel 2 at Lowell Observatory: Continued Spin-Down, Coma Morphology, Production Rates, and Numerical Modeling. *The Astronomical Journal*, 144:153.
- Meech, K.J., et al. (incl. **Schwieterman, E.W.**) 2011. EPOXI: Observations from a Worldwide Earth-Based Campaign. *The Astrophysical Journal Letters*, 734:L1.
- Knight, M.M., Farnam, T.L., Schleicher, D., **Schwieterman, E.W.** 2011. The Increasing Rotation Period of Comet 10P/Tempel 2. *The Astronomical Journal*, 141:2.
- Schwieterman, E. W.**, et al. 2010. Time-Series Photometry of GW Librae One Year after Outburst. *Journal of the Southeastern Association for Research in Astronomy*, Vol 3.