

## Edward W. Schwieterman

### CURRICULUM VITAE

---

**Mailing Address**

University of California, Riverside  
Department of Earth Sciences  
Riverside, CA 92521

**Contact Information**

Phone: (321)-505-1605  
Email: [eschwiet@ucr.edu](mailto:eschwiet@ucr.edu)  
Website: [eddieschwieterman.com](http://eddieschwieterman.com)

**Current Position:** NASA Postdoctoral Program Fellow  
University of California, Riverside (UCR)  
NAI Alternative Earths Team, Department of Earth Sciences  
Supervisor/PI: Timothy Lyons

**Education:** UNIVERSITY OF WASHINGTON (UW)  
Ph.D., Astronomy & Astrobiology, August 2016  
Thesis Advisor: Dr. Victoria Meadows  
Master of Science, Astronomy, August 2011

FLORIDA INSTITUTE OF TECHNOLOGY (FIT)  
B.Sc., Astronomy & Astrophysics, *Magna Cum Laude*, May 2010  
B.Sc., Physics, *Magna Cum Laude*, May 2010

**Other Professional Experience**

---

2015-Present. Research Scientist, Blue Marble Space Institute of Science (BMSIS)  
2010-2016. Graduate Research & Teaching Assistant, University of Washington  
2009-2010. Research Assistant, Lowell Observatory

**Grants and Awards**

---

2018. NASA NExSS Virtual Planetary Laboratory (Co-I; ~\$11M)  
2016-2018. NASA Postdoctoral Program Fellowship (~\$140K)  
2018. NAI Scholarship for the Astrobiology Grand Tour, Western Australia (\$1K)  
2016. NASA Astrobiology Institute Director's Discretionary Fund (PI; \$46K)  
2015. Kenilworth Foundation Grant for the UW Pre-Major in Astronomy Program (\$16.5K)  
2015. Wildcard Award, NASA Famelab Contest, Chicago/AbSciCon Regional Heat  
2015. UW Student Technology Fee (STF) Grant, Planetarium Upgrade (Co-I; \$47K)  
2015. UW STF Grant, Manastash Ridge Observatory Imaging Camera (Co-I; \$37K)  
2011-2015. UW GPSS grants for graduate student improvements (\$1.5K total)  
2013. American Philosophical Society Lewis and Clark Fund for Research (PI; \$4K)  
2013. NAI Scholar, International Summer School in Astrobiology

**Selected Academic Service and Synergistic Activities**

---

- 2016 - present. Peer reviewer for the journals *Astrobiology*, *Astronomical Journal (AJ)*, *Monthly Notices of the Royal Astronomical Society (MNRAS)*, and *Journal of Astronomical Telescopes, Instruments, and Systems (JATIS)*
2017. Co-convener, session on “Characterizing Exoplanet Biosignatures with Ground and Space-based Telescopes”, Astrobiology Science Conference
- 2016-2018. NExSS Workshop on Exoplanet Biosignatures, Review Paper Lead
- 2015-2016. Student Technology Fee Committee (UW; \$5 million/yr fund)
2015. Executive Secretary, NASA Solar System Workings Panel
- 2010-2015. Senator, Graduate and Professional Student Senate (GPSS)  
*GPSS Committees:* Executive (2014-2015), Finance & Budget (2012-2014; Chair: 2012-2013), Elections (2014, 2015), STF Oversight (2015), Judiciary (2010-2011)
2015. Student Representative, Academic Grievance Hearing Panel

**Selected Scientific Talks**

---

2018. “Characterizing Ozone Detectability and Seasonality on Weakly Oxygenated Terrestrial Exoplanets” The LUVOIR Seminar Series, Goddard Space Flight Center [Remote]. Greenbelt, MD, April 4, 2018.
2017. “An Introduction to Planetary Habitability and its Connection to the Search for Life Beyond Earth.” The Early History of Planetary Systems and Habitable Planets. Tartu, Estonia, Aug 8-10, 2017.
2017. “Characterizing N<sub>2</sub>O as an Exoplanet Biosignature: Early Earth as a Template” Goldschmidt conference, Paris, France, Aug 12-18, 2017.
2017. “A Phase-dependent Spectral Earth Database With Applications For Directly Imaged Earth-like Exoplanets.” The Astrobiology Science Conference 2017, held April 24–28, 2017 in Mesa, Arizona. No. 1965, id. 3515.
2017. “VPL Stellar and Planetary Spectra. Identifying Habitable Planets of Nearby M Dwarfs: The Virtual Planetary Laboratory Tools Workshop”. The 229<sup>th</sup> American Astronomical Meeting, held January 2-7 in Grapevine, TX.
2016. “Exploring Exoplanet Biosignatures using Spectral Models.” University of California, Riverside Earth Sciences & Astrobiology lunch talk.
2016. “Spectral identification of abiotic O<sub>2</sub> buildup from early runaways and rarefied atmospheres.” American Astronomical Society Meeting #227, #211.04.
2015. “Using Dimers to Constrain Planetary Habitability and Discriminate Against False Positives for Life.” Astrobiology Science Conference 2015 held in Chicago, IL talk #7486.
2015. “Distinguishing True and False Positive Oxygen Signatures with Models and Observations.” American Astronomical Society Meeting #225, #224.02.
2015. “Spectrally Identifying Habitable Worlds and Biosignatures”, Blue Marble Space Institute of Science, Seattle, WA and broadcast online.

### **Selected Education and Outreach Talks and Events**

---

2017. "Alien Planets: Are Other Earths Lurking in our Galaxy?" UCR Palm Desert Campus on April 6, 2017. Approximately 350 members of the public attended.
2017. Demonstrated cloud chamber to interested audience members during "Sensing the Universe" activity following "Are We Alone?" science lecture on February 1, 2017.
2016. "Measuring Exoplanet Atmospheres for Signs of Life." Night Sky Network webinar held on November 16, 2016. 111 audience members attended virtually.
2016. "Life Beyond the Solar System: The hunt for habitable worlds and biosignatures in the 2020s and beyond", public talk to the Seattle Astronomical Society (Seattle, April 20, 2016).
2016. "Biosignatures and Technosignatures: Finding life outside of the solar system", the Pacific Science Center's Science and a Movie Night (Seattle, March 23-24, 2016).
2016. "Promoting Inclusivity in STEM through Active Recruiting and Mentoring: The Pre-Major in Astronomy Program (Pre-MAP) at the University of Washington." American Astronomical Society Meeting #227, #313.04.
2015. "An Astrobiologist in the Land of Eternal Sunsets", NASA Famelab (Chicago, 2015).
2015. "Lifesigns and Biosignatures: How we'll find life outside the solar system", Astronomy on Tap science outreach talk (Seattle, October 28, 2015).
2015. "Bridging the Skill Gap from High School to Student Researcher: The Pre-Major in Astronomy Program (Pre-MAP) at the University of Washington." Northwest Astronomy Teaching Exchange (NATE), Center for Astronomy Education (CAE).

### **Teaching and Advising Experience and Relevant Professional Development**

---

2018. How to Teach Students Problem Solving Skills (CAE/AAS) (06/05)
2018. Using Anchored Inquiry to Teach Astronomy and Physics (BSCS/AAS) (06/03)
2018. Guest Lecture. "Spectral Signs of Habitability" Astro 630, University of Hawaii (04/25)
- 2016-2018. Co-advisor to Stephanie Olson, PhD student at UCR (2 papers)
2017. Co-advisor to Spandan Dash, student in BMSIS Young Scientist Summer Program
2016. Guest Lecturer, Astronomy 150 "The Planets" (UW)
2015. Facilitator, "Being an RA in the Physical Sciences" workshop, TA/RA Conference (UW)
2014. Instructor of Record, ASTR 192 "Pre-Major in Astronomy seminar" (UW)
2013. Teaching Assistant, ASTBIO 115 "Introduction to Astrobiology" (UW)
- 2012-2013. Physics/Astronomy Tutor, Student Athlete Academic Services (UW)
2011. Teaching Assistant, ASTR 101 "Introduction to Astronomy" (UW)
- 2010-2011. Teaching Assistant, ASTR 150 "The Planets" (UW)
- 2011, 2014. Astronomy Tutor, CLUE program (UW)

## Education and Outreach Service

---

2010-2016. UW Planetarium and Mobile Planetarium Show Presenter

2010-2016. Staff Member & Events Organizer, Pre-Major in Astronomy Program (UW)

2009. NASA International Year of Astronomy Student Ambassador, Florida

2006-2008. Coach, Brevard County (FL) Collaborative High School Science Bowl Team

## Peer-Reviewed Papers and Book Chapters

(Google Scholar h-index=14; \*includes an advised student (co)author)

---

- \***Schwieterman, E.W.** et al. 2018. Exoplanet Biosignatures: A Review of Remotely Detectable Signs of Life. *Astrobiology*, 18(6), 663-708. doi: [10.1089/ast.2017.1729](https://doi.org/10.1089/ast.2017.1729)
- \*Olson, S.L., **Schwieterman, E.W.**, Reinhard, C.T., Ridgwell, A., Kane, S.R., Meadows, V.S., and Lyons, T.W., 2018, Atmospheric seasonality as an exoplanet biosignature: *Astrophysical Journal Letters*, 858, L14. doi:[10.3847/2041-8213/aac171](https://doi.org/10.3847/2041-8213/aac171).
- 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., Lyons T.W. (2018) Earth: Atmospheric Evolution of a Habitable Planet. In: Deeg H., Belmonte J. (eds) Handbook of Exoplanets. Springer, Cham. doi: [10.1007/978-3-319-30648-3\\_189-1](https://doi.org/10.1007/978-3-319-30648-3_189-1)
- Meadows, V.S., Arney, G.N., **Schwieterman, E.W.** et al. 2018. The Habitability of Proxima Centauri b: Environmental States and Observational Discriminants *Astrobiology*, 18(2). doi: [10.1089/ast.2016.1589](https://doi.org/10.1089/ast.2016.1589)
- \*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., et al. 2016. Identifying Planetary Biosignature Impostors: Spectral Features of CO and O<sub>4</sub> Resulting from Abiotic O<sub>2</sub>/O<sub>3</sub> Production. *The Astrophysical Journal Letters*, 819: L13
- Krissansen-Totton, J., **Schwieterman, E.W.**, et al., 2016. Is the Pale Blue Dot Unique? Optimized Photometric Bands for Identifying Earth-Like Exoplanets. *The Astrophysical Journal* 817, 31.
- Schwieterman, E.W.**, Robinson, T.D., Meadows, V.S., Misra, A., Domagal-Goldman, S., 2015. Detecting and Constraining N<sub>2</sub> Abundances in Planetary Atmospheres Using Collisional Pairs. *The Astrophysical Journal* 810, 57.
- Harman, C.E., **Schwieterman, E.W.**, Schottelkotte, J.C., Kasting, J.F., 2015. Abiotic O<sub>2</sub> Levels on Planets Around F, G, K, and M Stars: Possible False Positives for Life? *The Astrophysical Journal* 812, 137.
- Schwieterman, E.W.**, Cockell, C.S., Meadows, V.S., 2015. Nonphotosynthetic Pigments as Potential Biosignatures. *Astrobiology* 15, 341–361.
- 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.

- Meadows, V.S., Reinhard, C.T., Arney, G.N., Parenteau, M.N., **Schwieterman, E.W.** et al., 2018. Exoplanet Biosignatures: Understanding Oxygen as a Biosignature in the Context of Its Environment. *Astrobiology*, 18(6), 630-662. doi: [10.1089/ast.2017.1727](https://doi.org/10.1089/ast.2017.1727)
- Walker, S.I., et al. (including **Schwieterman, E.W.**) 2018. Exoplanet Biosignatures: Future Directions. *Astrobiology* 18(6), 779-824. doi: [10.1089/ast.2017.1738](https://doi.org/10.1089/ast.2017.1738)
- Kiang, N.Y., Domagal-Goldman, S., Parenteau, M.N., Catling, D.C., Fujii, Y., Meadows, V.S., **Schwieterman, E.W.**, Walker, S.I., 2018. Exoplanet Biosignatures: At the Dawn of a New Era of Planetary Observations. *Astrobiology* 18(6). doi:[10.1089/ast.2018.1862](https://doi.org/10.1089/ast.2018.1862)
- Arney, G.N., et al. (including **Schwieterman, E.**) 2017. Pale Orange Dots: The Impact of Organic Haze on the Habitability and Detectability of Earthlike Exoplanets. *The Astrophysical Journal* 836, 49.
- Gentry, D.M., et al. (including **Schwieterman, E.W.**) 2017. Correlations Between Life-Detection Techniques and Implications for Sampling Site Selection in Planetary Analog Missions. *Astrobiology* 17, 1009–1021.
- Stüeken, E.E., et al. (including **Schwieterman, E.W.**) 2016. Modeling pN<sub>2</sub> through Geological Time: Implications for Planetary Climates and Atmospheric Biosignatures. *Astrobiology* 16, 949–963.
- Arney, G., et al. (including **Schwieterman, E.**). 2016. The Pale Orange Dot: The Spectrum and Habitability of Hazy Archean Earth. *Astrobiology* 16, 873–899.
- Amador, E.S., et al. (incl. **Schwieterman, E.**). 2015. Synchronous in-field application of life-detection techniques in planetary analog missions. *Planetary and Space Sciences*, 106:1-10.
- Robinson, T.D., et al. (including **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. (including **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. (including **Schwieterman, E.W.**) 2011. EPOXI: Observations from a Worldwide Earth-Based Campaign. *The Astrophysical Journal Letters*, 734:L1.
- Knight, M.M., et al. (including **Schwieterman, E.W.**) 2011. The Increasing Rotation Period of Comet 10P/Tempel 2. *The Astronomical Journal*, 141:2.
- Addison, B. C., et al. (including **Schwieterman, E.W.**) 2010. Modeling and Observing Extrasolar Planetary Transits. *Journal of the Southeastern Association for Research in Astronomy*, Vol 3.
- Piwowar, D., Wood, M.A., **Schwieterman, E.W.**, et al. 2010. Time-Series Photometry of the Cataclysmic Variable Systems VY Aquarii and V2491 Cygni. *Journal of the Southeastern Association for Research in Astronomy*, Vol 3.

### **White Papers and Other Non-Refereed Articles** (\*includes a student author)

---

- \***Schwieterman, E.**, Reinhard, C., Olson, S., Lyons, T., 2018. *The Importance of UV Capabilities for Identifying Inhabited Exoplanets with Next Generation Space Telescopes*. A white paper submitted in response to the National Academies of Sciences Astrobiology Science Strategy and Exoplanet Science Strategy calls. [arXiv preprint 1801.02744](#).
- Domagal-Goldman, S., et al. (including **Schwieterman, E.W.**) 2018. *Life Beyond the Solar System: Remotely Detectable Biosignatures*. A white paper submitted in response to the National Academies of Sciences Study: Astrobiology Science Strategy and Exoplanet Strategy Calls. [arXiv preprint 1801.06714](#).
- Trainer, M., et al. (including **Schwieterman, E.W.**) 2018. *“Pale Orange Dot”: Titan As An Analog For Early Earth And Hazy Exoplanets*. A white paper submitted in response to the National Academies of Sciences Study: Astrobiology Science Strategy for the Search for Life in the Universe.
- Haqq-Misra, J., Som, S., Mullan, B., Loureiro, R., **Schwieterman, E.**, et al. 2018. *The Astrobiology of the Anthropocene*. A white paper submitted in response to the National Academies of Sciences Study: Astrobiology Science Strategy for the Search for Life in the Universe. [arXiv preprint 1801.00052](#).
- Henning, W.G., et al. (including **E.W. Schwieterman**). 2018. Exoplanet Science Priorities from the Perspective of Internal and Surface Processes for Silicate and Ice Dominated Worlds. A white paper submitted in response to the National Academies of Sciences Exoplanet Science Strategy call. [arXiv preprint 1804.05094](#)
- Kopparapu, R., et al. (including **E.W. Schwieterman**). 2018. Exoplanet Diversity in the Era of Space-based Direct Imaging Missions. A white paper submitted in response to the National Academies of Sciences Exoplanet Science Strategy call. [arXiv preprint 1803.03812](#)
- Fischer et al. (**E.W. Schwieterman** contributing author). 2018. National Aeronautics and Space Agency. The Large Ultraviolet Optical Infrared Surveyor (LUVOIR) Interim Report. Greenbelt, MD.
- Knight, M., **Schwieterman, E.**, Schleicher, D. 2010. Comet 103P/Hartley. IAU Circ. 9163.

### **Press Releases & Media**

---

2018. “UCR Team Among Scientists Developing Guidebook for Finding Life Beyond Earth” Sarah Nightingale, *UCR Today*: <https://ucrtoday.ucr.edu/54211>
2018. “Atmospheric Seasons Could Signal Alien Life” Sarah Nightingale, *UCR Today*: <https://ucrtoday.ucr.edu/53416>
2018. “False Positives, False Negatives; The World of Distant Biosignatures Attracts and Confounds.” Marc Kauffman, *Many Worlds/ NASA Astrobiology Newsletter*: <https://astrobiology.nasa.gov/news/false-positives-false-negatives-the-world-of-distant-biosignatures-attracts-and-confounds/>
2017. “A new atmosphere in astronomy: UW alumni and Virtual Planetary Laboratory featured for exoplanet modeling.” Alan Brazelton, *The UW Daily*: [http://www.dailyuw.com/features/article\\_fc7ca23e-021f-11e7-9e7e-1f7266f313ac.html](http://www.dailyuw.com/features/article_fc7ca23e-021f-11e7-9e7e-1f7266f313ac.html)

2016. "Planet Hunters Seek New Ways to Detect Alien Life." Alexandra Witze, *Nature News*. doi:10.1038/535474a
2016. "False Positives in the Search for Extraterrestrial Life." Paul Glister, *Centauri Dreams*. <https://www.centauri-dreams.org/2016/03/02/false-positives-in-the-search-for-extraterrestrial-life/>
2016. "Life or an illusion? Avoiding 'false positives' in the search for living worlds." Peter Kelley – *UW Today*. <https://www.washington.edu/news/2016/02/29/life-or-illusion-avoiding-false-positives-in-the-search-for-living-worlds/>
2016. "Nitrogen may be a sign of habitability." Elizabeth Howell, *Astrobiology Magazine*. <https://www.astrobio.net/news-exclusive/nitrogen-may-be-a-sign-of-habitability/>
2015. "Earth observations show how nitrogen may be detected on exoplanets, aiding search for life." Peter Kelley, *UW Today*. <https://www.washington.edu/news/2015/09/03/earth-observations-show-how-nitrogen-may-be-detected-on-exoplanets-aiding-search-for-life/>
2015. "Spectrum of life: Nonphotosynthetic pigments could be biosignatures of life on other worlds." Peter Kelley, *UW Today*. <https://www.washington.edu/news/2015/06/22/spectrum-of-life-nonphotosynthetic-pigments-could-be-biosignatures-of-life-on-other-worlds/>

### **Memberships in Professional Societies**

---

American Astronomical Society, Division of Planetary Sciences, American Physical Society, European Association of Geochemistry, American Geophysical Union