Jacob Lustig-Yaeger

Curriculum Vitae

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Office Address
Department of Astronomy, University of Washington
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Education

University of Washington, Seattle, WA 2014 – present
Graduate student in Astronomy and Astrobiology (dual-title PhD program)

University of Washington, Seattle, WA 2014 – 2016
M. Sci. in Astronomy

University of California, Santa Cruz, CA 2009 – 2013
B.S. with Honors in Physics
Minor in Mathematics

Research Experience

Graduate Research Assistant: Virtual Planetary Laboratory Sept 2014 –
Extrasolar planets, their atmospheres, & habitability with Dr. Victoria Meadows
- Lead developer of a novel retrieval model for the analysis of terrestrial exoplanet spectra
- Experience simulating and analyzing radiative transfer, photochemical, climate, and telescope noise models
- Programming in Python, Julia, IDL, & Fortran

Junior Specialist: University of California, Santa Cruz Dec 2013 – Aug 2014
Hot Jupiter atmospheres with Jonathan Fortney and Michael Line
- Wrote Python code to analyze the emission spectra of exoplanets observed during secondary eclipse
- Gained experience using Bayesian methods of parameter estimation

Undergraduate Researcher: University of California, Santa Cruz June 2012 – Dec 2013
Extrasolar planet and brown dwarf atmospheric opacity sources with Jonathan Fortney
- Wrote IDL code to calculate, tabulate, and plot weighted mean opacities over a wide range of atmospheric temperatures, pressures, and metallicities

Teaching Experience

Teaching Assistant: Department of Astronomy, University of Washington Sept 2014 – June 2015
Led two biweekly sections for undergraduate students
- ASTR 101 (Spring 2015; Autumn 2014)
- ASTR 150 (Winter 2015)

Math & Writing Tutor: Learning Support Services, UCSC Sept 2010 – June 2012
Instructed students in college level mathematics and writing as a group and drop-in tutor

Honors & Awards

- Honors undergraduate thesis in physics (2013)
- University Honor, *cum laude* at University of California, Santa Cruz (2013)

Publications

- Luger, R., **Lustig-Yaeger, J.**, Fleming, D. P., Tilley, M. A., Agol, E, Meadows, V. S., Deitrick, R., & Barnes, R. (2016). "The Pale Green Dot: A Method to Characterize Proxima Centauri b using Exo-Aurorae". *arXiv preprint arXiv:1609.09075.*
- Meadows, V. S., Arney, G. N., Schwieterman, E. W., **Lustig-Yaeger, J.**, Lincowski, A. P., Robinson, T., Domagal-Goldman, S. D., Barnes, R. K., Fleming, D. P., Deitrick, R., Luger, R., Driscoll, P. E., Quinn, T. R., Crisp, D. (2016). "The Habitability of Proxima Centauri b II: Environmental States and Observational Discriminants". *arXiv preprint arXiv:1608.08620.*

— Barnes, R., Deitrick, R., Luger, R., Driscoll, P. E., Quinn, T. R., Fleming, D. P., Arney, G., Crisp, D., Domagal-Goldman, S. D., Lincowski, A. P., **Lustig-Yaeger, J.**, & Schwieterman, E. (2016). "The Habitability of Proxima Centauri b I: Evolutionary Scenarios". *arXiv preprint arXiv:1608.06919*.

— Greene, T. P., Line, M. R., Montero, C., Fortney, J. J., **Lustig-Yaeger, J.**, & Luther, K. (2016). "Characterizing transiting exoplanet atmospheres with JWST". *The Astrophysical Journal*, 817(1), 17.

— Freedman, R. S., **Lustig-Yaeger, J.**, Fortney, J. J., Lupu, R. E., Marley, M. S., & Lodders, K. (2014). "Gaseous Mean Opacities for Giant Planet and Ultracool Dwarf Atmospheres over a Range of Metallicities and Temperatures". *The Astrophysical Journal Supplement Series*, 214(2), 25.

Conference Presentations

Contributed Talks

— **Lustig-Yaeger, J.**, Line, M. R., & Fortney, J. J. (2015). "On the Confidence of Molecular Detections in the Atmospheres of Exoplanets from Secondary Eclipse Spectra". American Astronomical Society Meeting Abstracts, 225, #124.03

Posters

— **Lustig-Yaeger, J.**, Schwieterman, E., Meadows, V., Fujii, Y., & NAI Virtual Planetary Laboratory, I. '. E.-C. I. P. (2016). "Modeling Earth's Disk-Integrated, Time-Dependent Spectrum: Applications to Directly Imaged Habitable Planets". AAS/Division for Planetary Sciences Meeting Abstracts, 48, #122.34

— **Lustig-Yaeger, J.**, Meadows, V., Schwieterman, E. W., & Robinson, T. (2016). "Modeling Earths Disk-Integrated Spectrum through a Lunar Month: Applications to Directly Imaged Habitable Exoplanets". Exoplanets I

— **Lustig-Yaeger, J.**, Meadows, V., Line, M., & Crisp, D. (2015). "A Novel Approach to Atmospheric Retrieval for Small Exoplanets". AAS/Division for Planetary Sciences Meeting Abstracts, 47, #416.10

— **Lustig-Yaeger, J.**, Line, M., Fortney, J. J., & Meadows, V. (2015). "Detecting Molecules in Exoplanet Atmospheres: Lessons Learned from Hot Jupiters". Astrobiology Science Conference, #7558

— **Lustig-Yaeger, J.**, Line, M. R., & Fortney, J. J. (2014). "On the Detection Significance of Molecules in Exoplanets from Secondary Eclipse Observations". Cool Stars, 18, #267

— **Lustig-Yaeger, J.**, Fortney, J. J., Freedman, R., Marley, M. S., & Lupu, R. E. (2014). "Gaseous Mean Opacities for Giant Planet and Brown Dwarf Atmospheres". American Astronomical Society Meeting Abstracts #223, #347.04

Public Talks

— "BREAKING: Terrestrial Exoplanet Discovered in the Habitable Zone of Proxima Centauri" Astronomy on Tap, Peddler Brewing Company, Seattle, WA. August 24, 2016.