COLBY OSTBERG

University of California, Riverside
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RESEARCH INTERESTS

Simulating Observations of ExoVenuses and ExoEarths
modelling exoplanet atmospheres; modelling the transmission, emission, and reflectance spectra of exoplanets using output from 1D and 3D climate models; simulating the signal-to-noise of atmospheric spectroscopy with JWST and future direct imaging telescopes like HWO

Modeling Planets Transitioning Into a Runaway Greenhouse
determining whether known exoVenuses are in runaway greenhouse states; reevaluating the runaway greenhouse limits for different stellar types; identifying key spectral features in each phase of a runaway greenhouse transition

EDUCATION & INTERNSHIPS

Education

PhD in Earth and Planetary Sciences (Expected Graduation: Jun 2025)
Department of Earth and Planetary Science
University of California, Riverside — Riverside, CA *Sep 2018 - Present*

Bachelor of Science in Physics
Physics and Astronomy Department
San Francisco State University — San Francisco, CA *Aug 2014 - Jun 2018*

Internships

DAVINCI Internship at NASA GSFC
Investigating the potential of detecting volcanism on exoplanets
Advisor: Dr. Scott Guzewich
NASA Goddard Space Flight Center — Greenbelt, MD *Sep 2022 - Jan 2023*

NASA JPL Year-Round Internship Program
Using new lithospheric thickness values for Venus to update heat flow estimates
Advisor: Dr. Suzanne Smrekar
NASA Jet Propulsion Laboratory — Pasadena, CA *Nov 2019 - Nov 2020*

NASA JPL Summer Internship Program
Constraining the thickness of Venus' elastic lithosphere
Advisor: Dr. Suzanne Smrekar
NASA Jet Propulsion Laboratory — Pasadena, CA *Summer 2019*

NSF REU Internship
Subtracting background energy from particle collisions
Advisor: Dr. Saskia Mioduszewski
Texas A&M Cyclotron Institute — College Station, TX *Summer 2017*

TEACHING EXPERIENCE

Teaching Assistant, University of California, Riverside *2018 - 2024*
- GEO 009 Oceanography
- GEO 080 Astrobiology: The Search For Life in the Universe
- GEO 013 Our Planetary Neighbors: The Solar System and Beyond
- GEO 006 Planets in Science Fiction

Tutor, CARP at San Francisco State University *2017*
- Assisted with all non-major physics and math courses

PUBLICATIONS

First and Second Author

"Reading Between the Lines: Investigating the Ability of JWST to Distinguish Exo-Earths and Exo-Venuses"
C. Ostberg, S.R. Kane, A.P. Lincowski, P.A. Dalba 2023 Astronomical Journal, 166, 213

"The Prospect of Detecting Volcanic Signatures on an ExoEarth using Direct Imaging"
C. Ostberg et al. (2023) Astronomical Journal, 166, 199

"The Demographics of Terrestrial Planets in the Venus Zone"
C. Ostberg, S.R. Kane, Z. Li, E.W. Schwieterman, M.L. Hill, K. Bott, P.A. Dalba, T. Fetherolf, J.W. Head, C.T. Unterborn 2023 Astronomical Journal, 165, 168

"Predicting the Yield of Potential Venus Analogs from *TESS* and their Potential for Atmospheric Characterization"
C. Ostberg, S.R. Kane, (2019) Astronomical Journal, 158 (5), 195

"Earth-like Lithospheric Thickness and Heat Flow on Venus Consistent With Active Rifting"
S. Smrekar, **C. Ostberg**, and J.G. O'Rourke 2022, Nature Geoscience, 16 (1), 13-18

"Synergies between Venus & Exoplanetary Observations: Venus and Its Extrasolar Siblings"
M. Way, **C. Ostberg**, B.J. Foley, C. Gillmann, D. Höning, H. Lammer, J.G. O'Rourke, M. Persson, A. Plesa, A. Salvador, M. Scherf, M. Weller 2022, Space Science Reviews 219 (1), 13

Co-Author

"A Global Survey of Lithospheric Flexure at Steep-Sided Domical Volcanoes on Venus Reveals Intermediate Elastic Thicknesses"
M.E. Borelli, J.G. O'Rourke, S.E. Smrekar, **C.M. Ostberg** 2021, JGR Planets, 126 (7), e2020JE006756

"Eccentricity Driven Climate Effects in the Kepler-1649 System"
S.R. Kane, E.T. Wolf, **C. Ostberg**, M.L. Hill 2020, Astronomical Journal, 161 (1), 31

"Transits of Known Planets Orbiting a Naked-eye Star"
S.R. Kane, et al. including **C. Ostberg** 2020, Astronomical Journal, 160 (3), 129

"Science Extraction from TESS Observations of Known Exoplanet Hosts"
S.R. Kane et al. including **C. Ostberg** 2020, PASP, 133 (1019), 014402

"A Catalog of Habitable Zone Exoplanets"
M.L. Hill, K. Bott, P.A. Dalba, T. Fetherolf, S.R. Kane, R. Kopparapu, Z. Li, **C. Ostberg**
2023, Astronomical Journal, 165, 34

FELLOWSHIPS & COMPETITIVE AWARDS

- 2023 Dissertation Year Program Fellowship, UCR Earth and Planetary Sciences Dept.
- Outstanding Student Presentation Award, American Geophysical Union Fall 2019 Meeting
- Dean's Distinguished Fellowship Award, UC Riverside (2018-2023)
- Venus as a System Conference Travel Stipend 2023
- NASA Astrobiology Institute Student Travel Stipend, Astrobiology Science Conference 2019
- Venus Exploration and Analysis Group (VEXAG) Travel Stipend, VEXAG 2019 Meeting
- VEXAG Travel Stipend, Exoplanets in our Backyard 2020
- VEXAG Travel Stipend, Exoplanets in our Backyard 2024

PRESENTATIONS

Invited Talks

"An Overview of Terrestrial Planets in the Venus Zone"
Friends of DAVINCI Seminar Series 2024 (NASA GSFC)

"Investigating the Ability of JWST NIRSpec to Identify Discerning Features in ExoEarth and ExoVenus Transmission Spectra"
Astrobiology Science Conference 2024

"The Prospect of Detecting Volcanism on an ExoEarth Using Direct Imaging"
ExSoCal Meeting 2023

"The Study of Venus Through Exoplanets and DAVINCI"
CSU San Marcos 2024

"The Prospect of Detecting Volcanism on an ExoEarth Using Direct Imaging"
SETI Live 2023

"The Prospect of Detecting Volcanism on an ExoEarth Using Direct Imaging"
NASA GISS 2023

"Investigating the Ability of JWST NIRSpec to Identify Discerning Features in ExoEarth and ExoVenus Transmission Spectra"
Max Planck Institute 2023

"The Demographics of Terrestrial Planets in the Venus Zone"
Brown University 2023

"The Study of Venus Through Exoplanets and DAVINCI"
NASA Night Sky Network 2022

"The Study of Venus Through Exoplanets and DAVINCI"
Riverside Astronomical Society 2022

Talks at Conferences

"A Climatic and Observational Overview of Two Potential ExoVenuses"
VEXAG 2024

"Investigating the Ability of JWST NIRSpec to Identify Discerning Features in ExoEarth and ExoVenus Transmission Spectra"
Venus as a System Conference 2023

"A Catalog of ExoVenus Candidates and Their Potential for Follow-Up Observations"
AbSciCon Spring Meeting 2022

"Identifying Potential Venus Analogs from Exoplanet Discoveries"
AGU Fall 2019 Meeting (Abstract ID: 517488)

Poster Presentations

"The Prospect of Detecting Volcanism on an ExoEarth Using Direct Imaging"
LPSC 2024

"The Prospect of Detecting Volcanism on an ExoEarth Using Direct Imaging"
SEEC Symposium 2024

"Surprising Similarities: Comparing the Transit Spectra of Potential Earth-Like and Venus-Like Exoplanets"
AGU Fall Meeting 2021

"Identifying Potential Venus Analogs from Exoplanet Discoveries"
AbSciCon 2019 (Abstract ID: 480282), Bellevue, WA

"Identifying Potential Venus Analogs from Exoplanet Discoveries"
Extreme Solar Systems IV, Reykjavick, Iceland

"Identifying Potential Venus Analogs from Exoplanet Discoveries"
Lunar and Planetary Science Conference 2019 (Abstract ID: 2123), The Woodlands, TX

"Understanding Venus' Interior Processes as a Control Case for the Evolution of Earth and Earth-sized Exoplanets"
American Geophysical Union Fall 2019 Meeting (Abstract ID: 589674), San Francisco, CA

SKILLS

- Python
- GIS Software
- Matlab
- Data Analysis and Visualization
- Scientific Writing