

SAMANTHA R. GILBERT-JANIZEK

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EDUCATION

University of Washington, WA

Sept. 2019 - Present

Dual Title PhD in Astronomy & Astrobiology (exp. Summer 2026)

MS Astronomy

University of Chicago, IL

Oct. 2013 - June 2017

BA Physics/Astrophysics Specialization, Awarded with Honors

SKILLS

Languages: English, Spanish

Programming: Python, Fortran, C, MATLAB

Software & Tools: rfast, SMART, SMARTER, Atmos, Astropy, MultiNest, VPLanet

SELECTED RESEARCH EXPERIENCE

University of Washington, Advisor: Prof. Rory Barnes

Sept. 2019 - Present

Graduate Research Assistant

One aspect of my research at the University of Washington has focused on bridging the gap between interior and atmospheric evolution models to *simulate fully self-consistent planets* in anticipation of the Habitable Worlds Observatory. This has involved building new physical models with ordinary differential equations, extending the VPLanet software ecosystem. Another aspect of my work has involved studying the *impact of atmospheric modeling assumptions* on the interpretation of Earth-like exoplanet spectra under the Bayesian retrieval model SMARTER.

Stanford University, Prof. Laura Schaefer

Fall 2023

Visiting Researcher

Studied the habitability of JWST targets of interest using geologic convection models. Wrote code to model systems of ordinary differential equations, investigating the effects of stagnant lid convection and crustal recycling on the stability of the atmosphere and surface liquid water for the inner rocky planets L-98-59 b and TOI-1685 b.

Lawrence Berkeley National Laboratory, Prof. Akito Kusaka

Aug. 2017 - Aug. 2018

Post-Baccalaureate Research Assistant

Researched and successfully developed a cryogenic test-bed for the study of cosmic microwave background (CMB) anisotropies, which probe the early fluctuations leading to large-scale structure, with POLARBEAR-2. Developed motor control scripts for the POLARBEAR-2 cold half-wave plate.

Columbia University, Prof. Brian Humensky

Summer 2016

REU Participant

Optimized image cleaning for the detection of high-energy gamma-ray events with the Cherenkov Telescope Array, adapting scripts to manage large data trees generated by 200,000 simulated shower events.

PUBLICATIONS

Gilbert-Janizek, S. et al., (*in review at Planetary Science Journal.*) “Retrieved Atmospheres and Inferred Surface Properties for Habitable Terrestrial Exoplanets Using Transmission and Direct Imaging.”

INVITED TALKS

“A Modeling Comparison of Retrieved Planetary Properties for Habitable Exoplanets Using Transmission and Direct Imaging”. University of Washington - Bothell Physics Seminar, Virtual, Nov. 2023.

“A Modeling Comparison of Retrieved Planetary Properties for Habitable Exoplanets Using Transmission and Direct Imaging”. Jet Propulsion Laboratory, Virtual, Apr. 2023.

“Searching for Life on Exoplanets.” Lawrence Berkeley National Laboratory, SULI/BLUR Internship Meeting, Virtual, Mar. 16, 2022.

CONTRIBUTED PRESENTATIONS

“Retrieved Atmospheres and Inferred Surface Properties for Habitable Terrestrial Exoplanets Using Transmission and Direct Imaging.” American Astronomical Society Conference 241, In Person, Jan 2023. Talk.

“A Modeling Comparison of Retrieved Atmospheres and Inferred Surface Properties for Habitable Terrestrial Exoplanets Using Transmission and Direct Imaging.” Astrobiology Science Conference, In Person, May 2022. Talk.

“How will we find and recognize life out there?” University of Washington Astrobiology Public Science Panel, Virtual, Jul. 28, 2021. Panelist.

“Developing a hierarchy of models for terrestrial habitability studies.” TRAPPIST Habitable Atmosphere Intercomparison (THAI) Workshop, Virtual, Sept. 2020. Talk. *Video link available on website.*

SELECTED MENTORSHIP & OUTREACH

Raising e-STEAM

Feb. 2022 - Present

Founder, Leader, Tutor

- Founded and lead the effort to mentor incarcerated youth at a medium to maximum security juvenile detention center.-
- Organizing and leading 8 PhD students who provide weekly 1:1 tutoring.
- Volunteers develop hands-on Astrobiology lab activities and python coding camps for after-school and over the summer.
- Highlighted in the press by [Popular Science](#) and [Astrobites](#)

Amelie Sharples and Ally Payne

Summer 2022-Summer 2023

- Mentored undergraduates in implementing a nested sampling-based retrieval model to characterize theoretical steam atmospheres on TRAPPIST-1 c with JWST.
- Amelie won “Best Poster” (overall) at CUWiP in Ithaca, NY, Fall 2022.
- Ally is now a Post-Baccalaureate Researcher working with Dr. Geronima Villanueva on the Planetary Spectrum Generator at NASA Goddard Space Flight Center.

Leah Zuckerman

Summer 2019

- Co-mentored undergraduate on implementing and debugging a 1D coupled photochemistry-climate model to simulate the hazy Titan atmosphere.
- Leah is now a PhD student in Astrophysics and Planetary Sciences at UC Boulder.

GRANTS & AWARDS

Washington NASA Space Grant

Sep. 2022- Jun. 2024

Awarded \$28,000 over 3 years