SAMANTHA R. GILBERT-JANIZEK

samgilbertjanizek.neocities.org samroseg@uw.com (561)-951-2219

EDUCATION

University of Washington, WA *Sept. 2019 - Present*
Dual Title PhD in Astronomy & Astrobiology (exp. Spring 2026)
MS Astronomy

University of Chicago, IL *Oct. 2013 - June 2017*
BA Physics/Astrophysics Specialization, ***Awarded with Honors***

SKILLS

Languages:	English, Spanish
Programming:	Python, C, Fortran, MATLAB
High-Performance Computing:	parallel processing, optimization, SLURM scheduling
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
I am bridging the gap between interior and atmospheric evolution models to simulate *fully self-consistent planets* in anticipation of the launch of the Habitable Worlds Observatory (HWO) by extending the `VPLanet` software ecosystem. I have also studied 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 using convection models. Modeled 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.

University of Chicago, Prof. Abigail Vieregg *Sept. 2016 - Jun. 2017*
Senior Thesis Project
Designed, built, and characterized a radio frequency anechoic chamber for detection of ultra-high energy neutrinos with the Askaryan Radio Array (ARA). Shared my results in a journal-style paper and conference-style talk to obtain Honors in Physics with a Specialization in Astrophysics.

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.

University of Chicago, Prof. Scott Wakely *Jan. 2015 - Jun. 2016*
Research Assistant
- Designed, fabricated, and programmed electronics for the CTA prototype camera, including Arduino microcontrollers
- Implemented web page-based control of stepper motors to improve handling of the camera

PUBLICATIONS

Gilbert-Janizek, S. et al., 2026, submitted to *Astrophysical Journal Letters*, "The effect of spectral resolution on biosignature detection via reflected light observations of the Earth through time."

Gilbert-Janizek, S. et al., 2026, submitted to *Planetary Science Journal*, "A whole-planet model of the Earth without life for terrestrial exoplanet studies."

Gilbert-Janizek, S. et al., 2024, *Planetary Science Journal*, "Retrieved Atmospheres and Inferred Surface Properties for Habitable Terrestrial Exoplanets Using Transmission and Direct Imaging."

Joshua Krissansen-Totton, Anna Grace Ulses, Maxwell Frissell, **Samantha Gilbert-Janizek**, Amber Young, Jacob Lustig-Yaeger, Tyler Robinson, Stephanie Olson, in review at *Astrobiology*, "Wavelength Requirements for Life Defection via Reflected Light Spectroscopy of Rocky Exoplanets."

Emilie Lafleche, Anna Grace Ulses, **Samantha Gilbert-Janizek**, Jonathan Jernigan, Nicholas Wogan, Michael D. Himes, Stephanie L. Olson, Edward W. Schwieterman, Mary N. Parenteau, Joshua Krissansen-Totton, Avi Mandell, "Breathing Worlds: Leveraging Seasonality for Exo-Earth Biosphere Characterization with HWO." Biosignature Seasonality HWO Science Case Development Document. (2025).

Giada Arney, Niki Parenteau, Natalie Hinkel, Eric Mamajek, Joshua Krissansen-Totton, Stephanie Olson, Edward Schwieterman, Sara Walker, Kevin Fogarty, Ravi Kopparapu, Jacob Lustig-Yaeger, Mark Moussa, Sukrit Ranjan, Garima Singh, Clara Sousa-Silva, Maxwell Frissell, **Samantha Gilbert-Janizek**, Vincent Kofman, Natasha Latouf, Mary Anne Limbach, Rhonda Morgan, Christopher Stark, Anna Grace Ulses, Nicholas Wogan, Mike Wong, Amber Young, "The Search for Life on Potentially Habitable Exoplanets." Living Worlds HWO Science Case Development Document. (2025).

Hobson-Ritz, Marshall, Jessica Birky, Leah Peterson, Peter Gwartney, Rachel Wong, John Delker, Tyler Gordon, **Samantha Gilbert-Janizek**, James RA Davenport, and Rory Barnes. *The Astrophysical Journal.* "Tidal Synchronization of TESS Eclipsing Binaries."

INVITED TALKS

"Exo-Earths from the Inside Out: Characterizing Earth-like Exoplanets with HWO".
UC Santa Cruz Lunch Seminar, Oct. 2024

"A Modeling Comparison of Retrieved Planetary Properties for Habitable Exoplanets Using Transmission and Direct Imaging".
NASA Goddard Space Flight Center Seminar, Nov. 2024
Carnegie Earth and Planets Laboratory Seminar, Nov. 2024
Carnegie Observatories Lunch Seminar, Oct. 2024
University of Washington - Bothell Physics Seminar, Virtual, Nov. 2023
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

"Exo-Earths From the Inside Out." American Astronomical Society Conference 247, In Person, Jan 2026. Dissertation Talk.

"Predicting Atmospheric and Surface Volatile Inventories of Abiotic Earths around HWO Target Stars." American Astronomical Society Conference 245, In Person, Jan 2025. Talk.

"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.*

"Assessing Our Ability to Interpret Biosignatures via Transmission and Direct Imaging." Sagan Workshop, Caltech, Jul. 15-19 2021. Poster and lightning talk.

"Design and evaluation of a cryogenic continuous rotation stage for CMB polarization modulation on POLARBEAR-2." SPIE Astronomical Telescopes + Instrumentation Conference, Austin, TX, Jun. 2018. Conference poster. *Coauthor*.

"Comparing two-level and time next neighbor cleaning protocols for optimizing CTA image cleaning." REU Program Presentation, Nevis Laboratories, NY, Aug. 2016.

SELECTED MENTORSHIP & OUTREACH

Raising e-STEAM *Feb. 2022 - Present*

Education in Science, Technology, Engineering, Astrobiology/Art, and Math

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 in subjects including Financial Math, Geometry, Chemistry, Spanish, Language Arts
- Volunteers develop hands-on Astrobiology lab activities, python coding camps, and a Lego Mars rover simulator for after-school and over the summer. All lesson plans available on website linked here.
- Highlighted in the press by Popular Science and Astrobites
- Activities include: Recreating the Mars Viking experiment, a Mobile Planetarium show, Solar Observing, and Reflected Light Spectroscopy. All lesson plans available on website linked here.
- Program provides incarcerated children with committed, reliable adult role models who are STEM professionals to encourage an interest in STEM education/careers

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.

More Active Girls in Computing (MAGIC) *Jan. 2022 - Jan. 2023*
Mentor
- Mentored a high school girl interested in STEM careers by collaborating on a real astronomy research project: assessing our ability to discriminate between different types of terrestrial atmospheres on the inner TRAPPIST-1 planets using future emission spectroscopy measurements
- Program encourages girls from marginalized backgrounds to pursue careers in STEM by sparking an early interest in computing

Pre-Major in Astronomy Program (Pre-MAP) *Sept. 2021 - Jun. 2022*
Academic Advisor
- Mentored new UW undergraduate students in coding and the scientific method as they work on their first astronomy research projects
- Program encourages students from marginalized backgrounds to pursue the Astronomy major at UW and careers in STEM
-Developed lesson plans and workshops for teaching how to write and debug Python code and how to navigate academic mentoring relationships

GRANTS & AWARDS

Washington NASA Space Grant *Sep. 2022- Jun. 2025*
Awarded $28,000 over 3 years

2025 Zonta International Amelia Earhart Fellowship *Sep. 2025-May 2026*
Awarded $10,000
Won by up to 30 scientists per year **worldwide**

American Astronomical Society Rodger Doxsey Travel Prize *Winter 2026*
9 of 114 applicants awarded $900 to present my dissertation research at the 247th meeting of the AAS

Washington NASA Space Grant Dissertation Award *Spring 2026*
Awarded $6,000 for the completion of my dissertation work at the University of Washington - Seattle