COURTNEY CARREIRA

(she/her)
ccarreir@ucsc.edu ◇ courtneycarreira.github.io ◇ ORCID: 0000-0001-6301-3667

EDUCATION

Ph.D. Student September 2023 - Present
Department of Astronomy & Astrophysics, The University of California, Santa Cruz *Santa Cruz, CA*
Advisor: Professor Brant Robertson

B.S. Physics Graduated with General Honors, May 2023
Department of Physics and Astronomy, Johns Hopkins University *Baltimore, MD*
Minor in Applied Mathematics and Statistics
Relevant Coursework: Astrophysical Plasmas, Radiative Astrophysics, Introduction to Stellar Physics

RESEARCH EXPERIENCE

Graduate Student Researcher April 2024 - Present
Department of Astronomy & Astrophysics, The University of California, Santa Cruz *Santa Cruz, CA*

- As a member of the *JWST* Advanced Deep Extragalactic Survey (JADES) collaboration, I am analyzing the star formation histories of observed galaxies via the study of their morphologies.
- Using Bayesian techniques to perform robust model-fitting of Sérsic profiles to galaxies in GOODS-S.

NSF REU Intern and NRAO SOS Researcher June 2022 - Present
Smithsonian Astrophysical Observatory *Cambridge, MA*

- Using observations of atomic and molecular gas emissions in M33 to analyze the effect of proximity from the southeastern spiral arm in the formation of molecular clouds; advised by Dr. Eric Koch and Dr. Sarah Jeffreson, within Professor Alyssa Goodman's research group.
- Ongoing work resulted in a successful NRAO Student Observing Support award to obtain observations that resolve the filamentary morphology of molecular clouds across M33. Co-PI: Eric Koch, Title: *Linking the Resolved Filamentary Molecular ISM to Massive Star Formation across M33.*

Undergraduate Researcher May 2021 - May 2022
Department of Physics and Astronomy, Johns Hopkins University *Baltimore, MD*

- Collected photometric and spectroscopic data for a large set of low-metallicity stellar objects, believed to host transiting exoplanets; advised by Professor Kevin Schlaufman.
- Utilized Python coding and packages to numerically analyze the stellar objects of interest.

Undergraduate Research Intern May 2021 - January 2022
The Johns Hopkins University Applied Physics Laboratory *Laurel, MD*

- Performed correlation analysis of simulated gamma-ray and UVOIR emissions from Type Ia supernovae, and assisted with scientific validation for mission proposal; advised by Dr. Richard S. Miller.

CIRCUIT Intern April 2020 - May 2021
The Johns Hopkins University Applied Physics Laboratory *Laurel, MD*

- Analyzed Monte Carlo simulations of volatile transport across the lunar surface, specifically looking at water and carbon dioxide; advised by Dr. Parvathy Prem and others.

PUBLICATIONS

1. Robertson, B., et al. incl. Carreira, C. (2024). Earliest Galaxies in the JADES Origins Field: Luminosity Function and Cosmic Star Formation Rate Density 300 Myr after the Big Bang. ApJ, 970(1), 31. DOI: 10.3847/1538-4357/ad463d

- Carreira, C., et al. (2024). How do spiral arms influence molecular cloud and star formation? Comparing multiple ISM tracers across M33's spiral arm to simulations. *Manuscript in preparation.*

PRESENTATIONS

Oral Presentations

Do spiral arms form molecular clouds? — August 2022
SAO Astronomy REU Summer Symposium — *Cambridge, MA*

Poster Presentations

The Effect of Spiral Arms on Molecular Cloud Formation in M33 — January 2023
241st Meeting of the American Astronomical Society — *Seattle, WA*

Lunar Crater Maturity Analysis in Python: Developing a Toolkit for Ejecta Analysis — June 2021
5th Planetary Data Workshop & Planetary Science Informatics & Analytics — *Virtual*

Lunar Crater Maturity Analysis in Python: Developing a Toolkit for Ejecta Analysis — March 2021
52nd Lunar and Planetary Science Conference — *Virtual*

The Effect of Isotopic Composition and Surface Residence Times on Lunar Volatile Transport — March 2021
52nd Lunar and Planetary Science Conference — *Virtual*

TEACHING

Teaching Assistant for ASTR 2 — January 2024 - March 2024
Department of Astronomy & Astrophysics, The University of California, Santa Cruz — *Santa Cruz, CA*

- Led one recitation section per week, which included a short lecture, group activities, and live demonstrations.
- Hosted office hours on a weekly basis, in collaboration with other TAs.

Teaching Assistant for General Physics I — August 2022 - December 2022
Department of Physics and Astronomy, Johns Hopkins University — *Baltimore, MD*

- During Active Learning sections of this course, worked closely with students as they completed a series of problems and hands-on demonstrations during their lectures.
- Hosted office hours on a weekly basis.

OUTREACH AND SERVICE

Local Organizing Committee — January 2025
JADES Team Meeting — *Santa Cruz, CA*

PI: WiPA-Osterbrock Bridge Scholarship — March 2024 - Present
Osterbrock Leadership Program Mini-Grant — *Santa Cruz, CA*

- Created scholarship program, in collaboration with the UCSC Women in Physics and Astrophysics organization, to provide $500 to four women and gender minority undergraduates to offset costs associated with applying to graduate school programs in physics and/or astronomy.
- Provided mentorship and support in developing application materials to the students selected to receive this scholarship.
- Funding generously provided by the Osterbrock Leadership Program during the 2024 Mini-Grant cycle.

Updated as of December 12, 2024.