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

M.S. Astronomy and Astrophysics June 2025
Department of Astronomy & Astrophysics, The University of California, Santa Cruz *Santa Cruz, CA*

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

RESEARCH EXPERIENCE

Graduate Student Researcher January 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.

NSF REU Intern and NRAO SOS Researcher June 2022 - September 2023
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

Science Review: Galaxy Morphology & Kinematics — June 2025
JADES Team Meeting, Madrid/Boston 2025 — *Cambridge, MA*

Revealing the relationship between galaxy formation and morphology across cosmic time with JADES — May 2025
UCSC Friday Lunch Astrophysics Seminar Hour (FLASH) — *Santa Cruz, CA*

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

Lead Organizer, Department Journal Club — January 2025 - Present
Department of Astronomy & Astrophysics, The University of California, Santa Cruz — *Santa Cruz, CA*

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

PI, Osterbrock Rising Graduate Award Program — March 2024 - Present
Osterbrock Leadership Program at the University of California, Santa Cruz — *Santa Cruz, CA*

- Created award program, in collaboration with the UCSC Women in Physics and Astrophysics organization, to provide $500 to four UCSC women and gender minority undergraduates to offset costs associated with applying to graduate school programs in physics and/or astronomy.
- Created additional award program to provide $500 to four UCSC undergraduates who are negatively impacted by the current immigration landscape (for example, students who are undocumented or DACAmented, or whose families are) to offset costs associated with applying to graduate school programs in STEM.
- Provided mentorship and support in developing application materials to the students selected to receive this award.
- Funding generously provided by the Osterbrock Leadership Program during the 2024 and 2025 Mini-Grant cycles.

Updated as of June 18, 2025.