

COURTNEY CARREIRA

(she/her)

ccarreir@ucsc.edu ♦ courtneycarreira.github.io ♦ [ORCID: 0000-0001-6301-3667](https://orcid.org/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

2. Danhaive, A., et al. incl. Carreira, C. (2025). Beyond the stars: Linking H α sizes, kinematics, and star formation in galaxies at $z \approx 4 - 6$ with JWST grism surveys and geko. arXiv e-prints, arXiv:2510.06315.
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](https://doi.org/10.3847/1538-4357/ad463d)
- Shields, T., et al. incl. Carreira, C. (2025). JADES: Low Surface Brightness Galaxies at $0.4 < z < 0.8$ in GOODS-S. Submitted to MNRAS.
- 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 <i>JADES Team Meeting, Madrid/Boston 2025</i>	June 2025 <i>Cambridge, MA</i>
Revealing the relationship between galaxy formation and morphology across cosmic time with JADES <i>UCSC Friday Lunch Astrophysics Seminar Hour (FLASH)</i>	May 2025 <i>Santa Cruz, CA</i>
Do spiral arms form molecular clouds? <i>SAO Astronomy REU Summer Symposium</i>	August 2022 <i>Cambridge, MA</i>

Poster Presentations

The Effect of Spiral Arms on Molecular Cloud Formation in M33 <i>241st Meeting of the American Astronomical Society</i>	January 2023 <i>Seattle, WA</i>
Lunar Crater Maturity Analysis in Python: Developing a Toolkit for Ejecta Analysis <i>5th Planetary Data Workshop & Planetary Science Informatics & Analytics</i>	June 2021 <i>Virtual</i>
Lunar Crater Maturity Analysis in Python: Developing a Toolkit for Ejecta Analysis <i>52nd Lunar and Planetary Science Conference</i>	March 2021 <i>Virtual</i>
The Effect of Isotopic Composition and Surface Residence Times on Lunar Volatile Transport <i>52nd Lunar and Planetary Science Conference</i>	March 2021 <i>Virtual</i>

AWARDS AND RECOGNITION

Whitford Prize

Department of Astronomy & Astrophysics, The University of California, Santa Cruz	June 2025 <i>Santa Cruz, CA</i>
• Awarded to the second-year UCSC Astronomy & Astrophysics graduate student who, in the judgment of the faculty, attains the highest achievement in research, coursework, and teaching.	

Graduate Research Fellowship Program (GRFP) Honorable Mention

National Science Foundation	April 2025 <i>Alexandria, VA</i>
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TEACHING

Teaching Assistant for ASTR 2

Department of Astronomy & Astrophysics, The University of California, Santa Cruz	January 2024 - March 2024 <i>Santa Cruz, CA</i>
• 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
Department of Physics and Astronomy, Johns Hopkins University

August 2022 - December 2022
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
Department of Astronomy & Astrophysics, The University of California, Santa Cruz

January 2025 - Present
Santa Cruz, CA

Local Organizing Committee
JADES Team Meeting, Santa Cruz 2025

January 2025
Santa Cruz, CA

PI, Osterbrock Rising Graduate Award Program
Osterbrock Leadership Program at the University of California, Santa Cruz

March 2024 - Present
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 October 11, 2025.