Collin O'Connor

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EDUCATION

University of California, Santa Cruz (UCSC) — *B.S., Physics (Astrophysics)* *03/2021*

- Overall GPA: 3.50
- GPA in Major: 3.47
- GPA in Upper-Division Courses: 3.75

EXPERIENCE

UCSC, Physics Department— *Research Assistant* *01/2020 - Present*

- Investigate whether millisecond pulsar wind nebulae are capable of trapping cosmic-rays in the Milky Way galaxy
- Design machine-learning algorithms to perform image analysis on Fermi Large Area Telescope gamma-ray maps

UCSC, Astronomy and Astrophysics Department— *Research Assistant* *06/2019 - 03/2021*

- Conducted thesis study on galaxy evolution and formation of Milky Way type galaxies and primordial helium abundance estimates during Big Bang Nucleosynthesis through local universe observations of dwarf galaxies and RR Lyrae stars
- Developed algorithm in Python to efficiently scan over ~56,000 galaxies found in the Deep Extragalactic Evolutionary Probe (DEEP2) catalog and retract spectra of low metallicity, low redshift dwarf galaxies
- Worked on IDL-based Spec2d/Spec1d data reduction pipeline to produce light curve plots of targeted RR Lyrae stars

UCSC, Department of Physics — *Research Assistant* *10/2019 - 12/2020*

- Assisted with research to determine the role diffused cosmic-ray electrons and protons have in the gamma-ray emission surplus in M31's spherical halo and far outer halo
- Designed 3D model Monte Carlo simulations that recorded positions and energies of millions of simulated cosmic-rays as they diffused from either pulsars, star forming regions, or the center of M31
- Published article: *Do, A., Duong, M., McDaniel, A., O'Connor, C., et al. 2021, Phys. Rev. D, 104, 123016*

COMPUTER SKILLS

- **Operating Systems:** Windows, macOS, Linux
- **Languages:** Python, Mathematica, Fortran, C++
- **Applications:** Microsoft Excel, Word, Powerpoint

VOLUNTEER ACTIVITIES

Astronomical Society of Greater Hartford *11/2017-Present*

- Volunteer in teaching the general public about various topics in astrophysics
- Educate public how to operate backyard telescopes and telescope imaging software