Corin Marasco

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Research Interests

I am passionate about conducting observational astrophysics research. My research interests and experience include stellar astronomy and high-energy astrophysics.

Education

University of Florida August 2022 – present

- PhD in Astronomy

Georgia Institute of Technology August 2018 – May 2022

- B.S. in Physics with Astrophysics Concentration — Overall GPA: 3.82
- Graduated Summa Cum Laude

Georgia State University, Perimeter College August 2017 – May 2018

- High School Dual Enrollment Student — Overall GPA: 4.00

Research Experience

University of Florida, Department of Astronomy August 2022 – present

Research Assistant – Asteroseismology of Low-Metallicity Red Giants Observed by TESS; Jamie Tayar, PhD

- Using recently-received light curves from TESS to determine the most accurate asteroseismic parameters to date for low-metallicity red giants.
- Using those parameters to calculate the masses and ages of the stars and verifying their validity.
- Writing a scientific paper about this research that will soon be submitted for review.

NASA Marshall Space Flight Center, Science Research and Projects Division June 2022 – August 2022

Intern – Probabilistic Background Subtraction for Chandra Data; Steven Ehlert, PhD

- Tested a new probabilistic background subtraction method on diffuse, high-energy sources observed by the Chandra telescope.
- Used Python and CIAO to generate surface brightness profiles of galaxy clusters and images of sources with diffuse emission before and after different background subtraction methods had been applied.
- Successfully provided evidence that probabilistic background subtraction was more effective than other common background subtraction methods.

NASA Goddard Space Flight Center, Astrophysics Science Division June 2021 – August 2021

Intern – Cross-Calibration of X-ray Satellites; Kristin Madsen, PhD

- Cross-calibrated the X-ray satellites NuSTAR, XMM-Newton, Swift, and Chandra using yearly observations of the quasar 3C 273 from 2015-2021.
- Determined good time intervals for each of the observations.
- Extracted light curves and X-ray spectral data for the NuSTAR, Swift, and Chandra observations.
- Used NASA's XSPEC software to fit a model to the spectral data, then used Python to visualize and analyze the fit data and calculate cross-normalization constants for each observatory pair.

Georgia Institute of Technology, School of Physics January 2020 – May 2022

Research Assistant – Yellow Supergiants in the Michigan Spectral Catalogue; James Sowell, PhD

- Sourced various catalogs, surveys, and other literature to compile the most accurate characteristics data on yellow supergiants included in the Michigan Spectral Catalogue.
- Visualized the supergiant data through plots created with Python and identified trends and outliers in the set of stars.
- Writing a scientific paper about this research.

Georgia State University, Physics and Astronomy March 2018 – October 2018

Research Volunteer – Ultra-Fast Outflow Signatures in Active Galactic Nuclei; Jay Dunn, PhD

- Surveyed active galactic nuclei for ultra-fast outflows.
- Plotted and analyzed ultraviolet spectral data from the FUSE telescope using IDL.
- Searched for absorption in the spectral data indicating ultra-fast outflow signatures.

Abstracts

Marasco, C., & Sowell, J. 2021, in American Astronomical Society Meeting Abstracts, Vol. 53, American Astronomical Society Meeting Abstracts, 548.09

Oral Presentations

Giant Stars and How We Study Them
Guest Speaker for the Alachua Astronomy Club April 2024

Traveling Back in Time – Asteroseismology of Low-Metallicity Red Giants Observed by TESS
UF Astronomy Graduate Symposium September 2023

Probabilistic Background Subtraction for Chandra X-ray Data
NASA MSFC Virtual Intern Symposium August 2022

Cross-Calibrations of X-ray Satellites with the Quasar 3C 273
NASA GSFC Virtual Intern Symposium August 2021

Posters

Characteristics of Yellow Supergiants in the Michigan Spectral Catalogue
237th Meeting of the American Astronomical Society January 2021

A Survey of Ultraviolet Spectra for UFO Signatures
Georgia Regional Astronomy Meeting October 2018

Outreach

Scientist in Every Florida School (SEFS) Visiting Scientist February 2023 – present

- Visiting public middle and elementary schools around Florida (with a focus on Title I schools) to present mobile planetarium shows, stargaze using UF's telescopes, lead fun astronomy lectures and activities, and do Q&A sessions with students.
- Have organized and participated in 17 SEFS activities at 12 different schools and spoken with a total of over 2,500 children and parents.

UF Astronomy Graduate Outreach Chair August 2023 – present

- Coordinate and assist with larger outreach events hosted by the UF astronomy department.
- Organize and lead outreach trainings and other initiatives to engage UF astronomy students in outreach.

Teaching

TA Lecturer for Astronomy Lab (AST 1022L) – University of Florida August 2022 – December 2022

- Taught and graded two sections of an introductory astronomy lab for undergraduates.
- Presented lectures and guided students through both classroom labs and observational night labs.
- Helped students outside of class through office hours.

TA for Optics I (PHYS 3232) – Georgia Institute of Technology August 2021 – December 2021

- Tutored and mentored students through office hours and graded assignments.

Skills

Computer – Python (Matplotlib, NumPy, AstroPy, Pandas, Lightkurve, pySYD, and Jupyter Notebook), Machine Learning, HEASARC Software (Xselect, Xspec, Ximage, SAOImageDS9, FTOOLS, FV), CIAO/CALDB, Java (JavaFX), IDL, LaTeX, C, Website Design (JavaScript, HTML, CSS), GitHub, Emacs, Windows, Mac OS, Linux, Terminal, Microsoft Excel

Research – Asteroseismology, Time-Series Photometry, Observational Techniques, X-ray Observation, Spectroscopy, Data Analysis, Data Visualization, Scientific Writing, Data Retrieval

High-Level Physics – Stellar Astronomy, Galactic Astronomy, High-Energy Astrophysics, Radiative Processes, Computational Physics, Cosmology, Relativity, Astrobiology, Interstellar Matter, Quantum Mechanics, Optics, Classical Mechanics, Electrodynamics, Thermodynamics