Carolina Navarrete

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EDUCATION

The University of Texas at Austin, Austin, TX May 2024
Bachelor of Science and Arts, Astronomy
Certificate in Elements of Computing
Minor in Mexican-American Studies
Relevant Coursework: Software Design, Data Visualization, Differential Equations, Physics I, II, & III, Modern Physics and Thermodynamics, Planetary Systems, Software Engineering, Research Methods in Astronomy

SKILLS

Technical/Computer Skills: Advanced Python, Advanced Java, Intermediate Julia, Javascript, and HTML
Platforms/Environments: Processing, Jupyter Notebook/Juypiter Lab, Git Version Control, Linux, SAOImageDS9
Languages: English and Spanish, Native

EXPERIENCE

Morley's Exoplanet Atmospheres Research Group, The University of Texas at Austin, Austin, TX Jan. 2023 - Present
Undergraduate Research Assistant

- *Supervisors:* Dr. Briana Lacy and Dr. Caroline Morley
- Performed spectral retrievals on the exoplanet WASP-39b
- Developed various modules to add to atmospheric retrieval code to improve parameterization capabilities
- Skills used: software development, object-oriented programming, statistical analysis, and data reduction.
- Programming Languages: Julia, Python

FRI Summer Research Fellowship, The University of Texas at Austin, Austin, TX May - Aug. 2022
Student Researcher

- *Supervisors:* Dr. Mike Montgomery
- Observed white dwarf pulsars to analyze the differences between standard age and anomalous old WD stars.
- Systematically analyzed spectra to determine the existence of the rare DQ white dwarf stars (carbon-heavy).
- Skills used: Operated systems such TopCat and visualized large datasets for analysis.
- Programming Languages: Python, HTML

TECHNICAL PROJECTS

Game Development & Graphics Project (Java, Processing, Unity):

- Built and designed an endless scrolling runner-based arcade game based on the game mechanics of the mobile game Jetpack Joyride.
- Implemented motion functionality, user interfaces, and interactive graphics.

Visual Analytics Science and Technology (VAST) Mini Challenge (Python, DataFrames.Py, Seaborn.Py):

- Visualized water pollution with the given hydrology datasets derived from a preserve.
- Applied various data visualization techniques such as interactive plots, graphic user interfaces, and data reduction/binning.

Chemical Cartography of the Milky Way (Python, NumPy, Jupyter Labs):

- Investigated the metallicity distribution of OBAF-type disk stars across the Milky Way using APOGEE and GAIA DR3 data.
- Analyzed chemical signatures in the Milky Way using statistical analysis, data fitting & visualization, and mathematical modeling.

LEADERSHIP & COMMUNITY INVOLVEMENT

White Dwarfs Freshman Research Initiative, University of Texas at Austin Jan 2023 - Present

Peer Mentor/TA

- Mentored students through laboratory astrophysics experiments
- Facilitated learning of essential research skills (i.e. hosting Python boot camps, tutoring students on lab skills, etc.)

INTERESTS (SCIENTIFIC AND OTHER)

Astronomy: Exoplanet detection and characterization, planetary atmospheres, and statistical analysis in astronomy.
Computer Science: Algorithms, visualization, data modeling, instrumentation, and machine learning.
General: Community engagement, public awareness of science, equity & inclusion in science.

SCIENTIFIC TALKS AND POSTERS

Posters

- 9th Frank N. Bash Symposium (Bashfest), Austin, TX 10/30/2023
- (Future) 242st American Astronomical Society Meeting (AAS), New Orleans, LA 01/07/2024