Daniel Bautista

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Education

University of California, Berkeley **Berkeley, CA**
B.A. Astrophysics, Physics, GPA: 3.64 *August 2019 – December 2021*

Monterey Peninsula College **Monterey, CA**
A.S-T Physics, Math, GPA: 4.00 *August 2016 – May 2019*

Research

Berkeley SETI Research Center: The Breakthrough Listen Project **Berkeley, CA**
Advisor: Dr. Steve Croft *September 2020 - December 2022*
Developed a program to assess the quality of data based on how frequently signals were detected at that frequency.
Developed a python program to quantify the amount of human-caused radio frequency interference (RFI) in a particular bandwidth, which will be used in the future to quantify RFI for Murchison Widefield Array.
Developed a python program to visualize signal detections and plot them as a function of frequency and time, which is used to verify by eye whether a detected signal is of interest.
Presented results to research group at the end of each semester.

Georgia Institute of Technology: Tissue Mechanics Lab **Remote Research**
PI: Dr. Wei Sun, GitHub poster *May 2021 - July 2021*
Summer REU via the Summer Undergraduate Research in Engineering/Sciences (SURE program)
Participated in a project working to automate the segmentation of the whole human heart using a deep learning model.
Learned about the anatomy of the human heart as well as common causes of cardiovascular disease.
Used Slicer to label the dataset by going through CT scan images and tracing out the segments of the heart. These labeled scans will go on to be used to train the deep learning model to automate the process.
Presented process of heart segmentations in a virtual research symposium at the end of the summer.

Undergraduate Laboratory at Berkeley: Physics and Astronomy **Berkeley, CA**
Research Mentee, GitHub poster *September 2019 - May 2020*
Wrote python program to read GLEAM data and calculate parameters of radio sources to be used in a simulation of the antenna response of a radio interferometer array.
Presented results to other research teams and ULAB staff.

Relevant Coursework

Physics: Classical Mechanics, Quantum Mechanics, Statistical Mechanics, Classical Electromagnetism, Instrumentation Lab, Experimentation Lab

Astrophysics: Special and General Relativity, Astronomy Data Science Lab, Stellar Physics, Cosmology and Relativity

Mathematics: Multivariable Calculus, Linear Algebra, Ordinary Differential Equations

Computer Science: Python, Bayesian Data Analysis and Machine Learning, Java

Additional Skills

Telescope Observer Training: Green Bank Telescope – **96 hours** experience as primary observer on call
Software: Python, Latex, GitHub, Linux, TensorFlow, Google Cloud Platform, GNU Radio, 3D Slicer, Java, LabVIEW
Hardware: Linear Circuits, semiconductor diodes, Op-Amps

Coursework Related Projects

Galaxy Image Classification and Merger Rate
Berkeley, CA

Astronomy Data Lab – Data Analysis, GitHub Jupyter Notebook *Spring 2021*

Built a convolutional neural net using TensorFlow to classify images from the GalaxyZoo dataset across 37 labels with a classification accuracy of 79.9%

Used fraction of classified galaxy mergers to estimate the fractional merger rate within an order of magnitude.

Investigating Differences in the Evolutionary Tracks of High Mass Stars
Berkeley, CA

Stellar Physics – Literature Review *Fall 2020*

Worked in a group with two fellow students to read scientific articles and synthesize information investigating factors other than initial mass that determine the type of stellar remnant.

Analysis of Gravitational Wave Events
Berkeley, CA

Cosmology and Relativistic Astrophysics – Data Analysis, GitHub write-up *Spring 2020*

Wrote python program analyze LIGO data for gravitational wave events GW150914 and GW170814.

Used a Newtonian approximation of the relation between gravitational wave frequency and mass to estimate the "chirp" mass of the merging black holes.

Activities

NASA's L'SPACE Mission Virtual Concept Academy

Online Academy *Summer 2019*

Researched and selected probe instruments to perform experiments and collect data.

Characterized one of the hydrocarbon lakes on Saturn's moon, Titan.

Learned and exercised NASA mission protocols, procedures, and practices.

NASA Community College Aerospace Scholar

Scholar *Summer - Fall 2017*

Participated in an online course in which I learned about current and future NASA projects, culminating in a research paper proposing a propulsion system for future Mars supply delivery.

Selected to travel to Stennis Space Center to participate in a rover design competition with other community college students. My role was designing and testing rover models.

Rover performance was ranked 2nd overall.

Leadership

Foundational Course for Physical Science Transfer Students
Berkeley, CA

Mentor *Fall 2020, 2021*

Helped facilitate a course aimed at assisting physical science transfer students adjust to being a Berkeley student, and connecting them with fellow students in transfer cohort.

Fielded questions during Q&A sessions with professors and graduate students, offered my experiences with getting involved with research and studying techniques, and helped make the transfer students aware of campus resources.

Astronomy Scholars Program
Berkeley, CA

Mentor *Spring 2021*

Contributed to the diversity UC Berkeley's astro community by being hand-selected to be a peer advisor mentor to prospective astro majors.

Weekly check-ins with astro buddy to see how they are doing, answer questions about the major, help with study strategies or answer astro related questions they may have.

Employment

Monterey Peninsula College Tutoring Center
Monterey, CA

Student Tutor *February 2017 - July 2019*

Tutored fellow community college students in math ranging from introductory algebra through differential equations, as well as physics, general chemistry, and python.

Trained new tutors on best practices by leading tutoring sessions and providing feedback.