

Michael Gutierrez

Astrophysics/Engineering @ Caltech

Greetings! I'm a third-year undergraduate at Caltech. I have a passion for learning how the universe works and pushing the bounds of human achievement. My dream job is one where I can do exactly that — I love to get my hands dirty and dive deep into rabbit holes (figuratively or literally), and I'm not coming back up until I've cleared a path to Wonderland!



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Experience

3/2022 - Present
Pasadena, CA

Caltech CubeSat Club - Communications Lead

- Prototyping and testing of LoRa-based radio communications for (short term) high-altitude balloon payloads and (long term) an orbital CubeSat
- Restoring Moore Lab's 6m radio antenna for astronomy and satcom applications (Receiver calibration, signal pathway component selection, RFI hunting)
- Mentor junior members (mechanical, electrical, compsci principles)

Summer 2023
Copenhagen,
Denmark

Cosmic DAWN Center - Summer Undergraduate Research Fellowship

- Analyzed "waterfall" data of Fast Radio Bursts (FRBs) from the CHIME/FRB Public Database utilizing unsupervised machine learning tools (UMAP, t-SNE, k-means)
- Created interactive plots to visualize how the algorithms categorized individual FRBs
- Arrived at evidence for a single astrophysical origin of FRBs

Summer 2022
Westford, MA

MIT Haystack Observatory - Research Experience for Undergraduates

- Integration and testing for flight models of AERO/VISTA CubeSats
- Developed an open-source ground station interface with GNURadio to automate satcom operations for Westford Radio Antenna UHF uplink/downlink

Summer 2021
Glendale, CA

XOS Trucks - Engineering Intern

- Prototyping and manufacturing design for electric vehicle battery packs
- Used CATIA/3DEXPERIENCE software to design parts/assemblies
- Ran environmental tests (vibration and ingress) on high voltage & structural battery components for integration into vehicles

Education

2021 - 2025
Pasadena, CA

Caltech - pursuing B.S. in Astrophysics

- Physics coursework: Advanced Classical, Quantum, Statistical Mechanics; Electricity + Magnetism; Cosmology; Stellar Structure and Thermodynamics
- Engineering coursework: CAD Design and Prototype Fabrication; Robotics (Mechanical, Electrical, and Software); Space Frames and Structures
- Other: Complex Analysis; Storytelling for Scientists

Things that are important to me

Open communication Collaboration Work-life balance Perseverance Sense of humor

Skills

