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Mayra Gutierrez

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Education:

University of California, Santa Cruz (September 2024 – Present)
Graduate Student in Astronomy and Astrophysics

The University of Michigan, Ann Arbor (August 2020-May 2024)
Bachelor of Science in Astronomy & Astrophysics, Physics
Minor: Latino Studies

Publications:

Setterholm, B. R., Monnier, J. D., Le Bouquin, J., [and 20 others, including **Gutierrez, M.**] (2023) MYSTIC: a high angular resolution K-band imager at CHARA. *Journal of Astronomical Telescopes, Instruments, and Systems, 9(02). https://doi.org/10.1117/1.jatis.9.2.025006*

Torres, G., Schaefer, G.H., Stefanik, D.W. [and 20 others, including **Gutierrez, M.**] (2023) ORBITS AND DYNAMICAL MASSES FOR THE ACTIVE HYADES MULTIPLE SYSTEM HD 284163 (Submitted to MNRAS)

Monnier, J. D., [and others, including **Gutierrez, M.**] (2024), Precision interferometry with MIRC-X/MYSTIC for exoplanets, *SPIE Astronomical Instrumentation Conference 2024* (Submitted)

Monnier, J. D., [and others, including **Gutierrez, M.**] (2024), Prospects for using drones to test formation-flying cubesat concepts, *SPIE Astronomical Instrumentation Conference 2024* (Submitted)

Research Products:

MIRC-X Combiner Spectrograph Upgrade, August 2024

Gutierrez, M., Monnier, J. D., (2024) MIRC-X Combiner: Advancements in Interferometry Instrumentation, *2024 Michigan Astronomy Undergraduate Poster Session*

Gutierrez, M., Monnier, J. D., (2023) STARI: Vibration Characterization for Astronomy, *2023 Michigan Astronomy Undergraduate Poster Session*

Six Telescope Star Tracker (STST) Instrument for CHARA Array, August 2022

Switchyard Mirror Instrument Addition to Michigan InfraRed Combiner-eXeter (MIRC-X), August 2023

Research Experience:

Formation Flying Cubesat Interferometer (May 2022 - Present)

Began working on the initial stages of a formation flying cubesat interferometer project, which aims to operate in low earth orbit. Advisor: John Monnier

- Gained CAD experience through SolidWorks tutorials and designing optics holders and optical systems.
- Used bandsaw, grinder, mill, and lathe machinery to fabricate optics and camera plates.
- Programmed microcontrollers and Raspberry Pi devices to record accelerometer data.

- Gained experience using optics including lasers, lenses, prisms, beam splitters, retroreflectors, and cameras. Assembled an optical system to image light interference fringes.

MIRC-X Instrumentation Development (May 2023 -August 2024)

- Managed, designed, machined, and assembled upgrades for the MIRC-X combiner instrument used at the CHARA Array.
- Created and installed mirror fiber switching instrument in August 2023.
- Designed, tested, and installed MIRC-X combiners spectrograph upgrade , which featured a filter wheel and filter slide. Instrument was installed August 2024.
- Developed skills in wiring, soldering, and programming motors and motor controllers.
  Advisor: John Monnier

Center for High Angular Resolution Astronomy (CHARA) Array (June 2022 - August 2022)

- Assisted in machining, assembling, and designing parts for the Six Telescope Star Tracker (STST), which monitors the beam drift of the array.
- Installed an instrument and assisted in repairs to the facility during the week long observing run.
  Advisor: John Monnier

Observing Experience:

CHARA Array Engineering Observing Run (August 2024)

Assisted in an engineering observing run at the CHARA Array. Learned about the facility and how to observe using a telescope array and MIRC-X and MYSTIC combiner instruments.
Advisor: John Monnier

Other Experience:

Astronomía en Español -University of Michigan (2022-Present)

Participated in Astronomy in Spanish meetings and connected with hispanic peers, grad student instructors, and faculty members. Expanded scientific vocabulary in Spanish by speaking about astronomy research topics with peers and faculty.

First Generation College Students -University of Michigan (2020- Present)

Joined the First Generation College Student coalition and bonded with peers undergoing a similar college experience. Has continued to engage and connect with the first-generation community through professional and social functions on campus.

La Casa: Latino Student Organization -University of Michigan (2020-Present)

Took part in La Casa's Latino student welcome program and found a strong community in the organization. Participated in the organization's leadership development workshops and social events.

Skills:

- Excellent teamwork and communication abilities
- Strong leadership and organizational skills
- Coding experience with Python, C, and C++ programming languages
- Familiar with Excel and Google sheets data visualization programs
- Fluent in both English and Spanish

- Experienced with SolidWorks CAD program
- Machine shop experience and training
- Experience with wiring, soldering, and microelectronics