Sai Krishanth PM

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Education

University of Arizona, College of Science — August 2018–May 2022
B.S. Physics and Astronomy with a minor in Mathematics

Relavent Coursework

Nuclear & Particle Physics
General Relativity (Graduate)
Quantum Mechanics I & II
Statistical Mechanics
Electromagnetism
Computational Physics
Optics
Cosmology and Extragalactic Astronomy
Stellar Structure and Evolution
Radiative Processes
Astrophysical Dynamics
Mathematical Proofs
Linear Algebra
Applied Mathematics
Fourier Analysis

Research Experience

Characterizing HI distributions in nearby massive spiral galaxies — September 2018–May 2022
Advisor: Dr. Alyson Ford, Steward Observatory

- Reducing Green Bank Telescope (GBT) spectroscopic data of neutral hydrogen (HI) for low redshift spiral galaxies
- Calculating column density and error boundaries from generated FITS files
- Co-writing proposal for an expanded survey based on the results of reduced data and observing targets at GBT for said survey
- Reducing HI data from quiescent elliptical galaxies and creating deep maps to measure cool gas content and distribution.

Pipeline development for the NEID spectrograph — January 2020-August 2021
Advisor: Dr. Chad Bender, Steward Observatory

- Manually checking for errors in lightcurves obtained by the NEID spectrograph
- Debugging the NEID control software
- Writing and implementing error correcting code in the NEID data collection pipeline
- Designing and building shutter control boxes for the NEID and HPF spectrographs.

Determining the dominant source of uncertainty in FoM calculations — July 2020-Present
Advisor: Dr. Tim Eifler, Steward Observatory

- Running simulated likelihood analysis of Dark Energy Survey Year 3 data (DES Y3)
- Quantifying the dominant source of uncertainty by performing figure of merit (FoM) calculations.
- Using Self organizing maps (SOMs) to generate photometric redshift probability distribution functions (PDFs).

Internship at Paramium Technologies — May 2021-August 2021
Advisor: Dr. Justin Hyatt

- Building a test bench to generate a hysteresis curve of the stepper motor response on an adjustable radio dish mold
- Designing and 3D printing components for use in the test bench
- Quantifying test results by writing a technical report and generating a GIF of the mold for qualitative analysis

Testing Universal Relations in Neutron Stars — September 2021–Present
Advisor: Dr. Vasileios Paschalidis, Steward Observatory

- Quantifying violations in universal relations using millions of equations of states of neutron stars
- Implementing momentum of inertia computations for equations of state in the slow rotation limit

Proposals and Publications

- *A Survey of Extended HI Disks Around Nearby Galaxies*, Alyson Ford, Joel Bregman, Edmund Hodges-Kluck, Jeremy Bailin, Michael Hardegree-Ullman, **Sai Krishanth Pulikesi Mannan**. Observing during the Spring 2022 semester at GBT.
- *Accelerating cosmological inference with Gaussian processes and neural networks - an application to LSST Y1 weak lensing and galaxy clustering*, Supranta S. Boruah, Tim Eifler, Vivian Miranda, **Sai Krishanth P.M.**. Submitted to MNRAS.

Technical Skills

Programming Languages: Python, C++, IDL, IRAF
Software: MATLAB, GBTIDL (Custom version of IDL for GBT), LaTeX, SLURM, AstroImageJ, DS9, Solidworks, Adobe Inventor
Other: Certified observer at GBT, Soldering, Circuit Design

Outreach

Vice President, Astronomy Club December 2019 - September 2021

- Student led organization to promote outreach and education in Astronomy.
- Responsibilities:
  - Facilitated the Astrophotography program in the club.
  - Organized and planned field trips.
  - Acted as liaison between officers and club members
  - Lead the diversity and inclusion initiative.
  - Organized a graduate student panel to discuss diversity and equity in STEM.

TIMESTEP Leader, Steward Observatory August 2020 - January 2021

- Organization to promote minority student engagement and retention in STEM.
- Responsibilities:
  - Participated in a discussion panel about undergraduate research.
  - Aided in organizing other panels and proposed future meeting ideas.

Talks and Presentations

- Astronomy club internal colloquium
- Astronomy news of the week presentations for astronomy club
- TIMESTEP summer internship summary presentation
- Splendido retirement community astronomy research presentation