
EDUCATION

Johns Hopkins University (JHU)

Baltimore, MD

B.S., Double Major in Physics and Mathematics, Minor in Philosophy

Aug. 2022 - May 2026

- ◆ **GPA:** 3.83/4.0
- ◆ **Core Courses:** Astrophysical Dynamics, Radiative Astrophysics, Interstellar Medium and Astrophysical Fluid Dynamics, Astrophysical Plasmas, Physical Cosmology, Stellar Structure and Evolution, Introduction to Galaxies and Active Galactic Nuclei, Advanced Physics Laboratory
- ◆ **Honors:** Departmental Honors in Physics; General Honors; Dean's List: 22-23 Academic Year, 23-24 Academic Year, 24-25 Academic Year, 25 Fall

RESEARCH EXPERIENCE

Investigating the Dynamics of Ultra-Diffuse Galaxy Pairs

University of Arizona

Supervisor: Dennis Zaritsky

Aug. 2026 - Present

- ◆ Analyzed spectra of six ultra-diffuse galaxy (UDG) candidates from the SMUDGes catalog, observed with the Binospec Integral Field Unit on the 6.5 m MMT.
- ◆ Developed a pipeline to obtain the redshift of UDGs by using emission and absorption lines, incorporating sky-residual masking, continuum subtraction, and Gaussian profile fitting.
- ◆ Constructed narrow-band maps and optimized spectral extraction apertures to reduce uncertainties in the measured redshifts.

Measuring Intrinsic Velocity Dispersions in Milky Way Satellites

Yale University

Summer Research Assistant, *Supervisor: Marla Geha*

Jun. 2026 - Aug. 2026

- ◆ Investigated methods for measuring intrinsic velocity dispersions and estimating reliable upper limits in Milky Way satellite galaxies with small samples of stellar radial velocities.
- ◆ Reanalyzed Keck/DEIMOS stellar radial velocities, examining how flat and log-uniform priors affected the inferred dispersions and upper limits.
- ◆ Generated mock samples of 10–1,000 stars with velocity uncertainties ranging from 0.2 to 2 times the true intrinsic velocity dispersion. Compared the bias and reliability of maximum likelihood, restricted maximum likelihood (REML), and Bayesian methods, with particular attention to small samples.
- ◆ Used Bayesian model comparison and mock-data tests to determine when intrinsic velocity dispersions could be resolved and evaluate the reliability of upper limits for unresolved systems.

Investigating Small-Scale Routly-Spitzer Effect

Space Telescope Science Institute (STScI)

Supervisor: Andrew Fox, Sapna Mishra

Feb. 2025 - Aug. 2026

- ◆ Probed the small-scale variation of the neutral and ionized Milky Way halo gas by analyzing six blue horizontal-branch (BHB) spectra located in two Milky Way halo regions separated by 20 degrees in Galactic longitude and 11 quasars as control sample.
- ◆ Used VPFIT to perform Voigt profile fitting to Ca II 3934, 3969 Å, and Na I 5891, 5897 Å absorption in VLT/UVES high-resolution spectra of 6 BHB stars and 11 quasars, deriving component velocities and column densities for analysis.
- ◆ Compared the results with those of the literature, such as the 1952 paper that proposed the Routly-Spitzer effect and the later papers that confirmed the global Routly-Spitzer effect.
- ◆ Investigated correlations between the Na I/Ca II column-density ratio and the column densities of individual ions, probed the column-density variations as a function of angular separation between sight lines, and proposed possible physical reasons of the observed Routly-Spitzer effect.

Probing the Ionizing Photon Budget in Cosmic Reionization

Johns Hopkins University

Supervisor: Colin Norman

Sep. 2024 - Feb. 2025

- ◆ Investigated the cosmic ionizing photon budget crisis in cosmic reionization proposed in 2024, focusing on whether the faint galaxies newly observed by JWST may overproduce LyC photons, potentially driving reionization earlier than the one allowed by the CMB and Ly α constraints.
- ◆ Synthesized the recent literature about faint galaxies, Ly α -emitting galaxies, and LyC leakers, analyzed key physical parameters, including the escape fraction, ionizing photon production efficiency and the clumping factor.
- ◆ Discussed possible resolutions to the photon overproduction problem.

Refining Gamma-ray Periodicity in Active Galactic Nuclei with Extended Fermi-LAT Data

Supervisor: Partha Sarathi Pal, The University of Hong Kong (HKU)

Jun. 2024 - Aug. 2024

- ◆ Reanalyzed gamma-ray light curves of five active galactic nuclei (AGN) using 17 years of Fermi LAT data, extending the 2020 periodicity studies based on nine-year datasets.
- ◆ Used Python to construct a periodicity search pipeline incorporating six detection methods, including Lomb-Scargle-based approaches, REDFIT, PDM, and MCMC sinusoidal fitting.
- ◆ Refined the periodicity measurements of five AGNs by using the constructed pipeline and evaluated the statistical significance.
- ◆ Compared results from the extended dataset with earlier published results, finding consistent periods for three high significance sources and confirming the periodic behavior of two lower significance candidates.

Computational Gravitational Wave Waveform Modeling

Johns Hopkins University

Supervisor: Thomas Edwards

Oct. 2022 -May 2024

- ◆ Contributed to computational research in gravitational wave waveform modeling by comparing newly generated waveforms with existing waveform libraries.
- ◆ Used Python to perform waveform matching, contributing to the Ripple Python package.

EXTRACURRICULAR ACTIVITIES

Astronomy Club at JHU

Founder

Dec. 2023 - May 2026

- ◆ Founded and served as president of the club, managing daily operations, online platforms, event organization, and astrophotography activities; recruited approximately 30 members.
- ◆ Cooperated with the KnoWhiz, providing technical advice and feedback on their online study products.

OTHERS

- ◆ **Professional Skills:** Python, VPFIT, CASA, Carta, Telescope Operation, Logger Pro, 3D Modeling
- ◆ **Hobbies:** Photography (especially astrophotography), Skiing, Scuba Diving, Electric Guitar, Piano