Colin W. Macrie

NSF GRFP Fellow | Purdue University | West Lafayette, IN

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EDUCATION

Purdue University, *Ph.D. Physics and Astronomy* September 2025- Current

Rutgers University, *B.S. in Astrophysics, Highest Honors* May 2025

- *Cumulative GPA:* 3.61/4.00 as of April 2025
- *Relevant Coursework:* Radiative Processes 541, Stars and Star Formation 441, High Energy Astrophysics 442, Galaxies & the Milky Way 443, Introduction to Cosmology 444, Computational Astrophysics 345, Observational Astrophysics 346, Principles of Astrophysics 341-2, Intermediate Quantum Mechanics 417, Electromagnetism 385-6, Thermal Physics 351

Research Interests: Observations and Modeling of Thermonuclear Supernovae, Transient Astronomy.

FELLOWSHIPS, HONORS, AND AWARDS

Graduate Research Fellowship (GRFP) | National Science Foundation (NSF) Awarded April 2025
Presidential Excellence Ph.D. Award | Purdue University …
Highest Honors, Astrophysics Major | Rutgers University …
Paul L. Leath Prize, Outstanding Honors Thesis | Rutgers University …
Henry Rutgers Award | Rutgers University, School of Arts and Sciences Awarded May 2025
SAS Executive Dean Council of Student Representatives | Rutgers University September 2024
Mary Wheeler Wigner Memorial Scholarship | Rutgers University Awarded April 2024

PUBLICATIONS

Macrie C. W. et al. (in review), "*JWST Nebular Spectroscopy of SN2023qov: Circumstellar Dust Emission in a Normal Type Ia Supernova,"* The Astrophysical Journal.

Macrie C. W. et al. (2024), "*The Temperature versus Orbital Period relation of AM CVns: Insights from their Donors*," Research Notes of the American Astronomical Society, arXiv:2412.05442.

Barna B. et al. (including **C. W. Macrie**) (2026) "*The extremely low-luminosity Type Iax SNe 2022ywf and 2023zgx,"* The Astrophysical Journal, arXiv:2602.23175.

Dubey M. et al. (including **C. W. Macrie**) (2026) "*SN 2023zcu: A Type IIP SN with Early Flash Features,*" The Astrophysical Journal, arXiv:2601.14830.

Kwok L. A. et al. (including **C. W. Macrie**) (2025b) "*JWST Spectroscopy of SN Ia 2022aaiq and 2024gy: Evidence for Enhanced Central Stable Ni Abundance and a Deflagration-to-Detonation Transition*," The Astrophysical Journal, arXiv:2510.09760.

Shrestha M. et al. (including **C. W. Macrie**) (2024), "*Extended Shock Breakout and Early Circumstellar Interaction in SN2024ggi,"* The Astrophysical Journal, arXiv:2405.18490.

POSITIONS

Research Fellow, *Purdue University Dept. of Physics & Astronomy* September 2025- Current

- **Advisor:** Prof. Abigail Polin
- **Project Description:** Observations and modelling of thermonuclear supernovae, especially focused on the nebular phases and mid infrared wavelength range. Funding via the NSF GRFP.

Teaching Assistant, *Purdue University Dept. of Physics & Astronomy* September 2025- Current

- **Description:** Astronomy 263 and 264 labs, for non-majors. Grading and leading weekly labs.

Research Assistant, *Rutgers University Dept. of Physics & Astronomy* September 2023- August 2025

- **Advisor:** Prof. Saurabh Jha
- **Project 1 Description:** Reduction, classification, analysis, and monitoring of supernova spectra obtained via the Southern African Large Telescope (SALT). Examining the characteristics of various detected supernovae, especially type 1a, and how they evolve over time with ground based and JWST data (Macrie, C. W. et al. (in review)).
- **Project 2 Description:** Data consolidation and visualization for the Supernovae in the InfraRed Avec Hubble (SIRAH) program, which measures and analyzes around 30 type Ia supernovae in the near infrared for use in cosmology.

President, *Rutgers Astronomical Society* May 2024- May 2025

- **Advisors:** Prof. Blakesley Burkhart, Prof. Libarid A. Maljian
- **Description:** Executive of the primary astronomy public outreach organization of the Rutgers Physics & Astronomy department, RAS. Operator of the Robert A. Schommer Observatory, hosting weekly stargazing and astronomy-related presentations to students and the public alike.

Summer Undergraduate Research Fellow, *University of Texas, Rio Grande Valley* June- August 2024

- **Advisor:** Prof. Liliana Rivera Sandoval
- **Description:** Analyzed the spectral energy distribution of ~105 accreting white dwarf binary systems belonging to two classes, to discern temperatures of objects in each system and probe their nature. Results shown in Macrie C. et al. (2024).

Aresty Research Assistant, *Rutgers Dept. of Marine and Coastal Sciences* June 2023- May 2024

- **Advisor:** Prof. Karen Bemis
- **Description:** Analysis and visualization of underwater multibeam sonar data from an autonomous underwater vehicle to characterize hydrothermal plumes in a controlled environment.

Learning Assistant, *Rutgers University Learning Centers* September 2022- May 2024

- **Advisor:** Gabe Alba
- **Description:** Teaching ~9 lab sections for "Analytical Physics": calculus-based physics courses.

CONFERENCES & TALKS

LSST Discovery Alliance | Tucson, AZ (poster) August 2025
Rutgers Transient Soiree | Piscataway, NJ (organizer) July 2025
245th AAS Meeting | National Harbor, MD (poster) January 2025
Rise_Time | Purdue University, West Lafayette, IN (poster) August 2024
UTRGV REU Poster Symposium | Brownsville, TX (poster) August 2024
Aresty Undergraduate Research Symposium | New Brunswick, NJ (poster) April 2024

TECHNICAL SKILLS

Python: Experience with NumPy, AstroPy, SciPy, PANDAS, emcee, matplotlib, SNCosmo, yt. Supernova light curve and spectra fitting and analysis. Plotting non-rectangular PANDAS data frames in visually useful ways. Implementation of Monte-Carlo sampling into astronomical models.

Bash Scripting: Utilizing terminal to retrieve, reduce, and analyze data from the SALT data server. Accessing and utilizing the Amarel supercomputing cluster at Rutgers to run GADGET-4 (Galaxies with Dark Matter and Gas Interact) simulations of galaxy cluster formation.

Instrumentation: Aligning, guiding, adjusting the Robbert A. Sommer Observatory. Utilizing the onboard CCD and auto guider to take photometric light curves of exoplanet transits. Taking flat field images, and subsequent reduction of data with RUPhAst, a customized version of PhAst, an interactive data reduction viewer.

Astrophotography: Aligning enthusiast-grade telescopes, taking long-exposures with DSLR camera, stacking and processing the data in DeepSkyStacker among other open-source applications.

Other Programming: IRAF/Pyraf, LaTeX, SAO DS9, GitHub