Priyam Das

PhD Candidate, UNSW Canberra (ADFA)
• Email: priyam.das@unsw.edu.au • Phone: +61 423 673 021
Google Scholar: https://scholar.google.com/citations?hl=en&user=NzW2gpcAAAAJ
Website: https://pdas888.github.io

Summary

Observational astrophysicist specialising in integral-field spectroscopy of Type Ia supernova remnants. My research combines detailed integral-field spectroscopic analysis, spectral diagnostics, and data-driven methods to investigate explosion physics, shock conditions, and the 3D structure of ejecta. Experienced in large-scale spectral analysis of IFU datasets (MUSE), comparison with hydrodynamical and explosion models, and developing machine-learning tools for kinematic and morphological studies. Actively pursuing postdoctoral fellowships to continue research into Type Ia progenitors and remnant evolution.

Research interests

- Explosion physics and progenitor diagnostics for Type Ia supernovae
- Integral-field spectroscopy, 3D kinematic reconstruction, and comparison to models
- Shock physics and non-equilibrium line diagnostics
- Automated data reduction and ML tools for large IFU datasets
- Theoretical cosmological models like wormholes and sonic black holes

Education

PhD in Astrophysics, The University of New South Wales (UNSW Canberra), School of Science
Apr 2023 – present
Thesis: Integral-field spectroscopy of Type Ia supernova remnants
Supervisors: Ivo R. Seitenzahl, Ashley J. Ruiter, Simon Murphy

M.Sc. in Physics, Amity University, India (2019–2021)
Thesis: Traversable Wormholes in the Milky Way galaxy with global monopole charge.
Supervisor: Prof. Mehedi Kalam

B.Sc. (Hons) in Physics, Durgapur Government College, Kazi Nazrul University, India (2016–2019)

Telescope Time

A/2025B/31 – "Probing Helium Enrichment and Shock Physics in SNR 0548–70.4 with KOALA"
Proposers: Priyam Das (PI), Chris Lidman, Ashley Ruiter, Ivo Seitenzahl.
Awarded observing time of **3 dark nights** with the KOALA IFU on the Anglo-Australian Telescope (AAT), 2025B semester.

P117 – "Constraining Explosion Parameters and Progenitor System for Kepler's SNR Using Optical Spectroscopy"
Proposers: Priyam Das (PI), Ivo Seitenzahl, et al. (2025). **Applied** for MUSE observations, 32 hours, ESO VLT.

P117 – "Deep optical tomography to revealing progenitor system and explosion mechanism of SNR 0519-69.0."
Proposers: Priyam Das (PI), Ivo Seitenzahl, et al. (2025). **Applied** for MUSE observations, 32 hours, ESO VLT.

JWST Cycle 5 – "Tracing Reverse Shocked Ejecta and Dust Evolution in the Type Ia Supernova Remnant SNR 0509–67.5."
Proposers: Priyam Das (PI), Samar Safi Harb (CoPI), Ivo Seitenzahl (CoPI), Ashley Ruiter (CoPI), et al. (2025). **Applied** for NIRSpec IFU and MIRI MRS IFU, 40.3 hours, JWST, STSCI.

Selected publications

Das, P., Seitenzahl, I., Ruiter, A. J., et al. (2025). Calcium in a supernova remnant as a fingerprint of a sub-Chandrasekhar-mass explosion. Nature Astronomy, 9, 1356.

Mandal, Ghavamian, Das, et al. (2025). Was SNR 0509–67.5 the result of a double detonation? arXiv:2509.02422 (preprint).

Das, P., Kalam, M. (2022). Wormhole in the Milky Way galaxy with global monopole charge. Eur. Phys. J. C, 82, 342.

Appointments

PhD Candidate, UNSW Canberra, School of Science (Apr 2023 – present)

Assistant Professor (Physics), Bengal College of Engineering and Technology, India (Oct 2021 – Apr 2023)

Associate Researcher, Acadecraft Pvt Ltd, India (Jul 2021 – Nov 2021)

Grants & awards

DRTG grant (AUD $2800), UNSW Canberra (2025)

Runner-up, Best Presentation, (Australian National Institute for Theoretical Astrophysics) ANITA summer school (2024)

Press coverage for Nature Astronomy paper: ESO, Reuters, Forbes, etc. (Altmetric score: 807)

Computational skills

- Programming: Python, Git/GitHub
- Workflows: ESO Reflex, MUSE DRS, MUSE-ZAP, FORS2 DRS, QFitsView, LaTeX

Selected talks & presentations

Contributed talk, "**Imaging the signature of type Ia supernova explosion mechanism, a novel approach using optical IFS to study the reverse shocked ejecta**" at 'One Hundred Years of Supernova Science', Sweden (2025)

Contributed talk, "**Integral field spectroscopy of type Ia supernova remnants**" at 'HITS Winter Workshop', Heidelberg (2024)

Poster, "**Observational tudy of the reverse shocked ejecta in SNR 0509-67.5**" at 'Supernova Remnant III', Greece (2024)

Contributed talk, "**Spectroscopy on reversed shocked ejecta of a type Ia supernova remnant**" at 'ANITA Summer School', Australia (2024)

Poster, "**Observational study of the reverse shocked ejecta and their ionized states in SNR 0509-67.5**" at 'Transients Down Under', Australia (2024)

Teaching & mentoring

Laboratory demonstrations and physics support for undergraduate students, UNSW Canberra.