

Anirban Dutta, Ph.D.

✉ anirbaniamdutta@gmail.com

🌐 anirbanhome 🐙 github.com/Knights-Templars

Employment

Feb 2026 - present	📌 Post Doctoral Researcher National Central University;
March 2024 - September 2025	📌 Research Associate Michigan State University;
September 2023 - January 2024	📌 Visiting Researcher Michigan State University; Post Doctoral Research Associate Indian Institute of Astrophysics

Research Interest

- 📌 Multi-wavelength study of supernovae, GRBs, and kilonovae.
- 📌 UV-Optical Data Analysis,
- 📌 Monte Carlo transport, Radiative transfer.

Education

- 2018 – 2024 📌 **Ph.D., Indian Institute of Astrophysics** in Physics.
Awarded by Pondicherry University,
Thesis title: *Unravelling the nature of explosion of thermonuclear supernovae*. Thesis available at <http://prints.iiap.res.in/handle/2248/8364>
- 2015 – 2017 📌 **M.Sc., Calcutta University** in Physics.
Advanced: *Nuclear astrophysics, quantum field theory, cosmology*.
- 2012 – 2015 📌 **B.Sc., Calcutta University** in Physics.

Research Publications

Refereed [most recent first]

- 1 Michael W. Coughlin et al. "GROWTH on S190425z: Searching Thousands of Square Degrees to Identify an Optical or Infrared Counterpart to a Binary Neutron Star Merger with the Zwicky Transient Facility and Palomar Gattini-IR". In: *ApJL* 885.1, L19 (Nov. 2019), p. L19. 🔗 DOI: 10.3847/2041-8213/ab4ad8. arXiv: 1907.12645 [astro-ph.HE].
- 2 Hrishav Das et al. "Unveiling SN 2022eyw: A Bright Member of the Type Iax Supernova Subclass". In: *Astrophysical Journal* 999.1, 10 (Mar. 2026), p. 10. 🔗 DOI: 10.3847/1538-4357/ae31ed. arXiv: 2512.23428 [astro-ph.HE].
- 3 **Dutta, Anirban** et al. "Can the Violent Merger of White Dwarfs Explain the Slowest Declining Type Ia Supernova SN 2011aa?" In: *ApJL* 938.2, L22 (Oct. 2022), p. L22. 🔗 DOI: 10.3847/2041-8213/ac940d. arXiv: 2209.00569 [astro-ph.HE].
- 4 **Dutta, Anirban** et al. "Effect of Positronium on the γ -Ray Spectra and Energy Deposition in Type Ia Supernovae". In: *ApJ* 990.2, 129 (Sept. 2025), p. 129. 🔗 DOI: 10.3847/1538-4357/ade880. arXiv: 2505.22992 [astro-ph.HE].
- 5 **Dutta, Anirban** et al. "SN 2017hpa: a carbon-rich Type Ia supernova". In: *MNRAS* 503.1 (May 2021), pp. 896–910. 🔗 DOI: 10.1093/mnras/stab481. arXiv: 2102.08121 [astro-ph.SR].
- 6 **Dutta, Anirban** et al. "SN 2020sck: Deflagration in a Carbon-Oxygen White Dwarf". In: *ApJ* 925.2, 217 (Feb. 2022), p. 217. 🔗 DOI: 10.3847/1538-4357/ac366f. arXiv: 2111.01226 [astro-ph.SR].

- 7 Mansi M. Kasliwal et al. “Kilonova Luminosity Function Constraints Based on Zwicky Transient Facility Searches for 13 Neutron Star Merger Triggers during O3”. In: *ApJ* 905.2, 145 (Dec. 2020), p. 145.  DOI: 10.3847/1538-4357/abc335. arXiv: 2006.11306 [astro-ph.HE].
- 8 Miho Kawabata et al. “Intermediate luminosity type Iax supernova 2019muj with narrow absorption lines: Long-lasting radiation associated with a possible bound remnant predicted by the weak deflagration model”. In: *PASJ* 73.5 (Oct. 2021), pp. 1295–1314.  DOI: 10.1093/pasj/psab075. arXiv: 2107.02822 [astro-ph.HE].
- 9 Amit Kumar et al. “SN 2020ank: a bright and fast-evolving H-deficient superluminous supernova”. In: *MNRAS* 502.2 (Apr. 2021), pp. 1678–1693.  DOI: 10.1093/mnras/staa4047. arXiv: 2012.15251 [astro-ph.HE].
- 10 Harsh Kumar et al. “GROWTH on S190426c II: GROWTH-India Telescope search for an optical counterpart with a custom image reduction and candidate vetting pipeline”. In: *MNRAS* 516.3 (Nov. 2022), pp. 4517–4528.  DOI: 10.1093/mnras/stac2516. arXiv: 2209.02077 [astro-ph.HE].
- 11 Harsh Kumar et al. “India’s First Robotic Eye for Time-domain Astrophysics: The GROWTH-India Telescope”. In: *AJ* 164.3, 90 (Sept. 2022), p. 90.  DOI: 10.3847/1538-3881/ac7bea. arXiv: 2206.13535 [astro-ph.IM].
- 12 Harsh Kumar et al. “The long-active afterglow of GRB 210204A: detection of the most delayed flares in a gamma-ray burst”. In: *MNRAS* 513.2 (June 2022), pp. 2777–2793.  DOI: 10.1093/mnras/stac1061. arXiv: 2204.07587 [astro-ph.HE].
- 13 Mulchand Kurre et al. “Photometric and Spectroscopic Studies of Type Ic Supernovae SN 2020akf and SN 2021mxx”. In: *arXiv e-prints*, arXiv:2607.12525 (July 2026), arXiv:2607.12525.  DOI: 10.48550/arXiv.2607.12525. arXiv: 2607.12525 [astro-ph.HE].
- 14 Avinash Singh et al. “SN 2018hna: 1987A-like Supernova with a Signature of Shock Breakout”. In: *ApJL* 882.2, L15 (Sept. 2019), p. L15.  DOI: 10.3847/2041-8213/ab3d44. arXiv: 1908.07807 [astro-ph.HE].
- 15 Mridweeka Singh et al. “Observational Properties of a Bright Type Iax SN 2018cni and a Faint Type Iax SN 2020kyg”. In: *ApJ* 953.1, 93 (Aug. 2023), p. 93.  DOI: 10.3847/1538-4357/acd559. arXiv: 2305.12713 [astro-ph.HE].
- 16 Mridweeka Singh et al. “Optical studies of a bright Type Iax supernova SN 2020rea”. In: *MNRAS* 517.4 (Dec. 2022), pp. 5617–5626.  DOI: 10.1093/mnras/stac3059. arXiv: 2210.11752 [astro-ph.HE].
- 17 Mridweeka Singh et al. “SN 2020udy: A New Piece of the Homogeneous Bright Group in the Diverse Iax Subclass”. In: *ApJ* 965.1, 73 (Apr. 2024), p. 73.  DOI: 10.3847/1538-4357/ad2618. arXiv: 2401.07107 [astro-ph.HE].
- 18 Gokul P. Srinivasaragavan et al. “Characterizing the Ordinary Broad-line Type Ic SN 2023pel from the Energetic GRB 230812B”. In: *ApJL* 960.2, L18 (Jan. 2024), p. L18.  DOI: 10.3847/2041-8213/ad16e7. arXiv: 2310.14397 [astro-ph.HE].
- 19 Rishabh Singh Teja et al. “Far-ultraviolet to Near-infrared Observations of SN 2023ixf: A High-energy Explosion Engulfed in Complex Circumstellar Material”. In: *ApJL* 954.1, L12 (Sept. 2023), p. L12.  DOI: 10.3847/2041-8213/acef20. arXiv: 2306.10284 [astro-ph.HE].

9 first author and 20+ non-refereed publications in the form of Astronomer’s Telegram and Gamma-ray coordinates network.

Accepted observing proposals

- PI  *Unravelling the nature of thermonuclear transients from the early to late phase at the 2-m Himalayan Chandra Telescope.*
-  *Regular monitoring of Type Ia Supernovae with the GROWTH India Telescope.*

Accepted observing proposals (continued)

- Co-PI**
- *The search for electromagnetic counterparts to Neutron Star Mergers : Kilonova* at the 2.0 m Himalayan Chandra Telescope.
 - *In the search for GRB optical afterglows* at the 2-m Himalayan Chandra Telescope.
 - *Investigating the observational properties of fast-evolving luminous transients (FELT)* at the 3.6-m Devasthal Optical Telescope.
 - *Late phase investigation of peculiar supernovae* at the 3.6-m Devasthal Optical Telescope.
 - *Observations of low redshift supernovae and other related transients* - Target of Opportunity proposal at the 2-m Himalayan Chandra Telescope.

Presentations

- 2026
- **25 years of Himalayan Chandra Telescope** at Indian Institute of Astrophysics
Invited talk - 25 Years of Exploring Thermonuclear Explosions: A Multi-wavelength Journey with the Himalayan Chandra Telescope
 - **Department Seminar** at National Central University
Talk - Exploding or Surviving: A multi-wavelength constraint on thermonuclear supernovae
 - **Astronomical Society of the Republic of Taiwan 2026** at College of Hakka Studies at National Yang Ming Chiao Tung University
Contributed talk - Probing unburned Carbon in White Dwarf Explosions: SN 2022xlp in the Context of Thermonuclear Supernovae
- 2025
- **Miracurall 2025** at Jadavpur University, Kolkata
Invited talk - Cosmic Fireworks: Exploring the Universe through the explosions of stars.
 - **Rutgers Transient Soirée** at Rutgers
Contributed talk - γ -rays as probe of the explosion mechanism of SNe Ia - Detection prospects with COSI.
 - **IRENA-CENAM 2025** at Ohio University
Contributed talk - Detection prospects of Type Ia supernovae with the Compton Spectrometer and Imager.
 - **Third Frontiers in Nuclear Astrophysics Summer School** at Ohio University
Invited talk - Supernova spectroscopy
 - **OISS Scholar Showcase** at Michigan State University
Poster - TARDIS-High Energy: A Monte Carlo code for high energy photon transport in stellar explosions.
- 2024
- **Department seminar** at Michigan state University
Talk - Looking deeply: Gamma-rays as a probe of the explosion mechanism of Type Ia supernovae.
 - **Rise Time** at Purdue University.
Poster and flash talk - Gamma-ray transfer in Type Ia supernovae.
 - **Frontiers in nuclear astrophysics** at University of Notre Dame.
Contributed talk - Looking deeply: Gamma-rays as a probe of the explosion mechanism of Type Ia supernovae.
- 2023
- **SuperVirtual Online**
Poster and flash talk - Probing the similarity/diversity in normal Type Ia supernova explosions.
 - **REcent Trends on Compact Objects** at Kodaikanal Solar Observatory, India
Contributed talk - Probing the homogeneity/diversity in Type Ia supernova explosions.

Presentations (continued)

- 2022  **SuperVirtual Online**
Flash talk - Can the violent merger of white dwarfs explain the slowest declining Type Ia supernova SN 2011aa?
-  **Physics of the Cosmos : NASA Time Domain and Multi Messenger Astrophysics workshop**
Flash talk - Can the violent merger of white dwarfs explain the slowest declining Type Ia supernova SN 2011aa?
-  **Boom! A workshop on explosive transients with LSST** University of Illinois at Urbana Champaign
Contributed talk - Can the violent merger of white dwarfs explain the slowest declining Type Ia supernova SN 2011aa?
-  **Astronomical Society of India meeting** IIT Roorkee, India
Poster - Understanding type Ia supernova explosion through time-dependent Monte Carlo radiative transfer simulation.
- 2021  **Astronomical Society of India meeting** Online
Poster - Observational Study of nearby type Ia Supernova 2019np for over 400 days.
-  **20 years of the Himalayan Chandra Telescope**
Poster and flash talk - SN 2017hpa: a carbon-rich Type Ia supernova.
- 2020  **Astronomical Society of India meeting** IISER Tirupati
Contributed talk - SN 2017hpa: a carbon-rich Type Ia supernova.
- 2019  **Data Science in Astrophysics** IIIT Allahabad
Photometric and Spectroscopic studies of Type Ia Supernova SN 2017hpa.

Schools & Workshops

- 2026  **Institute of Astronomy Summer Camp 2026** [Instructor]
Graduate Institute of Astronomy, National Central University
-  **International Workshop on Multi-wavelength Studies of Supernovae, Kilonovae and Gamma-Ray Bursts** [Participant]
Graduate Institute of Astronomy, National Central University
-  **Time-domain Astronomy Hands-on Workshop** [Participant]
Graduate Institute of Astronomy, National Central University
- 2025  **TARDIS summer school** [Instructor] - Summer school on radiative transfer for supernovae
Michigan State University
-  **Third Frontiers in Nuclear Astrophysics Summer School** [Instructor] - Supernova spectroscopy
Ohio University
-  **Connector 2025** [Participant] - Simulating stripped envelope supernovae from birth to death
Center for Computational Astrophysics, Flatiron Institute
- 2024  **TARDIS-Con** [Participant] - Radiative transfer in Supernovae.
Michigan State University
- 2021  **ZTF summer school** [Participant] - Transient survey data processing.
Online
-  **IIA summer school** [Instructor] - Introductory astrophysics.
Indian Institute of Astrophysics
- 2020  **GROWTH Astronomy school** [Instructor]- Data analysis of transients.
Online

Schools & Workshops (continued)

- 2019  **Applications of Data Science in Astrophysics and Gravitational Wave Research** [Participant]
IIIT, Allahabad

Mentorship

- 2023-25  **Cecelia Powers**, Undergraduate research assistant - Gamma ray transport in SNe Ia simulations and documentaion of the open source code TARDIS- γ .
- 2022-23  **Aishwarya**, Master's student - Thesis on light curve analysis of SNe Ia.
- 2021-22  **Simran Joharle**, Undergraduate research student - Image subtraction and photometry of SN 2020sck.

Service and Outreach

-  Reviewer for Journal of Astrophysics and Astronomy.
-  Reviewer of Proceedings of the 3rd BINA Workshop on the Scientific Potential of the Indo-Belgian Cooperation
-  Reviewing of observing proposals for the Devasthal Optical Telescope.
-  Code and issues review for the open source code TARDIS.
-  Teaching radiative transfer to undergraduates at Michigan State University.
-  Public talk on "How supernovae forge elements and threaten life" at the Astronomy on Tap event in Lansing.
-  Public talk on "Universe through the largest digital camera" at the Astronomy on Tap event in Lansing.
-  Public outreach on lunar and solar eclipse at Bengaluru, India.
-  Developed science experiments for school and college level students and instructors at Bengaluru, India.
-  Science based articles for news and magazines.
-  Computer support with installations of softwares like ATLAS, FFTW, MPICH, IRAF to students at Indian Institute of Astrophysics.

Computational skills

- Coding  Python, C++
- Software  *Radiative Transfer* TARDIS, SEDONA, SYN++, SYNAPPS, CLOUDY
Astronomical Data Analysis IRAF, HEASOFT, SWARP, SCAMP, SEXTRACTOR, Astrometry.net, ZOGY
Stellar Evolution MESA
Instrumentation MEGALib
Miscellaneous VsCode, git, vim

References

Prof. G. C. Anupama

Indian Institute of Astrophysics,

✉ gca@iiap.res.in

Thesis Advisor

Prof. Wolfgang Kerzendorf

Michigan State University,

✉ wkerzend@msu.edu

Prof. D. K. Sahu

Indian Institute of Astrophysics,

✉ dks@iiap.res.in