

Aman Katira

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EDUCATION

Master of Science in Physics

Indian Institute of Technology, Mandi, India

Thesis Title: X-ray view of binary neutron star merger GW170817

Cumulative GPA: 8.05/10

Aug 2021 — July 2023

Bachelor of Science in Physics

Guru Jambheshwar University of Science and Technology, Hisar, India

Final Grade: 7.17/10

Aug 2017 — May 2020

RESEARCH POSITIONS HELD

Research Associate

Indian Institute of Technology, Kanpur

Aug 2023 — Present

Kanpur, India

The late-time afterglow modeling of GW170817

- Conducted in-depth analysis of the late-time afterglow of GW170817 to predict its long-lived X-ray signal. Studied jet dynamics, ejecta velocity, and surrounding material using data from multiple observatories.

The GW170817 X-ray deep field

- Using approximately 1.7 Ms of Chandra data, studying and identifying the X-ray sources present around GW170817.

Galactic Transients in eROSITA DR1

- Conducting research on X-ray transients using eROSITA DR1 data, with a focus on compact object systems such as Cataclysmic Variables (CVs) and X-ray binaries (XRBs). The selection criteria include the position of sources on the Hertzsprung-Russell Diagram, X-ray luminosity, spectral characteristics, and photometric data (for calculating orbital periods) from Gaia DR3. This study has led to the discovery of five new Cataclysmic Variables.

Workshop collaboration

Inter-University Centre for Astronomy and Astrophysics (IUCAA),

Feb 2024 — Present

Pune, India

Classifying Spectral States of Cygnus X-1 Using Traditional Techniques and Machine Learning

- Collaborating with multiple institutes under Prof. Ranjeev Mishra (IUCAA), analyzing eight years of Cygnus X-1 data to distinguish spectral states using traditional astronomical techniques and modern machine-learning methods (nearest neighbor algorithm).

Winter Research Internship

Physical Research Laboratory (PRL)

Jan 2023

Ahmedabad, India

X-ray counterparts of M-class Solar flares

- Worked with Dr. Santosh V. Vadawale and Dr. Mithun N P S on X-ray counterparts of M-class solar flares, determining the densities of various elements and the temperature of isotherms present in such flares.

Summer Research Internship

Aryabhata Research Institute of Observational Sciences (ARIES)

Apr 2023

Nainital, India

X-ray data counterparts of ON231

- Conducted a short-term project on X-ray data reduction of ON231 (ISP Blazar) using XMM-Newton data, focusing on its variability properties.

PUBLICATIONS

- Katira A., Yadav M., Mooley P.K., Hotokezaka K. - Submitted to MNRAS
- Galactic Transients in Erosita DR1 - In Preparation
- Chandra Deep field catalogue of GW170817 – In Preparation.
- Classifying Spectral States of Cygnus X-1 Using Traditional Techniques and Machine Learning - In Preparation

CONFERENCES, PRESENTATIONS AND SEMINARS

ISRO-sponsored workshop

X-ray Workshop on AstroSat & XPoSat
Workshop Link

Kozhikode, India
28 Feb 2024 – 3 Mar 2024

Invited presentation on multi-messenger astronomy

11th International Workshop on Very High Energy Particle Astronomy (VHEPA 2024)
Workshop Link

IIT Kanpur, India
17 Oct 2024 – 19 Oct 2024

AWARDS & ACHIEVEMENTS

- Scholarship Awarded for academic excellence in BSc Physics
- Scholarship Awarded for academic excellence in MSc Physics

SKILLS

- **Programming:** Python, C, MATLAB
- **Software:** Astropy, SAS (XMM-Newton), CIAO (Chandra), HEASoft (FTOOLS), XSPEC, ds9, AstroSat Tools, XSMDAS

EXTRA CURRICULAR ACTIVITIES

- Volunteered at the 63rd DAE Solid State Physics Symposium organized by Bhabha Atomic Research Centre (BARC), Mumbai. (2018)
- Participated in various state and national **sports events** in Kabaddi and Volleyball.
- **Teaching assistant and mentor**, instructed high school students in Mathematics and Physics during my undergraduate studies.
- **Organized and led** an Astronomical data analysis workshop, teaching X-ray data analysis to undergraduate students while pursuing MSc Physics.

REFEREES

Dr. Kunal P. Mooley

Assistant Professor, SPASE, Indian Institute of Technology Kanpur, India
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Dr. Nirmalya Kajuri

Assistant Professor, School of Physical Sciences, Indian Institute of Technology, Mandi, India
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Dr. Akash Garg

Post Doctoral Fellow, Inter-University Centre for Astronomy and Astrophysics (IUCAA), Pune, India
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