Anirudh Salgundi

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Education

1. Master of Science (Physics) June 2020 – May 2022
Final Grade: 8.5/10 CHRIST University, India

- Thesis: "Spectral properties of GX 5-1"
  Utilized archival observations of Low Mass X-ray Binary GX 5-1 from *AstroSat* and performed Flux Resolved Spectroscopy to study spectral evolution along the Hardness Intensity Diagram.
- Courses taken: Stellar Astrophysics, Galactic Astronomy and Cosmology, Electromagnetic Theory I & II, Classical Mechanics, Quantum Mechanics I & II, Nuclear and Particle Physics.

2. Bachelor of Science June 2017 – Sep 2020
Final Grade: 7.89/10 *Bangalore University, India*

- Triple Major in Physics, Chemistry, and Mathematics.
- Attended Research Education Advancement program conducted by Bangalore Association for Science Education.
- Recipient of Best Science communicator award by Department of Science and Technology, Government of Karnataka, India.

Research Experience

1. Project Research Assistant *Jan 2023 - Present*
Supervisor - Prof. Varun Bhalerao (STAR Lab) *IIT Bombay, India*

Thermonuclear Bursts in X-ray Binaries

- Studying a sample of 15 thermonuclear X-ray Bursts from two transient Low Mass X-ray Binary sources 4U 1728–34 & 4U 1735–44 using *AstroSat* data.
- Developed pipelines for basic data reduction, time-resolved burst spectral analysis, and timing analysis for exploring accretion phenomena and rapid variability in lightcurves.

Fast Transients with GROWTH-India

- Observations and Follow-up campaigns for Gravitational Wave (GW) events from LIGO, Virgo, KAGRA detectors and fast transients using the 0.7m GROWTH-India telescope in collaboration with the Zwicky Transient Facility (ZTF) led by Caltech.
- Following up transient X-ray binaries undergoing outbursts.
- Daily scanning for fast transients in ZTF data through `ZTFRest`.

2. Vistitng Student Researcher *Dec 2022- Jan 2023*
Supervisor - Dr. Santanu Mondal *IIA Bengaluru, India*

Temporal study of GX 339-4, a Black Hole Transient

- Conducted energy-dependent time-averaged temporal analysis of a transient black hole X-ray binary GX 339-4 by utilising archival data from *NICER* and *AstroSat* missions.
- Studied energy dependence and time evolution of Quasi periodic Oscillations (QPOs) and their harmonic components in the power density spectrum.
- Developed pipelines energy dependent and time resolved temporal studies of persistent surces.
- Co-authored a publication.
- Recipient of **IIA Visiting Students Fellowship**.

Publications

Below is the list of my published/to be submitted refereed publications

1. **Salgundi, A**., et al. (*in prep*) (2024), "Spectro-Temporal studies of Thermonuclear bursts and kHz QPOs in Slow Burster 4U 1728-34" *(submitting to ApJ)*
2. Mondal, S., **Salgundi, A**., et al. (2023), "Evolution of low-frequency quasi-periodic oscillations in GX 339-4 during its 2021 outburst using AstroSat data", MNRAS, 526, 4718. (Citations: 2) DOI (Citations: 4)
3. Ahumada, T., Anand, S., Coughlin, M. W., ... **Salgundi, A**., et al. (2024),"Searching for gravitational wave optical counterparts with the Zwicky Transient Facility: summary of O4a", arXiv:2405.12403, *(Submitted to ApJ)*. (Citations: 3)
4. Rekhi. P ., **Salgundi, A**., et al. (*in prep*) (2024), "Timing and spectral studies of 4U 1735-44 using AstroSat" *(submitting to ApJ)*

Some of my important non-refereed publications are listed below. **Here** is a full list of my non-refereed publications (43 GCNs, 3 TNS and 2 ATels)

1. **Salgundi, A**., Swain, V., Kumar, H., et al. (2023), GRB Coordinates Network, "GRB 230812B: Zwicky Transient Facility Identifies Optical Afterglow Candidate of Fermi GRB (Trigger 713559497)", 34397, 1.
2. **Salgundi, A**., Swain, V., Kumar, R., et al. (2023), GRB Coordinates Network, "AT2023sva/GRB230916B: GIT observations of the afterglow", 34780, 1.

3. Swain, V., Andreoni, I., Coughlin, M., Kumar, H., **Salgundi, A**., (2023), Transient Name Server AstroNote, "ZTF23aaoohpyAT20 Zwicky Transient Facility discovery of a fast fading red transient", Transient Name Server 178, 1.
4. Thomas, N. T., **Anirudh, S**., Giridharan, L., Gudennavar, S. B., et al. (2022), The Astronomer's Telegram, "AstroSat observes XTE J1701-462 in its Z phase", 15654, 1.

Approved Target of Opportunity proposals

1. Chandra DDT (Co - PI) *Sep 2023*

50 *ks observations with ACIS instrument*
"Observing GRB230812B - To understand Jet Physics for an Extremely Bright GRB"
GCN Circular 34632

2. AstroSat ToO (Co - PI) *Aug 2022*

40 *ks observations with LAXPC and SXT instruments*
"Spectro-temporal studies of GX 339−4 during its outburst, using AstroSat"
Astronomer's Telegram #15615

3. AstroSat ToO (Co - PI) *Sep 2022*

40 *ks observations with LAXPC and SXT instruments*
"Spectro-temporal studies of XTE J1701−462 during its outburst, using AstroSat"
Astronomer's Telegram #15654

Conferences, Workshops and Summer schools

1. The 42nd meeting of the Astronomical Society of India *Feb 2024*

Conference - Poster Presentation *IISc, India*
a. Broadband spectral and timing analysis of Slow Burster 4U 1728−34 using AstroSat
b. GRB 230812B - Exploring Jet physics and Polarization for an extremely bright Gamma Ray Burst

2. Transients 2024–IIT Bombay *April 2024*

Conference - LOC & Poster Presentation *IIT Bombay, India*
Broadband spectral and timing analysis of Slow Burster 4U 1728−34 using AstroSat

3. Zwicky Transient Facility time-domain astronomy Summer School *July 2023*

Summerschool - Remote Attendee *University of Minnesota, USA*

4. The 41st meeting of the Astronomical Society of India *March 2023*

Conference - Poster Presentation *IIT Indore, India*
Spectro-Temporal behaviour of Black Hole X-ray Binary GX 339-4 using AstroSat data

5. Conference on 7 years of AstroSat *Sep 2022*

Conference - Attendee *ISRO Headquarters, Bangalore, India*

6. Time Domain and Multi-Messenger Astronomy workshop *Aug 2022*

Workshop - Remote Attendee *NASA-GSFC, Maryland, USA.*

Project mentoring

1. Nishant Kartik Nayak *Nov 2022*

First year undergraduate student in Physics at Pensylvenia University
"Determining Distances and Ages of Open Clusters"

2. Shibam Sundar Mahakud *Nov 2022*

First year Undergraduate at IIT Bombay in Mechanical Engineering
"Determining Distances and Ages of Open Clusters"

3. Manan V Jain *Sep 2022*

Fourth year undergraduate at Amrita Vishwa Vidyapeetham in Aerospace Engineering
"Building Citizen Science program back end infrastructure for SSERD (a Non Profit Organization)"

Outreach and Positions of Responsibility

1. Program Head - Asteroid search campaign *March 2020 - Present*

Society for Space Education and Research Development
My responsibilities encompass coordinating the citizen science program, searching for Near Earth Objects (NEOs). I have a track record of training over 850 participants, resulting in 358 preliminary discoveries.

2. Astronomy Education Content Developer for ISRO's YUVIKA program *June 2022*

Genex Space
My primary contribution has been to design and develop a chapter titled "Universe within us" designed to provide high school students with a comprehensive understanding of the subject.

3. Associate editor - Shasthra Snehi *2020 - Present*

Shasthra Snehi
My main role involves crafting science blog articles and conducting proofreading tasks on articles submitted by diverse pool of authors.

Extracurricular Awards & Achievements

1. Cultural Patronage - Inter College theater Competition *Feb 2020*

Awarded by: Bharata Yatra Kendra, Mysore, India. *Rangasourabha*
Secured first prize state level professional theater arts competition, where I led Music production for the play "*Agnivarna*".

2. Best Student science communicator award *Sep 2018*

Awarded by: Government of Karnataka, India. Department of Science and Technology
For Securing the first position in the state level science communication competition.

3. Sri Thirunarayana Memorial Prize *2017*

Awarded by: National Degree College, Bangalore National Education Society
For best freshman student in Cultural activities.