

## *Aditya Sow Mondal*

Department of Physics

Siksha-Bhavana

(Institute of Science)

Visva-Bharati

Santiniketan-731235

West-Bengal, INDIA

Contact No: +91 9732249932

Email Id: [adityas.mondal@visva-bharati.ac.in](mailto:adityas.mondal@visva-bharati.ac.in)



## Education:

**Ph.D. in Science**, 2019 – Visva-Bharati University. In the field of Observational Astronomy.

Title of the thesis: *Studies on the broadband X-ray emission from Neutron star X-ray binaries.*

Supervisors: Dr. B. Raychaudhuri (Visva-Bharati) and Prof. G. C. Dewangan (IUCAA, Pune)

**M.Sc. in Physics**, June 2008 – Visva-Bharati University.

**B.Sc. in Physics**, June 2006 – Visva-Bharati University

## Research Interests:

Astrophysics, Observational astronomy (X-ray Astronomy), Neutron star and Black hole physics.

Neutron stars in X-ray binary systems are exciting objects that show a wide range of spectral and timing phenomena in X-rays. These spectral and timing features are much crucial for probing the extreme environment of and around Neutron Stars. These features have been discussed in our studies mainly from an observational point of view. Our work aims at characterizing the observational X-ray properties of different Neutron star low-mass X-ray binaries (LMXBs) of different subclasses (atoll and Z sources). The data for such studies are primarily obtained from various space-based X-ray observatories (like *XMM-Newton*, *Suzaku*, *Swift*, *NuSTAR*, *NICER*). Some research also has been performed on the Blackhole X-ray binaries to understand accretion geometry on Blackhole systems.

## Appointments:

Assistant Professor (presently at Phase-III): Department of Physics, Visva-Bharati University. From May 2009 to Present. Date of joining at Visva-Bharati: 24.05.2009

## Achievements:

Selected as a Visiting Associate of Inter-University Centre For Astronomy And Astrophysics (IUCAA) from August 1, 2019 for a period of three years. Term of Visiting Associateship at IUCAA has been extended for a further period of three years with effect from August 1, 2022.

## Publications:

1. Broad-band X-ray emission and the reality of the broad iron line from the neutron star–white dwarf X-ray binary 4U 1820–30 (**2016 MNRAS.461.1917M**)  
**Aditya S. Mondal**, G. C. Dewangan, M. Pahari, R. Misra, A. K. Kembhavi and B. Raychaudhuri  
<https://ui.adsabs.harvard.edu/abs/2016MNRAS.461.1917M/abstract>
2. NuSTAR and Swift joint view of neutron star X-ray binary 4U 1728–34: disc reflection in the island and lower banana states (**2017 MNRAS.466.4991M**)  
**Aditya S. Mondal**, Mayukh Pahari, G. C. Dewangan, R. Misra and B. Raychaudhuri  
<https://ui.adsabs.harvard.edu/abs/2017MNRAS.466.4991M/abstract>
3. NuSTAR view of the iconic neutron star X-ray binary Cyg X-2 (**2018 MNRAS.474.2064M**)  
**Aditya S. Mondal**, G. C. Dewangan, M. Pahari, B. Raychaudhuri  
<https://ui.adsabs.harvard.edu/abs/2018MNRAS.474.2064M/abstract>
4. XMM–Newton view of a hard X-ray transient IGR J17497–2821 (**2015 MNRAS.451.3078A**)  
Md. Shah Alam, Dipanjan Mukherjee, **Aditya S. Mondal**, Gulab C. Dewangan, Sanjay Jhingan and Biplab Raychaudhuri  
<https://ui.adsabs.harvard.edu/abs/2015MNRAS.451.3078A/abstract>
5. Study of the reflection spectrum of the bright Atoll source GX 3+1 with NuSTAR (**2019MNRAS.487.5441M**)  
**Aditya S. Mondal**, G. C. Dewangan, B. Raychaudhuri  
<https://ui.adsabs.harvard.edu/abs/2019MNRAS.487.5441M/abstract>
6. On the disc reflection spectroscopy of NS LMXB Serpens X-1: analysis of a recent NuSTAR observation (**2020MNRAS.494.3177M**)  
**Aditya S. Mondal**, G. C. Dewangan, B. Raychaydhuri  
<https://ui.adsabs.harvard.edu/abs/2020MNRAS.494.3177M/abstract>
7. Evidence of disc reflection in the X-ray spectrum of the neutron star low mass X-ray binary 4U 1636-536 (**2021MNRAS.504.1331M**)  
**Aditya S. Mondal**, B. Raychaydhuri, G. C. Dewangan.  
<https://ui.adsabs.harvard.edu/abs/2021MNRAS.504.1331M/abstract>
8. NuSTAR and AstroSat observations of thermonuclear X-ray bursts with short-recurrence times in 4U 1636-536. **published in the special issue of the journal of Astrophysics and Astronomy (JAA)**  
Pinaki Roy, Aru Beri and **Aditya S. Mondal**  
<https://ui.adsabs.harvard.edu/abs/2022arXiv220207379R/abstract>
9. The complex spectral behavior of the newly discovered neutron star X-ray binary Swift J1858.6-0814 (**2023MNRAS.524.5918M**)  
**Aditya S. Mondal**, B. Raychaydhuri, G. C. Dewangan.  
<https://ui.adsabs.harvard.edu/abs/2023MNRAS.524.5918M/abstract>
10. Evidence of hard power-law spectral cutoff and disc reflection from the X-ray transient XTE~J1739-285. (**2022MNRAS.516.1256M**)  
**Aditya S. Mondal**, B. Raychaudhuri, G. C. Dewangan and Aru Beri.  
<https://ui.adsabs.harvard.edu/abs/2022MNRAS.516.1256M/abstract>
11. Spacetime trajectories in BTZ spacetime and comparison with timelike and lightlike trajectories  
S. K. Roy, B. Raychaudhuri and **Aditya S. Mondal**.  
<https://doi.org/10.1088/1402-4896/ac91b1>

12. Relativistic X-ray reflection and highly ionized absorption in the spectrum of NS LMXB 1A 1744-361 (2024MNRAS.527.2362M)

**Aditya S. Mondal**, B. Raychaydhuri, G. C. Dewangan.

<https://ui.adsabs.harvard.edu/abs/2024MNRAS.527.2362M/abstract>

### **Conference presentation:**

1. Some Aspects of Rotating Accoustic Blackhole (ready for communication)

Biplab Raychaudhuri, Soumyakanti Roy, **Aditya S. Mondal**

presented at Internation Conference on the emerging issues in Cosmology and Particle Physics (EICP2), held at Visva-Bharati during 12-14 January 2020.

<https://indico.cern.ch/event/849205/attachments/1909230/3270103/contributory-final.pdf>

### **Communicated Manuscripts:**

1. **Title:** Tachyonic field coupled with global monopole.

**Authors:** B. Samanta, B. Raychaudhuri, F. Rahaman, S. Sarkar and **Aditya S. Mondal**.

Submitted to Modern Physics Letter A. \\\

### **Conference/Workshop/school attended:**

1. **Workshop on data analysis: X-ray pulsars and compact objects.** During December 1-3, 2011 held at North Bengal University.
2. **IUCAA sponsored workshop on X-ray astronomy.** During March 23-25, 2013 held at North Bengal University.
3. **2<sup>nd</sup> IUCAA X-ray astronomy school.** During February 4 – March 2, 2013 held at IUCAA.
4. **Refresher course in astronomy and astrophysics.** During May 6 – June 7, 2013 held at IUCAA.
5. **MIT - IUCAA workshop on X-ray studies of transient astronomical sources.** During January 13-24, 2014 held at IUCAA.
6. **Workshop on observational aspects of astrophysics and cosmology.** During November 3- 4, 2014 held at Visva-Bharati.
7. **Astrosat Announcement of Opportunity (AO – 1) workshop.** During 13 -14 July, 2016 held at IUCAA.
8. **6<sup>th</sup> topical conference on gravity, cosmology, astronomy and astrophysics – eastern region.** 24<sup>th</sup> September, 2016 held at Visva-Bharati.
9. **Introductory workshop on astrophysics and cosmology.** During September 27-28, 2016 held at Aliah University, West-Bengal.
10. **Advanced application of 'R' in Planning, Research and Development.** During December 2-11, 2019 held at Visva-Bharati, West-Bengal.

11. **Recent advancements in Physical, Chemical and Mathematical Sciences.** During February 12-25, 2020 held at Burdwan University, West-Bengal.
12. **Introductory seminar on Astrophysics & Cosmology (webinar)** organized by ICARD, Department of Physics, North Bengal University on 16th September 2020.
13. **Refresher Course: Contemporary issues in Physics,** Organized by the UGC Academic Staff College, Jadavpur University, Kolkata from 13<sup>th</sup> to 25<sup>th</sup> February, 2023.
14. **International workshop on Galaxy Formation and Evolution Across the Cosmic Time,** organized by the Department of Physics, Visva-Bharati from 13<sup>th</sup> to 14<sup>th</sup> December, 2022.

**Worked as a resource person:**

1. **National workshop on recent advances in astrophysics and cosmology.** During March 17-18, 2017 held at North Bengal University.