SAYANTAN BHATTACHARYA

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ACADEMIC BACKGROUND

PhD (Physics)	**University of Massachusetts** Lowell, MA, USA	**Year of joining: 2021** **Ongoing**
MS (Physics) GPA 3.7/4	**University of Massachusetts** Lowell, MA, USA	**Year of joining: 2018** **Year of Completion: 2021**
M.Sc (Physics) GPA 8.12/10	**University Of Hyderabad** Hyderabad,India	**Year of joining: 2016** **Year of completion: 2018**
B.Sc (Physics) GPA 7.78/10	**Banaras Hindu University** Varanasi,India	**Year of joining: 2013** **Year of completion: 2016**

WORK EXPERIENCE

Lowell Center for Space Science & Technology, Umass Lowell — May2019 --- Ongoing
Graduate Research Assistant

- Reseach on Blue Supergiant High Mass X-ray Binary population in the starburst galaxy IC 10.
- Understanding the Accretion-Wind interaction in WR+BH HMXB IC 10 X-1, using x-ray and optical data (spectral and temporal).
- Radiative transfer modelling for IC 10 X-1 using CMFGEN, PoWR.
- Contributed to X-ray data analysis using Heasoft for creating a comprehensive library of X-ray pulsars in SMC.

Department Of Physics & Applied Physics, Umass Lowell — September 2018 --- May 2021
Graduate Teaching Assistant

- Teaching undergraduate course i.e., Physics I, II, III, electronics devices lab, exploring the Universe lab, nuclear physics lab

Bose Institute, Kolkata, India — 12th May2017 --- 11th July2017
Summer Intern

- Worked on SSNTDs (Solid State Nuclear Track Deectors) and detecting cosmic rays with SSNTDs.
- Learnt track measurements using Leica microscope.
- Contributed to a conference paper on Comparison of different brands of PET as SSNTD (with Dr.Atanu Maulik, Dr. Sanjay Ghosh and group) at 27th ICNTRM-2017 (International Conference on Nuclear Tracks and Radiation Measurements) ,Strasbourg,2017.

SKILLS

- Astrophysics
- Heasoft (X-ray data)
- Statistics
- Linux Shell scripts
- Fortran
- Python
- Matlab
- R
- Plasma Physics
- SQL
- Data Analytics
- Digital and Analog Electronics
- Research Methodology
- Spectroscopy (optical & X-ray)
- IRAF

RESEARCH PROJECTS

- PhD research (Ongoing) on blue supergiant population in IC 10 and understanding accretion-wind interaction in IC 10 X-1, with Dr. Silas G. T. Laycock, University of Massachusetts, Lowell.
- MS research thesis: Optical Spectroscopic Monitoring of BH+WR HMXB IC 10 X-1 with Dr. Silas G. T. Laycock, University of Massachusetts, Lowell.
- M.Sc final year Project on Big Bang Nucleosynthesis, using computational modeling under the guidance of Dr. Soma Sanyal, University of Hyderabad (2017-18).
- Summer Internship project at Center For Astroparticle Physics, Bose Institute, Kolkata, worked on PET as an SSNTD (Solid State Nuclear track detector) and comparison of different brand of PETs as detectors., under the guidence of Dr.Atanu Maulik, Dr.Sanjay Ghosh.
- B.Sc. project on Theory of sliding friction using Thermodynamics, with Dr. S.C Tiwari Banaras Hindu University, Varanasi (2015).

WORKSHOP/CONFERENCES ATTENDED

- Attended and presented at AAS winter (2020, 21), summer (2022) and HEAD (2022) meetings.
- Attended and presented at APS April meetings (2019, 20, 21, 22)
- Workshop on radiative transfer modelling using CMFGEN, TDLI, Shanghai, China. (2019)
- Workshop on Research Methodology organised by IEEE, Hyderabad Section, IIIT-Hyderabad.(2017)
- National Conference on Physics at small scale and Advanced Materials, University Of Hyderabad,(2017).

etc……

AWARDS & ACHIEVEMENTS

- Co-I in HST Proposal: The missing piece of the IC 10 X-1 Puzzle : What is the mass of the Black hole ?
- APS Division of Astrophysics Graduate student Travel award (2021, 22)
- University of Massachusetts Lowell personal development award (PDA) 2019

EXTRA-CURRICULAR ACTIVITIES

- Event Management (i.e., Took management responsibilities of multiple outreach activities including at Schuller observatory, Umass Lowell)
- Listening to music of different genres (Bengali, English, Hindi), Painting, Tabla .
- Playing Table Tennis.

PUBLICATIONS

Bhattacharya, S., Christodoulou, D.M., Chené, A.N., Laycock, S.G. and Binder, B.A., 2023 . Accreting Black Holes Skewing and Bending the Optical Emission from Massive Wolf-Rayet Companions—A Case Study of IC10 X-1. *Submitted to* *Monthly Notices of the Royal Astronomical Society*

Bhattacharya, S., Laycock, S.G., Chené, A.N., Binder, B.A., Christodoulou, D.M., Roy, A., Sorabella, N.M. and Cappallo, R.C., 2023. Probing the Stellar Wind of the Wolf–Rayet Star in IC 10 X-1. *The Astrophysical Journal*, *944*(1), p.52.

Roy, A., Cappallo, R., Laycock, S.G., Christodoulou, D.M., Vasilopoulos, G. and **Bhattacharya, S.,** 2022. Modeling the Luminosity-dependent Pulse Profile and Emission Geometry of SMC X-2 during a Giant Outburst. *The Astrophysical Journal*, *936*(1), p.90.

Sorabella, N.M., **Bhattacharya, S.,** Laycock, S.G., Christodoulou, D.M. and Massarotti, A., 2022. Modeling Long-term Variability in Stellar-compact Object Binary Systems for Mass Determinations. *The Astrophysical Journal*, *936*(1), p.63.

Christodoulou, D.M., **Bhattacharya, S.**, Laycock, S.G. and Kazanas, D., 2022. Anatomy of Pulsar XTE J1829-098: Ultramassive SXFT with a Dominant Nondipolar Magnetic Field, or the Third Canonical HMXB Caught at the Bottom of the Corbet Gap?. *The Astrophysical Journal*, *929*(2), p.137.

Monageng, I.M., Coe, M.J., Townsend, L.J., Laycock, S.G., Kennea, J.A., Roy, A., Udalski, A., **Bhattacharya, S.,** Christodoulou, D.M., Buckley, D.A. and Evans, P.A., 2022. Disentangling the neighbouring pulsars SXP 15.3 and SXP 305. *Monthly Notices of the Royal Astronomical Society*, *511*(4), pp.6075-6086.

Sorabella, N.M., **Bhattacharya, S.,** Laycock, S.G., Christodoulou, D.M. and Massarotti, A., 2022. Chandra Observations of Spikey: A Possible Self-lensing Supermassive Black Hole Binary System. *The Astrophysical Journal*, *927*(2), p.234.

Binder, B.A., Sy, J.M., Eracleous, M., Christodoulou, D.M., **Bhattacharya, S**., Cappallo, R., Laycock, S., Plucinsky, P.P. and Williams, B.F., 2021. The Wolf–Rayet+ Black Hole Binary NGC 300 X-1: What is the Mass of the Black Hole?. *The Astrophysical Journal*, *910*(1), p.74.

Christodoulou, D.M., Laycock, S.G., Cappallo, R., Roy, A., **Bhattacharya, S.** and Kazanas, D., 2020. Variable Magellanic HMXB Sources versus Variable ULX Sources: Nothing to Brag about the ULX Sources. *Galaxies*, *8*(4), p.70.

Cappallo, R.C., Laycock, S.G.T., Christodoulou, D.M., Roy, A., **Bhattacharya, S**., Coe, M.J. and Zezas, A., 2020. On the Geometry of the X-ray emission from pulsars a consistent inclination and beaming solution for the Be/X-ray pulsar SXP 1062. *Monthly Notices of the Royal Astronomical Society*, *495*(2), pp.2152-2161.

Sau, S., **Bhattacharya, S.** and Sanyal, S., 2019. Diffusion coefficients and constraints on hadronic inhomogeneities in the early universe. *The European Physical Journal C*, *79*, pp.1-10.

Bhattacharya, S., Bhattacharyya, R., Dey, S., Ghosh, S.K., Jhingan, A., Maulik, A., Raha, S. and Syam, D., 2018. Comparison of charge response of PET films of different brands used as high threshold Nuclear Track Detectors. *Radiation Measurements*, *119*, pp.166-169.