

Ritesh Bachhar

Graduate Student, University of Rhode Island

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RESEARCH INTEREST

General Relativity, Gravitational wave modeling, Strong Gravity

EDUCATION

- **University of Rhode Island, Department of Physics** RI, USA
Ph.D. Candidate, Physics (first-year graduate student) September, 2021 - Present
- **Indian Institute of Technology Bombay** Mumbai, India
Master's in Physics; CPI: 9.17/10 July 2018 - June, 2020
- **Scottish Church College** Kolkata, India
B.Sc. Physics; University of Calcutta; 61.5% July 2014 - April 2017

RESEARCH EXPERIENCE

Current Projects

- **Data-driven modeling of Gravitational Wave from Black holes**
Advisor: Dr. Gaurav Khanna and Dr. Scott Field
As a part of the research group UMass-URI Gravity Research Consortium I am carry out research on surrogate models of gravitational wave to build accurate and fast waveform for aLIGO and future space-based gravitational wave observatory LISA.
September 2021 - Present

Past Projects

- **Master's Project** Pulse phase resolved analysis of a High mass X-ray Binary Cen X-3 under supervision of **Prof. Varun Bhalerao**, and **Dr. Gayathri Raman**. I analysed Indian satellite Astrosat's data and performed high precision **timing** and **spectral analysis** of the source. Currently, I am working towards publishing the results.
August 2019 - April 2021
- **Winter Project** Under the guidance of **Prof. Subhrangshu Sekhar Manna** in **SNBNCBS I** simulated self organized critically in **Sandpile model (critical slope, critical hight)** and studied it dynamical properties.
December 2018
- **Electronics project** I successfully completed another project titled "**Measuring velocity of an object using Infrared Diodes and Sensors**" under the observation of **Prof. Varun Bhalerao** of IIT Bombay.
September - November 2018

PUBLICATIONS

- Timing and spectral studies of Cen X-3 in multiple luminosity states using AstroSat
Ritesh Bachhar, Gayathri Raman, Varun Bhalerao *et al.* December 2021 (Submitted to MNRAS).

TEACHING EXPERIENCE

- TA for AST 108 and AST118H (Spring 2022) with Prof. Douglas Gobeille.
- TA for AST108 and AST118 (Fall 2021) with Prof. Douglas Gobeille.
Help many students to solve their doubts, conducted multiple observation(daytime and night-time) observations.

ACADEMIC ACHIEVEMENTS

- Awarded **Bhavesh Gandhi Memorial Prize**(2019-20), IIT Bombay, for best M.Sc. thesis.
- Scored 98 in **TOEFL iBT Test**.
- Qualified **CSIR NET** June 2019 with **AIR 66** and eligible for Junior Research Fellowship.
- Achieved **All India Rank 61** in JEST 2018 Physics for Integrated Ph.D.
- Secured 97.3 percentile in JAM 2018.

PROGRAMMING SKILLS

- **Languages** : Python(NumPy, SciPy, SymPy, AstroPy and Pandas), C, Fortran
- **Statistical Packages** : emcee, xspec_emcee
- **Software** : HEASOFT, XSPEC, LaTeX, Origin, GnuPlot, and Mathematica
- **Microcontroller** : Arduino

WORKSHOP AND ONLINE COURSE

- Attended Primordial Black Holes confront GW data workshop at Sapienza University of Rome (Feb 8-12, 2021)(virtual)
- **Machine Learning**, successfully completed the machine learning course taught by **Andrew Ng**

POSITION OF RESPONSIBILITY

Student Companion ISCP, IIT Bombay

Mentored 12 students from M.Sc. physics and assisted them on various academic and non-academic fronts.

- 147 student companion were selected out of 256 applicant based on SOP, interview and peer review.
- Helped in organizing institute orientation program for 1867 students and parent orientation for 600 parents.

June 2019 - June 2020