

Som Dev Bishoyi

University of Massachusetts Dartmouth
Department of Mathematics
Dartmouth, MA 02747

sbishoyi@umassd.edu
sdbishoyi.github.io
Phone: +1 508-458-1220

Education **University of Massachusetts Dartmouth**

PhD in Engineering and Applied Sciences, *September 2022 to Present*
Computational Science and Engineering/Gravitational Wave Physics
GPA: 4.00

Indian Institute of Science Education and Research Kolkata

5 Year BS-MS Dual Degree, *August 2017 to July 2022*
Major in Physical Sciences,
Minor in Mathematics;
GPA: 9.05

Grades in Relevant courses

General Theory of Relativity - A+
High Energy Physics - A
Astrophysics and Cosmology - A

Quantum Field Theory II - A
Quantum Field Theory I - A
Symmetries in Physics - A+

Research **Asymptotic Tails in GR and modified GR regular BHs**

Experience with Prof. Gaurav Khanna and Prof. Scott Field, UMass Dartmouth
March 2021-present

Project Details

Time Domain DG code to numerically solve KG wave equation

Used Discontinuous Galerkin method to numerically solve for scalar perturbations evolving according to the Klein-Gordon equation in a modified GR regular BH spacetime.

Late time behavior of tails at fixed r_* and at null infinity

Constructed the routines for calculating local tail decay rates for static and generic initial data at some fixed tortoise coordinates r_* for the modified GR regular BH and compared with Schwarzschild BH.

Energy fluxes from point particle source term in the wave equation

Goal is to numerically solve the Regge-Wheeler equation for scalar perturbations with a source term that models a point particle or a secondary black hole to eventually calculate energy fluxes at fixed r_* and \mathcal{I}^+ .

Studies on the spacetime of a slowly rotating star

Masters thesis with Prof. Golam Mortuza Hossain, IISER Kolkata
June 2021-April 2022

Project Details

Solving for $g_{\mu\nu}$ in the exterior vacuum

The Einstein Field equations were solved analytically which involved solving for an additional equation for the frame dragging parameter ω in the metric.

Solving for $g_{\mu\nu}$ in the interior for given EOS

Present work focuses on analytically solving the Tolman-Oppenheimer-Volkoff equations and the additional equation for the mass-radius relationship using a suitable equation of state.

Teaching Department of Physical Sciences, IISER Kolkata

Teaching Assistant, Mechanics II, *August 2020 to December 2020*

Teaching Assistant, Mechanics II, *August 2021 to December 2021*

Teaching Assistant, Introductory EM, *January 2021 to May 2021*

Computation and Data Sciences, IISER Kolkata

Teaching Assistant, Scientific Computing in Python, *January 2022 to May 2022*

Awards and Fellowships UMass Dartmouth Doctoral Fellowship

Research fellowship for a period of 1 year, *September 2022 to May 2023*

IISER-K Summer Fellowship

Fellowship of 10,000 rupees for summer research project on advanced quantum mechanics, *May 2019 - July 2019*

IIT Indore Research Internship

Internship at Department of Astronomy , Astrophysics and Space Engineering IIT Indore for two months, *May 2020 - July 2020*

IIIT Hyderabad ML Summer School

Selected for attending the competitive machine learning summer school at IIIT Hyderabad in *July 2019*

1st Prize in Scientific Innovation

For completion of project titled "Industrial applications of Seebeck effect" in high school, *2014*

Languages English, Odia, Hindi

Coding Skills Python, MatLab, \LaTeX , Mathematica

References

Prof. Gaurav Khanna	Prof. Scott Field
Department of Physics	Department of Mathematics
University of Rhode Island	University of Massachusetts Dartmouth
gkhanna@uri.edu,+1 (123) 456-7899	sfield.umassd.edu,+1 (987) 654-3210