

Agrim Sharma

Ph.D. Student

Department of Physics

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Education

- **Master of Science** 2021-22
Indian Institute of Science, Bengaluru; Major in Physics CGPA: 8.1
- **Bachelor of Science (Research)** 2017-21
Indian Institute of Science, Bengaluru; Major in Physics, Minor in Mathematics CGPA: 8.2
- **Senior Secondary Board Examination** 2017
Central Board of Secondary Education Score: 96%
- **Secondary Board Examination** 2015
Central Board of Secondary Education CGPA: 10

Projects

- **QuantumMASALA: Quantum MATERIALS Ab initio eLECTronic-structure pACKage** 2021-23
Project Guide: Prof. Manish Jain Department of Physics, IISc
Implemented the GW method in QuantumMASALA – an electronic structure calculation package written in pure Python, with the aim of enhancing the rate of advancements in this field by reducing the time to implement new methods. (Part of Masters thesis work.)
- **Wilson Coefficient Bounds** 2020-21
Project Guide: Prof. Aninda Sinha Centre for High Energy Physics, IISc
Tested the bounds imposed on Wilson coefficients due to crossing symmetry of scattering amplitudes and studied Feynman blocks in the context of ϕ^4 theory, through analytical calculations. (Part of Bachelors thesis work.)
- **Modified Newtonian Gravity: Explaining observations of sub- and super-Chandrasekhar limiting mass white dwarfs** Summer, 2019
Project Guide: Prof. Banibrata Mukhopadhyay Department of Physics, IISc
Studied effective modifications to Newtonian gravity and the resulting critical mass of white dwarfs to explain the observations of sub- and super-Chandrasekhar mass white dwarfs and their instabilities as sources of peculiar Type-Ia supernovae.
- **Reading project on Special relativity and the Mansuripur paradox** Summer, 2018
Project Guide: Prof. Subroto Mukerjee Department of Physics, IISc
Studied relativistic electrodynamics, the Mansuripur paradox and the solution proposed by Griffiths and Hnizdo.

Fellowships and Awards

Prime Minister's Reserch Fellowship (PMRF) (2023 – Present)

UGC-JRF Fellowship (2022 – 2023): All India Rank 33 in Joint CSIR-UGC NET 2021 (Physics Stream)

KVPY Fellowship (2017-2022): All India Rank 222 in Kishore Vaigyanik Protsahan Yojana (SA) 2015 examination.

Performance in Recent National-level Examinations

GATE 2022 (Physics Stream) : All India Rank **5**

JEST 2022 (PhD, Physics) : All India Rank **4**

JEST 2021 (Int-PhD, Physics) : All India Rank **3**

CSIR-UGC NET 2021 (Physics Stream) : All India Rank **33**

BARC Recruitment 2022 : Selected as Trainee Scientific Officer for the post of Scientific Officer 'C' at Bhabha Atomic Research Centre in Physics Stream.

Technical Skills

Languages: C, C++, Python, MATLAB, Wolfram Language

Parallel programming: Studied and worked with parallel programming in MPI, OpenMP, CUDA.

Specialized Codes : Density functional theory: QuantumESPRESSO, and ABINIT,
GW method: BerkeleyGW, Molecular simulation: LAMMPS.

Publications

- **Agrim Sharma** and Banibrata Mukhopadhyay. Modified Newtonian Gravity: Explaining observations of sub- and super-Chandrasekhar limiting mass white dwarfs. *Scientific Voyage 2 (No. 1) (2021) 20-28*, 2021
- Shri Hari Soundararaj, **Agrim Sharma**, and Manish Jain. Quantum MASALA: Quantum MATERIALS Ab initio eLECTronic-structure pACKage. *arXiv:2308.07277*, 2023