Nishi Prabhat Hazarika

✉ iamnishi347@gmail.com | ⌨ iamnishi347 | 🔗 nishi-prabhat-hazarika | 📍 Hyderabad, India

Profile

M.Sc. Physics student at the Indian Institute of Technology Hyderabad specializing in **theoretical and computational condensed matter physics**. Experienced in **density functional theory (DFT)**, electronic structure analysis, and high-performance computing workflows. Skilled in **Python-based automation, data visualization, and first-principles simulations** of topological materials.

Education

Indian Institute of Technology Hyderabad (IITH), India   *2024 – Present*
M.Sc. in Physics — CGPA: **8.14**/10.0 (Current)

- **Specialization:** Theoretical and Computational Condensed Matter Physics
- **Relevant Courses:** Quantum Mechanics, Solid State Physics, Open Quantum Systems, Computational Physics, Statistical Mechanics, Mathematical Physics

Cotton University, Guwahati, India   *2021 – 2024*
B.Sc. in Physics (Major) — CGPA: **8.29**/10.0 (Major), 8.16 (Overall)

- **Key Courses:** Classical Mechanics, Thermodynamics, Electronics, Quantum Mechanics, Nuclear Physics
- **Lab Skills:** Circuit design, spectroscopy, optical experiments, introductory XRD analysis

Research Experience

M.Sc. Project – Computational Investigation of Topological Quantum Materials,
Indian Institute of Technology Hyderabad   *2024 – Present*

- **First-principles calculations** using VASP to study the electronic and topological properties of candidate materials.
- Constructing and analyzing **band structures, density of states, and phonon dispersions** to identify possible topological phases.
- Implementing **Wannier90** and **WannierTools** for tight-binding model construction and Fermi surface analysis.
- Developing **custom Python/MATLAB workflows** for automated data post-processing and visualization.
- Research manuscript **in preparation for submission** to *Physical Review B*.

Independent Computational Work   *2023 – 2024*

- Designed **Python-based scripts** for numerical solutions of the Schrödinger equation, Monte Carlo simulations, and visualization of random walks.
- Applied scientific libraries (NumPy, SciPy, Matplotlib) to validate models against analytical predictions.
- Strengthened foundations in computational physics through self-directed coding projects.

Technical Skills

- **Programming & Scripting:** Python (NumPy, SciPy, Pandas, Matplotlib), MATLAB
- **First-Principles Tools:** VASP, Quantum ESPRESSO (basic), WannierTools, Wannier90
- **Analysis & Visualization:** VESTA, OriginLab, XCrySDen
- **Computing Environment:** Linux (Ubuntu), Git/GitHub, LaTeX, HPC job submission with Slurm