

Parth Bhargava

+65 9121 7298 | Singapore | bhargava.parth07@gmail.com
<https://github.com/Vis-42> | <https://vis-42.github.io/> | [linkedin.com/in/parth-bhargava-6819b124a/](https://www.linkedin.com/in/parth-bhargava-6819b124a/)

EDUCATION

National University of Singapore

Aug 2024 – May 2028

Bachelor of Science in Physics (Honors, Distinction)

GPA: 4.43

EXPERIMENTAL PHYSICS

- Measured carrier mobility and type in semiconductors via Hall effect; cross-validated results through magnetoresistance analysis ($R^2 > 0.99$); identified intrinsic transition temperature
- Determined lattice constants via X-ray diffraction with sub-2% accuracy; applied structural fingerprinting to identify unknown crystal phases; validated Kramers theory for bremsstrahlung cutoff
- Calibrated Helmholtz field configuration; validated five independent scaling laws ($R^2 > 0.997$); quantified uncertainty in field constant to 3.3% through cross-method comparison
- Characterized electron spin resonance in paramagnetic systems; extracted g-factors and analyzed hyperfine interactions
- Analyzed laser light propagation through optical media; measured diffraction patterns and beam characteristics

PROJECTS

Quantum Wavepacket Visualization

Jan 2025 – Mar 2025

Developed interactive visualizations of quantum phenomena in Python

- 3D simulation of a quantum wavepacket traversing a potential barrier
- Quantum harmonic oscillator dynamics

RELEVANT COURSEWORK & CAPABILITIES

Mechanics:	Lagrangian and Hamiltonian formulations, coupled ODEs, variational principles
Electromagnetism:	Maxwell's equations, boundary-value problems, vector calculus
Quantum Mechanics:	Schrödinger equation, operator methods, eigenvalue problems
Mathematical Methods:	Linear algebra, ODEs/PDEs, Fourier analysis, complex analysis
Computation:	Python, Julia, C++; numerical methods, data analysis, visualization
Experimental Methods:	Statistical analysis, uncertainty propagation, calibration, regression

ACHIEVEMENTS

- BITSAT: 321/390**, strong proficiency in Physics, Chemistry, and Mathematics
- JEE Mains: 99.14 percentile** (Top 1% of 2 million candidates)
- JEE Advanced Rank: 9112**, exceptional problem-solving abilities
- Awarded **Silver Medal** in International Aerospace Olympiad 2024
- IISER Aptitude Test Rank: 357**

INTERESTS

- Computational Physics and Machine Learning:** Physics-informed neural networks, scientific computing, and data-driven approaches to modeling complex physical systems
- Experimental and Theoretical Integration:** Laboratory techniques in condensed matter physics, instrumentation development, and bridging experimental data with computational models