



Krishna Gupta

Project student|Tata Institute of Fundamental research(TIFR)

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Education

St. Stephen's College- Delhi, India

2022-2025 Bachelor of Science (Honours) Physics; CGPA: 8.6

St. Thomas School - Kanpur, India

2021-2022 Indian School Certificate(ISC): 98.25%

2019-2020 Indian Certificate of Secondary Education(ICSE):96.6%

Technical Skills

Programming Languages

Python, Java, HTML5 & CSS

Python Libraries

Matplotlib, Scipy, Pandas, Numpy, Turtle

Quantum Computing Software

Qiskit, Qiskit-metal, Qiskit-Dynamics, Qutip

Software Tools and Development Environments

AWR Microwave environment , Keysight ADS, Ansys HFSS, AutoCAD, LPKF Circuit Pro

Research Experience

Project Student- Quantum measurement and Control Laboratory (QuMac),

Department of Condensed Matter and Materials Science, TIFR, Mumbai, India.

Guide: Prof. Rajamani Vijayaraghavan (Pioneer of India's National Quantum Mission)

Nov 25

On-Chip Broadband Parametric Amplifier (BPA) for Quantum Readout (Ongoing)

- Upgrading PCB-based BPA to silicon for scalable, multiplexed superconducting qubit readout.
- Optimized CPW transmission-line geometry using FEM simulations to maximize bandwidth across the desired frequency range.

Hands-on Experimental Experience with Superconducting Qubit Systems

- Assembled qubit–cavity system and integrated waveguides for microwave signal routing.
- Participated in dilution refrigerator operations — including disassembly, sample mounting, reassembly, and cool-down procedures.

Oct 25	Designed a Coupled-Line Directional Coupler (6 GHz, -20 dB Coupling) for Multi-Stage Josephson Parametric Amplifiers(JPA)
	<ul style="list-style-type: none"> • Performed FEM simulations to analyze and optimize S-parameters for desired coupling. • Developed the PCB layout in AutoCAD and fabricated the circuit using an LPKF milling machine. • Assembled and soldered microwave connectors for experimental testing and characterization.
Sep 25	Designed single- and four-transmon qubit chips in Keysight ADS
	<ul style="list-style-type: none"> • Analyzed quantum parameters (qubit/resonator frequencies, Quality factor, anharmonicity, cross-Kerr coupling, Purcell time) and optimized device structure.
Aug 25	Designed $\lambda/4$ and $\lambda/2$ transmission-line resonators (CPW & microstrip)
	<ul style="list-style-type: none"> • Performed EM simulations and analyzed S-parameters for critically, under, over coupled, and optimized structures for maximum Q-factor.
	<p>Summer Intern - Quantum Material Design Laboratory (QMD), Department of Condensed Matter and Materials Science, TIFR, Mumbai, India.</p> <p>Guide: Dr. Bahadur Singh</p> <p>Project Title: Ab-initio Investigation of Structural and Electronic Properties of Materials Link</p>
Jul 25	Analyzed bulk and monolayer MoS₂ using Density Functional Theory (DFT)
	<ul style="list-style-type: none"> • Designed 2D MoS₂ structure from the bulk unit cell. • Demonstrated indirect-to-direct band gap transition upon exfoliation, highlighting its suitability for optoelectronic devices.
Jun 25	DFT simulations with VASP on bulk Cu, NaCl, and Si
	<ul style="list-style-type: none"> • Analyzed band structures/DOS to classify them as metal, insulator, and semiconductor. • Gained hands-on experience in k-point path selection, pseudo potential choice (POSCAR), and convergence testing.
	Certification Link
Sep 25	Introduction to Quantum Computing: Quantum Algorithms and Qiskit – IIT Madras, 2025
Aug 25	Quantum Business Foundation – IBM Quantum Learning (Online), 2025
Jun 24	Semiconductor Technology & Microfabrication Workshop – IISc Bangalore (Online), 2024
	Honours & Awards
2022-2025	Recipient of the INSPIRE scholarship, DST Government of India .
2022-2025	3 Times- Recipient of the Sumitomo scholarship for academic excellence by the Sumitomo Corporation, Japan .
2022	Recognized as top 1% students in the ISC board examinations .