Research Interests

- Theoretical modelling of III-V semiconductor quantum dots
- Strain engineering in heterostructures
- Spintronics, spin injection
- Physics of CMOS devices

Scholastic Achievements	**Year**
• Department rank of 2 (Microelectronics)	Current
• JEE rank of **135**, AIEEE rank of **229** (All India) and **28** (State)	2009
• **424 out of 450** marks in BITSAT	2009
• **6th position** in Dehradun in District Talent Search Exam	2003
• Pursuing **Physics minor**; **CPI 10** (in 2 courses completed so far)	Present

Academic Projects — Year

Theoretical Modelling of Semiconductor Quantum Dots and DWELLs- Undergraduate Research — Aug 2010-present

- **Submitted two extended abstracts** on **dot growth pause modelling** and **DWELL ground state PL and thermal anneal modelling** to **IWPSD-2011, IIT Kanpur** to be held in December 2011.
- Working at the **Centre for Excellence in Nanotechnology, IIT Bombay** on theoretical modelling of semiconductor heterostructures.
- Analysed experimental **photoluminescence** results and prepared appropriate models for simulation using **MATLAB**. Heterostructures analysed include **Quantum Dots** and the technologically important **Quantum Dot-in-a-Well (DWELL)** ,with **InGaAs** capping.
- Currently working on modelling of **GaAsN** and **InAlGaAs** capped samples. There has been almost no work on **InAlGaAs** capped dots reported previously.

Unique ID project for IITB campus -Course Project — Sep-Nov 2009

- **Overall Project Co-ordinator** for team of 20 students
- Developed **programs** to register, assign a unique ID, check for forgery and reading and storing fingerprints of students
- Used C++ for coding and **CVS** for co-ordinating the work of various team-members and maintaining versions of programs.

CPU design and implementation-Course Project — Mar-Apr 2011

- Designed a CPU based on von Neumann architecture and an I/O interface for programming the CPU
- Implemented design on a breadboard using EEPROMs, counters, etc.
- Simulated the design using Verilog HDL and tested the Verilog program on an FPGA board

Skills

- **Programming Language**: C,C++
- **Software Proficiency**: Microsoft Office, SCILAB, MATLAB, OriginPro, 8085 Assembly Language,CVS, Verilog HDL,NG Spice
- **Operating System**: Windows, Linux
- Proficient knowledge of basic **quantum mechanics**, and advanced approximation methods such as perturbation theory, variational principle, WKB approximation.

Courses completed (as of 2011)

Core Courses		
Calculus	Linear Algebra	Differential Equations-1
Differential Equations-2	Introduction to Electrical Engineering	Introduction to Electronic Engineering
Complex Analysis	Electronic Devices	Network Theory
Electronic Devices Lab	Power Electronics	Analog Circuits
Digital Electronics	Digital Electronics Lab	Power Electronics Lab
Analog Circuits Lab	Microprocessors	Communication Systems
Electromagnetic Waves	Probability and Random Processes	Compound Semiconductor Materials and Devices
Communications Lab	Signals and Systems	Physics of MOS Transistors*
Digital Signal Processing*	Control Systems*	Digital Communications*

Non-Core Courses		
Electricity and Magnetism	Classical Mechanics	Quantum Mechanics-1
Thermal and Statistical Physics	Astrophysics	Engineering Drawing
Computer Programming (in C++)	Data Analysis and Interpretation	Economics
Instrumentation Lab	Introduction to Psychology	DSP Lab*

***-will be completed by April 2012**

Positions of Responsibility	**Year**
• **Organiser** in Mood Indigo	2009
• **Organiser** in Aagomani (Electrical Dept. Fest)	2009
• **Project Co-ordinator** for Course Project (Unique ID)	2009
• **Activity Associate** in NSS	2010

Extracurricular Activities	**Year**
• **National Service Scheme**	2009-10
○ Worked with NSS **(Educational Outreach and Personality Development)**	
○ Continued association with NSS in second year, **Activity Associate for Educational Outreach**	2010
• Member of **Editorial Team** of Electrical Department Magazine, **Background Hum.**	2010

- **Other interests**
  - Proficient with handling microscopes and preparing slides
  - Reading, writing poetry, stories, essays, blogs