Vishal Sharma

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My Webpage

Education

July '14 - July' 18	Bachelor of Technology in Engineering Physics **IIT Delhi**
March 2013	ALL INDIA SENIOR SCHOOL CERTIFICATE EXAMINATION (AISSCE) in Sciences **Somerville School, Vasundhara Enclave** Aggregate Percentage: 90.4%
March 2011	SECONDARY SCHOOL CERTIFICATE EXAMINATION **Somerville School, Vasundhara Enclave** CGPA: 9.8

Courses Taken during Undergraduate Degree

Mathematics	Calculus, Linear Algebra, Probability and Statistics, Complex Analysis, Partial Differential Equations, Special Functions, Fourier and Laplace transforms, Integral Equations
Physics	Applied Optics, Electrodynamics, Quantum Mechanics, Solid State Physics, Materials Processing, Synthesis of Functional Materials, Semiconductor Physics, Classical Mechanics and Relativity, Statistical Mechanics, Advanced Quantum Mechanics (with Introduction to Relativistic Quantum Mechanics), Computational Physics, Field Theory and Quantum Electrodynamics, Quantum Electronics, Quantum Information and Computation
Experimental Skills	Experiments performed in the fields of Optics, Interferometry, Material Science, Control Systems, Electrical and Electronics, Characterisation techniques, Semiconductors, Optoelectronics, Superconductivity over the course of 6 semesters
Computer Science	Introduction to Computer Science, Digital Electronics, Data Structures and Algorithms, Signals and Systems, Advanced functional Brain Imaging, Machine Learning

Bachelor's Thesis

- Bachelor thesis on the Transport Properties of Quark Gluon Plasma with Prof. V Ravishankar.
- Obtained the required theoretical background and worked out perturbatively and self-consistently a set of transport equations via semi-classical approach.
- Achieved an 'A' grade (: 10/10 in grade points).

Undergraduate Internship Experience

June-August 2018 — Research Intern at Laboratoire Kastler Brossel, École Normale Supérieure, Paris,
Atom Chips group (Fundamental many-body Quantum Physics and applications in Quantum Information)

- Team of Jakob Reichel at LKB, ÉNS, Paris.
- Experiment on Quantum Enhanced Metrology with Ultra-Cold Strontium atoms in a high finesse optical cavity.
- Fabricated an electronic box with a Direct Digital Synthesizer (DDS) chip for driving the Acousto-Optic Modulators, controlled via Ethernet with Arduino Hardware used for communication and storing Instructions for the DDS chip.
- Characterization of the delay in response w.r.t the input trigger of the fabricated DDS box.
- Performed Saturated Absorption Spectroscopy for the 707nm transition wavelength of Strontium atoms in a Cathode Discharge Cell and observed the Doppler-free(and broadened) absorption peaks for Sr88 and isotopes.
- Python program for controlling the Cameras near the glass cell to be driven by an external trigger.

May-July 2017 — Research Intern at Laboratoire Kastler Brossel, École Normale Supérieure, Paris,
Atom Chips group (Fundamental many-body Quantum Physics and applications in Quantum Information)

- Team of Jakob Reichel at LKB, ÉNS, Paris.
- Worked on quantum information via cold atoms achieved through laser cooling. Built a control system using Arduino controllers and electronics for nanometre scale control of atom cavity walls.
- Result: 10X gain in Cavity Locking time. Increased from 2-3 mins to approx. 30 mins.
- Extreme precision is essential for sustenance of standing waves inside the cavity.
- Epoxy glue characterisation in vacuum
- Developed an experimental setup for saturated absorption spectroscopy

May-July 2016 — Research Intern at Defence Research and Development Organisation, Govt. of India
Solid State Physics Laboratory

- Developed a theoretical prototype of a mass sensor using graphene sheets with Dr. Shankar Dutta
- Performed analysis of loaded weight on the sheet using the difference in natural (unloaded) resonant and altered frequency for the calculation of weight.

Computing Skills

Experience with: JAVA, Python, R, Labview, MATLAB, Arduino Programming, FSL (Software library of analysis tools for brain imaging data)

ML Project: Implemented, trained and tested a Multiclass (10-class) logistic regression algorithm from scratch in python as a part of a project along with a Report (Obtained accuracy on Page-12)

Standardized International Tests

GRE Physics:	GRE Physics 2017 Result: 930/990
TOEFL English Test:	TOEFL iBT 2018 Result: 109/120

Awards & Achievements

All India Rank of 1822 in JEE-Advanced 2014	June-2014
Percentile score of 99.57 in JEE-Mains 2014 among 1.4 million registered candidates	May-2014
AISSCE award for highest marks obtained in mathematics (99%)	May-2013

Extra Curricular Activities

IIT Delhi (Sep'15 - Apr'16)	**eDC** Ex-Member of eDC, the Entrepreneurial Club of IIT Delhi
IIT Delhi (Aug'15 - Apr'17)	**Football** August'15 - April'16 : Vice-Captain of the Hostel Football team August'16 - April'17 : Captain of the Hostel Football team
IIT Delhi Oct'16	**Music** Participated in Western Music Competition as a Pianist with a Podium finish.

Referees

École Normale Supérieure	**Prof. Jakob Reichel** *Professor, Department of Physics, Laboratoire Kastler Brossel, Paris* email: jakob.reichel@ens.fr
IIT Delhi	Prof. RaviShankar *Professor, Department of Physics, IIT Delhi* email: vravi@physics.iitd.ac.in
IIT Delhi	**Prof. Amruta Mishra** *Professor, Department of Physics, IIT Delhi* email: amruta@physics.iitd.ac.in