VIBHOR R. SINGH

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SUMMARY:

My Research interest lies in Theoretical High Energy Physics, Quantum Field Theory and Physics Beyond Standard Model. I am aiming for getting a hands on experience in the research field which will help me broaden my knowledge in this field and would like to contribute in the research areas in near future.

EDUCATIONAL QUALIFICATIONS

	Board	Name of Institution	Year of Completion	Percentage/Grade
10th	Gujarat Board	St. Francis' High School	2016	85.5
12th	Gujarat Board	St. Francis' High School	2018	85.69
Integrated MSc (Physics) sem-4	SVNIT	Sardar Vallabhbhai National Institute of Technology		9.62 CGPA

Experience/Projects:

- *Klein Paradox in Photonic Crystals (April2021 - July2021)*
  Supervisor: Dr. Prasanta K Panigrahi (Professor), IISER Kolkata
  Abstract: While considering reflection from a potential barrier in one particle solution of Relativistic QM, we get a paradoxical solution, called Klein paradox, with negative reflection coefficient and transmission coefficient greater than one. This project gives an insight into the Klein paradox in Bosons and discusses the same in the case of Graphene.

- *Dynamical Symmetries in the Kepler Problem (Augustl2021 - November2021)*
  Supervisor: Dr. K N Pathak (Professor), SVNIT Surat
  Abstract: The Kepler system have some special symmetrical properties which makes the system maximally super-integrable. In this project we intend to look for the properties of the Laplace-Runge-Lunz vector, and study the dynamical symmetry group of the system. Extending further this project deals with a Quantum mechanical application i.e. The Hydrogen atom and derive the energy spectrum of hydrogen atom purely from the group theory.

COURSEWORK

University offered Courses:

Classical Mechanics, Introductory Quantum Mechanics, Electromagnetism, Atomic and Molecular Physics, Plasma Physics, Kinetic theory of Gases, Thermodynamics, Rigid body

Dynamics, Introduction to Statistical Mechanics, Solid State Physics, Basic Electronics.
Partial Differentiation, Ordinary Differential equations, Vector Calculus, Laplace Transform,
Fourier Series and Transform, Complex Variables, Computational and Numerical Methods.

Self Studied Topics:

Introductory Relativistic Quantum Mechanics, QFT Formalism, Discrete and continuous Group
theory.
Read prominent books like Introduction to Quantum Mechanics by David J. Griffiths,
Introduction to Electrodynamics by David J. Griffiths, Classical Mechanics by Goldstien,
Classical Dynamics of particles and systems by Thornton & Marion, Feynman Lectures Vol-1,3,
Modern Physics by Arthur Beiser, Heat thermodynamics and statistical physics by Brijlal, etc.
Completed lecture series offered by Stanford University under the title 'The theoretical
minimum', taught by Dr Leonard Susskind, of subjects Classical mechanics, Quantum
mechanics, Special Relativity and General Relativity.

Currently Reading Principles of Quantum Mechanics by R. Shankar, Spacetime and Geometry by
Sean M. Carroll

TECHNICAL SKILLS:

Programming Skills: MATLAB, C
Operating System: Windows, Linux
Others: Microsoft Office, LaTeX, NI Labview (Basic)

ACTIVITIES

- author at thehavok.com