

CURRICULUM VITAE

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EDUCATION AND RESEARCH EXPERIENCE

- 2014 – 2020 **Ph.D., Theoretical Nuclear Physics**
Babasaheb Bhimrao Ambedkar University, Lucknow, India.
Thesis: “Implications of Neutrinoless Double Beta Decay”
Advisor: [Dr. Ramesh Chandra](#)
Co-advisor: [Prof P. K. Rath](#)
- 2012 – 2014 **M.Tech., Applied Optics**
Indian Institute of Technology Delhi (IITD), New Delhi, India
Thesis: “Investigation of Fresnel Incoherent Correlation Holography (FINCH)”
Advisor: [Prof. Joby Joseph](#)
- 2010 – 2012 **M.Sc., Applied Physics**
Babasaheb Bhimrao Ambedkar University, Lucknow, India.
Thesis: “Hierarchies in neutrino mass spectrum through the study of neutrino oscillations”
Advisor: [Dr. Ramesh Chandra](#)
- 2007 – 2010 **B.Sc., Physics and Computer Science**
University of Lucknow, Lucknow, India.

EXPERTISE AND COMPUTATIONAL SKILLS

- **Simulation:** Numerical simulations, Programming, Optical Workshop.
- **Material Characterization:** XRD, SEM, FTIR and UV-Vis spectroscopy.
- **Material synthesis:** Polyaniline (PANI, Conductive Polymer).
- **Tools:** Scientific Workplace and LYX.
- **Programming Languages:** PYTHON, MATLAB, MATHEMATICA, C and FORTRAN for scientific applications.
- **Proficient in:** Microsoft Office (Word, Excel, PowerPoint)
- **Operating Systems:** Windows and little bit aware of Linux.

COURSES

- Mathematical Physics, Quantum Mechanics I and II, Nuclear and Particle Physics, Electronics, Statistical Physics, Electromagnetic Theory, Condense Matter Physics, Material Science, Environmental Physics, Atomic and Molecular Physics.

- Theory appl. of Holography, Fourier Optics Optical Processing, Fiber Optics, Optical Instrument Metrology, Photometry, Statistical and Quantum Optics, Optics Lasers, Optical System Design, Numerical and Computational Methods.
- Data Structure using C, C++, Visual Basic, Database Management System.

RESEARCH EXPERIENCE

- 2014 – 2020 **Babasaheb Bhimrao Ambedkar University, Lucknow, India.**
Research Scholar (Ph.D. research work)
 Project: “Implications of Neutrinoless Double Beta Decay”
- Study of Nuclear Transition Matrix Elements (NTMEs), Phase space factor.
 - Software: FORTRAN and MATHEMATICA.
- 2012 – 2014 **M.Tech, Indian Institute of Technology Delhi, India.**
Master Student (Project)
 Project: “Investigation of Fresnel Incoherent Correlation Holography (FINCH)”
- Recording and reconstruction of on axis Hologram using white light.
 - Software: MATLAB for Numerical Simulations.
 - Lab: Phase SLM for recording the hologram, White light source.
 - Mentor: Prof. Joby Joseph
- 2010 – 2012 **M.Sc., Babasaheb Bhimrao Ambedkar University, Lucknow, India.**
Master Student (Project)
 Project: “Hierarchies in neutrino mass spectrum through the study of neutrino oscillations”
- Study of Majorana neutrino mass in three neutrino flavor mixing on Normal and Inverse mass Hierarchies.
 - Software: FORTRAN.

WORKSHOPS AND SCHOOLS

- 2nd DAE-BRNS workshop on Neutrinoless Double Beta Decay (NDBD-2016)' during October 17-21, 2016 at IIT Ropar, Rupnagar (Punjab).
- 2nd DAE-BRNS workshop on 'Evaluation of Nuclear Structure and Decay Data' during February 29 - March 04, 2016 at HBCSE, TIFR Mumbai.
- Winter School on ‘Beyond the Standard Model Physics’ held at Banaras Hindu University, Varanasi during Jan 24-Feb 14, 2016.
- DST-SERC School on ‘Nuclear Structure on High Angular Momentum and Isospin’ held at HBCSE campus, Tata Institute of Fundamental Research, Mumbai during October 5-24, 2014.
- Winter School on ‘Astroparticle Physics’ held at Cosmic Ray Laboratory (Tata Institute of Fundamental Research), Ooty during December 20-28, 2012.

ACADEMIC ACHIEVEMENTS

- I got selected by **National Changhua of Education (NCUE)** via **Taiwan Experience Exchange Program (TEEP)** which is cooperated with **Ministry of Education (MOE)** under the supervision of Prof. Wei-Chia Su in 2020.
- **Honor Code Certificate:** Successfully completed and received a passing grade in ANU-ASTRO1x: Greatest Unsolved Mysteries of the Universe, a course of study offered by ANUx, an online learning initiative of **Australian National University** through edX in 2012.

- Qualify the National Eligibility Test (NET) Exam in June, 2012 conducted by the **Council of Scientific & Industrial Research (CSIR)** and **University Grant Commission (UGC)**, India.
- Qualify the **Graduate Aptitude Test in Engineering (GATE)** Exam in 2012 and 2016 conducted by the Indian Institute of Technology, India.
- Cleared the **Combined Geo-Scientists and Geologist** written exam in 2015 conducted by **Union Public Service Commission (UPSC)**, India.
- Gave an Interviews for the post of Scientist in **Bhabha Atomic Research Centre (BARC)** and **Indian Space Research Organization (ISRO)**, respectively.
- Selected for the post of research scholar in **Institute of Plasma Research (IPR)** and **Aryabhata Research Institute of Observational Sciences (ARIES)** in 2012.
- I got selected in **WIPRO Company** in **WASE** program in 2010.

PUBLICATIONS

Book (Published)

- Bipin Singh Koranga, Sanjay Kumar Padaliya, **Vivek Kumar Nautiyal**, **SPECIAL FUNCTIONS AND THEIR APPLICATIONS**, **River publisher (Denmark)**, (2021). ISBN – 9788770226264 | e-ISBN - 9788770226257

Articles in Refereed Journals (Published)

- **V. K. Nautiyal**, R. Gautam, N. Das, R. Chandra, P. K. Rath, P. K. Raina, Occupation numbers and nuclear transition matrix elements for $0\nu\beta\text{-}\beta\text{-}$ decay within a mechanism involving neutrino mass, *European Physical Journal A* 58, 28 (2022).
<https://doi.org/10.1140/epja/s10050-022-00677-y>
- P. K. Rath, B. Shukla, K. Chaturvedi, **V. K. Nautiyal**, R. Chandra and P. K. Raina, Nuclear transition matrix elements for neutrinoless double- β decay within Rp-violating squark-neutrino mechanism, *Int. J. Mod. Phys. E.* **29**, 8, 2050066 (2020).
<https://doi.org/10.1142/S0218301320500664>
- **Vivek Kumar Nautiyal**, Bipin Singh Koranga, Effect on Jarlskog Determinant above the GUT scale within Four Flavor Neutrino framework, *Int. J. Theor. Phys.* **60**, 3548-3565 (2021).
<http://dx.doi.org/10.1007/s10773-021-04916-8>
- Bipin Singh Koranga, **Vivek Kumar Nautiyal**, Effective Neutrino Masses from Four Flavor Neutrino Mixing Matrix, *Int. J. Theor. Phys.* **60**, 781-792 (2021).
<https://doi.org/10.1007/s10773-020-04683-y>
- Bipin Singh Koranga, **Vivek Kumar Nautiyal**, CPT Violation in Four Flavor Neutrino Framework from Planck Scale Effects, *Int. J. Theor. Phys.* **60**, 976-981 (2021).
<https://doi.org/10.1007/s10773-021-04720-4>
- Bipin Singh Koranga, **Vivek Kumar Nautiyal**, A. K. Jha, M. Narayan, Quantum Gravity Effects on Oscillation Parameters in a Four Flavor Framework, *Int. J. Theor. Phys.* **60**, 1920-1932 (2021).
<https://doi.org/10.1007/s10773-021-04811-2>
- **Vivek Kumar Nautiyal**, Bipin Singh Koranga, Sanjay Kumar Padaliya, Neelam Das and Ashish Shrivastava, Jarlskog Determinant in Four Flavor Neutrino Oscillation Framework, *Journal of Graphic Era University* 10_2, 83–94 (2022).
[doi: 10.13052/jgeu0975-1416.1022](https://doi.org/10.13052/jgeu0975-1416.1022)
- Hiba Khan, Santosh Kumar Singh, **Vivek Kumar Nautiyal**, Constraints on Neutrino Mass Matrix with no Majorana Phases, *Journal of Graphic Era University* 10_2, 133-154 (2022).

[doi: 10.13052/jgeu0975-1416.1025](https://doi.org/10.13052/jgeu0975-1416.1025)

- Bipin Singh Koranga, **Vivek Kumar Nautiyal**, Mohan Narayan, Quantum Gravity Correction to Co-bimaximal Neutrino Mixings, *Boson Journal of Modern Physics*, 7(1), 24-35 (2020).
- **Vivek Kumar Nautiyal**, Pawan Singh, Pranav Upadhyay, Khem B Thapa, Theoretical investigation of optical properties and Faraday rotation of one-dimensional periodic structure of magneto-optical material with a defect electro-optical material for supported the Tamm plasmon-polaritons, *Indian Journal of Physics* (2022).
- Pawan Singh, **Vivek Kumar Nautiyal**, Ram Janma, Khem B Thapa, Theoretical investigation of enhanced sensing property in 1D TiO₂/SiO₂ periodic layers containing a defect layer of the nanocomposite with different radii of silver nanoparticles in the host liquid crystal, *Physica Scripta* **95**, 6, 065507 (2020).
<https://doi.org/10.1088/1402-4896/ab82c5>
- Kaushlendra Agrahari, **Vivek Kumar Nautiyal**, Tripti Vimal, Shivani Pandey, Sandeep Kumar, Rajiv Manohar, Modification in different physical parameters of orthoconic antiferroelectric liquid crystal mixture via the dispersion of hexanethiol capped silver nanoparticles, *Journal of Molecular Liquids* **332**, 115840 (2021).
<https://doi.org/10.1016/j.molliq.2021.115840>
- Pawan Singh, **Vivek Kumar Nautiyal**, Neeraj Singh, Khem B Thapa, Study of the effective surface Plasmon in a nano-composite of silver nanoparticles with a host ZrO₂ in one-dimensional ternary periodic structure for solar cell application, *Physica Scripta* **96**, 025504 (2021).
<https://doi.org/10.1088/1402-4896/abd200>

Conference Proceedings

- Yash Kaur Singh, **V. K. Nautiyal**, R. Chandra, P. K. Rath and P. K. Raina, Nuclear transition matrix elements of neutrinoless double beta decay including V+A current, *Symp. Nucl. Phys*, 63, 148 (2018).
- R. Gautam, **V. K. Nautiyal**, R. Chandra, P. K. Rath and P. K. Raina, Correlations in the nuclear transition matrix elements of $(\beta\beta)_{0\nu}$ decay within PHFB model, *Symp. Nucl. Phys*, 62, 324 (2017).
- Yash Kaur Singh, Pooja Lohani, **V. K. Nautiyal**, R. Gautam, R. Chandra, K. Chaturvedi, **P. K. Rath** and **P. K. Raina**, Neutrinoless double beta decay and Physics beyond the Standard Model, *Symp. Nucl. Phys*, 61, 286 (2016).
- R. Chandra, **V. K. Nautiyal**, R. Gautam, K. Chaturvedi, **P. K. Rath** and **P. K. Raina**, Study of squark-neutrino mechanism of neutrinoless double beta decay in R-parity violating supersymmetric models, *Symp. Nucl. Phys*, 60, 300 (2015).

INVITED TALKS

- **Vivek Kumar Nautiyal**, Holography, October 3-4, 2019 organized by Department of Physics & Electronics, National Post Graduate College, Lucknow, India.

CONFERENCE PRESENTATIONS

Oral Presentations

- **Vivek Kumar Nautiyal**, Neutrinoless double beta decay within R-parity violating supersymmetric models. Online oral presentation at VI International School for Young

Scientists: Magnetic Resonance and Magnetic Phenomena in Chemical and Biological Physics in Roshchino, *St. Petersburg (Leningrad) region, Russia* on September 5-10, 2020.

Poster Presentations

- **Vivek Kumar Nautiyal** and Joby Joseph, Investigation of Fresnel Incoherent Correlation Holography, Poster presentation at IIT Delhi, April 2014.
- R. Chandra, **V. K. Nautiyal**, R. Gautam, K. Chaturvedi, P. K. Rath and P. K. Raina, Study of squark-neutrino mechanism of neutrinoless double beta decay in R-parity violating supersymmetric models, Poster presentation at *60th DAE BRNS Symposium on Nuclear Physics, India, December 7-11, 2015*.
- **Vivek Kumar Nautiyal**, Yash Kaur Singh, R. Chandra, P. K. Rath and P. K. Raina, Majoron accompanied Neutrinoless double beta decay, Poster presentation at *6th IJAA-JSPS International conference on 'Contemporary Advances of Science and Technology (IC-CAST-2015)' held at Banaras Hindu University on August 7-9, 2015*.
- **Vivek Kumar Nautiyal** and R. Chandra, SUSY accompanied neutrinoless double beta decay within PHFB model, Poster presentation at *3rd Lucknow Science Congress and National conference on 'Science for Society: An Interdisciplinary Approach held at Babasaheb Bhimrao Ambedkar University, Lucknow, India on Oct. 31- Nov.2, 2015*.

TEACHING EXPERIENCE

2014 – 2017: Teaching Assistant

Department of Applied Physics, Babasaheb Bhimrao Ambedkar University, India

- Teaching: Taking classes in M.Sc Nuclear Medicine.
- Tutorials: Taking tutorials of M.Sc students
- Technical sessions: Teach MATLAB to M.Sc Students.

2013 – 2014: Teaching Assistant

Department of Physics, IIT Delhi, India

Training and Conducting Practical to B.Tech 2nd year students.