Name: Dr. Surender Verma

Designation: Professor

Contact: Department of Physics and Astronomical Sciences
School of Physical and Material Sciences
ShahpurParisar,Distt. Kangra, Himachal Pradesh, Pincode-176206
Mob. No.-9817241400

Academic Qualification: M. Sc., CSIR-NET-JRF, M. Phil., Ph. D.

Specialization and Research Interests:

- Neutrino Mass Model Building and their low energy phenomenology
- Dark Matter and its Collider Complementarity
- CP Violation in Leptonic sector and Leptogenesis
- Matter-antimatter asymmetry
- Aspects of Modular symmetries and canonical seesaw models

Research Projects Completed:

1. "Theoretical and Phenomenological Aspects of Lepton Mass Matrices in light of the Neutrino Oscillation Data", funding agency: UGC-BSR, April 01, 2014 to March 31, 2016, Sanction No. and Date of award: No. F. 20-2(30)/2013(BSR), Dated 14.02.2014.

2. "Investigation of neutrino mass models based on discrete flavor symmetries and associated phenomenology",funding agency: DST-Inspire Programme with Dr. Monal Kashav.Sanction No. and Date of award:No: DST/INSPIRE Fellowship/[IF180327], Dated 08.02.2019.

3. "On W-boson Mass Anomaly, Matter-Antimatter Asymmetry and Dark Matter withinScotogenesis framework of Neutrino Mass Generation", funding agency: CSIR, Direct SRF programme with Mr. Labh Singh.Sanction No. and Date of award: 9/1196(18553)/2024-EMR-I, Dated 24.05.2024.

Research Fellowships:

1. Junior Research Fellow (JRF) under research project entitled “Constraints on Solar Neutrino and Astrophysical Parameters from Solar Neutrino Data" funded by Department of Atomic Energy (DAE), Board of Research in Nuclear Sciences (BRNS), Govt. of India during 2004-2006.

2. Senior Research Fellow (SRF) under research project entitled “Constraints on Solar Neutrino and Astrophysical Parameters from Solar Neutrino Data" funded by Department of Atomic Energy (DAE), Board of Research in Nuclear Sciences (BRNS), Govt. of India during 2006-2007.

3. Senior Research Fellowship (SRF) from Council of Scientific and Industrial Research (CSIR)-University Grants Commission (UGC) NET", 2008-2009.

4. Awarded Dr. D. S. Kothari Post-Doctoral Fellowship (PDF), 2012.

5. Visiting Associate, Inter-University Centre for Astronomy and Astrophysics (IUCAA), for a period of three years from August 1, 2024.

Ph. D. Supervised/Supervising: 03/02

S. No.	Name of the Student and Registration No.	Title of the Thesis	Year of Award
1	DR. SHANKITA BHARDWAJ CUHP13RDPHY03	PHENOMENOLOGICAL ASPECTS OF NEUTRINO MASSES, MIXING AND LEPTONIC CP VIOLATION	2020
2	DR. GAZAL SHARMA CUHP13RDPHY02	INVESTIGATING NEUTRINO PARAMETERS, STERILE NEUTRINO AND DARK MATTER	2021
3	DR. MONAL KASHAV CUHP17RDPHY06	SOME ASPECTS OF NEUTRINO MASS MODELS AND ASSOCIATED PHENOMENOLOGY	2024
4	LABH SINGH CUHP20RDPHY01	STUDY ON MODELS OF NEUTRINO MASS AND MIXINGS BASED ON SYMMETRY APPROACH IN LIGHT OF NEUTRINO AND COSMOLOGICAL DATA	2025, THESIS SUBMITTED
5	TAPENDER CUHP21RDPHY19	INSIGHTS INTO NEUTRINO PHYSICS AND DARK MATTER PHENOMENOLOGY FROM THEORIES BEYOND THE STANDARD MODEL	SYNOPSIS APPROVED

Research Statement

Neutrinos are the second most abundant elementary particle in nature yet it is one of the least understood. The Neutrino Physics Research Group at CUHP **(NPRG@CUHP)** is dedicated to exploring the fundamental connections between neutrino mass, dark matter models, lepton flavor structure, and leptogenesis scenarios, aiming to address some of the most profound questions in particle physics and cosmology. Our work focuses on understanding the origin of neutrino mass, which remains one of the key open problems in the Standard Model, and its implications for physics beyond the Standard Model (BSM). We

investigate neutrino mass generation mechanisms within various theoretical frameworks, including seesaw mechanisms, radiative mass generation models, and other extensions that naturally incorporate neutrino masses while maintaining consistency with experimental constraints. A significant aspect of our research involves studying the interplay between neutrino mass and dark matter, seeking viable particle physics models in which the same underlying mechanisms give rise to both phenomena. This involves constructing and analyzing minimal extensions of the Standard Model that accommodate stable dark matter candidates while simultaneously explaining neutrino oscillation data and cosmological observations. The group, also, explores the role of lepton flavor symmetries and their breaking patterns in shaping the observed hierarchy of charged lepton and neutrino masses, employing group theoretical methods to construct predictive models that could be tested in future experiments. Another critical area of our research lies in the study of leptogenesis as a mechanism for generating the observed baryon asymmetry of the Universe, linking the properties of neutrinos to the cosmic matter-antimatter imbalance. Our approach is deeply rooted in phenomenology, combining analytical model-building techniques with numerical simulations to explore viable parameter spaces consistent with current neutrino oscillation data, cosmological observations, and constraints from collider experiments. Furthermore, we explore potential signals of new physics at upcoming experiments and future colliders, identifying novel signatures that could distinguish between different BSM scenarios. By bridging the study of neutrino physics with broader themes in particle physics and cosmology, the research group aims to construct a more unified understanding of the fundamental forces and particles that govern the Universe, contributing to the ongoing effort to extend the Standard Model and uncover the physics of the early Universe. Through our work, we provide valuable theoretical insights into the nature of neutrinos, the role of lepton flavor in the evolution of the Universe, and the possible connections between neutrino physics and the longstanding mystery of dark matter, ultimately paving the way for a deeper comprehension of the fundamental laws of nature.

Research Publications

Remark: The research publications can be accessed online by:

Scanning QR Code

Alternatively, click on the links

https://orcid.org/0000-0002-5671-5369

OR

https://inspirehep.net/literature?sort=mostrecent&size=25&page=1&q=Surender%20Verma&ui-citation-summary=true

OR visit the website of our research group at:

https://sites.google.com/view/nprgcuhp/home

Research Publications in 2025*:

1. Priya, Labh Singh, B. C. Chauhan and **Surender Verma**, "Type-III Seesaw in Non-Holomorphic Modular Symmetry and Leptogenesis",
   Published in: JHEP 01 (2026) 036,e-Print: 2508.05047 [hep-ph].
   Impact Factor- 5.5

2. Tapender, Labh Singh and **Surender Verma**, "Dark Matter and Collider Phenomenology in Radiative Type-III Seesaw Model with Two Inert Doublets",
   Published in: Physics of the Dark Universe,50, 102085 (2025), e-Print: 2503.18566 [hep-ph].
   Impact Factor-6.4

3. Labh Singh, Rahul Srivastava, **Surender Verma** and Sushant Yadav, "Type-III Scotogenic Model: Inflation, Dark Matter and Collider Phenomenology",
   Published in:Phys. Rev. D 112, 095014 (2025), e-Print:2501.13171 [hep-ph].
   Impact Factor- 5.3

4. Tapender, **Surender Verma** and Sanjeev Kumar, "On Lepton Flavor Violation and Dark Matter in Scotogenic model with Trimaximal Mixing",
   Published in:Eur. Phys. J. Plus 140, 1, 43 (2025), e-Print: 2402.16491 [hep-ph].
   Impact Factor-2.9

5. Ajay Kumar, Dikshit Gautam and **Surender Verma**, "Neutrino Mass Matrix with Broken Scaling in Light of LMA and Dark-LMA Solutions",
   Published in:Int. J. Theor. Phys. 64, 6, 171 (2025), e-Print: 2503.08273 [hep-ph].
   Impact Factor-1.7

6. Monal Kashav and **Surender Verma**, "A Modular A_4Symmetric Minimal Model for One-Loop T4-2-i Topology",
   Published in: Springer Proceedings in Physics, 361 (2025) 155-163,
   https://doi.org/10.1007/978-981-97-7441-8_15.

7. Labh Singh, Devabrat Mahanta and **Surender Verma**, "TeV Scale Leptogenesis in Extended Scotogenic Model",
   Published in: Springer Proceedings in Physics, 361 (2025) 107-117,
   https://doi.org/10.1007/978-981-97-7441-8_11.

** The impact factors are taken from Clarivate Analytics, 2025.*

8. Tapender, **Surender Verma** and Sanjeev Kumar, "Unveiling the impact of Generalized CP Symmetry on 2HDM and Neutrino Physics",
   Published in: Springer Proceedings in Physics, 361 (2025) 261-272,
   https://doi.org/10.1007/978-981-97-7441-8_26.

Research Publications in 2024:

9. Labh Singh, Monal Kashav and **Surender Verma**, "Minimal Type-I Dirac seesaw and Leptogenesis under A4 modular invariance",
   Published in:Nucl. Phys. B 1007, 116666 (2024).
   Impact Factor-2.8

10. Aditya Raj, Tapender, Labh Singh and **Surender Verma**, "One-Zero Textures of Inverse Neutrino Mass Matrix withTM1 variant of Trimaximal Mixing",
    Published in: Physics of Particles and Nuclei Letters, 21, 6, 1124-1138 (2024).
    Impact Factor-0.4

11. Monal Kashav, Labh Singh, Tapender, and Surender Verma, "Neutrino Mass Hierarchy, θ23 and CP-violation in a variant of Magic Majorana Neutrino Mass Matrix",
    Published in:Springer Proceedings in Physics, 304, 695-697 (2024),
    https://doi.org/10.1007/978-981-97-0289-3_165.

12. Monal Kashav and **Surender Verma**, "Baryon Asymmetry and Corrections to ScalingNeutrino Mass Matrix in Type-I+II Seesaw Model under A4 Modular Invariance",
    Published in:Springer Proceedings in Physics, 304, 672-674 (2024),
    https://doi.org/10.1007/978-981-97-0289-3_156.

13. Labh Singh, Monal Kashav, and **Surender Verma**, "Implications of Dark-θ12 Solution on Two-zero Texture Inverse Neutrino Mass Matrix",
    Published in:Springer Proceedings in Physics, 304, 675-677 (2024),https://doi.org/10.1007/978-981-97-0289-3_157.

14. Simran Arora, Monal Kashav, **Surender Verma**, and B. C. Chauhan, "Muon anomalous Magnetic Moment and Neutrino Mass in U (1)Lμ−Lτ Extended Scotogenic Model",
    Published in:Springer Proceedings in Physics, 304, 713-715 (2024),
    https://doi.org/10.1007/978-981-97-0289-3_171.

15. Tapender, Sanjeev Kumar and **Surender Verma,** "Neutrino Phenomenology in a Model with Generalized CP symmetry within Type-I seesaw framework",
    Published in: Phys. Rev. D 109, 015004 (2024).
    Impact Factor-5.3

16. Labh Singh, Devabrat Mahanta and **Surender Verma**, "Low Scale Leptogenesis in Singlet-Triplet Scotogenic Model",
    Published in: Journal of Cosmology and Astroparticle Physics (JCAP) 02, 041, (2024), e-Print: 2309.12755 [hep-ph].
    Impact Factor-5.9

Research Publications in 2023:

17. Monal Kashav and **Surender Verma**, "A_4 flavor model for Deviation in $\mu-\tau$ Reflection Symmetry with Type-I+II Seesaw Extensions",
    Published in: Int. J. Theor.Phys. 62, 12, 267 (2023).
    Impact Factor-1.7

18. **Surender Verma** and Anil Kumar, "On the Deviation in Co-bimaximal Neutrino Mixingemanating from Charged Lepton Sector",
    Published in: Physics of Particles and Nuclei Letters, 20, 6, 1350–1356, (2023).
    Impact Factor-0.4

19. Sahil Singh and **Surender Verma**, "Effect of Sterile Neutrino State on Neutrino Oscillation Probability at Short and Long Baseline Experiments",
    Published in: Edited Book entitled "**Challenges and Opportunities in Science: A Multidisciplinary Perspective**", Aryabhat Publication House, ISBN: 978-93-95463-09-6.

20. Labh Singh, Tapender, Monal Kashav and **Surender Verma, "**Trimaximal Mixing and Extended Magic Symmetry in a Model of Neutrino Mass Matrix",
    Published in: Europhysics Letters (EPL), EPL 142,6,64002, (2023), e-Print: 2207.13328 [hep-ph].
    Impact Factor-1.8

21. Monal Kashav and **Surender Verma**, "On Minimal realization of Topological Lorentz Structures with one-loop Seesaw extensions in A_4 Modular Symmetry",
    Published in:Journal of Cosmology and Astroparticle Physics (JCAP) 03, 010, (2023), e-Print: 2205.06545 [hep-ph].
    Impact Factor-5.9

22. Simran Arora, Monal Kashav, **Surender Verma** and B. C. Chauhan, "Muon $(g-2)$ in $U(1)_{L_\mu-L_\tau}$ Scotogenic Model Extended with Vector like Fermion",
    Published in:Phys. Scr. 98, 025304 (2023), e-Print: 2206.12828 [hep-ph].
    Impact Factor- 2.6

Research Publications in 2022:

23. Labh Singh, Monal Kashav and **Surender Verma,** "Gauged $U(1)_{L_\mu-L_\tau}$ Symmetry and two-zero Textures of Inverse Neutrino Mass Matrix in light of Muon $(g-2)$",
Published in:Mod. Phys. Lett. A37, No. 30, 2250202(2022), e-Print: 2207.08415 [hep-ph].
Impact Factor-1.6

24. Simran Arora, Monal Kashav, **Surender Verma** and B. C. Chauhan, "Muon $(g-2)$ and W-boson mass Anomaly in a model Based on Z_4 Symmetry with Vector like Fermion",
Published in:Prog. Theor. Exp. Phys.,2022, 113B06, (2022), e-Print: 2207.08580 [hep-ph].
Impact Factor- 8.3

25. Labh Singh, Monal Kashav and **Surender Verma**, "Investigating Two-zero Textures of Inverse Neutrino Mass Matrix under the Lamp Post of LMA and LMA-D Solutions and Symmetry Realization",
Published in:Eur. Phys. J. C 82, 841 (2022), e-Print: 2205.00765 [hep-ph].
Impact Factor-4.8

26. Ankush, Monal Kashav, **Surender Verma** and B C Chauhan, "Scotogenesis in Hybrid Textures of Neutrino Mass Matrix and Neutrinoless Double Beta Decay",
Published in:Phys. Lett. B 824, 136796 (2022),e-Print: 2109.14211 [hep-ph].
Impact Factor-4.5

Research Publications before 2022:

27. Monal Kashavand **Surender Verma**, "Broken Scaling Neutrino Mass Matrix and Leptogenesis based on A_4 Modular invariance"
Published in: JHEP 09 (2021) 100, e-Print: 2103.07207 [hep-ph].
Impact Factor-5.5

28. Rishu Verma, Monal Kashav, **Surender Verma**and B C Chauhan, "Scalar Dark Matter in an Inverse Seesaw Model with A$_4$ Discrete Flavor Symmetry" **Published in: Prog. Theor. Exp. Phys., 2021, 12, 123B01 (2021),**
e-Print: 2102.03074 [hep-ph].
Impact Factor-8.3

29. Rishu Verma, Monal Kashav, Ankush, Gazal Sharma, **Surender Verma** and B C Chauhan, "Texture One Zero Model Based on A4 Flavor Symmetry and its Implications to NeutrinolessDouble Beta Decay"

Published in:J. Nucl. Phys. Mat. Sci. Rad. A. Vol. 9, No. 1 (2021), pp. 67–71.

30. Gazal Sharma, B.C. Chauhan and **Surender Verma**, "CP Phase Analysis Using Quark-Lepton Complementarity Model in 3+1 Scenario"
    DOI: 10.1007/978-981-33-4408-2_160
    Published in: Springer Proc. Phys. 261 (2021), 1087-1092.

31. **Surender Verma**, Shankita Bhardwaj and Monal Kashav, "Majorana Unitarity Triangle in Two-Texture Zero Neutrino Mass Model and Associated Phenomenology"
    DOI: 10.1007/978-981-33-4408-2_144
    Published in: Springer Proc. Phys. 261 (2021), 995-1000.

32. **Surender Verma**andShankita Bhardwaj, "Implications of Non-unitarity on $\theta _{23}$, Neutrino Mass Hierarchy and CP-Violation Discovery Reach in Neutrino Oscillation Experiments"
    DOI: 10.1007/978-981-33-4408-2_145
    Published in: Springer Proc. Phys. 261 (2021), 1001-1005.

33. **Surender Verma** and Monal Kashav, "Neutrino Mass Matrix with one-zero in Type-I+II seesaw model with A4 Symmetry".
    Published in: Frontiers in Basic Physics and Applications, ISBN 978-81-933014-8-7.

34. **Surender Verma** and Monal Kashav, "Magic Neutrino mass model with broken $\mu-\tau$ symmetry and Leptogenesis"
    Published in: J. Phys. G 47, 085003 (2020).
    Impact Factor-3.5

35. **Surender Verma** and Monal Kashav, "Ramifications of Texture one-zero neutrino mass model in coherence with the latest Neutrino Data"
    Published in: Mod. Phys. Lett. A 35, 2050165 (2020).
    Impact Factor-1.6

36. **Surender Verma**, Monal Kashav and Shankita Bhardwaj, "Highly predictive and testable A_4 flavor model within type-I and II seesaw framework and associated phenomenology"
    Published in: Nucl. Phys. B 946, 114704 (2019).
    Impact Factor-2.8

37. **Surender Verma** and Shankita Bhardwaj, "Non-standard interactions and prospects for studying standard parameter degeneracies in DUNE and T2HKK" **Published in: Advances in High Energy Physics, 8464535 (2019).** arXiv:1808.04263[hep-ph].
    Impact Factor-1.1

38. **Surender Verma**, Shankita Bhardwaj, B.C. Chauhan, Gazal Sharma, "Probing CP Violation in Neutrino Oscillation Experiments and Leptonic Unitarity Quadrangle",10.1007/978-3-319-73171-1_58.
    Published in: Springer Proc. Phys. 203 (2018) 257-261.

39. Govind Singh, Ashish Sharma, Gazal Sharma, Shankita Bhardwaj, **Surender Verma**, B.C. Chauhan, "Bounds on Sterile Neutrino Component in the Solar Neutrino Flux",10.1007/978-3-319-73171-1_170.
    Published in: Springer Proc. Phys. 203 (2018) 713-716.

40. Ashish Sharma, Govind Singh, Gazal Sharma, Shankita Bhardwaj, **Surender Verma**, B.C. Chauhan, "Search for Sterile Neutrino Signal in the ^{7}Be Solar Neutrino Measurement with KamLAND", 10.1007/978-3-319-73171-1_12. **Published in: Springer Proc. Phys. 203 (2018) 59-64.**

41. **Surender Verma** and Shankita Bhardwaj, "Connecting Majorana phases to the geometric parameters of the Majorana unitarity triangle in a neutrino mass matrix model",
    Published in: Phys. Rev. D 97, 095022 (2018). arXiv:1803.04162[hep-ph].
    Impact Factor-5.3

42. Gazal Sharma, Shankita Bhardwaj, B.C. Chauhan, **Surender Verma**, "Quark-lepton Complementarity model based predictions for θ_{23}^{PMNS} with neutrino mass hierarchy", arXiv:1711.08796[hep-ph]. 10.1007/978-3-319-73171-1_57.
    Published in: Springer Proc. Phys. 203 (2018) 251-256.

43. **Surender Verma** and Shankita Bhardwaj, "Probing Non-unitary CP Violation effects in Neutrino OscillationExperiments", arXiv:1609.06412 [hep-ph]. 10.1007/s12648-018-1211-7.
    Published in: Indian J. Phys. 92 (2018) no.9, 1161-1167.
    Impact Factor-1.7

44. **Surender Verma** and Shankita Bhardwaj "Prospects for Reconstruction of Leptonic Unitarity Quadrangle and Neutrino Oscillation Experiments".
    Published in: Nucl. Phys. B 907, (2016) 249-257.
    Impact Factor-2.8

45. **Surender Verma**, "Vanishing Effective Majorana Neutrino Mass and Light Sterile Neutrino"
    Published in: Mod. Phys. Lett. A, 31 (2016) 06, 1650040.
    Impact Factor-1.6

46. **Surender Verma** and Shankita Bhardwaj, "Non-vanishing θ_{13} and CP-Violation in Inverse Neutrino Mass Matrix".
    Published in: Springer Proc. Phys.174, 383-387 (2016).

47. **Surender Verma,** "Theoretical and Phenomenological Status of Neutrino Physics: A Review".
    Published in: Advances in High Energy Physics, **2015, open source article ID 385968.**
    Impact Factor-1.1

48. **Surender Verma**, "Maximal *CP*-Violation in Neutrino Mass Matrix in light of the latest Daya Bay result on theta_{13}",
    Published in: Phys. Lett. B 714, 92-96 (2012);
    arXiv:1206.6583 [hep-ph].
    Impact Factor-4.5

49. **Surender Verma**, "Non-zero$\theta_{13}and *CP*-Violation in Inverse Neutrino Mass Matrix".
    Published in: Nucl. Phys. B 854, 340-349 (2012).
    arXiv:1109.4228 [hep-ph].
    Impact Factor-2.8

50. S. Dev, Sanjeev Kumar, **Surender Verma**, Shivani Gupta and R. R. Gautam, "Four Zero Texture Fermion Mass Matrices in SO(10) GUT".
    Published in: Euro. Phys. J. C 70, 1940 (2012).
    Impact Factor-4.8

51. S. Dev and **Surender Verma**, "Leptogenesis in a Hybrid Texture Neutrino Mass Model",
    Published in: Mod. Phys. Lett. A 25, 2837-2848 (2010).
    arXiv:1005.4521 [hep-ph].
    Impact Factor-1.6

52. S. Dev, **Surender Verma**, Shivani Gupta and Radha Raman Gautam, "Neutrino Mass Matrices with a Texture Zero and a Vanishing Minor".
    Published in: Phys. Rev. D 81, 053010 (2010).
    Impact Factor-5.3

53. S. Dev, **Surender Verma** and Shivani Gupta, "Phenomenological Analysis of Hybrid Textures of Neutrinos".
    Published in: Phys. Lett. B 687, 53-60 (2010).
    arXiv: 0909.3182v3 [hep-ph].
    Impact Factor-4.5

54. S. Dev, Sanjeev Kumar, **Surender Verma** and Shivani Gupta, "Phenomenological Implications of a Class of Lepton mass matrices".
    Published in: Mod. Phys. Lett. A 24, 2251-2261 (2009).
    arXiv:0810.3080 [hep-ph].

Impact Factor-1.6

55. S. Dev, Sanjeev Kumar and **Surender Verma**, "*CP*-odd weak basis invariants and Texture Zeros".
    Published in: Phys. Rev. D 79, 033011 (2009).
    Impact Factor-5.3

56. S. Dev, Sanjeev Kumar, **Surender Verma** and Shivani Gupta, "*CP*-Violation in Two Texture Zero Neutrino Mass Matrices".
    Published in: Phys. Lett. B 656, 79-82 (2007).
    arXiv:0708.3321 [hep-ph].
    Impact Factor-4.5

57. S. Dev, Sanjeev Kumar, **Surender Verma** and Shivani Gupta, "Phenomenology of two-texture zero neutrino mass matrices".
    Published in: Phys. Rev. D 76, 013002 (2007).
    arXiv:hep-ph/0612102.
    Impact Factor-5.3

58. S. Dev, Sanjeev Kumar, **Surender Verma** and Shivani Gupta, "Phenomenological implications of a class of neutrino mass matrices"**.**
    Published in: Nucl. Phys. B 784, (2007) 103-117.
    arXiv:hep-ph/0611313.
    Impact Factor-2.8

59. S. Dev, Sanjeev Kumar and **Surender Verma**, "Model independent constraints on non-electronic flavors in the solar boron neutrino flux".
    Published in: Mod. Phys. Lett. A 21, 1761 (2006).
    arXiv:hep-ph/0512178.
    Impact Factor-1.5

Assignments as Reviewer (Scopus and Web of Science indexed Journals):

1. Journal of Physics G: Nuclear and Particle Physics, Institute of Physics (IoP).
2. Physics of the Dark Universe, Elsevier.
3. Physica Scripta, Institute of Physics(IoP).
4. International Journal of Modern Physics A (IJMPA), World Scientific.
5. Indian Journal of Physics, Springer.
6. European Physical Letters (EPL), Institute of Physics (IoP).
7. Journal of Subatomic Particles and Cosmology, ScienceDirect, Elsevier.
8. Involved in evaluating research proposals under UGC research schemes.

Teaching Experience and Courses Taught: 15 years

1. Quantum Mechanics
2. Advanced Quantum Mechanics
3. Quantum Field Theory
4. Statistical Mechanics
5. Nuclear and Particle Physics
6. Classical Mechanics
7. Neutrino Physics
8. Advanced Neutrino Physics
9. Mechanics
10. Elements of Modern Physics
11. Scientific Writing and Presentation

Conferences, Workshops and Seminar Organized (Recent):

1. Online International Conference "HEP Horizons: Summer Edition" 26-27 June 2025, https://sites.google.com/view/hep-horizons-cuhp?usp=sharing.

2. Organized Seminar on "Unveiling the Hidden Universe: Dark Matter, Neutrinos and other mysteries" by Dr. Satyabrata Mahapatra, Sungkyunkwan University, South Korea on 30-01-2025.

3. Organized Seminar on "Effects of Non-standard Cosmology on Matter-Antimatter Asymmetry and Dark Matter" by Dr. Devabrat Mahanta, Abhyapuri College, Assam on 15-02-2024.

4. Organized Seminar on "Neutrinos at the crossroads of particle physics, astrophysics and cosmology" by Dr. Debasish Borah, IIT Guwahati, Assam on 31-10-2023.

5. Organized workshop on High Energy Physics, Cosmology, Astrophysics, Theory and Simulations (HEPCATS) organized by Central University of Himachal Pradesh on 2nd September, 2022.

Participation in Seminars/Conferences:

1. Workshop and Exhibition on Plasma Science and Technology organized by CUHP and IPR Gandhinagar during 09-13 October, 2023.

2. CERN Neutrino Platform Pheno Week, 13th-17th March, 2023 organized by European Organization for Nuclear Research.

3. Workshop on High Energy Physics, Cosmology, Astrophysics, Theory and Simulations (HEPCATS) organized by Central University of Himachal Pradesh on 2nd September, 2022.

4. International Conference on Theoretical Aspects of Nuclear Physics organized by Central University of Himachal Pradesh from 15-20 February, 2021.

5. XXIV DAE-BRNS Symposium on High Energy Physics organized by NISER Jatni Odisha from December 14-18, 2020.

6. Young Scientists' Conference 2020, organized by Ministry of Science and Technology, Ministry of Earth Sciences and Ministry of Health and Family Welfare, Govt. of India from 22-12-2020 to 24-12-2020.

7. Schoolon Gravitation and Astroparticle Physics organized jointly by Inter University Centre for Astronomy and Astrophysics (IUCAA) and Central University of Himachal Pradesh at Central University of Himachal Pradesh from 29 February-12 March, 2016.

8. International Workshop, "Unification and Cosmology after Higgs discovery", Punjab University from 13-15 May, 2014.

9. International Workshop, "From Majorana to LHC: Workshop on the Origin of Neutrino Mass", Abdus Salam International Centre for Theoretical Physics (ICTP-Trieste, Italy) from 2-5 October, 2013.

10. International Workshop on High Energy Physics and Phenomenology (WHEPP), Physical Research Laboratory (PRL), Ahmadabad, 2-12 January, 2010.

11. XVIII DAE-BRNS Symposium on High Energy Physics, Banaras Hindu University, Banaras, 14-18 December, 2008.

12. International Workshop on Theoretical High Energy Physics (IWTHEP), Indian Institute of Technology, Roorkee (INDIA), 15-20 March, 2007.

13. XVII DAE-BRNS Symposium on High Energy Physics, Indian Institute of Technology, Kharagpur,11-15 December, 2006.

Participation in Refresher Course(s)/Faculty Development Programme and other(s):

1. Malaviya Mission Teacher Training Programme, "Short Term Programme on Indian Knowledge System" organized by MMTTC, CUHP from 10-11-2025 to 15-11-2025.

2. Faculty Development Programme, "Rashtriya Karmayogi Large Scale Jan Seva Program" of Capacity Building Commission on 28-08-2025.

3. Refresher Course- Environmental Studies, organized by UGC-HRDC, Aligarh Muslim University (AMU) from 03-09-2020 to 18-09-2020.

4. Faculty Development Programme (FDP) on Managing Online Classes and Co-creating MOOCS organized by TLC Ramanujan College University of Delhi under PMMMNMTT from 20-04-2020 to 06-05-2020.

5. Faculty Development Programme (FDP) on R Programming organized by IIT Bombay from May 25-29, 2020.

6. Certificate Programme in Python for Beginnersconducted by E&ICT Academy, IIT Roorkee.

7. Faculty Development Programme (FDP) on e-content Development for Teachers organized by UGC-HRDC, Savitribai Phule Pune University (SPPU), under PMMMNMTT from 01-06-2020 to 05-06-2020.

8. Faculty Development Programme (FDP) on Open Source Tools for Research organized by TLC Ramanujan College University of Delhi under PMMMNMTT from 08-06-2020 to 14-06-2020.

9. National Workshop on Technology and Instructional Reforms with reference to online teaching, learning and evaluation organized by CALEM, Panjab University under PMMMNMTT from July 15-20, 2020.

10. National Workshop on Curriculum Design and Development organized by Central University of Punjab under PMMMNMTT from July 21-31, 2020.

Involvement in University level Administrative and Co-Curricular Endeavours(Recent):

1. Deputy Superintendent, University End-Term Examination (Spring Semester), June 2025.

2. Member, Transportation, Boarding and Lodging Committee, Eighth Convocation, CUHP, 18-06-2025.

3. Member, Committee for selling old answer sheet, question paper in scrap, 23-09-2025.

4. Member, Printing and Facilitation committee, Annual Cultural function of the university, 2025.

5. Member, Venue Management Committee, All India Inter-Zonal Weight lifting (Women) Championship, 1-21 January 2025.

6. Member, document verification committee for Medical officer recruitment, 2025.

7. Member, Chess tournament during organization of Sports activities from 24-25 October 2024.

8. Member, Venue Management Committee, All India Inter-Zonal Weight lifting (Women) Championship, 9-12 February, 2024.

9. VC Nominee, Department Academic Integrity Panel (DAIP), Department of Physics and Astronomical Science, 24-06-2024.