

Name:

Dr. Surender Verma



Designation:

Associate Professor

Contact:

Department of Physics and Astronomical Sciences
School of Physical and Material Sciences
Shahpur Parisar, 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:

01, "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.

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 Students and Roll 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	SYNOPSIS APPROVED
5	TAPENDER CUHP21RDPHY19	YET TO BE DECIDED	PURSUING

Research Summary

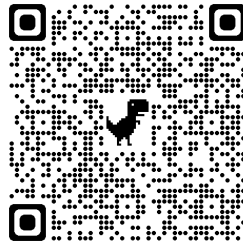
Neutrinos are the second most abundant elementary particle in nature yet it is one of the least understood. The Neutrino Physics Research Group at CUHP (**NPRG@CUHP**) is dedicated to exploring the fundamental connections between neutrino mass, dark matter models, lepton flavor structure, and leptogenesis 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>

1. 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-2.8
2. Monal Kashav and **Surender Verma**, “A Modular A_4 Symmetric Minimal Model for One-Loop T_4 -2-i Topology”,
Published in: Springer Proceedings in Physics, 361 (2025) 155-163,
https://doi.org/10.1007/978-981-97-7441-8_15.
3. 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.

4. 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.
5. 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-2.5
6. Aditya Raj, Tapender, Labh Singh and **Surender Verma**, "One-Zero Textures of Inverse Neutrino Mass Matrix with TM1 variant of Trimaximal Mixing",
Published in: Physics of Particles and Nuclei Letters, 21, 6, 1124-1138 (2024).
Impact Factor-0.4
7. Monal Kashav, Labh Singh, Tapender, and Surender Verma, "Neutrino Mass Hierarchy, θ_{23} 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.
8. Monal Kashav and **Surender Verma**, "Baryon Asymmetry and Corrections to Scaling Neutrino 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.
9. Labh Singh, Monal Kashav, and **Surender Verma**, "Implications of Dark- θ_{12} 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.
10. Simran Arora, Monal Kashav, **Surender Verma**, and B. C. Chauhan, "Muon anomalous Magnetic Moment and Neutrino Mass in U(1) $_{L\mu-L\tau}$ Extended Scotogenic Model",
Published in: Springer Proceedings in Physics, 304, 713-715 (2024),
https://doi.org/10.1007/978-981-97-0289-3_171.
11. 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-4.6
12. 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-5.3

13. Monal Kashav and **Surender Verma**, “ A_4 flavor model for Deviation in μ - τ Reflection Symmetry with Type-I+II Seesaw Extensions”,
Published in: Int. J. Theor. Phys. 62 12, 267 (2023).
Impact Factor-1.3

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

15. 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.

16. 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

17. 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-5.3

18. 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

19. 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-1.5

20. 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-6.2

21. 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-4.2

22. 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-4.2

23. Monal Kashav and **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-5.0

24. 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-6.2

25. Rishu Verma, Monal Kashav, Ankush, Gazal Sharma, **Surender Verma** and B C Chauhan, "Texture One Zero Model Based on A_4 Flavor Symmetry and its Implications to Neutrinoless Double Beta Decay"
Published in: J. Nucl. Phys. Mat. Sci. Rad. A. Vol. 9, No. 1 (2021), pp. 67-71.

26. 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.

27. **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.

28. **Surender Verma** and Shankita Bhardwaj, "Implications of Non-unitarity on θ_{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.

29. **Surender Verma** and Monal Kashav, "Neutrino Mass Matrix with one-zero in Type-I+II seesaw model with A_4 Symmetry".
Published in: Frontiers in Basic Physics and Applications, ISBN 978-81-933014-8-7.

30. **Surender Verma** and Monal Kashav, "Magic Neutrino mass model with broken μ - τ symmetry and Leptogenesis"
Published in: J. Phys. G 47, 085003 (2020).
Impact Factor-3.4

31. **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-1.5

32. **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-2.5

33. **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-1.5

34. **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.

35. 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.

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

37. **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-4.6

38. Gazal Sharma, Shankita Bhardwaj, B.C. Chauhan, **Surender Verma**, "Quark-lepton Complementarity model based predictions for $\theta_{23}^{\text{PMNS}}$ 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.

- 39. Surender Verma** and Shankita Bhardwaj, "Probing Non-unitary CP Violation effects in Neutrino Oscillation Experiments", arXiv:1609.06412 [hep-ph]. 10.1007/s12648-018-1211-7.
Published in: Indian J. Phys. 92 (2018) no.9, 1161-1167.
Impact Factor-1.6
- 40. 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-2.5
- 41. Surender Verma**, "Vanishing Effective Majorana Neutrino Mass and Light Sterile Neutrino"
Published in: Mod. Phys. Lett. A, 31 (2016) 06, 1650040.
Impact Factor-1.5
- 42. 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).
- 43. 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-1.5
- 44. Surender Verma**, "Maximal CP -Violation in Neutrino Mass Matrix in light of the latest Daya Bay result on θ_{13} ",
Published in: Phys. Lett. B 714, 92-96 (2012);
arXiv:1206.6583 [hep-ph].
Impact Factor-4.2
- 45. Surender Verma**, "Non-zero θ_{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-2.5
- 46. 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-4.2
- 47. 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-1.5

- 48.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-4.6
- 49.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-4.2
- 50.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-1.5
- 51.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-4.6
- 52.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-4.2
- 53.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-4.6
- 54.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-2.5
- 55.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:

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. Indian Journal of Physics, Springer.
5. European Physical Letters (EPL), Institute of Physics (IoP).
6. Journal of Subatomic Particles and Cosmology, ScienceDirect, Elsevier.
7. Involved in evaluating research proposals under UGC research schemes.

Teaching Experience: 15 years

Courses Taught:

1. Quantum Mechanics
2. Advanced Quantum Mechanics
3. Quantum Field Theory
4. Statistical Mechanics
5. Classical Mechanics
6. Neutrino Physics
7. Advanced Neutrino Physics

Participation in Seminars/Conferences:

1. **CERN Neutrino Platform Pheno Week**, 13th-17th March 2023 organized by European Organization for Nuclear Research.
2. **Workshop** on High Energy Physics, Cosmology, Astrophysics, Theory and Simulations (HEPCATS) organized by Central University of Himachal Pradesh on 2nd September, 2022.
3. **International Conference** on Theoretical Aspects of Nuclear Physics organized by Central University of Himachal Pradesh from 15-20 February, 2021.
4. **XXIV DAE-BRNS Symposium** on High Energy Physics organized by NISER Jatni Odisha from December 14-18, 2020.
5. **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.
6. **School** on 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**.
7. **International Workshop**, "Unification and Cosmology after Higgs discovery", Punjab University from 13-15 May, **2014**.

8. **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**.
9. **International Workshop** on High Energy Physics and Phenomenology (WHEPP), Physical Research Laboratory (PRL), Ahmadabad, 2-12 January, **2010**.
10. **XVIII DAE-BRNS Symposium** on High Energy Physics, Banaras Hindu University, Banaras, 14-18 December, **2008**.
11. **International Workshop** on Theoretical High Energy Physics (IWTHEP), Indian Institute of Technology, Roorkee (INDIA), 15-20 March, **2007**.
12. **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. **Refresher Course- Environmental Studies**, organized by UGC-HRDC, Aligarh Muslim University (AMU) from 03-09-2020 to 18-09-2020.
2. **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.
3. **Faculty Development Programme (FDP) on R Programming** organized by IIT Bombay from May 25-29, 2020.
4. **Certificate Programme in Python for Beginners** conducted by E&ICT Academy, IIT Roorkee.
5. **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.
6. **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.
7. **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.
8. **National Workshop on Curriculum Design and Development** organized by Central University of Punjab under PMMMNMTT from July 21-31, 2020.