# Poonam Mehta

*Curriculum Vitae*

*School of Physical Sciences*
*Jawaharlal Nehru University*
*New Delhi, India 110 067*
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✉ *pm@jnu.ac.in;* *pm@mail.jnu.ac.in*
*http://www.jnu.ac.in/SPS/Faculty.asp*

## Personal Information

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|---|---|
| Name | Poonam Mehta |
| Date of Birth | June 04, 1977 |
| Nationality | Indian |

## Education

1999 - 2004 **Ph.D. in Physics**, *Department of Physics and Astrophysics, University of Delhi*, Delhi, Thesis - Testing physics beyond the Standard Model in neutrino sector.
Advisor - Prof. Ashok K. Goyal

1997 - 1999 **M.Sc. in Physics**, *Department of Physics and Astrophysics, University of Delhi*, Delhi, Specialisation - Astrophysics and Computational Physics.

1994 - 1997 **B.Sc. (Honours) Physics**, *Acharya Narendra Dev College, University of Delhi*, New Delhi.

## Professional Employment

2013 - present **Assistant Professor (UGC)**, *School of Physical Sciences, Jawaharlal Nehru University* .

2011 - 2013 **Dr. D. S. Kothari Post-doctoral Fellow**, *Department of Physics and Astrophysics, University of Delhi*.

2008 - 2011 **Research Associate (PDF)**, *Raman Research Institute*, Bangalore.

2005 - 2007 **Visiting Scientist**, *Weizmann Institute of Science*, Rehovot, Israel.

2004 - 2005 **Post-doctoral Fellow**, *Harish-Chandra Research Institute*, Allahabad.

## Area of Research

***Theoretical high energy physics, Neutrino physics, Geometric aspects of quantum mechanics***.

## Scholarships, Grants and Awards

2019 **Fellowship from Brookhaven National Laboratory, USA** for visit to the Physics Department at BNL for a period of three weeks.

2018 **Fellowship from the European Organization for Nuclear Research, CERN** for visit to the Theoretical Physics Group at CERN, Geneva for a period of two weeks.

2017 **Bharat Vikas Award** from the Institute of Self Reliance, Bhubaneswar, India.

2017 **Fellowship from the European Organization for Nuclear Research, CERN** for visit to the Theoretical Physics Group at CERN, Geneva for a period of six weeks.

2017 **Fellowship from Brookhaven National Laboratory, USA** for visit to the Physics Department at BNL for a period of two weeks.

2014 **German Academic Exchange Service for the University Academics and Scientists (DAAD)** award for visit to DESY, Zeuthen, Germany for two months based on research project entitled "Quantum decoherence effects in high energy neutrinos".

2012 **DST Fast track project** entitled "High energy cosmic neutrinos and cosmogenic neutrinos" for three years from the Department of Science and Technology, India. Did not avail

2012 **CSIR Senior Research Associateship** under the Scientists' Pool Scheme for three years from the Council for Scientific and Industrial Research, India. Did not avail

2011 **UGC Dr. D. S. Kothari post-doctoral Fellowship** for three years from the University Grants Commission, India. Accepted

2010 **International Union of Pure and Applied Physics (IUPAP)** Women in Physics Travel Grant to attend Neutrino 2010, Athens, Greece.

2009 **Department of Science and Technology (DST)** Foreign Travel Grant and **CCSTDS (INSA)** partial support for attending "50 Years of Aharonov-Bohm effect" in Tel Aviv, Israel.

2009 **International Union of Pure and Applied Physics (IUPAP) and Deutsche Forschungsgemeinschaft (DFG)** support to attend Lepton Photon 09 in Hamburg, Germany.

2005 **International Union of Pure and Applied Physics (IUPAP)** Women in Physics Travel Grant to attend the Les Houches School on Particle Physics beyond the Standard Model in Les Houches, France.

2004 **Department of Science and Technology (DST)** Partial Travel Grant for attending Neutrino 2004 in Paris, France.

1998 Qualified the **National Eligibility Test (NET)** conducted by UGC - CSIR in **December 1998** bearing Roll No.66214 and was awarded **CSIR Fellowship** for pursuing **Ph D** in Physics at University of Delhi, India (1999 - 2004).

1997 - 1999 **All India Post Graduate Scholarship (AIPGS)** for two years by University of Delhi, India.

1996 & 1998 **Science Merit Awards** by University of Delhi, India.

1995, 1996 & 1997 **Merit Scholarships** for **first** position in college by Acharya Narendra Dev College, University of Delhi, India.

## International Collaborations

2015 - present Institutional Board member of the **Deep Underground Neutrino Experiment** at Fermilab, USA [https://dune.bnl.gov/people]

2015 - present Collaboration Member of the **India-based Neutrino Observatory** at Bodi West Hills, India [http://www.ino.tifr.res.in/ino//collaboration.php]

2016 - present Friends of **Invisibles Plus** and **Elusives** [http://invisiblesplus.eu, http://www.elusives.eu/about_us]

## Adminstration

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|---|---|
| Jul 2016 - present | Proctor, JNU |
| Oct 2013 - present | Warden, Tapti Hostel, JNU |

## Teaching

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|---|---|
| Jul 2019 - present | *Mathematical Physics I, PS417* [M.Sc. I Sem. course in SPS, JNU] |
| Jan 2019 - May, 2019 | *Relativistic Physics, PS424* [M.Sc. II Sem. course in SPS, JNU] |
| Jul - Dec, 2018 | *Mathematical Physics I, PS417* [M.Sc. I Sem. course in SPS, JNU] |
| Jan 2018 - May, 2018 | *Quantum Field Theory, PS529* [M.Sc. IV Sem. course in SPS, JNU] |
| Jul - Dec, 2017 | *Subatomic physics, PS512* [M.Sc. III Sem. course in SPS, JNU] |
| Jan - May, 2017 | *Quantum Field Theory, PS529* [M.Sc. IV Sem. course in SPS, JNU] |
| Jul - Dec, 2016 | *Subatomic physics, PS512* [M.Sc. III Sem. course in SPS, JNU] |
| Jan - May, 2016 | *Modern experiments : a survey, PS521* [M.Sc. IV Sem. course in SPS, JNU (jointly with Dr. Tanuja Mohanty)] |
| Jul - Dec, 2015 | *Subatomic physics, PS512* [M.Sc. III Sem. course in SPS, JNU (jointly with Prof. Deepak Kumar)] |
| Jan - May, 2015 | *Modern experiments : a survey, PS521* [M.Sc. IV Sem. course in SPS, JNU] |
| Jul - Dec, 2014 | *Subatomic physics, PS512* [M.Sc. III Sem. course in SPS, JNU] |
| Jan - May, 2014 | *Modern experiments : a survey, PS521* [M.Sc. IV Sem. course in SPS, JNU (jointly with Dr. Tanuja Mohanty)] |
| Jul - Dec, 2013 | *Subatomic Physics, PS512* [M.Sc. III Sem. course in SPS, JNU (jointly with Prof. Deepak Kumar)] |
| Jan - May, 2012 | *Statistics and Computer Applications - Phys 601* [Course work for first year Ph. D. students in the Department of Physics and Astrophysics, University of Delhi, Delhi] |

## Research Guidance

### *Ph.D.*

| | |
|---|---|
| 2013 - 2019 | *Mr. Jogesh Rout, SPS, JNU* [Title of the thesis : Impact of new physics on neutrino mixing at long baseline neutrino experiments.] |
| 2017 - present | *Mr. Samiran Roy* [Jointly with Prof. Raj Gandhi] |
| 2017 - present | *Ms. Sheeba Shafaq, SPS, JNU* |

### *M.Sc.*

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|---|---|
| Jan - May, 2019 | *Kalya Krishna, SPS, JNU* ; Project title : Some aspects of neutrino oscillations. |

Jan - May, 2019 *Pankaj Saini, SPS, JNU* ; Project title : Some aspects of neutrino oscillations. (Presently doing PhD at CMI, Chennai)

Jan - May, 2019 *Deepak Saini, SPS, JNU* ; Project title : Some aspects of neutrino oscillations.

Jan - May, 2018 *Ashu Kushwaha, SPS, JNU* ; Project title : Neutrino oscillations in flat and curved space time. (Presently doing PhD at IIT Bombay)

Jan - May, 2018 *Dharmendra Kumar, SPS, JNU* ; Project title : Geometric phases and neutrino oscillations.

Jan - May, 2017 *Devender Kumar, SPS, JNU* ; Project title : CP, T and CPT violation in neutrino oscillations. (Presently doing PhD at IIT Guwahati)

Jan - May, 2017 *Satyendra Rajput, SPS, JNU* ; Project title : Three flavour neutrino oscillations and CP/T violation.

Jan - May, 2017 *Ayaz Ahmed, SPS, JNU* ; Project title : Some aspects of conformal transformations. (Joint supervision with Prof. Md. Sami)

Jan - May, 2014 *Riya Nandi, SPS, JNU* ; Project title : Standard and non-standard neutrino matter interactions. (Presently doing PhD at Virginia Tech)

Jan - May, 2014 *Augniva Ray, SPS, JNU* ; Project title : Neutrino oscillations and quantum decoherence. (Presently doing PhD at Saha Institute for Nuclear Physics)

### *Summer Program and Project Students*

Jun - Jul 2018 *Hema Mann (SPS Summer Program, 2018), DU* ; Project title : Some aspects of neutrino oscillations.

Jun - Jul 2018 *Shivam Choudhary (Science Academies' Summer Research Fellowship 2018, NIT, Jalandhar)* ; Project title : Some aspects of neutrino oscillations.

May - Jul 2017 *Krishna Jalan (Science Academies' Summer Research Fellowship 2015, NIT, Rourkela)* ; Project title : Some aspects of neutrino oscillations.

Aug - Sep 2015 *Babita (IIT, Madras)* ; Project title : Neutrino oscillations.

May - Jul, 2015 *Ritwika Chakraborty (Science Academies' Summer Research Fellowship 2015, IISER, Bhopal)* ; Project title : Neutrino oscillations in curved space time. (Presently doing PhD at University of Kentucky)

May - Jul, 2015 *Prateek Kumar (Science Academies' Summer Research Fellowship 2015, IIT, Indore)* ; Project title : Series expansion of neutrino oscillation probabilities.

May - Jul, 2014 *Purushottam Singh (Science Academies' Summer Research Fellowship 2014, M.Sc. student from BHU, Varanasi)* ; Project title : Medium effects in neutrino oscillations.

Aug - Sep, 2010 *Aravinda Keta (VSP at RRI, M. Sc. Physics student at NITK Surathkal)* ; Project title : Neutrinos in astrophysics and cosmology.

May - Jul, 2009 *Gaurav Rai (VSP at RRI, B. Tech - 2nd year B.Tech student at IIIT - Allahabad)* ; Project title : Some aspects of neutrinos.

## Publications

1. Dev, B. et al (including Mehta, P.) (2019) : *Neutrino non-standard interactions - a status report.* arXiv:1907.00991 [hep-ph], Citations - 06
   URL - https://arxiv.org/abs/1907.00991
2. Masud, M., Roy, S. and Mehta, P. (2019) : *Correlations and degeneracies among the NSI parameters with*

*tunable beams at DUNE.*
Phys. Rev. D99, 115032 (2019)
Impact factor - 4.568 Citations - 02
URL - https://journals.aps.org/prd/abstract/10.1103/PhysRevD.99.115032

3. Masud, M., Bishai, M. and Mehta, P. (2019) : *Extricating New Physics Scenarios at DUNE with High Energy Beams.*
Scientific Reports 9, 352 (2019)
Impact factor - 4.609 Citations - 13
URL - https://www.nature.com/articles/s41598-018-36790-6
4. Wadhawan, D., Roychowdhury, K., Mehta, P. and Das, S. (2018) : *Multielectron geometric phase in intensity interferometry.*
Phys. Rev. B98, 155113 (2018)
Impact factor - 3.718
URL - https://journals.aps.org/prb/abstract/10.1103/PhysRevB.98.155113
5. Masud, M. and Mehta, P. (2017) : *Imprint of non-standard interactions on the CP violation measurements at long baseline experiments .*
Pramana 89 (2017) no.4, 62.
URL - https://link.springer.com/article/10.1007%2Fs12043-017-1457-1
6. Rout, J., Masud, M. and Mehta, P. (2017) : *Can we probe CP/T violation and non-unitarity at long baseline accelerator experiments?*
Phys. Rev. D95, 075035 (2017).
Impact factor - 4.568 Citations - 15
URL - https://journals.aps.org/prd/abstract/10.1103/PhysRevD.95.075035
7. Masud, M. and Mehta, P. (2016) : *Nonstandard interactions and resolving the ordering of neutrino masses at DUNE and other long baseline experiments.*
Phys. Rev. D94, 053007 (2016).
Impact factor - 4.568 Citations - 35
URL - http://journals.aps.org/prd/abstract/10.1103/PhysRevD.94.053007
8. Masud, M. and Mehta, P. (2016) : *Non-standard interactions spoiling the CP violation sensitivity at DUNE and other long baseline experiments.*
Phys. Rev. D94, 013014 (2016).
Impact factor - 4.568 Citations - 50
URL - http://journals.aps.org/prd/abstract/10.1103/PhysRevD.94.013014
9. Masud, M., Chatterjee, A. and Mehta, P. (2016) : *Probing CP violation signal at DUNE in presence of non-standard neutrino interactions.*
J.Phys. G43, no.9, 095005 (2016) .
Impact factor - 2.448 Citations - 57
URL - http://iopscience.iop.org/article/10.1088/0954-3899/43/9/095005/meta
10. Roychowdhury, K., Wadhawan, D., Mehta, P., Karmakar, B. and Das, S. (2016) : *Quantum Hall realization of polarized intensity interferometry.*
Phys. Rev. B93, 220101 (Rapid communication) (2016)
Impact factor - 3.718
URL - http://journals.aps.org/prb/abstract/10.1103/PhysRevB.93.220101
11. Wadhawan, D., Mehta, P., and Das, S. (2016) : *Geometric phase in p-n junctions in helical edge states.*
Phys. Rev. B 93, 085310 (2016).
Impact factor - 3.718
URL - http://journals.aps.org/prb/abstract/10.1103/PhysRevB.93.085310
12. Chatterjee, A., Mehta, P., Choudhury, D., and Gandhi, R. (2016) : *Testing non-standard neutrino matter interactions in atmospheric neutrino propagation.*
Phys. Rev. D. 93, 093017 (2016)
Impact factor : 4.568 Citations - 25
URL - http://journals.aps.org/prd/abstract/10.1103/PhysRevD.93.093017
13. Sathpathy, N., Pandey, D., Mehta, P., Sinha, S., Samuel, J. and Ramachandran, H. (2011): *Classical light*

*analogue of the nonlocal Aharonov-Bohm effect.*
Europhys. Lett. 97, 50011 (2012).
Impact factor : 2.753 Citations - 3
URL - http://iopscience.iop.org/0295-5075/97/5/50011/

14. Mehta, P. and Winter, W. (2011): *Interplay of energy dependent astrophysical neutrino flavor ratios and new physics effects.*
JCAP03, 041 (2011).
Impact factor : 6.497 Citations - 29
URL - http://iopscience.iop.org/1475-7516/2011/03/041/
15. Mehta, P., Samuel, J. and Sinha, S. (2010): *The Nonlocal Pancharatnam Phase in Two-Photon Interferometry.*
Phys. Rev. A82, 034102 (2010).
Impact factor : 2.866 Citations - 4
URL - http://link.aps.org/doi/10.1103/PhysRevA.82.034102
16. Mehta, P. (2010): *Reply to the comment on "Topological phase in two flavor neutrino oscillations".*
arXiv:1008.4543 [hep-ph].
URL - http://arxiv.org/abs/1008.4543
17. Mehta, P. (2009): *Geometric imprint of CP violation in two flavor neutrino oscillations.*
arXiv:0907.0562 [hep-ph].
Citations - 4
URL - http://arxiv.org/abs/0907.0562
18. Mehta, P. (2009): *Topological phase in two flavor neutrino oscillations.*
Phys. Rev. D79, 096013 (2009).
Impact factor : 4.568 Citations - 19
URL - http://link.aps.org/doi/10.1103/PhysRevD.79.096013
19. Chakrabortty, J., Joshipura, A. S., Mehta, P. and Vempati, S. K. (2009): *Maximal mixing as a sum of small mixings.*
arXiv:0909.3116 [hep-ph].
URL - http://arxiv.org/abs/0909.3116
20. Gandhi, R., Ghoshal, P., Goswami, S., Mehta, P., Uma Sankar, S. and Shalgar, S. (2007): *Mass Hierarchy Determination via future Atmospheric Neutrino Detectors.*
Phys. Rev. D76, 073012 (2007).
Impact factor : 4.568 Citations - 79
URL - http://link.aps.org/doi/10.1103/PhysRevD.76.073012
21. Gandhi, R., Ghoshal, P., Goswami, S., Mehta, P. and Uma Sankar, S. (2006): *Earth Matter Effects at Very Long Baselines and the Neutrino Mass Hierarchy.*
Phys. Rev. D73, 053001 (2006).
Impact factor : 4.568 Citations - 86
URL - http://link.aps.org/doi/10.1103/PhysRevD.73.053001
22. Sajjad Athar, M. et. al [INO Collaboration] (2006): *India-based Neutrino Observatory : Project Report Volume 1*, INO-2006-01, 1–221.
URL - http://www.imsc.res.in/∼ino/OpenReports/INOReport.pdf
23. Gandhi, R., Ghoshal, P., Goswami, S., Mehta, P. and Uma Sankar, S. (2005): *Probing the $\nu$ mass hierarchy via atmospheric $\nu_\mu + \bar{\nu}_\mu$ survival rates in megaton water cerenkov detectors.*
hep-ph/0506145.
Citations - 24
URL - http://arxiv.org/abs/hep-ph/0506145
24. Gandhi, R., Mehta, P. and Uma Sankar, S. (2005): *Neutrino detectors of the future : A comparison table.*
In: INO Project Report Volume 1 (Appendix F) 193–198. INO/HRI/2005/03.
URL - http://www.imsc.res.in/ ino/Talks/tabmod0203.pdf
25. Gandhi, R., Mehta, P. and Uma Sankar, S. (2005): *Matter effects in Atmospheric $\mu^-/\mu^+$ in Magnetized Iron Calorimeters.* A note prepared for Solar and Atmospheric Working Group of American Physical Society.
In: INO Project Report Volume 1 (Chapter 3: Neutrino physics with magnetized iron calorimeter) 24–27. HRI-P-04-10-001.

URL - http://www.imsc.res.in/∼ino/OpenReports/INOReport.pdf

26. Gandhi, R., Ghoshal, P., Goswami, S., Mehta, P. and Uma Sankar, S. (2005): *Large matter effects in $\nu_\mu \to \nu_\tau$ oscillations.*
Phys. Rev. Lett. 94, 051801 (2005).
Impact factor : 7.328 Citations - 50
URL - http://link.aps.org/doi/10.1103/PhysRevLett.94.051801
27. Datta, A., Gandhi, R., Mehta, P. and Uma Sankar, S. (2004): *Atmospheric neutrinos as a probe of CPT Violation.*
Phys. Lett. B597, 356-361 (2004).
Impact factor : 5.083 Citations - 47
URL - 10.1016/j.physletb.2004.07.035
28. Goyal, A., Mehta, P. and Dutta, S. (2003): *Heavy quark production via leptoquarks at a neutrino factory.*
Phys. Rev. D67, 053006 (2003).
Impact factor : 4.568
URL - http://link.aps.org/doi/10.1103/PhysRevD.67.053006
29. Mehta, P., Dutta, S. and Goyal, A. (2002): *Leptoquark signals via neutrino interactions at neutrino factories.*
Phys. Lett. B535, 219–228 (2002).
Impact factor : 5.083 Citations - 4
URL - 10.1016/S0370-2693(02)01726-4
30. Datta, A., Gandhi, R., Mukhopadhyaya B. and Mehta, P. (2001): *Signals of R-parity violating supersymmetry in neutrino scattering at muon storage rings*
Phys. Rev. D64, 015011 (2001).
Impact factor : 4.568 Citations - 27
URL - http://link.aps.org/doi/10.1103/PhysRevD.64.015011

## Collaboration Reports

1. Abi, B. et al (2018) : *The DUNE far detector Interim design report Volume 3: Dual-phase module*
arxiv:1807.10340 [physics.ins-det]

URL - http://arxiv.org/abs/1807.10340
2. Abi, B. et al (2018) : *The DUNE far detector Interim design report Volume 2: Single phase module*
arxiv:1807.10327 [physics.ins-det]

URL - http://arxiv.org/abs/1807.10334
3. Abi, B. et al (2018) : *The DUNE far detector Interim design report Volume 1: Physics, technology and strategies*
arxiv:1807.10334 [physics.ins-det]

URL - http://arxiv.org/abs/1807.10334
4. Abi, B. et al (2017) : *The Single-Phase ProtoDUNE Technical Design Report*
arxiv:1706.07081 [physics.ins-det]

Citations - 19

URL - http://arxiv.org/abs/1706.07081
5. Kumar, A. et al [ICAL Collaboration] (2017) : *Invited review: Physics potential of the ICAL detector at the India-based Neutrino Observatory (INO).*
Pramana - J. Phys. (2017) 88:79, arXiv:1505.07380 [physics.ins-det].
Impact factor - 0.520 Citations - 98
URL - 10.1007/s12043-017-1373-4
6. Acciarri, R. et al (2016) : *Long-Baseline Neutrino Facility (LBNF) and Deep Underground Neutrino Experiment (DUNE) Conceptual Design Report Volume 1: The LBNF and DUNE Projects*
arxiv:1601.05471 [physics.ins-det]

Citations - 172

URL - http://arxiv.org/abs/1601.05471

7. Acciarri, R. et al (2016) : *Long-Baseline Neutrino Facility (LBNF) and Deep Underground Neutrino Experiment (DUNE) Conceptual Design Report, Volume 4 The DUNE Detectors at LBNF*
   arxiv:1601.02984 [physics.ins-det]
   Citations - 123
   URL - http://arxiv.org/abs/1601.02984
8. Acciarri, R. et al (2015) : *Long-Baseline Neutrino Facility (LBNF) and Deep Underground Neutrino Experiment (DUNE) Conceptual Design Report Volume 2: The Physics Program for DUNE at LBN*
   arxiv:1512.06148 [physics.ins-det]
   Citations - 351
   URL - http://arxiv.org/abs/1512.06148

## Summary of publications

h(HEP) index = 18 (from INSPIRE HEP)

## Conference Proceedings

1. Rout, J., Masud, M. and Mehta, P. (2018): *Impact of new physics on CP asymmetries at long baselines*, Springer Proc.Phys. 203 (2018) 795-797, Proceedings, XXII DAE High Energy Physics Symposium : Delhi, India, December 12 -16, 2016.
2. Mehta, P. and Winter, W. (2011): *Probing new physics with high energy astrophysical neutrinos*, to appear in Proceedings of the XXV International Symposium on Lepton Photon Interactions at High Energies (Lepton Photon 11), August 2011.
3. Mehta, P. (2010): *Topological phase in two flavor neutrino oscillations and imprint of the CPV phase*, Proceedings of the XXIV International Conference on Neutrino Physics and Astrophysics (Neutrino 2010) Athens, June 2010. Nucl. Phys. B. (Proc. Suppl.) 229, 467 (2012).
   URL - http://www.sciencedirect.com/science/article/pii/S0920563212003210
4. Mehta, P. (2009): *The Pancharatnam phase in two flavor neutrino oscillations*, in Proceedings of the XXIV International Symposium on Lepton Photon Interactions at High Energies (Lepton Photon 09) Hamburg, August 2009.
   URL - http://www-library.desy.de/preparch/desy/proc/proc10-04/P5.pdf
5. Chakrabortty, J., Joshipura, A. S., Mehta, P. and Vempati, S. K. (2009): *Quasi-degenerate neutrinos and maximal mixing in hybrid seesaws*, in Proceedings of the XXIV International Symposium on Lepton Photon Interactions at High Energies (Lepton Photon 09), Hamburg, August 2009.
   URL - http://www-library.desy.de/preparch/desy/proc/proc10-04/P28.pdf
6. Gandhi, R., Ghoshal, P., Goswami, S., Mehta, P., Uma Sankar, S. and Shalgar, S. (2008): *N*eutrino mass hierarchy determination via atmospheric neutrinos with future detectors. Proceedings of Neutrino 2008, Christchurch, New Zealand. J. Phys. Conf. Ser. 136:042015, 2008.
   URL - http://iopscience.iop.org/1742-6596/136/4/042015/
7. Gandhi, R., Ghoshal, P., Goswami, S., Mehta, P. and Uma Sankar, S. (2008): *Neutrino mass hierarchy determination via atmospheric neutrinos in future detectors*. Proceedings of PANIC, Eilat 2008, Particles and nuclei (PANIC08), Israel, 827 (2008).
   URL - http://dx.doi.org/10.1016/j.nuclphysa.2009.05.006
8. Mehta, P. (2005): *Atmospheric neutrinos as a probe of CPT violation*, Proceedings of the XXIst International Conference on Neutrino Physics and Astrophysics (Neutrino - 2004), Paris, June 2004, Nucl. Phys. B. (Proc. Suppl.) 143, 503 (2004).
   URL - 10.1016/j.nuclphysbps.2005.01.168

9. Goswami, S. *et* al. (2004): *Working group report: Neutrino and Astroparticle Physics*, Proceedings of 8th Workshop on High-Energy Physics Phenomenology (WHEPP-8), IIT Mumbai, January 2004. Pramana 63, 1391 (2004).
   URL - http://www.ias.ac.in/pramana/v63/p1391/fulltext.pdf
10. Dighe, A. *et* al. (2004): *Working group report: Low energy and flavor Physics*, Proceedings of 8th Workshop on High-Energy Physics Phenomenology (WHEPP-8), IIT Mumbai, January 2004. Pramana 63, 1359 (2004).
    URL - http://www.ias.ac.in/pramana/v63/p1359/fulltext.pdf
11. Datta, A., Gandhi, R., Mukhopadhyaya B. and Mehta, P. (2001): *Signals of R-parity violating supersymmetry at a muon storage ring*. Proceedings of the XIV DAE Symposium on High Energy Physics, Hyderabad, December 2000, hep-ph/0105137.
    URL - http://arxiv.org/abs/hep-ph/0105137

## Conferences/Seminars organisation

Apr 2018 **Course Coordinator (with Dr. Sheetal Sharma of School of International Studies, JNU)** for the $1^{st}$ Refresher course on "Liberal Arts (interdisciplinary)" at HRDC, JNU held during 26 Mar - 20 Apr 2018 at Jawaharlal Nehru University, New Delhi.

Dec 2017 **Course Coordinator for the GIAN course on "Dark Matter: the Astroparticle Perspective" by Prof. Subir Sarkar (Oxford University and Neils Bohr Institute, Copenhagen)** under the Global Initiative of Academic Networks (GIAN) of MHRD, Government of India held during 18-23 Dec 2017 at Jawaharlal Nehru University, New Delhi.

Dec 2017 **Co-convener (with Dr. Manimala Mitra) of the Working Group (WG III) on Neutrino Physics** for the Workshop in High Energy Particle Physics XV, IISER Bhopal held during 14-23 Dec 2017.

Mar 2017 **Co-organiser (with Dr. Tanuja Mohanty and Dr. Rabindra Nath Mahato) of the SPS March Meeting on "Perspectives on Graphene and Graphene like 2D materials"** at School of Physical Sciences, JNU.

## Presentations at Conferences and Talks

May 2019 Invited talk at the workshop on **Neutrino nonstandard interactions**, Washington University at St. Louis, USA (via Skype)
**Talk** : New physics with DUNE alternative configurations.

Jan 2019 Invited talk at **Conference on particle physics and cosmology**, University of Hyderabad, India
**Talk** : Impact of new physics at long baseline experiments.

Dec 2018 Invited talk at **The quest for new physics**, University of Valencia, Spain
**Talk** : Impact of new physics at long baseline experiments.

Jul 2018 Invited Plenary talk at **International Symposium on Neutrino Frontiers**, Vietnam. (via Skype)
**Talk** : Impact of new physics at long baseline experiments.

May 2018 Lecture at **Central University of Himachal Pradesh**, Dharamshala.
**Talk** : Neutrino oscillations, CP violation and long baseline experiments

Mar 2018 Talk at **Advances in Astroparticle Physics and Cosmology (AAPCOS)**, SINP, Kolkata.

**Talk** : Hunt for CP violation at long baseline neutrino experiments.

Feb 2018 Invited talk at **Nu HoRIzons VII**, HRI, Allahabad. (via Skype)

**Talk** : Role of beam tunes at DUNE.

Dec 2017 **Course Coordinator and a set of three lectures during the GIAN course on "Dark Matter: the Astroparticle Perspective" by Prof. Subir Sarkar (Oxford University and Neils Bohr Institute, Copenhagen)** under the Global Initiative of Academic Networks (GIAN) of MHRD, Government of India held during 18-23 Dec 2017 at Jawaharlal Nehru University, New Delhi.

**A set of lectures** : Neutrino Physics.

Dec 2017 **Working Group III Co-convener and talk in working group III on Neutrino Physics** at WHEPP XV, IISER Bhopal.

**Talk** : Quantum decoherence in neutrino oscillations.

Nov 2017 TPSC Seminar at **Institute of Physics,** Bhubaneswar.

**Talk** : Long baseline neutrino experiments and leptonic CP violation.

Sep 2017 Seminar at **International Summer school on New Advances in Condensed Matter Physics: Quantum transport, topological effects and energy conversion in low-dimensional systems**, Khiva, Uzbekistan

**Talk** : Polarised intensity interferometry : from quantum optics to solid state electronics

Jul 2017 Invited theory seminar at **Neils Bohr Institute**, Copenhagen, Denmark

**Talk** : Impact of new physics on leptonic CP violation signal at long baselines

Jun 2017 Invited parallel session talk at **International Conference on Weak Interactions and Neutrinos**, University of California at Irvine, USA (presented by Dr. Mary Bishai on my behalf)

**Talk** : Extricating new physics scenarios at DUNE using high energy beams

Apr 2017 Invited seminar at **Brookhaven National Laboratory,** USA.

**Talk** : CP violation in neutrino oscillations and impact of new physics

Mar 2017 TPSC Seminar at **Institute of Physics,** Bhubaneswar.

**Talk** : Hunt for leptonic CP violation and impact of new physics.

Dec 2016 Invited as a resource person in the GIAN course by **Prof. Sir Michael Berry** on **Super-oscillations and weak measurements**, IISER Kolkata.

**Lectures** : Introduction to neutrinos, geometric phases and non-local multi-photon phase in intensity interferometry.

Nov 2016 Invited talk at **International workshop on frontiers in electroweak interactions of leptons and hadrons (EILH-16)**, Aligarh Muslim University, Aligarh.

**Talk** : CP violation and non-standard interactions at long baselines.

Aug 2016 Invited theory seminar at **Argonne National Laboratory,** USA.

**Talk** : CP violation in neutrino oscillations and non-standard interactions.

Aug 2016 Invited parallel session talk at **ICHEP 2016**, Chicago, USA.

**Talk** : CP violation and non-standard interactions at long baselines.

Jun 2016 Invited talk at **Near detector workshop at CETUP 2016**, South Dakota, USA

**Talk** : CP violation and non-standard interactions at long baselines.

Apr 2016 Invited talk at **PHENO1@IISERM**, IISER Mohali.

**Talk** : Imprint of non-standard interactions on CP violation measurements at long baseline experiments.

Mar 2016 Invited talk at **Nu HoRIzons VI**, HRI, Allahabad.

**Talk** : Non-standard neutrino interactions in atmospheric and long baseline neutrino oscillations.

Dec 2015 **Discussion leader** and talk in working group III (Neutrino Physics) at WHEPP, IIT Kanpur.

**Talk** : Neutrino nonstandard interactions.

Oct 2015 **Physics Colloquium** at CTP, Jamia Milia Islamia, New Delhi.

**Talk** : Neutrino oscillations : from massless to massive neutrinos [Noble prize in Physics 2015].

Oct 2015 Invited lecture in the $1^{st}$ **Refresher course in Physics**, Human Resource Development Centre, JNU, New Delhi.

**Talk** : On neutrino oscillations [Noble prize in Physics 2015].

Oct 2015 **Journal Club talk**, SPS, JNU .

**Talk** : On neutrino oscillations [Noble prize in Physics 2015].

Sept 2015 Invited talk in **International school and workshop on Particle Physics (IPP15): Neutrino physics, dark matter and B physics** sponsored by ICTP and Invisibles, IPM, Tehran, Iran.

**Talk** : Nonstandard neutrino oscillations.

Mar 2015 **SPS In-house Colloquium**, SPS, JNU.

**Talk** : Big world of small neutrinos - introduction to India-based Neutrino Observatory (INO).

Mar 2015 **Celebrating 100 years of General Relativity at the IAGRG meeting**, RRI, Bangalore.

**Talk** : Probing neutrino properties using cosmology.

Dec 2014 **Talk and Parallel session chair** at **XXI DAE-BRNS High Energy Physics Symposium**, IIT Guwahati.

**Talk** : Testing non-standard neutrino matter interactions in atmospheric neutrino propagation.

Sept 2014 Invited lecture in the $14^{th}$ **Refresher course in Physics**, Academic Staff College, JNU, New Delhi.

**Talk** : Neutrino Physics : An introduction.

May 2014 **Astroparticle physics theory seminar** of DESY, Zeuthen and University of Potsdam, Germany.

**Talk** : New physics effects and astrophysical neutrino flavor ratios.

Sept 2013 Invited lecture in the $13^{th}$ **Refresher course in Physics**, Academic Staff College, JNU, New Delhi.

**Talk** : Neutrino Physics : An introduction.

Sept 2012 Invited lecture in the $12^{th}$ **Refresher course in Physics**, Academic Staff College, JNU, New Delhi.

**Talk** : Introduction to neutrino physics.

Jun 2012 International workshop on **Dark matter and neutrinos** and **What is $\nu$ ? Invisibles ITN $1^{st}$ General meeting and Alexei Smirnov fest**, Galileo Galilei Institute, Arcetri, Florence, Italy.

**Talk** : New physics effects in neutrino fluxes from cosmic accelerators.

Feb 2012 **Nu horizons V**, HRI, Allahabad, India.

**Talk** : New physics effects in neutrino fluxes from cosmic accelerators.

Sept 2011 **ICAPP**, PRL, Ahmedabad, India.

**Talk** : Probing new physics with high energy astrophysical neutrinos.

Sept 2015 **IISER, Mohali**, India.

**Talk** : Probing physics beyond the Standard Model with high energy astrophysical neutrinos.

Aug 2011 **The XXV International Symposium on Lepton Photon Interactions at High Energies (Lepton Photon 2011)**, TIFR, Mumbai, India.

**Poster** : Probing new physics with high energy astrophysical neutrinos.

Aug 2011 **International mini-symposium on dark matter and neutrinos**, CHEP, IISc., Bangalore, India.

**Talk** : Probing new physics by flavoring high energy astrophysical neutrinos.

Jul 2011 **Institut für Theoretische Physik und Astrophysik**, Universität Würzburg, Germany.

**Talk** : Probing physics beyond the Standard model with high energy astrophysical neutrinos.

Feb 2011 **International Conference on Quantum Information Processing and Applications (QIPA 2011)**, HRI, Allahabad, India.

**Poster** : Nonlocal Pancharatnam phase in two photon interferometry.

Jun 2010 **XXIV International Conference on Neutrino Physics and Astrophysics (Neutrino 2010)**, Athens, Greece.

**Poster** : Topological phase in two flavor neutrino oscillations and imprint of the CPV phase.

April 2010 **CHEP**, Indian Institute of Science, Bangalore India.

**Talk** : Some interesting aspects of cosmic neutrinos from core collapse Supernovae endowed with mildly relativistic jets.

Dec 2009 **IACS**, Kolkata, India.

**Talk** : Topological phase in two flavor neutrino oscillations and imprint of the CP phase.

Nov 2009 **SGTB Khalsa College**, Delhi University, India.

**Talk** : Topological phase in two flavor neutrino oscillations and imprint of the CP phase.

Oct 2009 **50 years of Aharonov-Bohm effect**, Tel Aviv University, Tel Aviv.

**Poster** : Topological phase in two flavor neutrino oscillations.

Aug 2009 **XXIV International Symposium on Lepton Photon Interactions at High Energies (Lepton Photon 09)**, Hamburg, Germany.

**Poster** : Degenerate neutrinos and maximal mixing.

**Poster** : Topological phase in two flavor neutrino oscillations.

April 2009 **Aspects of neutrinos (NuGoa)**, ICTS Program, Goa, India.

**Talk** : Topological phase in two flavor neutrino oscillations : a new interpretation from geometry.

April 2009 **Neutrinos in particle astrophysics and cosmology (NuPAC)**, Mahabalipuram, Chennai, India.

**Talk** : Topological phase in two flavor neutrino oscillations : a new interpretation from geometry.

March 2005 **INO Simulations Meeting**, IMSc, Chennai, India.

**Talk** : New physics issues for simulations @ INOs.

June 2004 **XXIst International Conference on Neutrino Physics and Astrophysics (Neutrino 2004)**, Collége de France, Paris, France.

**Talk** : Atmospheric neutrinos as a probe of CPT violation.

March 2004 **International Conference on Perspectives in Particle Physics, Gravity and Cosmology**, PRL, Ahmedabad, India.

**Talk** : $\nu_\mu$ survival probability : A probe of neutrino oscillation parameters.

Jan 2004 **Workshop on High Energy Physics Phenomenology (WHEPP8)**, IIT Mumbai, India.

**Talk** : Atmospheric neutrinos as a probe of CPT and Lorentz violation.

Sept 2002 **INO Meeting**, SINP, Calcutta, India.

**Talk** : Some simulation results using NUANCE and GEANT.

Dec 2000 **XIV DAE Symposium on High Energy Physics**, University of Hyderabad, India.

**Talk** : Signals of R-parity Violating Supersymmetry at a Muon Storage Ring.

## Other Conferences and Schools

Aug - Sep 2018 Refresher course in Physical Sciences/Nano Science, HRDC, JNU, India.

Jan 2018 Neutrino Platform Week jointly organised by CERN Theory Neutrino Platform and Fermilab Theory group, CERN, Geneva.

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| Jun 2015 | International conference on Particles, Strings and Cosmology (PASCOS 2015), ICTP, Trieste, Italy. |
| April - May 2015 | 95th Orientation Programme, Academic Staff College (HRDC), JNU, India. |
| April 2015 | INO Collaboration Meeting, IIT Madras, Chennai, India. |
| Oct 2014 | International conference on Matters of Gravity and the Universe, CTP, Jamia Milia Islamia, New Delhi, India. |
| Dec 2011 | International workshop on dark energy, CTP, Jamia Milia Islamia, New Delhi, India. |
| Nov 2011 | Mini-workshop on cosmology and galaxies, IIA, Bangalore, India. |
| Jun 2011 | International workshop on cosmic rays and cosmic neutrinos (Nusky 2011), ICTP, Trieste, Italy. |
| Feb 2011 | NuHoRizons IV, HRI, Allahabad, India. |
| Aug 2010 | Conference on Radicals in Science: Nature or Nurture, RRI, Bangalore, India. |
| Feb 2010 | NuHoRizons IV, HRI, Allahabad, India. |
| Jul 2009 | Workshop towards neutrino technologies, ICTP, Trieste, Italy. |
| Mar 2008 | National conference on Showcasing cutting edge science and technology by women, Vigyan Bhawan, New Delhi, India. |
| Dec 2006 | School on Physics at the LHC-II, Technion and Weizmann Institute of Science, Israel. |
| Dec 2006 | Topical Meeting on Physics at the LHC, HRI, Allahabad, India. |
| Nov 2006 | School on Physics at the LHC-I, Technion and Weizmann Institute of Science, Israel. |
| Jun 2006 | Research Workshop of the Israel Science Foundation on Nuclear Structure and Astrophysics with Radioactive beams, Weizmann Institute of Science, Rehovot, Israel. |
| Apr 2006 | John Bahcall Physics Day, Tel Aviv University, Tel Aviv, Israel. |
| Oct 2005 | INO Simulations Meeting, HRI, Allahabad, India. |
| Aug 2005 | The Les Houches School on Particle Physics beyond the Standard Model, Les Houches, France. |
| Mar 2005 | INO Simulations Meeting, IMSc, Chennai, India. |
| Jun 2004 | School on Astroparticle Physics and Cosmology, ICTP, Trieste, Italy. |
| Mar 2003 | Interaction Meeting on INO, SINP & VECC, Calcutta, India. |
| Jan 2003 | INO Meeting, TIFR, Mumbai, India. |
| Jan 2003 | IX International Symposium on Particles, Strings and Cosmology (PASCOS'03), TIFR, Mumbai, India. |
| Sep 2002 | School on Neutrino Physics and Astrophysics (NEUPAST), ICTP, Trieste, Italy. |
| Feb 2001 | XVI SERC School on Theoretical High Energy Physics, HRI, Allahabad, India. |
| Oct 1998 | Introductory School in Astronomy & Astrophysics (ISAA'98), Sri Venketeswara College, University of Delhi, Delhi, India. |
| May 1998 | Introductory Summer School in Astronomy & Astrophysics, IUCAA, Pune, India. |

## Visits to Other Institutes

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| Jan - Feb 2018 | CERN, Geneva, Switzerland |
| Dec 2017 - Jan 2018 | HRI, Allahabad |
| Jun - Jul 2017 | CERN, Geneva, Switzerland |

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| Apr - May 2017 | Brookhaven National Laboratory, USA |
| Dec 2016 - Jan 2017 | HRI, Allahabad |
| May 2016 | HRI, Allahabad |
| May - Jul, 2014 | Astroparticle Physics Theory Group, DESY, Zeuthen, Germany |
| Jul 01 - 16, 2012 | High Energy Section, ICTP, Trieste, Italy |
| Jun - Jul, 2012 | GGI, Florence, Italy |
| Jun 11 - 17, 2012 | Institut für Theoretische Physik und Astrophysik, Universität Würzburg, Germany |
| Nov - Dec, 2011 | RRI, Bangalore, India |
| Sep 14 - 16, 2011 | IISER, Mohali, India |
| Jul 16 - 23, 2011 | Institut für Theoretische Physik und Astrophysik, Universität Würzburg, Germany |
| Jul 06 - 09, 2010 | Institut für Theoretische Physik und Astrophysik, Universität Würzburg, Germany |
| Sep 12 - 19, 2009 | Centro de Fisica Teorica das Particulas, Departamento de Fisica, Instituto Superior Tecnico, Lisboa, Portugal |
| Sep 2009 | Institut für Theoretische Physik E, RWTH Aachen University, Germany |
| Jul 19 - 25, 2009 | Institut für Theoretische Physik und Astrophysik, Universität Würzburg, Germany |
| Nov, Dec 2006 | Harish-Chandra Research Institute, Allahabad, India |
| Jun, Sep 2005 | Department of Particle Physics, Weizmann Institute of Science, Rehovot, Israel |
| Mar - Apr, 2005 | IMSc, Chennai, India |
| Jun - Jul, 2004 | High Energy Section, ICTP, Trieste, Italy |

## Skills Summary

- Extensively programmed and developed algorithms for several years using F77; familiar with C.
- Comprehensively used the Numerical Recipes Fortran-77 libraries for numerical exercises to solve differential equations, performed integrations, interpolation, Monte Carlo techniques, and a host of other numerical problems.
- Operating systems: UNIX/Linux, Windows, Mac.
- Packages: Latex, Prosper, Beamer, Gnuplot, Jaxodraw, Xfig, Xmgrace, Mathematica, familiar with Origin, MSWord, familiar with MSExcel, Powerpoint, GEANT, NUANCE.

## Other Activities

- Participated in the counselling for admissions conducted by Joint Seat Allocation Authority (JOSAA) 2018 at JNU (Jun - Jul, 2018).
- Participated as a subject expert in three day Workshop on Identification of Subject Wise Resources for Teachers, organized by the National Resource Centre for Education (NRCE), on 6-8 June, 2018 at the National Institute of Educational Planning and Administration (NIEPA), New Delhi. (Jun, 2018)
- I initiated (in 2015) and got a Memorandum of Understanding (MoU) signed between the Homi Bhabha National Institute (HBNI) and JNU in 2017. This MoU facilitates co-supervision of students working in any of the DAE institutions under HBNI by JNU faculty in any of the science streams. Presently, **Mr. Samiran Roy** at HRI is registered for PhD with myself and Prof. Raj Gandhi at HRI under this MoU.

- Served as physics expert in the KVPY interviews held at Delhi University (Feb. 17-18, 2018).
- Member, Health Advisory Committee, JNU.
- Served as external examiner for Physics laboratory course of the B.Sc (Pass/Inst) sem-V course at JMI, New Delhi (Dec. 01, 2015).
- Served as theoretical physics expert to evaluate presentations by the participants of the Physics Refresher Course held at HRDC, JNU (Oct. 28, 2015).
- Served as physics expert in the KVPY interviews held at IISER Mohali (Jan. 24-26, 2015).
- Served as external examiner for Physics laboratory course of the B.Sc (Pass/Inst) sem-V course at JMI, New Delhi (Nov. 28, 2014).
- Served as theoretical physics expert to evaluate presentations by the participants of the Physics Refresher Course held at Academic Staff College, JNU (Oct. 16, 2014).
- Served as physics expert in the KVPY interviews held at ISI Delhi (Feb 2013).
- Refereeing for journals (APS, JHEP)