Curriculum Vitae

Title	Professor	First Name	Nivedita	Last Name	Deo	Photograph

Designation	Professor
Department	Department of Physics and Astrophysics
Address (Campus)	Room No. 148, Multistorey Block, Department of Physics and Astrophysics, University of Delhi, Delhi 110 007
(Residence)	51 Bharati Artist's Colony, Vikas Marg, Delhi 110 092
Phone No (Campus)	+91-11-2766 7725 (Extn. 1342)
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Education

Subject	Institution	Year	Details
Ph.D. Theoretical Physics	Purdue University, USA.	1988	Thesis topic: Anomalies.
M.Phil.	Department of Physics and Astrophysics, University of Delhi.	1982	Subjects: Physics
M.Sc.	Department of Physics and Astrophysics, University of Delhi.	1981	Subjects: Physics
B.Sc. (Honours)	Ravenshaw College, Cuttack, Orissa.	1979	Subjects: Physics

Career Profile

Organisation / Institution	Designation	Duration	Role
University of Delhi, Delhi-7, India.	Professor	(2009)-Present	Teaching and Research
University of Delhi, Delhi-7, India.	Associate Professor	(2006)-(2009)	Teaching and Research
University of Delhi, Delhi-7, India.	Reader	(2003)-(2006)	Teaching and Research
Poornaprajna Institute of Scientific Research, Bangalore, India.	Faculty Fellow	(2000)-(2003)	Research
Santa Fe Institute, Santa Fe, USA.	Visiting Professor	(1999)-(2000)	Research
Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore, India.	Fellow	(1998)-(1999)	Research
Raman Research Institute, Bangalore, India.	Post Doctoral Fellow	(1996)-(1998)	Research

Physics Department, Indian Institute of Science, Bangalore, India.	Research Associate (CSIR)	(1992)-(1996)	Research
Mary Ingraham Bunting Institute, Radcliffe College, Department of Physics, Harvard University, USA.	Radcliffe Fellow	(1991)-(1992)	Research
Department of Mathematics, Tufts University, USA.	Lecturer	(1991)-(1992)	Teaching
Department of Physics, Mount Holyoke College, USA.	Assistant Professor	(1988)-(1991)	Teaching and Research
Physics Department, Brown University, USA.	Visiting Scientist	(1988)-(1991)	Research
Physics Department, Purdue University, USA.	Research & Teaching Assistant David Ross Fellow Research & Teaching Assistant	(1986)-(1987) (1984)-(1986) (1982)-(1984)	Research & Teaching Research Research & Teaching

Research Interests / Specialization

- Anomalies
- Statistical Mechanics Of Superstrings
- Quantum Chaos
- Glasses
- Spectrum of Instantaneous Normal Modes in Liquids and Random Matrices
- Mathematical Properties of Random Matrix Models
- Random Matrix Models and Networks with Applications to RNA and Complex Systems
- Physics and Society: Econophysics, Applications of Statistical Physics to Economics and Finance
- Physics of Nano Structures: Carbon Nano-tubes and Graphene functionalized with DNA
- Topological quantum matter: Graphene and topological insulators.

Teaching Experience (Subjects/Courses Taught)

At University of Delhi

- Electromagnetic Theory
- Quantum Mechanics II
- Electronics Laboratory
- Computer Laboratory

At Mount Holyoke College

- Electricity and Magnetism
- Quantum Mechanics
- Classical Mechanics
- Mathematical Physics
- Lab of Electricity and Magnetism
- Lab of Classical Mechanics

At Tufts University

- Calculus and Analytic Geometry
- Linear Algebra

At Purdue University

- Electromagnetic Theory
- Classical Mechanics
- Quantum Mechanics
- Field Theory
- Mathematical Methods

Research Guidance

1. Supervision of awarded Doctoral Thesis: **5**
2. Supervision of Doctoral Thesis, under progress: **3**

Honors & Awards

- ICTS Senior Associate, International Centre for Theoretical Sciences, Bangalore, India
- Associate Member of the Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy, for 1998-2005, Visiting Scientist 2009, 2011.
- Akeley Memorial Award for Theoretical Physics – Best Graduate 1987, Purdue University, USA, 1987.
- David Ross Fellowship, Purdue University, USA, 1984-1986.
- Fellow of Radcliffe Institute of Advance Study (Sept 1991-Aug 1992), Mary Ingraham Bunting Institute, Radcliffe College and Department of Physics, Harvard University, USA.

Publications (LAST FIVE YEARS)

Books / Monographs

Year of Publication	Title	Publisher	Co-Author

In Indexed/ Peer Reviewed Journal

Year of Publication	Title	Journal	Co-Author
2019	Effect of hexagonal warping on the transport properties of topological insulator in the presence polarized radiation.	Phys. Rev. B 100, 035303	Tarun Choudhari
2018	Network architecture of a protein family	In Preparation	Pradeep Bhadola
2018	RNA Folding Using Random Matrix Models	In Preparation	I. Garg
2018	Effect of CO gas molecules on electronic transport in defective carbon nanotubes decorated with gold clusters	In Preparation	P. Poonam
2018	Study of electronic transport in DNA functionalized graphene sensors	In Preparation	P. Poonam
2016	Andreev reflection and bound states in topological insulator based planar & step Josephson junctions.	Physica E 85, 238-247	Tarun Choudhari
2016	Targeting functional motifs of a protein family	Phys. Rev. E 94, 042409	Pradeep Bhadola
2016	Electronic transport in DNA functionalized carbon nanotube and graphene gas sensors	Accepted in "The Journal of ISSS".	P. Poonam
2015	Study of RNA structures with a connection to random	Chaos, Solitons & Fractals 81,	Pradeep Bhadola

	matrix theory	542-550	
2015	Matrix models with Penner interaction inspired by interacting ribonucleic acid	Pramana 84 (2), 295-308	Pradeep Bhadola
2015	Analysing correlations after the financial crisis of 2008 and multifractality in global financial time series	Pramana 84 (2), 317-325	Sunil Kumar
2014	Graphene with Wedge Disclination in the Presence of Intrinsic and Rashba Spin Orbit Couplings.	EPL 108 (5), 57006	Tarun Choudhari
2013	Genus distribution and thermodynamics of random matrix model of RNA with Penner interaction	Phys. Rev. E. 88, 032706	Pradeep Bhadola
2013	Structure Combinatorics and Thermodynamics of a Matrix Model with Penner Interaction Inspired by Interacting RNA	Nuclear Phys. B , 870, 384	P. Bhadola, I. Garg
2012	Cross correlation dynamics of the global financial indices	Phys. Rev. E , 86, 026101	Sunil Kumar
2012	Analyzing Crisis in Global Financial Indices	Chapter 16, Econophysics of Systemic Risk and Network Dynamics, Springer	Sunil Kumar

Articles

Book Chapters

1. Chapter in Book: Spectral and network method in financial time series analysis: A study on stock and currency market, Network Science and Agent-Based Modelling in Economics and Finance, Springer Singapore, Submitted as Chapter in book, 2019

2. Chapter in book: Evolution and dynamics of the currency market. Pradeep Bhadola and N. Deo, New Economic Windows, Chapter in book, 2019

3. Editor : New Economic Windows: Econophysics and Sociophysics: Recent Progress and Future Directions F Abergel, H Aoyama, BK Chakrabarti, A Chakraborti, N Deo, D Raina and chapter 4: Extreme eigenvector analysis of global financial correlation matrices, Pradeep Bhadola and N. Deo, Springer International Publishing, 2018

4. Analyzing Crisis in Global Financial Indices, Sunil Kumar and N. Deo, Chapter 16, Econophysics of Systemic Risk and Network Dynamics, Springer, 2012

5. A Random Matrix Approach to Volatility In An Indian Financial Market V. Kulkarni and N. Deo, in New Economic Window Series: Econophysics of Stocks and Other Markets, edited by Arnab Chatterjee, Bikas K. Chakrabarti (Springer-Verlag, Italia, Milan, 2006), p. 35.

6. Statistical Mechanics of Strings at High Energies in Compact and Non-compact Spaces, N. Deo, S. Jain and C-I. Tan in The Formation and Evolution of Cosmic Strings edited by Gary Gibbons, Stephen Hawking and Tanmay Vachaspati (Cambridge University Press, Cambridge, 1990), Part 2, p. 69.

Conference Presentations

1. Perspectives in Nonlinear Dynamics (PNLD 2019),
   16 July-19July 2019, ICTP-SAIFR, São Paulo, Brasil,
   Talk: Evolution and Dynamics of World Currency Network.

2. 27th International Conference on Statistical Physics (StatPhys 27),
   8 July – 12 July 2019, UCA Puerto Madero , Buenos Aires, Argentina,
   Talk: Functional Domains in Proteins.

3. Indian Statistical Physics Community Meeting 2019,
   ICTS Bangalore, India, 14 -16 February 2019.
   Talk: Functional Domains in Proteins.

4. Summer Visitor:,
   23 June -7 July 2018, Sante Fe Institute, USA .

5. Participant : "Theoretical Computer Science and Statistical Physics Methods in Machine Learning", , December 26-30, 2017, The International Center for Theoretical Sciences (ICTS-TIFR), Bengaluru, India.

6. Summer Seminar 2017,
   12 July, 2017, Physics Department , Brown University , USA ,
   Talk: RNA folds from random matrix models.

7. SPS March Meeting 2017: Perspectives in Graphene and Graphene like 2D Materials.
   17-18 March 2017, Jawaharlal Nehru University , Delhi, India
   Talk: : DNA-decorated carbon nanotubes and graphene sensors.

8. Indian Statistical Physics Community Meeting 2017,
   ICTS Bangalore, India, 17 -19 February 2017.
   Talk: Functional motifs in Proteins Families.

9. Indian Statistical Physics Community Meeting 2016,
   ICTS Bangalore, India, 12 -14 February 2016.

10. Foundations and Applications of Random Matrix Theory in Mathematics and Physics
    Stony Brook University, Stony Brook , New York, 20 November 2015.

11. Complex system seminar,
    Max Planck Institute for Mathematics in the Sciences, Leipzig, Germany, 30 June, 2015.

12. Conference on Nonlinear Systems and Dynamics- CNSD15,
    IISER Mohali, 13 - 15 March 2015.

13. Indian Statistical Physics Community Meeting 2015,
    Physics Department, Indian Institute of Science, Bangalore, 13 Feb - 15 Feb, 2015.

14. DDAP08- Dynamics Days Asia-Pacific,
IIT Madras, Chennai, India, 21 July -24 July 2014.

15. Seventh ISSS International Conference on Smart Materials Structures & Systems (ISSS 2014)
Institute of Smart Structures & Systems, Indian Institute of Science, Bangalore, India, 7-11 July 2014.

16. SigmaPhi2014 - International Conference on Statistical Physics,
Rhodes, Greece, 7-11 July 2014

17. Indian Statistical Physics Community Meeting 2014, ,
IISc, Bangalore, India, 01-03 February 2014

18. Random Matrix Theory and Applications 2013, Okinawa Institute of Science and Technology, Okinawa, Japan, 27 October – 1 November 2013.

19. International Conference On Perspectives In Nonlinear Dynamics (PNLD 2013), Hyderabad Central University , Hyderabad, India.

20. Advanced Workshop on Energy Transport in Low-Dimensional Systems: Achievements and Mysteries, ICTP, Trieste, Italy. 15-24 October 2012.

21. Mini Program on Dirac Material and Quantum Computation.
Auditorium, New Physical Sciences Building, IISc, Bangalore. 16 Dec - 18 Dec, 2012.

22. Discussion Meeting: Advances in Graphene, Majorana Fermions, Quantum Computation.
Auditorium, New Physical Sciences Building, IISc, Bangalore. 19 Dec - 21 Dec, 2012.

23. VI International Conference on the fundamental science of Graphene and Applications of Graphene – BasedDevices
Aula Congresscentrum in Delft,
Delft University of Technology, Netherland. 4-8 June, 2012.
Poster Presentation: Quantum Transport in DNA-Decorated Graphene Sensors.

24. Seminar : Quantum Transport in DNA-Decorated Carbon Nanotubes and Graphene Sensors
Physics Department , Lorentz Institute at University of Leiden.
Niels Bohrweg 2, CA Leiden , The Netherlands, 7 June ,2012

25. ICNWNCN 2012 – International Conference and workshop on Nanostructures Ceramics and other Nanomaterials
Department of Physics and Astrophysics ,
University of Delhi, Delhi March 13 – 16, 2012.
Invited talk: Quantum transport in DNA-decorated carbon nanotubes and graphene sensors

26. Random matrix theory and applications
Indian Institute of Science, Bangalore, 27 Jan- 1 Feb 2012.
Invited Talk : Random Matrix Model for Folding Ribo-Nucleic Acid (RNA) with External Interactions

27. ICNANO 2012 – International Conference on Nanomaterials and Nanotechnology
Department of Physics and Astrophysics ,
University of Delhi, Delhi , 18-21 December, 2012
Planary talk: Quantum transport in DNA-decorated carbon nanotubes and graphene sensors.

28. ECONOPHYS-KOLKATA VI
International Workshop on "Econophysics of systemic risk and network dynamics"

October 21-25, 2011, Kolkata, India
Invited talk: Correlation, Networks and Multifractality in Global Financial Market.

29. ECP Seminar
Chaire de Finance Quantitative, Laboratoire de Mathématiques Appliquées aux Systèmes,
Ecole Centrale Paris, July 28, 2011
Title of Talk: Correlations and Multifractality in Financial Markets

30. Internal ICTP Talk
ICTP, Trieste – Italy, 18 July 2011
Title of Talk: Random Matrix Model for Folding of RNA with External Interactions.

31. Fifth Stig Lundqvist Conference on the Advancing Frontiers of Condensed Matter Physics
Trieste –ITALY, 11-15 July 2011.
Title of Talk and Poster presentation: Correlation functions and nonequilibrium electronic transport for gas flow over functionalized Graphene

32. Workshop and School on Topological Aspects of Condensed Matter Physics.
ICTP, Trieste – Italy , 27 June – 08 July 2011.
Poster Presentation : Correlation functions and nonequilibrium electronic transport for gas flow over a DNA functionalized Carbon Nanotube and Graphene

33. CARBON 10
IIT Kanpur, India, 15 – 17 December 2010.
Title of Talk: Nonequilibrium Green's function approach to study the effect of gas flow on electronic transport in a DNA functionalized Carbon Nanotube.

34. STATPHYS – KOLKATA
Satyendra Nath Bose National Centre for Basic Sciences, Kolkata in collaboration with the Saha Institute of Nuclear Physics, Kolkata. 26-30 November, 2010.
Poster Presentation 1: Asymptotic and Thermodynamic Properties of a Random Matrix Model of RNA Folding with Interactions.
Poster Presentation 2: A Matrix Model Study of RNA Folding with External Interactions.

35. The XXIV International Conference on Statistical Physics, STATPHYS 24,
Convention Centre, Cairns, Queensland, Australia, 19-23 July, 2010
Title of Talk: Matrix Models of RNA Folding With Interactions (Linear and Non-linear)
Poster presentation 1: Correlation functions and nonequilibrium electronic transport for gas flow over a DNA functionalized carbon nanotube
Poster presentation 2: Statistical properties of a random matrix model of RNA folding with interaction

36. StatPhysHK: Complexity, Computation and Information, Hong Kong 13 – 16 July, 2010
Poster presentation: A Matrix Model Study Of RNA Folding with External Interactions.