

Dr. Pradeep Bhadola

☎: +91 8800245300, +66-930419859, ✉: bhadola.pradeep@gmail.com

Permanent Address: 104 DDA SFS Flats, Pocket 1, Sector 1 Dwarka, Delhi, India 110075



CURRENT POSITIONS

- **Researcher and Lecturer**
Centre for Theoretical Physics & Natural Philosophy,
Mahidol University, Nakhon Sawan, Thailand.
March 2021 to Present.

EXPERIENCE

- **Researcher and Lecturer**
The Institute for Fundamental Study, Naresuan University, Phitsanulok, Thailand.
Courses Taught
Master of Science: Statistical Mechanics, Thermodynamics, Vibration and waves, Complex system & networks, Research Methodology, Dynamical Systems.
Doctor of Philosophy (Ph.D.): Econophysics, Non Equilibrium Thermodynamics.
Research Interest: Complex System and Networks, Computational Physics, Data Science, Application of Statistical Mechanics and Machine Learning to biology, economics and finance.
November 2016 to March 2021.
- **Senior Researcher Fellow**
Department of Physics & Astrophysics, University of Delhi, Delhi, India.
Managed Project: Application of Random Matrix Models to Study of Ribonucleic Acids (RNA) and Biological Networks
February 2012 to February 2015.
- **Junior Researcher Fellow**
Department of Physics & Astrophysics, University of Delhi, Delhi, India.
February 2010 to February 2012.

EDUCATION

- **Doctor of Philosophy (Ph.D.), Physics, (2016)**
Department of Physics & Astrophysics, University of Delhi, Delhi, India.
Title of Thesis: Statistical Mechanics of RNA and Proteins: Insights from Random Matrix Theory and Network Analysis
Supervisor: Prof. Nivedita Deo.
- **Master of Science (Hons.) Physics, (2008)**
Department of Physics & Astrophysics, University of Delhi, Delhi, India.
- **Bachelor of Science (Hons.) Physics, (2006)**
Atma Ram Sanatan Dharma College, University of Delhi, Delhi, India.

SKILLS

- **Software Skills**
Python (Scipy, Numpy, Pandas, Matplotlib, Networkx, Scikit-Learn, TensorFlow.)
Linux (Basic Bash Shell Scripting), Maple and Matlab.
Latex, Microsoft Office and Open Office.
Matlab and Maple.
- **Computational & Mathematical skills**
Machine Learning, Data Science, Statistical Inference, Graph Theoretical Analysis, Non Linear Dynamics, Random Matrix Theory, and Probability Theory.

RESEARCH PROJECTS

- **NU Research Project**
Title: Physics of Complex Systems: Economic, Social and Financial Systems
Funding Agency: Naresuan University, Thailand. (2018 to 2020).

FELLOWSHIPS AND AWARDS

- **Junior Research Fellowship UGC-CSIR NET** with All India Rank of 42, December 2009.
- **Junior Research Fellowship UGC-CSIR NET** June 2009
- **Joint Entrance Screening Test- JEST 2009** Cleared with 96.6 percentile.
- **Graduate Aptitude Test in Engineering GATE -2009** with 95.6 percentile.

OTHER ACTIVITIES

- **Organizer** of Workshop on Machine Learning with Python, 7-8 March 2020, The Institute for Fundamental Study, Naresuan University, Phitsanulok, Thailand.
- Member of **Organizing Committee** (Delhi University) **A joint International conference Econophys-2017 & Asia Pacific Econophysics Conference (APEC)-2017** November 15 - 18, 2017 Jawaharlal Nehru University / Delhi University, New Delhi, INDIA.
- Member of **Organizing Committee** (Delhi University) of **ECONOPHYS-2015 International Workshop on "Econophysics and Sociophysics** November 27-December 1, 2015, New Delhi, Jawaharlal Nehru University / Delhi University, India.
- Member of **Organizing Committee** (Delhi University) **Exploring an Interface between Economics and Physics**, 6-7 November 2012, Department of Physics and Astrophysics, University of Delhi, Delhi, India.
- Member of **Organizing Committee** (Delhi University) **3rd Introductory Computational Tool Workshop**, 29-31 October 2012, Department of Physics and Astrophysics, University of Delhi, Delhi, India.

ACADEMIC SERVICE

- Delivered series of 6 lectures on **Machine Learning and Application** during the **Workshop on Machine Learning with Python**, 7-8 March 2020, The Institute for Fundamental Study, Naresuan University, Phitsanulok, Thailand.
- Invited Speaker Academic Service Project: **Vedic math: The calculation techniques from India**, 1-5 April 2019, The Institute for Fundamental Study, Naresuan University, Phitsanulok, Thailand.

RESEARCH PUBLICATIONS

1. **Pradeep Bhadola, Itty Garg and Nivedita Deo**
Structure combinatorics and thermodynamics of a matrix model with Penner Interaction Inspired by Interacting RNA,
Nuclear Physics B, Vol. 870, 384-396 (2013).
2. **Pradeep Bhadola and Nivedita Deo**
Genus distribution and thermodynamics of random matrix model of RNA with Penner interaction,
Physical Review E. 88, 032706 (2013).
3. **Pradeep Bhadola and Nivedita Deo**
Study of RNA structures with a connection to random matrix theory,
Chaos Solitons & Fractals, 81, 542-550 (2015).
4. **Pradeep Bhadola and Nivedita Deo**
Matrix Model with Penner interaction inspired by interacting RNA,
Pramana 84(2), 295 – 308 (2015).
5. **Pradeep Bhadola and Nivedita Deo**
Targeting functional motifs of a protein family,
Physical Review E., 94(4), 042409 (2016).
6. **Pradeep Bhadola and Nivedita Deo**
Physiochemical property based approach for protein sequence analysis,
Journal of Physics: Conf. Series, 1144 (1), 012083 (2018).
7. **Pradeep Bhadola, S. Saichaemchan and N. Deo**
Spectral analysis of financial threshold networks,
Indian Academy of Sciences Conf. Series 3:1 (2020).
8. **O. Sujaritpong, S. Yoo-Kong and Pradeep Bhadola**
Analysis and dynamics of the international coffee trade network,
Journal of Physics: Conf. Series, 1719 (1), 012106 (2021).
9. **S. Saichaemchan and Pradeep Bhadola**
Evolution, structure and dynamics of the Thai stock market: A network perspective,
Journal of Physics : Conf. Series, 1719 (1), 012105 (2021).

10. **J. Tangpanitanon, C. Mangkang, P. Bhadola, Y. Minato, D. Angelakis, T. Chotibut**
Explainable natural language processing with matrix product states,
Accepted in New Journal of Physics (2022), arXiv:2112.08628.
11. **R. Kumari, N. Deo and Pradeep Bhadola**
Random Matrix Analysis of Protein Families
ECS Transactions 107 (1), 18877 (2022).
12. **S Homchan, Pradeep Bhadola and Y Gupta**
Statistical analysis of simple sequence repeats in genome sequence: A case of *Acheta domesticus* (Orthoptera: Gryllidae),
ECS Transactions 107 (1), 14799 (2022).
13. **P Bhadola, Y. M. Gupta, A. Kongbangkerd, B. Kunakhonnuruk**
Analysis of microenvironment data using low-cost portable data logger based on a microcontroller
ECS Transactions 107 (1), 15099, (2022).
14. **Yash M Gupta, Pradeep Bhadola**
Classifying DNA barcode sequences of four Orthoptera orders of insects using Tensor Network,
Accepted in Agriculture and Natural Resources, ANRES (2022).

BOOK CHAPTERS

1. **Pradeep Bhadola, Nivedita Deo**
Spectral & network method in Financial Time series analysis: a study on stock & currency Market,
Network Theory and Agent-Based Modeling in Economics and Finance, Springer, Singapore. (2019).
2. **Pradeep Bhadola, Nivedita Deo,**
Evolution and dynamics of the currency network,
New Perspectives and Challenges in Econophysics and Sociophysics, Springer, Cham (2019).

3. **Pradeep Bhadola, Nivedita Deo,**
Extreme eigenvector analysis of global financial correlation matrices,
Econophysics and Sociophysics: Recent Progress and Future Directions (2017).

SUBMITTED TO JOURNAL

1. **Vishal Choudary, Pradeep Bhadola**
Temporal variation assessment to correlate particulate matter, and regional COVID-19 regulations: Delhi based case study,
Submitted to Journal, under review.
2. **Pradeep Bhadola Nivedita Deo**
Physiochemical based Network analysis of the β -lactamase protein family,
In Process of Submission.
3. **V. Chaudhary, K. Markandan, A. Kaushik, M. Khalid, A. Khosla and Pradeep Bhadola**
Designing regional COVID-19 regulating modalities through assessing airborne particulate matter concentration
In Process of Submission.

PERSONAL INFORMATION

Date of Birth: 14 February 1986.

Place of Birth: Uttarakhand, India.

Nationality: Indian.

Languages Known: English and Hindi.

Marital Status: Married.