

PREET SHARMA

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EDUCATION

PhD	University of Mississippi, Department of Physics and Astronomy	2015
MS	Indian Institute of Technology, Roorkee (IITR), Department of Physics	2004
CERT.	MIT-IDSS DSML Data Science, Machine Learning & Artificial Intelligence	2022
BS	Ranchi University, Department of Physics	2002

WORK EXPERIENCE

Associate Professor of Physics, Physics and Astronomy College of Science and mathematics Midwestern State University Wichita Falls, Texas	2022 - Current
Scientific Advisor Humble Labs	Feb 2022 – May 2023
Assistant Professor of Physics, Physics and Astronomy College of Science and mathematics Midwestern State University Wichita Falls, Texas	2016 - 2022
Fermilab Summer Research Visitor Fermilab, Batavia, Illinois	2018
Adjunct Faculty – Data Analysis	Aug 2015 - May 2017, Spring 2018

Wilson School of Nursing
Midwestern State University
Wichita Falls, Texas

Visiting Professor of Physics, Oct 2015 - Aug 2016
DeVry University,
Irving, Texas

Data Scientist, Oct 2014 - May 2015
Illuminate 360,
Atlanta, Georgia

University of Mississippi Aug 2009 - Jul 2014
Department of Physics and Astronomy
Graduate Teaching Assistant (Astronomy & Physics)

Dr. B. R. Ambedkar Inter College Jul 2004 - Jun 2005
Science Department
Lecturer of Physics and Mathematics

Dr. B. R. Ambedkar Inter College Mar 2000 - May 2002
Science Department
Lecturer of Physics and Mathematics

TEACHING AND RESEARCH AWARDS

- Physics Department Honors Award, 2009, 2010, 2011
Department of Physics and Astronomy
University of Mississippi
- Physics Honors Award 1998, 1999, 2001, 2002
Ranchi University, India
Honors Award in Physics (Bachelor of Science)
- Nominated for the University Faculty award 2021
Midwestern State University
- Best Physics Faculty award 2018
Midwestern State University

TEACHING (IN USA)

- PHYS 1144 General Physics 1
- PHYS 1244 General Physics 2
- PHYS 1624 Mechanics, Wave Motion & Heat
- PHYS 2644 Electricity & Magnetism & Optics
- PHYS 1533 Descriptive Astronomy
- PHYS 4353 Quantum Physics
- PHYS 4103—X99 Research Seminar
- BioPhysics to my research group (open to all)
- Statistical Physics to my research group (open to all)
- Quantum Field Theory to my research group (open to all)
- Particle Physics to my research group (open to all)
- Research Topics in Particle Physics & non-Equilibrium Physics (open to all)
- Astronomy & Astronomy Labs (Graduate Teaching Assistant)

RESEARCH CENTER & GROUP

- Center for Theoretical & Computational Sciences
 - High Energy Particle Physics Theory
 - Complex Systems Research

RESEARCH COLLABORATIONS

- Beth Veale (Midwestern State University)
- Randal Hallford (Midwestern State University)
- Anant Kumar (Instituto Superior Técnico, Universidade de Lisboa, Portugal)
- Paolo Grigolini (University of North Texas, Denton)
- Lorenzo Brancaleon (UT San Antonio)
- Jeff Killion (Midwestern State University)
- Kendra Jean Jacques (Texas Tech University)
- Jitesh Kumar (University of Delhi, India)

PUBLICATIONS

Particle Physics/Quantum Field Theory/Quantum Mechanics

- Kendra Jean Jacques, **Preet Sharma** (corresponding author); Langevin Equations, Fokker–Planck Equations and Entropic Analysis of a Model-Independent Classical Plasma. <https://doi.org/10.1142/S2424942421500043>. 2022.
- Kendra Jean Jacques, Anna Roland, Christelle Billian, **Preet Sharma** (corresponding author). A Review on Neutrino Oscillation Probabilities and Sterile Neutrinos. *Emerging Science Journal*. 2022

- Kendra Jean Jacques, Anna Roland, **Preet Sharma** (corresponding author); Neutrino Oscillations in Quantum Field Theory, Bulletin of the American Physical Society, Publication 2021
- **Preet Sharma**(corresponding author); PT-Symmetric Quantum mechanics of Zeeman Effect. Reports in Advances of Physical Sciences, Vol. 4, No. 3, Publication 2020.
- Randal Hallford, **Preet Sharma**(corresponding author); Non-Hermitian Hamiltonian Treatment of Stark Effect in Quantum Mechanics, Emerging Science Journal Vol. 4, No. 6, December, Publication 2020.
- Jedeshkeran Chandrasegaran, **Preet Sharma** (corresponding author); Calculating neutrino oscillation probabilities in matter, Bulletin of the American Physical Society, Vol 64, Publication 2019
- **Preet Sharma**. Probing New Physics with Third Generation Leptons, AAT-3707751. Publication 2014.
- Murugeswaran Duraisamy, **Preet Sharma**, Alakabha Datta. The Azimuthal $\$B \to D^{*} \tau^{-} \bar{\nu}_{\tau}\$ Angular Distribution with Tensor Operators , Physical Review D90, 7, 074013. Publication 2014$
- Ahmed Rashed, **Preet Sharma**, Alakabha Datta. Tau neutrino as a probe of nonstandard interaction. Nuclear Physics B 877, 662-682. Publication 2013.
- **Preet Sharma**, Andreas Tziolas, Anzhong Wang, Zhong Chao Wu. Spacetime Singularities in String and its Low Dimensional Effective Theory. International Journal of Modern Physics A26, 273-300. Publication 2011
- **Preet Sharma**, Andreas Tziolas, Anzhong Wang, Zhong Chao Wu. Spacetime Singularities in String and its Low Dimensional Effective Theory. International Journal of Modern Physics A26, 273-300. Publication 2011
- **Preet Sharma**. Cosmology of Orbifold Branes in Superstring. In *APS Texas Sections Fall Meeting Abstracts*, pp. J5-002. Publication 2007.

Complex Systems

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- **Sharma, P.** (corresponding author), **Kumar, Jitesh.**, Entropic Analysis of a Non-Equilibrium System and Ornstein-Uhlenbeck Stochastic Process with Damping, ScienceOpen, October 2023, DOI: 10.14293/PR2199.000459.v1
- **Baughman, G., Sharma, P.** (corresponding author). Entropic Analysis of Protein Oscillations Through Langevin Equations and Fokker Planck Equations. Journal of Human, Earth and Future. **Doi:** 10.28991/HEF-SP2022-01-05
- Yelena Nemchen, Randal Hallford **Preet Sharma** (corresponding author); Types of potentials in a mitotic spindle. Biochemistry and Biophysics Reports Vol. 27, Issue, 101076, Publication 2021

- Sage Copling, **Preet Sharma**(corresponding author); The impact of Mutations: The future of Cancer, *ScienceOpen*, 28, 10.14293/S2199-1006.1.SOR-.PPZUQLW.v1, Publication 2021
- Phelecia Scotland, **Preet Sharma**(corresponding author); Density Functional Theory in Biology. *Ann Chem Sci Res.* 2(1). ACSR. 000530, Publication 2020.
- Chandrasegaran Jedeshkeran, **Sharma Preet**(corresponding author); A Short Review on Fokker-Planck Equations, Entropy Production and Entropy Generation, *Journal of Bioinform Proteom Imaging Anal* 4(1): 21-24, Publication 2020
- **Preet Sharma** , Randal Hallford, Salvatore Capotosto, and Bailey Smoot. "Non-Equilibrium Entropy of Cancer Based on Gompertzian Growth." *Biophysical Journal* 118, no. 3 (2020): 451a.
- Bailey Smoot, Randal L Hallford, Salvatore Capotosto, **Preet Sharma** (corresponding author); What is Genetic Entropy. An Equilibrium or a Non Equilibrium Entropy, *Biophysical journal*, Vol. 118, Issue, 3, Publication 2020.
- Capotosto, Salvatore, Bailey Smoot, Yelena Nemchen, Randal Hallford, and **Preet Sharma** (corresponding author). "Entropy Production in Protein Aggregation." *Biophysical Journal* 118, no. 3 (2020): 526a.
- Nicholas Utley, Michael Olaya, Salvatore Capotosto, Bailey Smoot, Randal Hallford, **Preet Sharma**(corresponding author); Non-Equilibrium Physics of Microbes, *Journal of Bioinformatics, Proteomics and Imaging Analysis*, Vol. 4, Issue 1, Publication October 2019.
- Salvastore Capotosto, Bailey Smoot, Randal Hallford, and **Preet Sharma** (corresponding author). Entropy Production, Entropy Generation, and Fokker-Planck Equations for Cancer Cell Growth. *Physics* 2019, 1, 147-153.
- Nick Utley and **Preet Sharma** (corresponding author). Non-Equilibrium Statistical Physics of Microbes. *Bulletin of the American Physical Society* 63 (2018).
- Olaya, Michael, Nick Utley, and **Preet Sharma** (corresponding author). An Attempt to Understand the Nonequilibrium Statistical Physics of Microbes. *Bulletin of the American Physical Society* 62 (2017).

Inter-disciplinary with Health Sciences Faculty & Students

- Yelena Nemchen, **Preet Sharma**(corresponding author); The Impact of Physical Exercise on Brain Health and Physiology of Depressed Individuals. *Journal of Cognitive Neuropsychology*, Vol. 4, Number 1, Publication 2019
- Veale L. Beth, Clark R. Kevin, Killion B. Jeffrey, **Sharma Preet**, The HESI Admission Assessment and Radiography Exit Examination as Predictors for Student Success, *Journal of Medical Imaging and Radiation Sciences* 48, 90-94 (Elsevier). Publication 2017.

Book Chapters

- **Sharma, Preet (2023)** Determination of Protein Oscillations Using Langevin & Fokker-Planck Equations: An Entropic Analytical Study. In: Advanced Research in Biological Science Vol. 3. B P International, pp. 71-92. ISBN 978-81-19491-43-8, <https://doi.org/10.9734/bpi/arbs/v3/6109C>
- **Sharma, Preet (2023)** *The Impact of Mutations: The Future of Cancer*. In: Advanced Research in Biological Science Vol. 3. B P International, pp. 38-47. ISBN 978-81-19491-43-8, <https://doi.org/10.9734/bpi/arbs/v3/6110C>
- **Sharma, Preet (2023)** *Study about Model Independent Genetic Mutations through Trends in Increase in Entropy*. In: New Frontiers in Physical Science Research Vol. 8. B P International, pp. 87-94. ISBN 978-81-19102-10-5, <https://doi.org/10.9734/bpi/nfpr/v8/4173C>
- **Sharma, Preet (2023)** Basics of PT -Symmetric Quantum Mechanics & Zeeman Effect. In: Fundamental Research and Application of Physical Science Vol. 9. B P. International, pp. 76-89. ISBN 978-81-19491-77-3, <https://doi.org/10.9734/bpi/fraps/v9/6111C>
- **Sharma, P.** Fokker Planck Equations, Entropy Production and Entropy Generation: A review. Research Trends and Challenges in Physical Sciences. Volume-7, pages 61-68, B.P. International.
- **Sharma, P.** The Statistical Physics Concepts of Microbes: New Frontiers in Physical Science Research. B.P. International. Accepted for publication.

INVITATION FOR BOOK EDITOR, GUEST EDITOR, ACADEMIC EDITOR, BOOK CHAPTERS (SOME RECENT ONES)

- **IntechOpen Academic Editor:** Physical Sciences, Engineering and Technology.
- **IntechOpen Book Editor:** Non-Equilibrium Physics.
- **Book Chapter, IntechOpen:** Redefining the Standard Model of Particle Physics.
- **Book Chapter, IntechOpen:** “Exergy - New Technologies and Applications”.

CONFERENCES AND WORKSHOPS ORGANIZED

- Organizing and hosting a conference “**Annual Biophysics and Quantitative Biology Conference and Workshop**” in January 2022.
- Organizing and hosting a conference “**Annual Biophysics and Quantitative Biology Conference and Workshop**” in February 2021.
- Organizing and hosting a conference “**Annual Biophysics and Quantitative Biology Conference and Workshop**” in January 2020.

- Organized the workshop, “**The Network Science of Squads**”, 03-05 December, 2016, UNT, Denton, TX on behalf of **Midwestern State University**. **Midwestern State University** was one of the official sponsors of the workshop.

JOURNAL REVIEWER (PEER REVIEW)

- Journal of Modern Physics
- Cogent Physics
- SCIRP
- MDPI-Entropy
- MDPI-Physics
- NHSJS
- Qeios
- Elsevier

MEMBERSHIPS

- APS
- APS-DPF
- APS-Biophysics)
- AAPT
- BPS
- AAPT-PhysPort

CONFERENCE PRESENTATIONS AND PARTICIPATION (MAJOR ONES)

2022

- Sharma, P. **Quantum Entanglement in Complex Bio-Molecules**, 3rd Annual Biophysics and Quantitative Biology Conference & Workshop. Midwestern State University, Wichita Falls, TX.
- Cook, L, Sharma, P. **Entropy Analysis in Protein Aggregation process**. 3rd Annual Biophysics and Quantitative Biology Conference & Workshop. Midwestern State University, Wichita Falls, TX.
- Sharma, P. **Corrections to the Fermi Golden Rule From Quantum Entanglement perspective**. 66th annual Biophysics society meeting.
- Baughman, G, Sharma, P. **Protein Oscillations through Fokker Planck Dynamics**. 66th annual Biophysics society meeting.
- Cook, L. Sharma, P. **Entropy Analysis in Protein Aggregation process** . 66th annual Biophysics society meeting.

- Sharma, P. Phenomenology 2022 symposium.

2021

- “**Texas Section of American Physical Society**”, Served as judge to conference presentations in Fall 2021
- “**Texas Section of American Physical Society**”, Served as judge to conference presentations in Spring 2021
- Baughman, G. Baker, H. Sharma, P. “Corrected Protein Structure” Fall 2021
- “**Texas Section of American Physical Society**”, Served as judge to conference presentations in Fall 2021
- Sharma, P. (February 2021). **Quantum Entanglement Applications in Complex Bio-Molecules**, 2nd Annual Biophysics and Quantitative Biology Conference & Workshop. Midwestern State University, Wichita Falls, TX.
- Jacques, K. J., Roland, A. and **Sharma, P.** (April 2021). Neutrino Oscillations In Quantum Field Theory *Texas Section of American Physical Society*.

2020

- **Sharma, P.** (January 2020). Quantum Mechanics and BioMolecules, 1st Annual Biophysics and Quantitative Biology Conference & Workshop. Midwestern State University, Wichita Falls, TX.
- Smoot, B., Halford, R. Capotosto, S., and **Sharma, P.** (February 2020). What is Genetic Entropy: An Equilibrium or a Non-Equilibrium Entropy. 2020 Biophysics Annual meeting, San Diego.
- **Sharma, P.**, Halford, R., Capotosto, S., and Smoot, B. (February 2020). Non-Equilibrium Entropy of Cancer based on Gompertzian Growth. *Biophysics Annual meeting*, San Diego.
- Capotosto, S., Smoot, B., Nemchen, Y., Halford, R., and **Sharma, P.** (February 2020). Entropy Production in Protein Aggregation. *Biophysics Annual meeting*, San Diego.
- Capotosto, S., Baughman, G., and **Sharma, P.** (February 2020). Protein Aggregation Entropy using a Non-Spherical Structure of Proteins. Biophysics Annual meeting, San Diego.
- **Sharma, P.** (January 2020). **Quantum Mechanics and BioMolecules**, 1st Annual Biophysics and Quantitative Biology Conference & Workshop. Midwestern State University, Wichita Falls, TX.
- “**Texas Section of American Physical Society**”, Served as judge to conference presentations in Spring 2020
- “**Texas Section of American Physical Society**”, Served as judge to conference presentations in Fall 2020

2019

- Smoot, B., Halford, R., **Sharma, P.** and Capotosto, S. (February 2019). Thermodynamic Analysis of Asymmetry within RAS Q61 Moiety via Non-

Equilibrium entropic changes in GTP hydrolysis. *International BioPhysical Society*, Baltimore.

- Halford, R. Smoot, B., **Sharma, P** and Capotosto, S. (February 2019). Cancer Mechanism Through Non-equilibrium Physics. *International BioPhysical Society*, Baltimore.
- Chandrasegaran, J. and **Sharma, P.** (October 2019). Calculating Neutrino Oscillation probabilities in Matter. *Texas Section of American Physical Society*, Lubbock, Texas.
- **Sharma, P.**, Capotosto, S., Smoot, B., Hallford, R. (November, 2019). Entropy Production, Entropy Generation, and Fokker-Planck Equations for Cancer Cell Growth. *Nature Conference*, Tempe, Arizona.
- **“Texas Section of American Physical Society”**, Served as judge to conference presentations in Spring & Fall 2019

2018

- **Fermilab Summer Research** Visitor 2018
- **HL/HE-LHC** working committee group meeting at Fermilab 2018
- **TSAPS** conference spring & fall 2018, Served as judge to conference presentations
- **Conference and Meeting** , “Non-Equilibrium Physics of microbes” TSAPS spring 2018
- **Conference and Meeting**, “2018 Biophysics Annual meeting”, San Francisco February 2018 “Quantum mechanical treatment of protein folding”
- **Conference and Meeting**, “2018 Biophysics Annual meeting”, San Francisco February 2018 “Non-Equilibrium Physics of Cancer”
- **“Texas Section of American Physical Society”**, Served as judge to conference presentations in Spring & Fall 2018

2017

- **Conference and Meeting**, “2017 Meeting of the APS Division of Particles and Fields (DPF 2017)”, Fermilab, Batavia, IL, July 31-Aug 4, 2017
- **Sharma, P.** (December 2017). **Workshop**: Recurrence, Self-Organization, and the dynamics of Turbulence, *Kavli Institute of Theoretical Physics*, Santa Barbara.
- **Sharma, P.** (May 2017). Symposium. *Phenomenology 2017*, University of Pittsburgh, PA.
- Olaya, M., Utley, N., & **Sharma, P.** (October, 2017). An Attempt to Understand the Nonequilibrium Statistical Physics of Microbes. *Texas Section of American Physical Society*. University of Texas, Dallas.
- **“Texas Section of American Physical Society”**, Served as judge to conference presentations

2016

- **Workshop & Research Participation**, “The Network Science of Squads”, 03-05 December, 2016, Center for Nonlinear Science, UNT, Denton, TX

2014

- **Research & Paper Presentation**, “Tau neutrino as a probe of nonstandard interaction”, Mississippi Academy of Sciences (MAS), 78th Annual Meeting, 06 March 2014, Hattiesburg MS.

2013

- **Research & Paper Presentation**, “Neutrino Nucleon Scattering”, Phenomenology 2013 Symposium, 06 May-08 May 2013, Pittsburgh PA.

2012

- **Research Presentation**, “International Neutrino Summer School”, 10 July-21 July, Center for Neutrino Physics, Virginia Tech, Blacksburg VA, 2012

2010

- **Research Presentation**, “A Review on Dark Matter”, Department of Physics and Astronomy, University of Mississippi, 28 September 2010, Oxford MS.

2009

- **“Gravity Meeting”**, October 2009, University of Michigan, Ann-Arbor MI.

2008

- **Research Presentation**, “Cyclic Universe and Brane Cosmology”, Department of Physics, Baylor University, December 2008, Waco, TX
- **Research Presentation**, “The Axis Problem in Cosmology”, Department of Physics, Baylor University, February 2008, Waco, TX

2007

- **Research Presentation**, “Cosmology of Orbifold Branes in Superstring”, American Physical Society’s Fall Meeting, 19 October 2007, Texas A&M, College Station TX.
- **“Workshop on Cosmology and Strings”**, 9 July-13 July 2007, Abdus Salam International Centre for Theoretical Physics, Miramare-Trieste, Italy.
- **“Origins of Dark Energy”**, 14 May-17 May 2007, McMaster University, Hamilton Canada
- **“American Physical Society’s Fall Meeting”**, 19 October 2007, Texas A&M, College Station TX.

PROGRAMMING LANGUAGES

- Python

- R programming
- Mathematica
- Fortran

OUTREACH ACTIVITIES

- **Science Cafe** (twice a semester) in Wichita Falls, Texas
- **Physics & Music** (annually) in Wichita Falls, Texas