# Bio-data



**Name**                          :  Dr. Shyamal Bhar

**Designation**                   :  Assistant Professor in Physics

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**Academic Qualification : M.Sc. (Physics), Ph.D. (Science)**

**Research Area and Area of Interest : Monte Carlo Simulation in Statistical Physics**

My broad area of research work is Statistical Physics. I am doing Monte Carlo simulation on different statistical model systems such as two-dimensional XY model, Heisenberg Model, One dimensional Lebwohl-Lasher model etc. in both equilibrium and non-equilibrium cases. I have adapted different Monte Carlo techniques for studying these systems. The techniques I used are Metropolis algorithm, Wang Landau Algorithm, Transition Matrix Monte Carlo method, Wang-Landau-Transition-Matrix Monte Carlo method and Swensden-Ferrenberg multiple histogram reweighting technique etc.

In non-equilibrium cases I studied the persistence property, which gives the details history of the system on XY and Heisenberg models.

Presently I am involving in a work for studying elastic constants of Lebwhol-Lasher model using MC simulation.

**Publications**            :

1. **Computer Physics Communications, Volume 180, Issue 5, May 2009, Pages 699-707**

Title of the Paper:
"Computer simulation of two continuous spin models using Wang-Landau-Transition-Matrix Monte Carlo Algorithm"

2. **Physical Review E**, Volume 82, 011138 (2010)

Title of the Paper:
"Local and global persistence exponents of two quenched continuous- lattice spin models"

3. **Computer Physics Communications, Volume 184 (2013), Pages 1387-1394**

Title of the Paper:
"A comparison of the performance of Wang-Landau-Transition-Matrix algorithm with Wang-Landau algorithm for the determination of the joint density of states for continuous spin models"

<u>Chapter  Publication</u>: Contributed a chapter  '**Wang-Landau Algorithm and Its Implementation for the Determination of Joint Density of States in Continuous Spin Models'** in a  book  **'<u>Applications of Monte Carlo Methods in science and Engineering'</u>  Edited by S. Mark and S. Mordechai ISBN : 978-953-307-691-1**

**Book Publication:** Computer Simulations in Statistical Mechanics: Continuous Spin models **,**

Lambert Academic Publishing. **ISBN**: 978-3-659-53735-6

**Topics Taught:**

- **Thermal Physics (Kinetic Theory of Gases)**

- **Electrostatics**

- **Classical Mechanics**

- **Quantum Mechanics**

- **Practical Classes**