

Kamal Sharma

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EDUCATION

Georgia Institute of Technology

(2012-ongoing)

MS + PhD, Physics

Atlanta, GA

Minor, Computational Physics

- PhD dissertation in Condensed Matter theory
- 3.43/4.0 GPA
- Physics GRE Score 980/990 (94 percentile)

Indian Institute of Technology

(2009)

Bachelor of Technology, Civil Engineering

Roorkee, India

RESEARCH / WORK EXPERIENCE

Transport in low dimensional interacting systems

May 2014 – Present

(PhD Thesis)

Georgia Tech, Atlanta

- Used many-body Quantum mechanics and Boltzmann kinetic theory to study the effects of electron-electron interaction on the thermal conductance of one-dimensional quantum Nano-wires.
- Used Wolfram Mathematica's symbolic manipulation to extract approximations and insights about my research.

Machine Learning: Black-hole merger prediction

Summer 2017

Course Project for Summer Semester

Georgia Tech, Atlanta

- Used a combination of signal processing techniques, pre-processing, data transformation and machine learning algorithms on *gravitational waveforms* obtained from simulations of black-hole collisions.
- Other projects: Handwriting recognition, Wine ratings prediction.

Study of Non-linear Dynamical Systems

2014

Graduate Student

Georgia Tech, Atlanta

- Simulation and control of cardiac arrhythmia on a *cardiac tissue model* using C programming language.
- Numerical symmetry reduction using *group theory* for chaotic attractor of complex Lorenz equation.

Graduate Teaching Assistant at Georgia Tech

August 2012-Present

- Taught labs and recitations for graduate level and undergraduate level *Electromagnetism, Mechanics and Quantum Mechanics*.
- Served as a judge at 13th Annual Undergraduate Research Spring Symposium at Georgia Tech.

Monte Carlo simulations to study liquid crystals

January 2011-May 2012

Visiting Student at Raman Research Institute

Bangalore, India

- Used Simulated Annealing algorithm (Monte Carlo) in C programming language to study the variation of polarization and the details of *phase transitions* for liquid crystals as the electric field is gradually increased.

First-passage time in one dimensional lattice

January 2011-May 2012

Visiting Student at Raman Research Institute

Bangalore, India

- Worked on the First-passage time probability problem for a *stochastic system* and determined a modification to the traditional boundary conditions needed to find the time of first passage of a particle past a barrier.

Tata Consulting Engineers Limited, Mumbai, India

April 2010-January 2011

Structural Engineer

Mumbai, India

SKILLS & INTERESTS

- **Skills:** Simulations & Modelling, Machine Learning, Theoretical Physics, Mathematical Analysis.
- **Languages and Packages:** MATLAB, WEKA, Mathematica, C, Python.
- **Fundamental Courses:** Machine Learning, Non-equilibrium Statistical Physics, Non-Linear Dynamics (Chaos), Quantum Mechanics (I & II), Electromagnetism (I & II), Fluid Mechanics, Mathematical Methods (I & II)
- **Interests:** Machine Learning, Technology, tweaking with electronics, guitar and singing.

PUBLICATIONS

- Sharma, Kamal, and N. Kumar. "First-passage time: Lattice versus continuum.", Physical Review E 86.3 (2012): 032104.
- Sharma, Kamal, and N. Kumar. "Getting Acquainted with Gears and Wheels-Quantum Mechanically.", Resonance 18.1 (2013):67-77.

POSTERS

- Sharma, K., Bolla R., and Khamesra B. "Gravitational Wave Analysis using Machine Learning.", Georgia Regional Astronomy Meet, 2017.