

CURRICULUM VITAE

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Designation: Assistant Professor
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Employment held:

- Assistant Professor, Dept. of Physics, BITS , Hyderabad, India (2012-2013)
- Post-Doc, Condensed Matter Theory Group, Institute of Physics, Bhubaneswar, India (2010-2012)
- Post-Doc, Theoretical Physics Division, Universitat des Saarlandes, Saarbrucken, Germany (2009-2010)
- Post-Doc, Department of Fundamental Physics, Universitat de Barcelona, Barcelona, Spain (2007-2009)

Education:

- Ph.D : Raman Research Institute, Bangalore, India (2000-2007)
Thesis Title :‘**Rheology and Transport in Active and Passive Filaments**’
- M.Sc (Physics), Dept. of Physics, Pune University, Pune, India
- M.Tech (Materials Science), IIT Bombay, Mumbai, India
- B.Sc (Physics), Presidency College, Calcutta, India

Research Work

My broad area of research work is in the field of Soft Condensed Matter and Biological Physics. The focus has been to develop theoretical models to describe and understand cellular phenomenon. The thrust of my current ongoing research can be classified under following categories:

(A) Understanding the physical mechanisms responsible for intra-cellular transport

- Single particle modeling of transport of individual cargo (vesicle, organelles)
- Collective description : Role of multiple tracks for transport
- Coupling of transport to dynamics of tracks, for i.e; Growth of Fungal Hyphae
- Transport on filament networks : Effect of junctions and branching on transport

(B) Role of filament in structural aspects within the cell

- Stability and Oscillations in treadmilling motor-filament complexes
- Cytoskeletal Dynamics
- Mesoscopic description of treadmilling filaments
- Rheology and mechanical response of filament structure to mechanical stresses.

(C) Statistical Mechanics of driven system

- Dynamics, phases and nature of phase transitions

Ongoing sponsored research project

Project title : Molecular Motor Driven Centrosomal Microtubule Motility: Mechanics and Spatio-temporal Organization.

Funding agency : Department of Biotechnology (DBT), under Rapid grant for young investigators (RGYI) for 2011-12.

Project details: Principal Investigator : Dr. Chaitanya A. Athale (IISER, Pune),
Co- Principal Investigator : Sudipto Muhuri

Publication List

- [1] Scale-invariant density profiles of a dynamically extending TASEP, **Sudipto Muhuri**, EPL 101, 38001 (2013).
- [2] Intrinsic oscillations of polymerizing antiparallel microtubules in a motor bath, **Sudipto Muhuri**, Ignacio Pagonabarraga and Jaume Casademunt, EPL 98, 68005 (2012).
- [3] Phase segregation and transport in a two species multi-lane system, **Sudipto Muhuri** and Ignacio Pagonabarraga, J.Stat.Mech, P11011 (2011).
- [4] Bidirectional transport in a multispecies TASEP model, **Sudipto Muhuri**, Lenin Shagolsem and Madan Rao, Phys. Rev. E 84, 031921 (2011).
- [5] Lattice gas model for active vesicle transport by molecular motors with opposite polarities, **Sudipto Muhuri**, Ignacio Pagonabarraga, Phys. Rev. E 82, 021925 (2010).
- [6] ‘Sequence’ dependent elasticity and local stiffness of a random heteropolymer, **Sudipto Muhuri** and Madan Rao, J.Stat.Mech , P02005 (2010).
- [7] Collective vesicle transport on biofilaments carried by competing motors, **Sudipto Muhuri**, Ignacio Pagonabarraga, EPL 84, 58009 (2008).
- [8] Shear flow induced isotropic to nematic transition in a suspension of active filaments, **Sudipto Muhuri**, Madan Rao and Sriram Ramaswamy, EPL 78, 48002 (2007).