



**Name of the Faculty:** Dr. Awadhesh Kumar Dubey

**Designation:** Assistant Professor

**Research Areas:** Soft-Condensed Matter Physics (Theoretical & Computational), Out of Equilibrium Systems: Granular Matter, Glass, Active Matter, Front Propagation in Random Media and Phase Transformations

## Research Highlights

### Theory and Simulations of a Viscoelastic Granular Gas

Our interest focuses to study the homogeneous and inhomogeneous cooling states, anomalous diffusion, rough and mixed Granular Gases.

#### References:

1. *Velocity distribution function and effective restitution coefficient for a granular gas of viscoelastic particles*

Awadhesh K. Dubey, Anna Bodrova, Sanjay Puri and Nikolai Brilliantov

**Phys. Rev. E 87, 062202 (2013).**

2. *Intermediate Regimes in Granular Brownian Motion: Superdiffusion and Subdiffusion*

Anna Bodrova, Awadhesh K. Dubey, Sanjay Puri and Nikolai Brilliantov

**Phys. Rev. Lett. 109, 178001 (2012).**

### Mechanical Properties of Amorphous Solids

We study the underlying physics of a glassy state using the methods of nonequilibrium statistical mechanics.

#### References:

1. *Elasticity in Amorphous Solids: Nonlinear or Piece-Wise Linear ?*

Awadhesh K. Dubey, Itamar Procaccia, Carmel ABZ Shor, and Murari Singh

**Phys. Rev. Lett. 116, 085502 (2016).**

2. *Statistics of Plastic Events in Post-Yield Strain-Controlled Amorphous Solids*

Awadhesh K. Dubey, H. George E. Hentschel, Itamar Procaccia and Murari Singh

**Phys. Rev. B 93, 224204 (2016).**

### Reaction Fronts in Disordered Flows

We are interested to understand the generic nature of growing interfaces in several contexts such as bacterial colony growth and reaction front propagation etc.

1. *Experimental Evidence for Three Universality Classes for Reaction Fronts in Disordered Flows* Severine Atis, Awadhesh K. Dubey, Dominique Salin, Laurent Talon, Pierre Le Doussal and Kay Jorg Wiese

**Phys. Rev. Lett. 114, 234502 (2015).**

2. *Avalanches dynamics in reaction fronts in disordered flows*

T. Chevalier, A. K. Dubey, S. Atis, A. Rosso, D. Salin, and L. Talon

**Phys. Rev. E. 95, 042210 (2017).**