Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad - 500107

Colloquium

Athermal Statistical Mechanics: Disorder, Entropy and Jamming

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Systems composed of macroscopic particulate matter where the large size of particles renders them robust to thermal agitations have been of continued interest in statistical physics. Since temperature plays only a weak role, phase transitions in such materials are primarily the result of geometrical effects. Geometrical phase transitions find applications in several fields including glassy systems, active matter, granular materials and the study of biological tissues. Lattice gas models, in which particles are constrained to be on the sites of a lattice and interact via extended hard-cores, serve as the easiest models of such complex physical systems. In continuum, hard and soft sphere models provide the building blocks for theories of real fluids. The point at which these systems begin to exhibit global rigidity or 'jamming' with increasing density has been the focus of intense research over the last decade. The extension of statistical physics tools to better understand such phenomena represents a fundamental challenge. In this talk I outline the study of athermal systems using lattice gases and soft spheres, and describe numerical techniques that can be used to extend our understanding of such materials.

Tuesday, Jul 17th 2018

11:30 AM (Tea/Coffee at 11:00 AM)

Auditorium, TIFR-H