



## **ICTS Statistical Physics and Condensed Matter Seminar**

**Title** : The Jammed Phase of Infinitely Persistent Active Matter

**Speaker** : Mahesh Chandrasekhar Gandikota (ICTS-TIFR, Bengaluru)

**Date** : Friday, 27 February 2026

**Time** : 3:30 PM (IST)

**Abstract** : We study an extreme active matter system, which is essentially a dense assembly of athermal, soft and infinitely persistent active particles. Using extensive numerical simulations we obtain jammed configurations of this system in two dimensions and probe the stability of such structures under increasing active forcing magnitude. We show that the critical active forcing magnitude for the jammed phase to yield scales with virial pressure and describes the yielding line. Using a Laplacian framework, we redistribute the active forces into a modified contact force network. By analysing the statistics of these redistributed forces, we obtain a very robust scaling law consistent with the passive limit, not just near the unjamming line, but in the entire jammed active phase. The probability distribution of the magnitude of the contact force deviates from the power-law form found in passive systems for values smaller than the active force. Moreover, within the jammed phase, the system displays elastic, plastic, and yielding events with increasing active forcing. This active plasticity appears abruptly and can not be captured by the continuous softening of the Hessian spectrum. However, we demonstrate that the Hessian still retains the ability to predict relaxation times. We will also discuss how the redistribution of force distributions can be carried over to jammed nonreciprocal systems.

**Venue** : Feynman Lecture Hall

Zoom Link: <https://icts-res-in.zoom.us/j/92481393119?pwd=0PAEaoWM5u6OTuSTzRMWci4oBONo2D.1>

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