
Seminar

Phase Transitions and Intermittency in an Aggregation-Fragmentation Model

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Motivated by the problem of transport of proteins through the Golgi organelle, we study a statistical physics model which includes diffusion, aggregation and chipping in the bulk, along with influx and outflux of particles at the boundaries. As the influx is increased, there is a transition to a condensate phase in which a large aggregate forms, with strong fluctuations in the number of particles it holds. Concomitantly, the total number of particles N in the system also shows giant fluctuations in steady state. The time series $N(t)$ shows quantitative features of intermittency: the flatness diverges as the scaled time approaches zero. These features are established analytically in the limit of zero chipping and by numerical simulations for non-zero chipping.

Friday, Jan 23rd 2015

4:00 PM (Tea/Coffee at 3:30 PM)

Seminar Hall, TCIS