TIFR Centre for Interdisciplinary Sciences, Narsingi, Hyderabad 500075

Seminar

Self-limited “living” 2-D colloidal clusters: Building blocks for cluster crystals

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Daily experience demonstrates that upon mixing oil and water quickly phase separate. Such liquid-liquid phase separation is ubiquitous in molecular mixtures as well as suspensions of nanoparticles, proteins and colloids. We investigate liquid-liquid phase separation in a simple system of two-dimensional fluid-like monolayer composed of long and short colloidal rods. The bulk phase separation of dissimilar rods within the monolayer is surprisingly unstable and gives way to formation of micron-sized, highly-monodisperse clusters. These clusters constantly exchange rods with the rest of the monolayer to robustly maintain a self-limited size. At high densities, the clusters hierarchically assemble in the form of cluster crystals and chains. We quantitatively relate the cluster induced distortions of the monolayer to the inter-cluster potential demonstrating that chirality of constituent rods is an essential requirement for cluster formation.

***Tuesday, November* 12th 2013**

11:30AM (Tea/Coffee at 11:15AM)

Seminar Hall, TCIS