



## **Cluster Crystals and other Surprises in Flatland**

by

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### Abstract:

Upon decreasing temperature or increasing concentration most nanometer sized particles undergo a transition from a disordered liquid to a solid crystal. However, dissolving such particles in 2D membranes fundamentally alters their interactions and leads to phase behavior that is drastically different from that of bulk suspensions. Due to small size of the constituent molecules it is very difficult to study the behavior of inclusions embedded in a conventional lipid bilayer. I will describe a model membrane system composed from micron sized rod-like colloids and techniques used to characterize the forces that drive such assembly. Colloidal membranes are an ideal model system to directly visualize inclusion induced distortions and measure their interactions. Our results suggest that membrane-mediated interactions assemble inclusions into robust finite-size clusters and that this is a ubiquitous feature of heterogeneous membranes. Such clusters can bind to each other via specific rules to make supra-clusters and at high enough concentrations they can assemble into 2D crystals and a myriad of other highly unusual structures.

**Friday, June 21<sup>st</sup>, 2013, 13:00**

**Room PH 127**