Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Assembly and interactions of achiral rafts in colloidal membranes

JOIA MILLER, Brandeis University, PRERNA SHARMA, Indian Institute of Science Bangalore, ZVONIMIR DOGIC, Brandeis Univesity — Two-dimensional colloidal membranes composed of rods of different lengths display rich phase behavior. In particular, chirality of constituent rods stabilizes assembly of colloidal rafts, micron sized droplets enriched in one type of rod floating in the background membrane. Colloidal rafts interact via long-range repulsive interactions that are mediated by local rod twisting due to their rods' inherent chirality. We explore the behavior of an achiral bidisperse mixture of colloidal rods. Even in the achiral limit we observe assembly of stable or meta-stable finite-sized rafts. However, in contrast to the chiral limit, the long-range interactions between achiral rafts are attractive. These rafts are embedded in a host membrane that has nearly critical fluctuations in composition. We correlate the attractive domain interactions with these critical fluctuations.

Joia Miller
Brandeis University

Date submitted: 14 Nov 2014 Electronic form version 1.4