
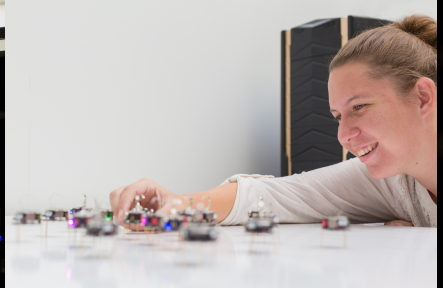


Physics colloquium

Rafts in Colloidal Membranes

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Date: **9/21/18**
Time: **10:30 AM**
Location: **COB2 170**

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Abstract: We describe a complex three step self-assembly pathway that is observed in a mixture composed of rod-like particles of different lengths and a non-adsorbing polymer. In a first step rod-like particles phase separate from the background polymer suspension and assemble into colloidal membranes, which are one rod-length thick liquid-like monolayers of aligned rods. In the second step the particles of different lengths within a membrane phase separate from each other forming colloidal rafts, which are uniform finite-sized liquid droplets. In the final step membrane-mediated interactions drive assembly of colloidal rafts into complex higher-order assemblages. In particular, we observed that rafts can switch both long-ranged repulsive interactions as well as short-ranged attractions. The change in these effective membrane-mediated interactions is accompanied by the conformational change of the raft structure, wherein they switch their chiral twist. These results demonstrate a robust pathway for self-assembly of diverse and highly reconfigurable colloidal superstructures that does not depend on tuning the shape and interactions of the elemental units, but rather on the emergent and still poorly understood properties of membrane-mediated interactions.