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Self-assembly of colloidal rafts PRERNA SHARMA, Brandeis University, THOAMS GIBAUD, Ecole Normale Supérieure de Lyon, ANDREW WARD, ZVONIMIR DOGIC, Brandeis University — Interactions between nanometer-sized particles or molecules suspended in a bulk fluid are well understood. However, when such particles are embedded in a membrane, the inter-particle potential is significantly modified by membrane mediated forces and gives rise to novel phase behavior. Visualizing and manipulating such inclusions in a lipid bilayer is difficult due to the nanometer length scales involved. Here, we use a model system of micron sized colloidal membranes doped with molecules shorter or longer than that of the bulk. Surprisingly, the dopant molecules form self-limited finite size clusters. These clusters further self-organize into a wide variety of higher order structures such as hexagonal and square lattice arrays, lamellar patterns and saddle shaped surfaces. Understanding the phase behavior and measuring repulsive forces between such clusters may have implications for the similar mechanisms that operate in conventional lipid bilayers.

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