Physics Colloquium

Professor Zvonimir Dogic

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"Assembly Pathways and Shape Transitions of Colloidal Membrane"

Friday, April 16, 2021

2:30pm—3:30pm

Zoom link: https://virginiatech.zoom.us/s/96084996911

In the presence of anon-adsorbing polymer, monodisperse rod-like colloids assemble into one-rod-length thick liquid-like monolayer, called colloidal membranes. The physics of these micron thick fluid-like assemblages are analogous to those oft wo-dimensional lipid bilayers. However, their micron size allows for visualization of various membrane mediated interactions that are not possible using nanometer-sized conventional membranes. Previous work on colloidal membranes has revealed new phenomena, such as chiral control of edge tension and assembly of finite sized fluid clusters. Using a colloidal membrane composed of rod-like molecules of differing lengths, we study how flat two-dimensional membranes fold into 3D structures. Above critical concentration of shorter rods flat 2Dmembranes become unstable and assume a bewildering variety of different shapes and topologies. Simple arguments suggest that doping colloidal membranes with miscible shorter rods tunes the membrane's Gaussian modulus, which in turn destabilizes flat 2D membranes

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