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Computational and theoretical analysis of chiral rafts in colloidal membranes[1] RAUNAK SAKHARDANDE, MICHAEL HAGAN, APARNA BASKARAN, BULBUL CHAKRABORTY, Brandeis University, BRANDEIS SOFT MATTER THEORY GROUP TEAM — In contrast to bulk liquids or crystals clusters of finite size are rare and their assembly usually requires sophisticated engineering. Recent experiments conducted on monolayer membranes composed of two species of chiral rodlike molecules leads to the spontaneous formation of thermodynamically stable, rafts with a well-defined finite size. To understand the fundamental forces driving this self-limited assembly, we combine Monte Carlo simulations and a mean field theory to explore the phase diagram of a monolayer of bidisperse rodlike molecules as a function of interparticle interactions and chirality. The simulations demonstrate that differences in chirality between the two rod species can stabilize finite-sized rafts. We present a phase diagram which predicts parameter ranges over which finite-sized rafts are stable.

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