DFD10-2010-020023

Abstract for an Invited Paper
for the DFD10 Meeting of
the American Physical Society

Composition dynamics in lipid bilayer membranes over long length and time scales

FRANK BROWN, UCSB

We present a stochastic phase-field model for multicomponent lipid bilayers, which explicitly accounts for the quasi-two-dimensional hydrodynamic environment unique to a thin fluid membrane immersed in aqueous solution. Dynamics over a wide range of length scales (from nanometers to microns) for durations up to seconds and longer are readily accessed and provide a direct comparison to fluorescence microscopy measurements in ternary lipid/cholesterol mixtures. Simulations of phase separation kinetics agree with experiment and elucidate the role of hydrodynamics in the coarsening process.