

# Geometric evolution and bifurcation in multicomponent amphiphilic blends

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## Abstract

We present a free energy model for multicomponent blends of lipid bilayers that describes its composition in terms of a rich dynamical systems problem, which couples naturally to the differential geometry of the corresponding co-dimension one interfaces and co-dimension two hypersurfaces. The associated gradient flows admit dynamic competition between network morphologies of distinct co-dimension, and permits competitive geometric evolution between morphologies of distinct co-dimension. We present an analysis of the associated spectral problems, and present rigorous existence results for pearled morphologies and for the curvature driven flow of the supporting interfaces.