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The Effect of Tension on Phase Transitions and Domains in Phospholipid Membranes MARIA SANTORE, University of Massachusetts Polymer Science, DONG CHEN, University of Massachusetts Physics — The relevance phase transitions in phospholipid membranes to the effect of confinement on phase transitions and to the structure-function relationship in biological membranes has driven decades of scientific study of the behavior of model membranes. A primary focus of these studies has been the impact of temperature. We argue here, however, that tension can have a profound impact on transitions, suppressing domain formation, or shifting the nature of the domains themselves. While Clausius-Clapeyron predicts depression of a melting transition as small as 1/3 C for every mN/m of applied tension, the presence of a triple point or similar features can lead to the formation of different domains altogether. We provide here dramatic demonstrations of these behaviors in the form of fluorescence microscopy images in systems with controlled tension.

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