

Abstract Submitted
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Elastic membranes in confinement JOSHUA BOSTWICK, MICHAEL MIKSIS, STEPHEN DAVIS, Northwestern University — An elastic membrane stretched between two walls takes a shape defined by its length and the volume of fluid it encloses. Many biological structures, such as cells, mitochondria and DNA, have finer internal structure in which a membrane (or elastic member) is geometrically “confined” by another object. We study the shape stability of elastic membranes in a “confining” box and introduce repulsive van der Waals forces to prevent the membrane from intersecting the wall. We aim to define the parameter space associated with mitochondria-like deformations. We compare the confined to ‘unconfined’ solutions and show how the structure and stability of the membrane shapes changes with the system parameters.

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