1002-74-198 **Tim Healey*** (`tjh10@cornell.edu`). *Modeling and Analysis of Two-Phase Equilibira of Bilayer Membranes.* Preliminary report.

We consider equilibria of models for Giant Unilamellar Vesicles (GUVs), which are closed-surface lipid-bilayer membranes of radii on the order of microns. Recent breakthroughs in imaging reveal highly complex equilibrium shapes of nominally spherical vesicles (with broken spherical symmetry) under excess pressure [1]. We consider a classical single-phase model [2] and explore various (regularized) two-phase models. In the former we demonstrate that the "first" instability is always axisymmetric, while the latter reveal the possibility of complex higher-mode bifurcations.

[1] T. Baumgart, et. al., Nature 425 (2003) 821-824. [2] J. T. Jenkins, Math. Biol. 4 (1976) 149-169. (Received September 14, 2004)