Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

**On the modeling of endocytosis** TAO ZHANG, RASTKO SKNEPNEK, JENNIFER SCHWARZ, MARK BOWICK, Syracuse University — Endocytosis is the primary mechanism by which extracellular material enters the cell. During endocytosis, the cell membrane deforms to surround the extracellular material and draw it into the cell, followed by a pinch-off to produce an internal vesicle. Recent experiments on clathrin-mediated endocytosis all agree that the actin cytoskeleton plays a crucial role in the deformation of the cell membrane. The actin cytoskeleton is a crosslinked network of filaments exerting active forces. However, competing ideas remain as to precisely how the actin cytoskeleton organizes itself to help drive the deformation. To begin to resolve this controversy, we mathematically model clathrin-mediated endocytosis using variational methods and Monte Carlo simulations. In particular, we investigate how the deformation of the cell membrane depends on the organization of the actin cytoskeletal network, and its associated active forces, to rule out one or more of the competing ideas.

Tao Zhang
Syracuse University

Date submitted: 09 Nov 2012 Electronic form version 1.4