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**Shuwang Li\*** ([sli@math.iit.edu](mailto:sli@math.iit.edu)), Engineering 1 Building, Room 208, 10 West 32nd Street, Chicago, IL 60616, and **Kai Liu**. *Dynamics of a vesicle in viscous fluids*.

In this talk, I will present the modeling and computation of a multicomponent vesicle and study its dynamics in viscous flow. Recent experimental results on giant unilamellar vesicles (GUVs) show that mixed multiple lipid components on the surface of a membrane may decompose into coexisting phases with distinct compositions, with concomitant changes in the surface morphology. The driving forces for the evolution involves line tension along the phase boundaries, inhomogeneous surface/bending energy, and fluid forces. Here we are interested in exploring the emergent morphologies of a vesicle in shear flow and in extensional flow. Our numerical results suggest that the nonhomogeneous surface tension/bending, together with the flow, introduces nontrivial dynamics including locomotion, budding, tumbling and wrinkling. (Received February 13, 2012)