1141-92-162 **YN Young*** (yyoung@njit.edu), 519 Cullimore Hall Dept. Math. Sci., NJIT, University Heights, Newark, NJ 07102, and **Y Mori** and **M Miksis**. *A two-phase flow model for a poroelastic drop actuated with swimming gaits.* Preliminary report.

In this work a two-phase flow model is constructed to study the combined effects of interfacial slip, permeability and elasticity of the porous skeleton inside a viscous drop under simple linear flows. This two-phase flow model describes a viscous fluid filling a deformable elastic skeleton inside a drop whose interface deforms according to the balance of traction on the interface. When the viscous dissipation of the interior porous flow is negligible (compared to the friction between the fluid and the skeleton), the two-phase flow is reduced to a poroelastic Darcy fluid instead. At the interface between such an interior poroelastic fluid and an exterior Stokesian fluid, both slip and permeability are taken into account. The permeating flow induces dissipation that depends on the elastic stress of the interior solid. Actuation on the drop surface gives rise to swimming, and analysis gives insight to possible flow patterns of a system of self-propelling swimmers with porous flow (such as intracellular cytosol) inside. (Received July 27, 2018)