1135-76-2367 **Nicholas D Brubaker*** (nbrubaker@fullerton.edu), 800 N. State College Blvd, Fullerton, CA 92831. *A Continuation Method for Computing Capillary Surfaces.*

The most common approach for computing the shape of a capillary surface is to first triangulate the given interface and then construct an optimization problem to determine locations of the vertices; however, since the resulting problem is often solved directly, only energetically stable interfaces can be determined. Additionally, these methods suffer in applications since they cannot be easily adapted to find families of surface when parameters, such as hydrostatic pressure difference or prescribed volume, are smoothly varied.

In this talk, we layout a new method for computing capillary surfaces based on solving a quasilinear, elliptic partial differential equation—facilitated by writing the unknown surface as a normal graph—using numerical arc-length continuation. The corresponding algorithm not only naturally produces a continuous family of surfaces, but also identifies both changes in stability and bifurcation points. Test examples will be presented to highlight the efficacy, accuracy and robustness of the proposed approach. (Received September 26, 2017)