Abstract Submitted
for the DFD12 Meeting of
The American Physical Society

**Multiphase flow of miscible liquids: drops and jets** TRAVIS WALKER, ALISON LOGIA, GERALD FULLER, Stanford University — Drops and jets of liquids that are miscible with the surrounding bulk liquid are present in many processes. Although the interactions of immiscible drops and jets show similarities to miscible systems, the small, transient interfacial tension associated with miscible systems create distinct outcomes such as intricate droplet shapes, break-up resistant jets, and spreading sessile drops. Experiments have been conducted to understand several basic multiphase flow problems involving miscible liquids including the free-surface pendant drops resulting from drop impaction and the dissolution of sessile drops in a miscible bath. Using high-speed imaging of the morphological evolution of the flows, we show that these processes are controlled by interfacial tensions. Further multiphase flows include investigating miscible jets, which allow the creation of fibers and tubular shapes from inelastic materials that are otherwise difficult to process due to capillary breakup. This work shows that stabilization from the diminishing interfacial tensions of the miscible jets allow various elongated morphologies to be formed. When combined with a mechanism to freeze these fibers, highly oriented materials can be created.

Travis Walker
Stanford University

Date submitted: 02 Aug 2012 Electronic form version 1.4