

**Center for Fluid Mechanics, Division of Applied Mathematics  
Fluids, Thermal and Chemical Processes Group, School of Engineering  
Joint Seminar Series**

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New Jersey Institute of Technology  
Newark, NJ**

**A Hybrid Numerical Method for Fluid Interfaces with Soluble Surfactant**

We address a significant difficulty in the numerical computation of fluid interfaces with soluble surfactant that occurs in the practically important limit of large bulk Peclet number  $Pe$ . At the high values of  $Pe$  in typical fluid-surfactant systems, there is a transition layer near the interface in which the surfactant concentration varies rapidly. Accurately resolving this layer is a challenge for traditional numerical methods but is essential to evaluate the exchange of surfactant between the interface and bulk flow. We present recent work that uses the slenderness of the layer to develop a fast and accurate 'hybrid' numerical method that incorporates a separate analysis of the dynamics in the transition layer into a full numerical solution of the interfacial free boundary problem.

**TUESDAY - APRIL 19, 2011**

**4:00 PM**

**Barus & Holley, Room 190**