1005-76-88 **Lou Kondic*** (`kondic@njit.edu`), Dept. of Mathematics, NJIT, 323 MLK Blvd, Newark, NJ 07102. *Thin liquid films with contact lines: instabilities, coalescence and rupture.*

This talk will concentrate on computational and experimental results involving dynamics of thin film flows on homogeneous and heterogeneous surfaces. In particular, we will discuss the dynamics of the fluid fronts, i.e., contact line. The presence of contact lines introduces microscale in a macroscale flow and therefore requires bridging the scales and careful modeling and numerical simulations. After presenting basic features of the flow, we will consider few flow configurations. One of these is an unstable configuration involving gravity driven flow on homogeneous and heterogeneous inclined solid surfaces, leading to pattern formation in the form of fingers and rivulets. In particular, the flow on heterogeneous surfaces is interesting since the effect of heterogeneity often competes with the basic instability mechanism, leading to an elaborate interplay of various sources of instability. The computational results are then related to the pattern formation process observed in the experiments performed at NJIT . Other topics of discussion include modeling of the problems involving topological changes, such as drop coalescence and formation of dry spots. (Received January 31, 2005)