University of Colorado Boulder

Department of Mathematics
395 UCB
Boulder, Colorado 80309-0395

t 303 492 7664
f 303 492 7707

Joint Mathematics & Applied Mathematics Colloquium

Particle laden thin films: theory and experiment

Andrea Bertozzi

(UCLA)

Modeling of particle laden flow, especially in the case of higher particle concentrations, does not readily allow for first principles models. Rather, semi-empirical models of the bulk dynamics require careful comparision with experiments. At UCLA we have developed this theory for the geometry of viscous thin film flow with non-neutrally buoyant particles. We have found that for these slower flows, that diffusive flux models, involving a balance between shear-induced migration and hindered settling, can provide reasonably accurate predictive models. I will discuss the current state of this work including recent extensions to bidensity slurries and the relevant mathematics needed to understand the dynamics. Lubrication theory can be derived for this problem and results in a coupled system of conservation laws including regular shock dynamics and singular shocks. I will also briefly discuss relevant applications such as spiral separators.

Friday February 13, 2015
3-4 PM
ECCR 265