Meeting: 1002, Pittsburgh, Pennsylvania, SS 5A, Special Session on Multiscale Algorithms in Computational Fluid Dynamics

1002-76-97 **Ashwin Vaidya*** (`avaidya@andrew.cmu.edu`), 6209 Wean Hall, Deptartment of Mathematical Sciences, Carnegie Mellon University, Pittsburgh, PA 15213. *Mathematical Analysis of Orientation of Rigid Bodies Falling in Newtonian and Non-Newtonian Fluids.*

The difference in behavior of Newtonian and Non-Newtonian liquids has captivated mathematicians and engineers alike for several decades now. The presence of the additional normal stress effects in viscoelastic liquids gives rise to a myriad of remarkable phenomenon such as rod-climbing, elastic recoil and open-siphon effect, among others. Yet another such difference appears in the form of steady, terminal orientation of rigid bodies sedimenting in Newtonian and viscoelastic liquids. In this talk, we shall address this orientation phenomenon and discuss the mathematical formulation of the problem, well-posedness of the models and analysis of the varying orientation behavior of rigid bodies of any shape falling in liquids modeled by the Navier-Stokes, power-law and second order fluid equations. (Received September 07, 2004)