PLEASE NOTE CHANGE IN DAY AND TIME FOR THIS SEMINAR ONLY

CENTER FOR FLUID MECHANICS
AND
THE FLUIDS, THERMAL AND CHEMICAL PROCESSES GROUP
OF
THE DIVISION OF ENGINEERING
SEMINAR SERIES

Micheline Abbas

Sheared Suspensions of Inertial Particles

The talk is about the rheological behavior of sheared gas-solid suspensions with finite particle inertia. The fluid inertia, Brownian diffusion and gravity are neglected. The respective role of the Stokes drag and collisions on the macroscopic behavior is investigated through the simulation of discrete particle trajectories (agitation, kinetic and collisional stresses, and self-diffusion).

When the Stokes number based on the shear rate increases from 1 to 10, the suspension evolves from weakly to strongly agitated regime. The transition between the two states is investigated for low to moderately concentrated suspensions. Results of numerical simulations are compared to models based on the kinetic theory adapted to moderate Stokes numbers. The effect of inelastic collisions will be briefly discussed.

Finally, a modification of the Force Coupling Method is proposed to model simultaneously the particle inertia and hydrodynamic interactions.

Thursday – December 6, 2007
37 Manning, Room 104
Noon