3:30-4:20pm, Friday, March 27th, 2015
Frank H. Walk Room (ELAB Building)

by Jos Derksen*

Many engineered processes rely on mass transfer between a solids phase and a liquid phase. Agitation and fluidization of dense solid-liquid suspensions are common ways of enhancing transfer rates. Suspensions have large interfacial area and the slip velocities between the phases help in transporting chemical species towards and away from the interfaces where in many cases surface-reactions occur. We present detailed simulations of flow dynamics and mass transfer in dense suspensions with explicit resolution of the solid-liquid interfaces. Solid and liquid dynamics are directly coupled through no-slip conditions at the solid particle surfaces and the (resolved) hydrodynamic forces and torques that translate and rotate the particles. The simulations are based on a lattice-Boltzmann scheme equipped with an immersed boundary method