SCHOOL OF CHEMICAL, BIOLOGICAL & MATERIALS ENGINEERING
And
UNIVERSITY OF OKLAHOMA BIOENGINEERING CENTER
100 E. Boyd, Sarkeys Energy Center, T-335
405-325-5811
The University of Oklahoma
Norman, Oklahoma

2010 – 2011 Seminar Series



# DR. JOS DERKSEN

PROFESSOR
CHEMICAL AND MATERIALS ENGINEERING
UNIVERSITY OF ALBERTA
EDMONDTON, ALBERTA, CANADA

Will present a seminar on

# "HYDRODYNAMIC INTERACTIONS IN ENERTIAL SOLID-LIQUID SUSPENSIONS"

Flowing solid-liquid suspensions are abundant in natural and engineered systems. In general, solid-liquid flows span a multi-dimensional parameter space, with coordinates such as the Stokes number, the solids volume fraction, the density ratio, and Reynolds numbers. We are interested in systems with appreciable inertia effects – i.e. non-zero Stokes and Reynolds numbers – having density ratios of the order of one (typical for solid-liquid systems) and solids volume fractions of at least 0.1. Additional effects are strongly inhomogeneous solids distributions, non-Newtonian liquids, sticky particles that tend to aggregate and particles that are non-spherical so that shape effects come into play. This all leads to a rich spectrum of solid-liquid and solid-solid interactions at the scale of individual particles. To reveal these interactions we perform direct simulations of collections of a few thousand of particles carried by a liquid flow. For this we use the lattice-Boltzmann method supplemented with an immersed boundary approach. This computational framework (with its advantages and limitations) will be discussed. The emphasis, however, will be on applications such as erosion and sedimentation, fluidization, flocculation, and drag in non-Newtonian suspensions.

## THURSDAY, MARCH 10, 2011
## COOKIES AND COFFEE -- 2:45 P.M.
## SEMINAR -- 3:00 P.M.
## SARKEYS ENERGY CENTER, ROOM M-204

**THIS IS A REQUIRED SEMINAR FOR CHE 5971**

Accommodations on the basis of disability are available by contacting the office above three days before the event.