## **CHEMICAL, BIOLOGICAL & MATERIALS ENGINEERING**

100 E. Boyd, Sarkeys Energy Center, T-335
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The University of Oklahoma
Norman, Oklahoma
2011 – 2012 Seminar Series

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Will present a seminar on

## "PHYSICS AND MODELLING OF PARTICLE DISPERSION IN TURBULENT FLOWS"

Particle deposition and entrainment in turbulent flows is influenced by inertia, gravity and local flow forcing. The role of inertia is intriguing: an inertial particle acts as a low-pass filter for high frequency turbulence fluctuations with a response fully determined by the complex pattern of coherent fluid motions. This response induces a preferential distribution of particles which plays a key role in a variety of industrial and environmental processes. In these processes, preferential distribution controls the rate at which reaction rates, dispersion re-entrainment and sedimentation.

To investigate preferential distribution we analyzed the different turbulent archetypal flow, such as boundary layers, jets and stratified flows in connection with the time and space local mechanisms by which transfer and segregation of inertial particles take place. From a phenomenological viewpoint, it was observed that fluid motions in turbulent boundary layers are intermittent and have a strongly organized and coherent nature represented by the large scale motions. We focused our attention also on the presence of shear which flavors wall turbulence with a unique multiscale aspect and adds intricacy to the role of inertia and gravity in influencing particle motion, and we were able to demonstrate that a sound rendering of wall turbulence mechanisms is required to produce a physical understanding of particle motion in turbulence. We demonstrate that without this understanding, advanced numerical predictions as for instance Large Eddy Simulations are seriously challenged.

THURSDAY, NOVEMBER 17, 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 before the event.