

CHEMICAL, BIOLOGICAL & MATERIALS ENGINEERING

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The University of Oklahoma

Norman, Oklahoma

2012 – 2013 Seminar Series

DR. CHRISTINE M. HRENYA

PROFESSOR

DEPARTMENT OF CHEMICAL AND BIOLOGICAL ENGINEERING

UNIVERSITY OF COLORADO

BOULDER, COLORADO

Will present a seminar on

“HYDRODYNAMICS OF GAS-SOLID FLOWS WITH A CONTINUOUS SIZE DISTRIBUTION: EXPERIMENTS AND THEORY”

Gas-solid fluidization is prevalent in nature and industry alike – windstorms, landslides, pneumatic transport lines, fluidized beds, and lunar soil ejection upon spacecraft landing, to name just a few. Often, these flows are characterized by a continuous distribution of particle sizes. For example, the coal and biomass feedstock used for energy production is characterized by a continuous size distribution that is lognormal in character. Nonetheless, the bulk of work done to date has focused on binary mixtures. Here, we explore experimentally the behavior of gas-fluidized systems in which the solids have a continuous size distribution. Surprisingly, many of the well-documented qualitative trends associated with binary mixtures are not observed for their continuous counterparts. For example, size segregation in binary mixtures is well known to increase with size disparity, while a non-monotonic trend is observed for continuous distributions. Motivated by such differences, efforts are also made to apply kinetic-theory models for a discrete number of species to continuous distributions. Specifically, a moment-based method is used to approximate the continuous distribution, and it is found that a relatively small number of species is needed for accurate predictions. This finding bodes well for the computational requirements needed to describe the more complex, yet more realistic, continuous size distributions.

THURSDAY, SEPTEMBER 6, 2012

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.