Weekly CEAFM Seminar: Fall 2014

JOHNS HOPKINS
Center for Environmental
& Applied Fluid Mechanics

Date: **Friday, November 14, 2014**

Time: 11:00 AM

Location: Gilman Hall # 132

Speaker: **Prof. Vemuri Balakotaiah** (University of Houston)

Title: ***"Dynamics of Waves in Gas-Liquid Two-Phase Flows"***

Abstract

Gas-liquid two-phase flows occur in many applications such as petroleum production systems, chemical reactors, nuclear, space, power and geothermal industries. The fluid mechanics of such flows can be better understood by studying isothermal two component systems. Even in such idealized systems, while exact governing equations can be written with interfacial boundary conditions, the degree of complexity of these models makes the solution practically not reachable even with the present day computational power. The main difficulty is in keeping track of the interfacial geometry between the phases, taking into account the various length scales and steep gradients that exist across the interface. In this talk, I will focus on two problems that I have some experience in the past few years. The first is that of interfacial waves in the so called "annular flow regime" of gas-liquid flows, the simplest case being that of waves on an inclined or vertically falling film. The second problem is that of void fraction waves in the so called "pulse flow" regime that exists in gas-liquid flows through a randomly packed bed of solid particles. For these two specific cases, I hope to illustrate how experimental data combined with theory and analysis can lead to useful engineering correlations.