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Center for Environmental
& Applied Fluid Mechanics

Weekly CEA FM Seminar: Fall 2011

Date: **Friday, October 28, 2011**
Time: 11:00 AM
Location: Gilman 50 (Marjorie M. Fisher Hall)
Speaker: **Dr. Nicos Martys** (National Institute of Standards and Technology)
Title: ***"Multi-scale modeling of suspensions:
application to cement based materials"***

Abstract

A multi-scale approach for modeling suspensions composed of particles with a wide size distribution, like that in cement based materials, is described. This multi-scale approach separates the suspension into fluid components that are identified by a characteristic solid inclusion size. Very simply, measured or modeled rheological properties of a characteristic fluid associated with one length scale, serve as the matrix or embedding fluid that larger scale solid inclusions are added to. The new "homogenized" fluid is usually non-Newtonian in nature. To account for the non-Newtonian properties of the matrix fluid a smoothed-particle-hydrodynamics-based approach was developed.

After a brief description of the model, simulation results are presented that help develop critical insights into mechanisms that control the rheological properties of cement based materials and, further, to improve interpretation of physical measurements.

Bio

Dr. Martys joined the Inorganic Building Materials Group of the Building Materials Division in October 1992. Dr. Martys research interests include mesoscopic modelling of complex fluids, the phase separation of fluids in confined geometries and under shear, moisture and diffuse transport porous materials.

Dr. Martys is currently developing computational models which describe the rheological properties of dense suspensions as a function of the shape and size distribution of the solid inclusions.