Center for Environmental & Applied Fluid Mechanics

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11:00 a.m., 110 Maryland Hall

Multiscale Modeling of Suspension Flows

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The analysis of particles suspended in nonlinear, viscous shear flows is playing an increasingly important and often critical role in a number of developing technologies including composite and ceramic processing, encapsulation of electronic components, secondary oil recovery by hydraulic fracturing, carbon-dioxide sequestration, and the transport of sediments, contaminants, and slurries, to name a few. A common outstanding fundamental research issue associated with the technologies listed above is the development of the relationship between microstructural interactions and macroscopic behavior. Linking recent progress in molecular- and nano-scale science to progress in the ability to accurately model suspension flows at the macroscale is an important scientific challenge. A multidisciplinary research program including experiment, analysis, and high-performance computing has been undertaken with the end goal of developing a reliable rheological model to allow engineers and scientists to design efficient processes for this important class of problems.