

**MECHANICAL ENGINEERING DEPARTMENT
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Clarifying Some Basic Consequences of Confinement for Fluids

by

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Wednesday, September 26, 2007
3:15 p.m. — Refreshments before the seminar
3:30 p.m. — Graduate Seminar
Room 1130 ME

ABSTRACT — It is widely appreciated that both molecular and colloidal fluids confined to small spaces behave differently than they do in the bulk. These differences have generated interest because confined fluids feature prominently in both nature and technology. Examples include dynamics of water near proteins or in concentrated cellular environments, transport processes across biological membranes, and fluid flows encountered in micro- or nanofluidic devices, to mention a few. Given that a significant fraction of the molecules (or particles) in these systems populate highly inhomogeneous interfacial environments, it is easy to appreciate why confinement might have nontrivial consequences for their thermodynamic properties and transport coefficients (e.g., diffusivity and viscosity). In this talk, we explore how computer simulations and liquid-state theory can be leveraged to understand the classical effects of confinement. The key insight is that while many individual properties of confined fluids are significantly modified relative to the bulk, a few relationships between those properties are not. We discuss how this insight naturally leads to new and straightforward means for predicting a priori the behaviors of confined fluids.

BIO — Thomas M. Truskett joined the the University of Texas at Austin in 2002, where he is currently Associate Professor and Paul D. & Betty Robertson Meek Fellow of Chemical Engineering. He received his Ph.D. in chemical engineering from Princeton University followed by a postdoctoral fellowship in biophysics at UCSF. Tom's research group develops computational and theoretical tools to probe the molecular behavior of solid and liquid states of matter at the nanoscale. He is an Alfred P. Sloan Research Fellow, a David and Lucile Packard Foundation Fellow, a recipient of the National Science

Foundation's CAREER Award and the 2007 recipient of the Allan P. Colburn Award from the American Institute of Chemical Engineers.

Informal Faculty Luncheon: Wednesday, September 26, 2007, 12:00 noon. Meet in 1100 ME and walk to lunch with other faculty. Prof. Thomas Truskett will be able to attend.