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Crazy Interdisciplinary Ideas Seminar Series

**Computational Challenges for Pore-Scale Image Based Modeling****Karsten E. Thompson, LSU**RSVP to [leanne@cct.lsu.edu](mailto:leanne@cct.lsu.edu) to reserve your pizza lunchJohnston Hall 338  
September 25, 2012 - 11:00 am**Abstract:**

This forum will provide an opportunity to explore interdisciplinary approaches to pore-scale modeling in porous materials. The idea for this discussion stemmed from a talk given this past summer, the abstract for which is below.

Fluid transport in porous media is relevant to processes ranging from energy production to environmental transport to advanced materials manufacturing. A long-standing problem faced by engineers working in these areas are linking the fundamental physics that occur at the pore scale to the empirical design equations that must be used in practice. Over the past two decades, the development x-ray microtomography and similar 3D imaging techniques has led to a new area of computational modeling, which we refer to as image-based modeling. Using these techniques, simulation of pore-scale transport processes is performed directly on microtomography images (as opposed to idealized structures as in the more traditional approach).

High-performance computing is relevant to this area of research because of the large computational problems that are generated from small physical structures (often millimeters in scale at the largest). This talk will use 3D microtomography images to introduce three interesting physical problems that are of interest to scientists and engineers, and then show novel computational methods that are being developed to simulate fundamental physics at the pore scale.

Co-speaker is Mark Jarrell.

**Speaker's Bio:**

Karsten Thompson is a professor and department chair in the Craft & Hawkins Department of Petroleum Engineering at LSU. He has a BS in chemical engineering from the University of Colorado and a PhD degrees from the University of Michigan. Prior to joining the Petroleum Engineering Department, he was on the chemical engineering faculty at LSU for 15 years. His area of research is transport in porous materials, with an emphasis on pore-scale and multi-scale numerical modeling.

