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Coast to Cosmos Lecture Series

Computational Modeling in Digital Rock Technology**Karsten E. Thompson, Louisiana State University**

Professor & Department Chair, Craft & Hawkins Department of Petroleum Engineering

Digital Media Center 1034
October 02, 2015 - 12:00 pm**Abstract:**

The term "digital rock technology" has taken root in the oil and gas industry in the last decade. It refers to high-resolution 3D imaging of porous rocks, followed by image analysis and computational modeling to extract information ranging from mineralogy to rock mechanics to multiphase flow behavior. The technology has spurred at least four start-up companies across the world, and traditional oilfield service and core analysis companies are positioning themselves to make sure they are involved, either through internal R&D or acquisition of technology.

A number of researchers at LSU have been active participants in digital rock technology during its development years. This continues today but in a different research environment: the base technology has been commercialized successfully, but major needs and questions remain regarding how the technology fits into large-scale, applied problems in the oil and gas industry.

This talk will provide a brief history and introduction to image-based modeling, illustrate the significant computational and modeling challenges, and show selected ongoing research at LSU. The latter will highlight issues that will be important to the continued development of the technology, including modeling techniques that operate over many length scales, computational methods that allow significant speedup, and novel methods for dealing with the multiphase and multiphysics processes that occur in the subsurface.

Speaker's Bio:

Karsten E. Thompson is professor and Department Chair in the Craft & Hawkins Department of Petroleum Engineering. He holds the Longwell-Leonard Distinguished Professorship and the Malcolm C., Jr. and Gene Perdue Lowe Professorship.

Dr. Thompson's research interests are in computational modeling of transport in porous materials, with a particular interest in high-resolution 3D imaging of materials and image-based modeling that relates to oil and gas production. He heads the PoreSim research consortium and collaborates/consults extensively with industry on a variety of applied research topics. He teaches graduate and undergraduate courses in the areas of fluid mechanics, computational modeling, heat and mass transfer, flow in porous media, and reservoir dynamics.

Dr. Thompson has been at LSU for 19 years, originally joining the Department of Chemical Engineering as an assistant professor. He was professor of chemical engineering prior to moving to petroleum engineering as department chair in 2011. He has a B.S. degree from the University of Colorado and M.S.E. and PhD degrees from the University of Michigan, all in chemical engineering.

