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Mathematical Challenges and Hot Topics in Oil Reservoir Simulation**Guan Qin, Institute for Scientific Computation, Texas A&M University**Johnston Hall 338
March 30, 2007 - 03:00 pm**Abstract:**

The purpose of mathematical reservoir simulation in petroleum applications is to try to optimize the recovery of hydrocarbon from underground reservoirs. To accomplish this, one must be able to predict the performance of the reservoir under various production schemes. There are two essential challenges, efficient mathematical modeling and software architecture design, while developing a comprehensive oil reservoir modeling and simulation platform that should be an integration of subsurface models, facility network models and economic models. Effective subsurface models must be constructed to describe the complex geomechanical, physical, and multiphase fluid flow processes that accompany the various recovery mechanisms. Upscaling need to be utilized to provide effective rock properties for coarse-grid reservoir models used for field-scale simulations. Aspects of coupling different grids, different discretization schemes and different physical equations also need to be addressed through various numerical techniques.

Speaker's Bio:

Guan Qin joined Institute for Scientific Computation, Texas A&M University as Associate Director in August 2004. Before joining Texas A&M University, he spent more than 8 years at Upstream Strategic Research Center, Mobil Oil and then Exxon Mobil Upstream Research Company from 1996 to 2004. He also served as a reservoir engineer with Research Institute of Petroleum Exploration & Development (RIPE) from 1984 to 1989. As a reservoir engineer, he has 14-year of progressively responsible research and development experiences in mathematical modeling of multi-phase and multi-component fluid flow in porous media, related numerical algorithms and computational methods, and software architecture design and development. Areas of expertise include reservoir engineering, reservoir simulation, basin simulation, software architecture design and development, field performance analysis and production engineering. Guan Qin joined Exxon Mobil Upstream Research Company after the merger of Exxon and Mobil in 2000. Over the past 4 years, he has been working on various assignments that include production data inversion, flow-based scaleup, reservoir simulation studies, prospect evaluations, basin simulations and software architecture design. During his tenure with Upstream Strategic Research Center at Mobil Oil, he is responsible for building a research program in numerical analysis, advanced computational methods and scientific software architecture design in reservoir and basin simulations. Activities include organizing external research programs, recruiting and supervising post-doctoral fellows, setting directions for the program as well as developing numerical testing software package and finite element object library. Guan Qin grew up in Beijing, China. He attended Tsinghua University, China for his undergraduate training. Later he got his Ph.D. in Petroleum Engineering from University of Wyoming, USA.

Refreshments will be served.**This lecture has a reception.**