UNIVERSITY of HOUSTON

CULLEN COLLEGE of ENGINEERING

Department of Civil & Environmental Engineering

CIVE 6111 Graduate Seminar Series

Satish Karra
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Los Alamos National Laboratory (LANL)

Discrete Fracture Network Modeling for Subsurface Systems

Friday, November 20th 2015
2:45pm-3:45pm
Location: Classroom Business Building (CBB)
Room: 104

Abstract

Several subsurface related applications including unconventional oil & gas, geological carbon sequestration, nuclear waste repository science, involve understanding flow and transport in fractured rock. Discrete fracture network (DFN) modeling provides a promising alternative to continuum-based approaches (such as stochastic continuum, dual/multiple continuum) for computational simulations of fluid flow and transport through sparsely fractured rocks in the subsurface. In this approach, fractures are explicitly represented as two-dimensional planes in three-dimensions where these planar fractures are stochastically generated based on geologic site information such as fracture orientation, shape, location and aperture distributions. Once these DFNs are generated, they are meshed and flow is solved on these meshes. The capability to include detailed site information leads to more accurate representation of the medium in contrast to using effective properties in continuum approaches…

About the speaker:

Dr. Satish Karra is a computational subsurface scientist in the Earth and Environmental Sciences division at Los Alamos National Laboratory (LANL). His research interests are modeling coupled multiphysics/multiscale processes in porous media, with applications to large-scale subsurface energy and environmental problems. He is one of the core-developers of the widely used open-source high-performance computing multiphysics subsurface simulator PFLOTRAN (www.pflotran.org), that can be used on laptops to supercomputers with 100,000+ processors. His research is being applied to LANL's efforts in subsurface applications such as Arctic hydrology, oil and gas recovery, used fuel disposition, enhanced geothermal systems, geological carbon sequestration and contaminant transport. He received his PhD degree in Mechanical Engineering from Texas A&M University in 2011.