Geomechanics the Adventurous Way – Paradoxes in Multi-scale Multi-physics Processes in Geomaterials

Prof. Liangbo Hu, Ph.D.
University of Toledo
4:30 pm November 11, 2015
Room 2355 GG Brown

ABSTRACT

Geotechnical engineers are facing new challenges that continue to emerge at the interface of materials, environments and energy. Geomaterials often respond to certain environmental circumstances through generation of a series of self-regulatory, usually coupled, mechanisms of mechanical deformation and non-mechanical processes. In many engineered geo-processes, especially those related to energy explorations, the interactions between biological, chemical, thermal, hydrological and geomechanical processes may become intensified or accelerated, and play an even more dominant role. This presentation briefly surveys some of the research topics studied by the Environmental and Energy Geomechanics Group at the University of Toledo in the pursuit for improved understanding of multi-scale multi-physics processes in geomaterials, as well as some paradoxical findings during this effort. These topics include sinkholes, landslides, subsidence, expansive soils and geological CO₂ sequestration; the primary example discussed in detail is the bio-mediated calcite precipitation for potential soil improvement. The paradoxes found in these adventures are indeed fascinating; intricacies of interactions and couplings of multi-physics phenomena across multiple scales seem to lead to global questions we are struggling to answer, are natural processes typically self-organized and perhaps should not be intervened? and to what extent should anthropogenic adventures be allowed to disrupt or alter the natural ways of evolution?

The Michigan Geotechnical Seminar Series is sponsored by:

SPARTAN SPECIALTIES LTD
Soil Stabilization Solutions

SME

HARDMAN CONSTRUCTION

****** Everyone is invited – refreshments will be available**********
More information on this seminar series: http://www.umich.edu/~geotech/lecture.html