Date:	February 27 th
Time:	11:00 AM
Location:	Ames 234
Speaker:	Dr. Tom Hou California Institute of Technology
Title:	''Multiscale modeling and computation for flows in heterogeneous porous media''

Abstract

Many problems of fundamental and practical importance contain multiple scale solutions. Composite materials, flow and transport in porous media, and turbulent flow are examples of this type Direct numerical simulations of these multiscale problems are extremely difficult due to the wide range of length scales in the underlying physical problems. In this talk, I describe some of our recent efforts in developing multiscale computational methods to upscale two-phase flows in strongly heterogeneous porous media. Further, we introduce a new multiscale analysis for convection dominated incompressible flow with multiscale solutions. The main idea is to construct semianalytic multiscale solutions locally in space and time, and use them to construct the coarse grid approximation to the global multiscale solution. Our multiscale analysis provides an important guideline in designing a multiscale method for computing incompressible flow with multiscale solutions.