UCCS Department of Mathematics Math Colloquium Series DR. VICTOR GINTING UNIVERSITY OF WYOMING



PATE: THURSDAY FEBRUARY 1, 2018

TIME:

12:30PM-1:30PM (REFRESHMENTS AT 12:15PM)

LOCATION:

OSBORNE ROOM #A204

Multiscale Methods for Flow and Transport in Porous Media

Abstract: Multiscale solution methods are currently under active investigation for the simulation of subsurface flow in heterogeneous formations. These procedures capture the effects of fine scale permeability variations through the calculation of specialized coarse scale basis functions. Most of the multiscale techniques presented to date employ localization approximations in the calculation of these basis functions. We present some applications of these techniques to simulations of subsurface flow and transport in porous formations. Furthermore, we also discuss simulations of advection dominant boundary value problems. The fact that the diffusion component is much less pronounced in relative comparison to the advection component produces boundary layers in the solution, for which standard numerical techniques typically exhibit instability. We describe a multiscale solution method that has the capability to capture the boundary layer. The proposed method maintains efficiency of the approximation and retains its stability at relatively small extra cost.

For more information please contact the UCCS Math Department at (719) 255-3311 http://www.uccs.edu/math