APPLIED AND NUMERICAL ANALYSIS SEMINAR

Thursday March 3   Period 7

Speaker: Sai-Mang Pun | Texas A&M University

Title: Computational multiscale methods for heterogeneous porous media

Abstract: Multiscale phenomena are very common in scientific applications such as the study of biochemical reactions, elastic mechanics, geoscience, and geophysics in porous media. In this talk, I will first motivate the research of multiscale modeling from the perspective of a computational mathematician. It has been aware that direct simulation of the physical system involving multiple scales will lead to tremendously large degrees of freedom using traditional approaches; it is therefore expensive in terms of computing cost. The main goal of multiscale modeling is to make use of the intrinsic structure of the physical systems to make fast simulation feasible in practice. I will present some recent findings of adaptive model reduction and computational multiscale methods for highly heterogeneous problems; several concrete examples in applications will be provided and fully discussed.