

Graduate Seminar in Mathematics

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**Thursday, March 3, 2016
1:00p.m., HH-3017**

Stochastic domain decomposition for parallel grid generation

Abstract:

In this talk a method for the parallel generation of adaptive meshes using stochastic domain decomposition is presented. The method rests on numerically evaluating the stochastic representation of the exact solution of a linear elliptic or linear parabolic mesh generator for generating the mesh at the interfaces of the sub-domains. Unlike traditional domain decomposition, this method does not require iteration on the sub-domains or optimization of the transmission conditions to generate adaptive meshes over the entire domain. We show the generation of adaptive meshes for prescribed mesh density functions and study the scaling properties of the algorithm. A few physical examples for the parallel generation of adaptive meshes for Burgers equation and the shallow-water equations are presented. This is joint work with Ronald Haynes and Emily Walsh.