

TEMPLE UNIVERSITY
Department of Mathematics

Applied Mathematics and Scientific Computing Seminar

Room 617 Wachman Hall

Wednesday, 8 March 2017, 4:00 p.m.

Smooth Subdivision Multigrid and Applications to Life Science

by Gillian Queisser
Temple University

Abstract.

Solving large scale applications on massively parallel systems is particularly interesting and challenging for life science problems. Complex geometric constraints and detailed models, based on non-linear coupled partial differential equations (PDEs), require careful attention to the simulation cascade from domain discretization, building multigrid hierarchies to solving the PDE-system. This talk will present a smooth subdivision multigrid technique for optimized grid refinement. The strategy is based on subdivision volume theory using hybrid-element meshes. Furthermore, concepts for hybrid-dimensional modeling and simulation of life science problems are presented. Results are shown for computational benchmark problems as well as for real life applications.