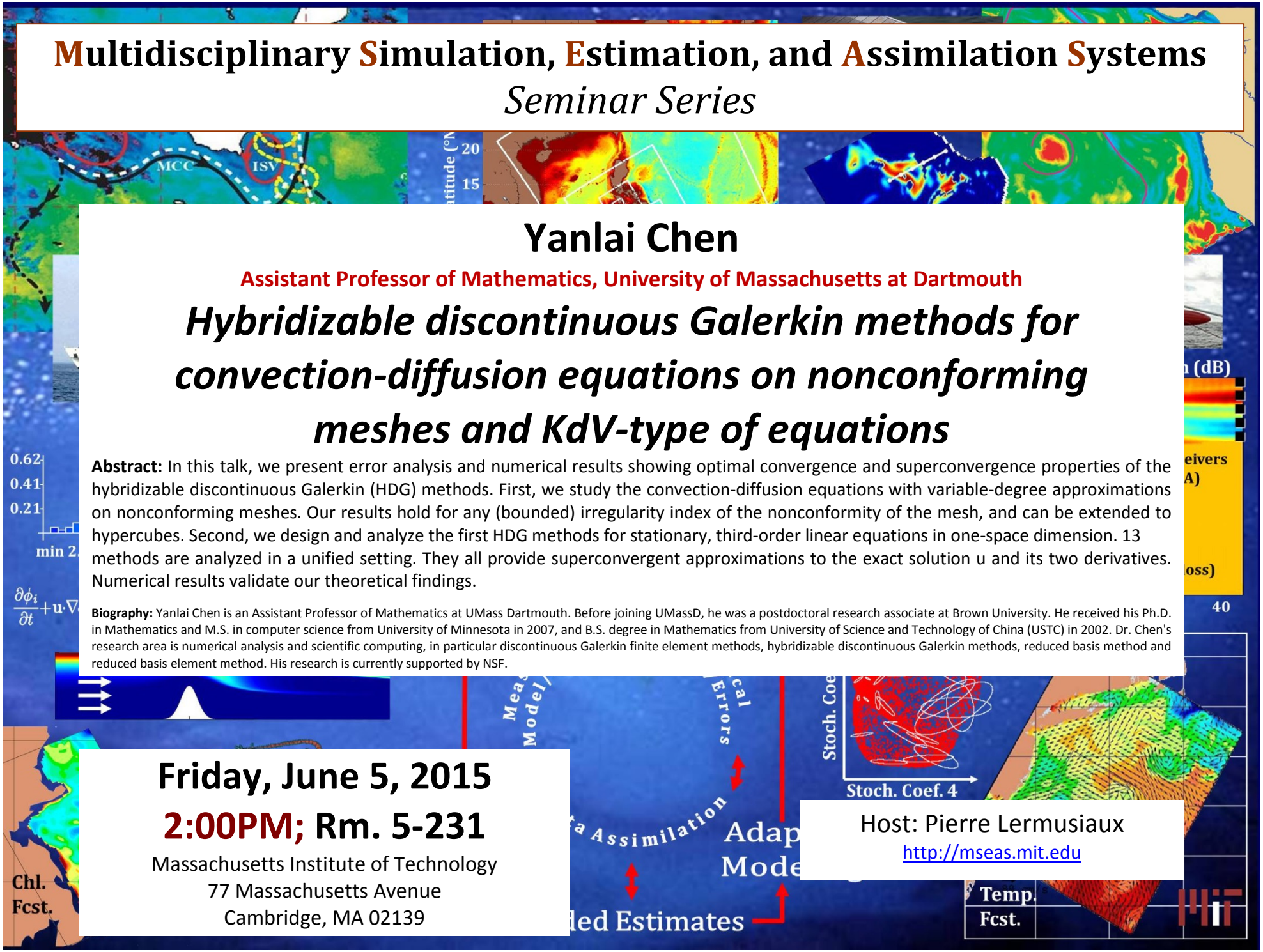
Multidisciplinary Simulation, Estimation, and Assimilation Systems

Seminar Series



Yanlai Chen

Assistant Professor of Mathematics, University of Massachusetts at Dartmouth

Hybridizable discontinuous Galerkin methods for convection-diffusion equations on nonconforming meshes and KdV-type of equations

Abstract: In this talk, we present error analysis and numerical results showing optimal convergence and superconvergence properties of the hybridizable discontinuous Galerkin (HDG) methods. First, we study the convection-diffusion equations with variable-degree approximations on nonconforming meshes. Our results hold for any (bounded) irregularity index of the nonconformity of the mesh, and can be extended to hypercubes. Second, we design and analyze the first HDG methods for stationary, third-order linear equations in one-space dimension. 13 methods are analyzed in a unified setting. They all provide superconvergent approximations to the exact solution u and its two derivatives. Numerical results validate our theoretical findings.

Biography: Yanlai Chen is an Assistant Professor of Mathematics at UMass Dartmouth. Before joining UMassD, he was a postdoctoral research associate at Brown University. He received his Ph.D. in Mathematics and M.S. in computer science from University of Minnesota in 2007, and B.S. degree in Mathematics from University of Science and Technology of China (USTC) in 2002. Dr. Chen's research area is numerical analysis and scientific computing, in particular discontinuous Galerkin finite element methods, hybridizable discontinuous Galerkin methods, reduced basis method and reduced basis element method. His research is currently supported by NSF.

Friday, June 5, 2015

2:00PM; Rm. 5-231

Massachusetts Institute of Technology
77 Massachusetts Avenue
Cambridge, MA 02139

Host: Pierre Lermusiaux
http://mseas.mit.edu