

Prof. Weizhang Huang, University of Kansas

Tuesday, May 28, 2019 1:00p.m., SN 2041

Phase-field modeling of brittle fracture

Abstract:

The phase-field approach for numerical simulation of initiation and propagation of brittle fracture will be presented. Challenges of the approach, including non-smoothness of the energy functional, violation of fracture boundary conditions, and the need for mesh adaptation, and possible remedies for these challenges will be discussed. In particular, a moving mesh finite element method will be presented for the numerical solution of a phase-field model for brittle fracture.

Biography of the speaker:

Dr. Huang received his PhD in 1989 from Institute of Applied Mathematics, Chinese Academy of Sciences, Beijing. He is currently professor and chair of Department of Mathematics, University of Kansas. His research is in Numerical Analysis and Scientific Computing. He is most recognized for his fundamental contributions to adaptive moving mesh methods, including the development of the MMPDE approach and theory and its various applications. His other major contributions include analysis of conditioning of finite element/volume equations on general meshes, error-based metric tensors for anisotropic mesh adaptation, and development and analysis of algorithms preserving solution positivity or the maximum principle. He has 120+ publications, including a monograph with the title "Adaptive Moving Mesh Methods" published by Springer in 2011.