1147-65-526 **Xiaobing Feng*** (xfeng@math.utk.edu), The University of Tennessee, 218 Ayres Hall, 1403 Circle Drive, Department of Mathematics, Knoxville, TN 37996. *Finite Difference and Discontinuous Galerkin Methods for Fully Nonlinear Second Order PDEs.*

In this talk I shall first present a newly developed narrow-stencil finite difference framework for approximating viscosity solutions of fully nonlinear second order PDEs (such as Hamilton-Jacobi-Bellman and Monge-Ampere equations). The focus of the talk will be on discussing how to compensate the loss of monotonicity of the schemes (due to the use of narrow stencils) in order to ensure the convergence of the schemes, and to explain some key new concepts such as generalized monotonicity, consistency and numerical moment. The connection between the proposed methods and some well-known finite difference methods for first order Hamilton-Jacobi equations will be explained. I shall then discuss how to extend these finite difference techniques to the (high order) discontinuous Galerkin setting, This talk is based on some recent joint works with Tom Lewis of the University of North Carolina at Greensboro. (Received January 25, 2019)