1125-65-1389 **Xiaobing Feng*** (xfeng@math.utk.edu), Department of Mathematics, The University of Tennessee, Knoxville, TN 37996, **Stefan Schnake** (schnake@math.utk.edu), Department of Mathematics, The University of Tennessee, Knoxville, TN 37996, and **Michael Neilan** (neilan@pitt.edu), Department of Mathematics, University of Pittsburgh, Pittsburgh, PA 15260.

Finite element and discontinuous Galerkin methods for linear elliptic PDEs in non-divergence form.

In this talk I shall present some newly developed finite element (FE) and discontinuous Galerkin (DG) methods for approximating strong solutions of a class of linear elliptic PDEs in non-divergence form whose leading coefficients are only continuous. Such PDEs are building blocks of fully nonlinear Hamilton-Jacobi-Bellman equations arising from stochastic optimal control and financial mathematics. The proposed numerical methods can use either C^0 or L^2 finite element spaces, they are very simple to implement and can be done using standard FE or DG codes. On the other hand, the convergence analysis of the methods is quite involved and very technical, it requires to establish a FE and a DG discrete Calderon-Zygmund theory, which will be the focus of this talk. Numerical experiments will be presented to demonstrate the effectiveness of the proposed FE and DG methods. This talk is based on two recent joint works with Michael Neilan of University of Pittsburgh and Stefan Schnake of the University of Tennessee. (Received September 16, 2016)