1172-65-221   **Juntao Huang*** (`huangj75@msu.edu`), **Yong Liu**, **Yuan Liu**, **Zhanjing Tao**, **Wei Guo** and **Yingda Cheng**. *A class of adaptive multiresolution ultra-weak discontinuous Galerkin methods for some nonlinear waves equations.*

In this talk, we will present our recent work on a class of adaptive multiresolution (also called adaptive sparse grid) ultra-weak discontinuous Galerkin (UWDG) methods for solving some nonlinear wave equations, including nonlinear Schrodinger equations, the Korteweg-de Vries (KdV) equation and its two dimensional generalization, the Zakharov-Kuznetsov (ZK) equation. For the ZK equation which contains mixed derivative terms, we develop a new UWDG formulation. The L2 stability and the optimal error estimate with a novel local projection are established for this new scheme on regular meshes. Adaptivity is achieved based on multiresolution and is particularly effective for capturing solitary waves and the blow-up phenomenon. Various numerical examples are presented to demonstrate the accuracy and capability of our methods. (Received August 29, 2021)