Title: Conservative discontinuous Galerkin methods for the generalized Korteweg-de Vries equation

Abstract: The Korteweg-de Vries (KdV) equation is a nonlinear mathematical model for the unidirectional propagation of waves in a variety of nonlinear, dispersive media. Recently it has attracted increasing attention as test-bed for the competition between nonlinear and dispersive effects leading to a host of analytical issues such global existence and finite time blowup, etc.

In this presentation, we construct, analyze, and numerically validate a class of conservative discontinuous Galerkin schemes for the generalized KdV equation. The schemes preserve the first two invariants (the integral and L2 norm) of the numerical approximations. We provide numerical evidence that this property imparts the approximations with beneficial attributes such as more faithful reproduction of the amplitude and phase of traveling wave solutions.