1135-35-2932   **Terrance L Pendleton*** (`terrance.pendleton@drake.edu`), IA , and **Hailiang Liu**. *On Invariant-Preserving Finite Difference Schemes for the Camassa-Holm Equation and the Two-Component Camassa-Holm System.*

The purpose of this talk is to develop and test novel invariant-preserving finite difference schemes for both the Camassa-Holm (CH) equation and one of its 2-component generalizations (2CH). The considered PDEs are strongly nonlinear, admitting soliton-like peakon solutions which are characterized by a slope discontinuity at the peak in the wave shape, and therefore suitable for modeling both short wave breaking and long wave propagation phenomena. The proposed numerical schemes are shown to preserve two invariants, momentum and energy, hence numerically producing wave solutions with smaller phase error over a long time period than those generated by other conventional methods. We first apply the scheme to the CH equation and showcase the merits of considering such a scheme under a wide class of initial data. We then generalize this scheme to the 2CH equation and test this scheme under several types of initial data. (Received September 26, 2017)