1154-76-1590 **K Chad Sockwell*** (kcsockw@sandia.gov), **Konstantin Pieper** and **Max Gunzburger**. *Mass Conserving, Hamiltonian-Structure-Preserving Reduced Order Modeling for the Rotating Shallow Water Equations.*

Ocean modeling, in a climate-modeling context, requires long time horizons over global scales, which when combined with accurate resolution in time and space makes simulations very computationally expensive. While high-resolution ocean-modeling simulations are still feasible on large HPC machines, performing uncertainty quantification or other many-query applications at these resolutions is not feasible. Reduced Order Modeling (ROM) techniques utilize existing simulation data to construct more efficient models. Models produced by these techniques provide a tremendous speed up at the cost of reduced accuracy. To offset this trade-off, novel strategies have been developed to retain as much accuracy as possible while still achieving tremendous speedups. Some of these methods improve accuracy by incorporating physical properties into the reduced model, leading to better solution quality. In this talk, a novel reduced order modeling method, the mass-conserving Hamiltonian-structure-preserving reduced order modeling method will be presented and applied to the rotating shallow water equations. (Received September 16, 2019)