

## A Discontinuous Galerkin Method for General Relativistic Hydrodynamics in thornado

Core-collapse supernovae (CCSNe) play an important role in the Universe: They are largely responsible for galactic distributions of metals, they are sources of gravitational waves, they are producers of immense numbers of neutrinos, and they are the progenitors of neutron stars, exotic objects which give astronomers insights into nuclear matter. The tremendous breadth and depth of information is not proffered easily however, for these are complicated, multi-physics phenomena which are difficult to model. The three main components—gravity, neutrino transport, and hydrodynamics—must be faithfully and robustly captured for the model to be useful. To that end we are developing a new code to model CCSNe, called thornado. This talk will focus on the (general relativistic) hydrodynamics component, for which we use a discontinuous Galerkin method of spatial discretization and an explicit strong-stability-preserving Runge-Kutta method of temporal discretization. The code has been validated against several challenging test-problems, including a relativistic Kelvin-Helmholtz instability problem, a relativistic 2D Riemann problem, and a relativistic standing accretion shock problem. Results from these problems will be shown, along with a description of the methods and associated caveats.