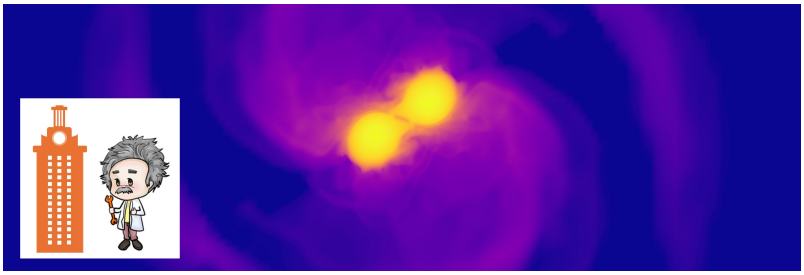

Contribution ID: **5** Type: **not specified**

(virtual) Numerical Relativity with Nmesh

Wednesday 11 June 2025 09:00 (1 hour)

We give an introduction to the Nmesh code, which is intended to run efficiently on large supercomputers. The goal is to solve challenging relativistic astrophysics problems such as binary neutron star or black hole mergers. To treat matter (e.g. neutron stars) we have implemented the Valencia formulation of the evolution equations for general relativistic hydrodynamics. These can be coupled to the evolution equations for gravity, for which we currently use the Generalized Harmonic system. The principal spatial discretization used in Nmesh is based on a discontinuous Galerkin method. However, we can also switch to finite difference or some form of finite volume methods, when needed in certain regions. We explain these methods and also how we can use a smoothness indicator to decide which scheme to use. We also show first results of the evolution of neutron stars, for single star and binary star cases.

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