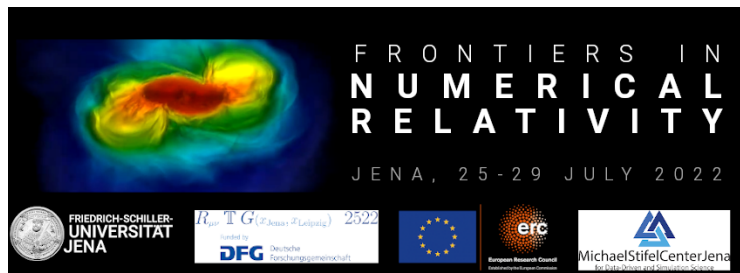


Frontiers in Numerical Relativity 2022 (FNR2022)



Contribution ID: 3

Type: **not specified**

A high-order discontinuous Galerkin-finite-difference hybrid method for numerical relativity

Wednesday, 27 July 2022 15:00 (45 minutes)

Conservative finite difference methods have proven extremely robust and reliable for magnetohydrodynamics simulations of binary neutron star mergers. However, finite difference methods are generally less accurate and efficient than spectral methods when the solution is smooth, e.g. away from the stellar surfaces. The attractiveness of spectral methods has been demonstrated by thousands of long and highly accurate binary black hole simulations. Discontinuous Galerkin methods seek to provide the accuracy of spectral methods while also robustly capturing shocks in hydrodynamics simulations. I will give an overview of a discontinuous Galerkin-finite-difference hybrid method that inherits the best properties of both spectral and finite difference methods. I will show longterm simulations of magnetized and rotating neutron stars, as well as test problems to demonstrate the reliability and accuracy of the hybrid method.

Presenter: Dr DEPPE, Nils (California Institute of Technology)

Session Classification: Invited talks