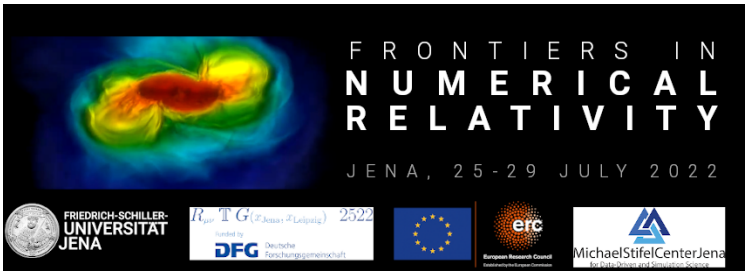

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Free hyperboloidal evolution using conformal compactification

Monday, 25 July 2022 17:00 (15 minutes)

Gravitational wave radiation, our window for probing the strong field and dynamical regime of gravity, is unambiguously defined only at future null infinity - the location in spacetime where light rays arrive and thus where signals and global properties of spacetimes can be measured. A convenient way to reach it within numerical relativity simulations is by means of hyperboloidal foliations, smooth spacelike slices that reach future null infinity. Among the approaches to the hyperboloidal problem, here I will focus on conformal compactification, based on an idea by Nobel-laureate Roger Penrose. Our implementation uses the BSSN and Z4 formulations of the Einstein equations and has provided some very promising numerical results of a massless scalar field coupled to gravity in spherical symmetry. I will give an update on the current ongoing work towards a 3D generalization, as the final goal of this work is to provide a far-field numerical framework that includes null infinity for simulations of compact object mergers with accurate gravitational wave extraction.

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Session Classification: Short talks