Beitrag ID: **69** Typ: **nicht angegeben**

Neutrino Transport in Binary Neutron Star Mergers

Dienstag, 24. September 2024 11:45 (20 Minuten)

Gravitational-Wave and Kilonova measurements have established Binary Neutron Star (BNS) mergers as a predominant candidate for the production of the heaviest elements in our Universe. Under hot and dense conditions such as those encountered in BNS mergers, neutrino transport effects play a crucial role in initiating mass-outflows and in shaping the composition of the ejecta and of the r-process nucleosynthesis in them. As such, in order to correctly model a BNS merger, neutrino emission, propagation and absorption also need to be taken into consideration. In this talk, we will give a brief overview of one of the methods that is used in simulating neutrino transport in the context of BNS mergers. Specifically, we will elaborate on a truncated moments scheme which evolves the first two moments of the neutrino radiation field. We will also present and discuss some of the first results of our implementation of the scheme in the 3D general relativistic moving-mesh code AREPO.

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Sitzung Einordnung: Session