

Binary Neutron Star Mergers and the Quark-Matter Equation of State

Monday, 16 May 2022 14:00 (20 minutes)

As neutron stars merge, very high nuclear densities are attained in the core. As the merged hyper neutron star collapses to form a black hole, it must inevitably pass through the transition from hadronic to a quark matter. Hence, the associated post-merger gravitational radiation could be used to probe properties of the quark-matter physics. In this talk, we analyze the evolution and gravitational wave emission from binary neutron star mergers using various parameterizations of the Quark-Hadron Crossover (QHC19) EOS. This EoS is motivated by the NJL nonperturbative description of quark matter including the quark pairing interaction and the formation of a color superconducting state. QCD. We show that the postmerger gravitational wave emission is very sensitive to properties of the high density-quark matter EOS and can be used to probe properties of matter in this non-perturbative phase of QCD.

Primary authors: Prof. MATHEWS, Grant (University of Notre Dame/ICRANet); Mr KEDIA, Atul (University of Notre Dame); Dr SUH, InSaeng (University of Notre Dame); Dr KIN, Hee (Sogang University)

Presenter: Prof. MATHEWS, Grant (University of Notre Dame/ICRANet)

Session Classification: Connection with Prof. Ruffini for greetings