

Updated constraints on the neutron star equation of state

The nuclear matter equation of state (EOS) is poorly known at the limit of high density and temperature. While this limit is not currently reached in laboratory settings, it is in neutron star interiors. In this talk, I will discuss an approach to probing the EOS using neutron star measurements. I will describe how neutron star mass and radius inferences from the NICER telescope and tidal deformability measurements, from the LIGO-VIRGO interferometers, constrain the EOS. Furthermore, I will explain how results from ab initio calculations - such as chiral effective field theory (cEFT) and perturbative QCD (pQCD) - can be incorporated to perform EOS inference. I will also discuss how the recent implementation of cEFT calculations including uncertainties obtained with Gaussian processes updated our knowledge of the high-density EOS behavior and enabled the inference of EOS parameters.

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