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Searching for quark matter: from loops to neutron-star cores

Thursday 28 July 2022 09:00 (45 minutes)

I will describe recent advances in the study of dense quark matter, expected to be present inside the cores of massive neutron stars. I will concentrate on two somewhat differing topics: first, on perturbative studies of the bulk thermodynamic properties of unpaired quark matter, and second, on the application of these results to the model-independent determination of the neutron-star-matter equation of state. I will argue that with recent improvements in ab-initio calculations at low and high density as well as in astrophysical measurements, we are close to being able to pinpoint the properties of matter inside neutron-star cores to such an extent that a reliable phase identification will soon become possible.

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