

RECENT TRENDS IN THE HIGH-DENSITY EOS

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I discuss recent theoretical developments in the high-density EoS relevant for astrophysical applications in compact stars and supernova/merger simulations as well as for near-future third-generation heavy-ion collision experiments at FAIR-CBM and JINR-NICA.

The indications that at high densities chiral symmetry restoration may not be accompanied with quark deconfinement, but rather with the occurrence of a "quarkyonic phase" challenge our traditional view on the emergence of QCD degrees of freedom in compact star interiors and heavy-ion collisions. Steps towards a theoretical description of quarkyonic matter within a cluster expansion for chiral quark models are outlined and contrasted to results from a more conventional two-phase approach to high-density matter using RMF nuclear and PNJL quark matter models.