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First-order phase transition from hypernuclear matter to deconfined quark matter obeying new constraints from compact star observations

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We reconsider the problem of the hyperon puzzle and its suggested solution by quark deconfinement within the two-phase approach to hybrid compact stars with recently obtained hadronic and quark matter equations of state. For the hadronic phase we employ the hypernuclear equation of state from the lowest order constrained variational method and the quark matter phase is described by a sufficiently stiff equation of state based on a color superconducting nonlocal Nambu-Jona Lasinio model with constant (model A) and with density-dependent (model B) parameters. We provide for the first time a hybrid star EoS with an intermediate hypernuclear matter phase for which the maximum mass of the compact star reaches 2.2 solar mass.

Primary author: SHAHRBAF, Mahboubeh

Presenter: SHAHRBAF, Mahboubeh