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Type: **Theory talk**

Early quark deconfinement in compact star astrophysics and upcoming experiments at NICA

Thursday, May 20, 2021 9:30 AM (20 minutes)

We outline a theoretical approach supporting strong phase transitions from normal nuclear matter to the deconfined quark-gluon plasma, in the equation of state (EOS) for compact star matter, from vanishing to moderately high temperatures that are accessible for BM(a)N and MPD experiments at NICA. We study the connection of such hybrid EOS with the mass-radius relation of cold compact stars, including the intriguing possibility of additional families, as a consequence of the presence of an early and strong phase transition. Special emphasis is devoted to eventually detectable signatures which can be directly related with the occurrence of a sufficiently strong phase transition. Therefore dynamical scenarios are being considered, such as binary compact star mergers including the subsequent emission of gravitational waves and supernova explosions of massive supergiant stars where neutrinos play the role of messengers.

Collaboration

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