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Equation of state for core collapse supernova simulation and neutron star core

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The Equation of state (EoS) of hot and dense matter plays a fundamental role in the understanding of core-collapse supernova. A phase transition from hadronic to exotic phases might occur in the early post-bounce phase of a core collapse supernova. We investigate the emergence of strange hyperons in the dynamical collapse of a non-rotating massive star to a black hole. We follow the dynamical formation and collapse of a proto neutron star (PNS) from the gravitational collapse of a massive star adopting the Shen hyperonic EOS. We also study the neutrino signals that may be used as a probe to core collapse supernova. We compare the results with those of Shen nuclear EoS and understand the role of strange hyperons in the core collapse.

Primary author: Dr BANIK, Sarmistha (Saha Institute of Nuclear Physics)

Presenter: Dr BANIK, Sarmistha (Saha Institute of Nuclear Physics)

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