

The Structure and Signals of Neutron Stars, from Birth to Death



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Compact stars and general constraints on exotic phases

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With the measurements of two-solar-mass neutron stars the question of how to reconcile the existence of large masses with the possibility of more exotic compact objects like hyper stars and hybrid stars has gained major importance. In order to address this point theoretical approaches to model stars containing quarks as well as nucleons and hyperons are discussed, also considering the general phase structure and types of phase transitions in dense and hot strongly interacting matter.

Possible limits on the amount of hyperon and quark matter are investigated.

Within the same ansatz results from other areas of strong interaction physics, especially heavy-ion physics and lattice QCD simulations, are considered that might constrain non-nucleonic contributions to compact stars.

In this context seemingly conflicting results from lattice simulations and model studies regarding quark interactions can be understood by separately analyzing the hadronic and quark phases.

Author: Prof. SCHRAMM, Stefan (Frankfurt Institute for Advanced Studies Johann Wolfgang Goethe Universität)

Presenter: Prof. SCHRAMM, Stefan (Frankfurt Institute for Advanced Studies Johann Wolfgang Goethe Universität)

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