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Type: **Poster presentation**

## Hadron-quark crossover phase transition in hybrid compact stars

*Tuesday 3 September 2024 19:10 (20 minutes)*

Lattice simulation of QCD at small net baryon densities and high temperature have revealed that the transition to hadronic phase to the deconfined quark-gluon plasma is a crossover. Recently, the structure of neutron stars have been studied with a crossover equation of state by means of a switching function to model a smooth transition from a pure neutron matter to massless quarks [1]. The switch function parameter was constrained in order to reproduce neutron stars up to about two solar masses. Afterwards, such a study has been extended by considering the relevance of color superconducting quarks in the cold dense matter [2]. In this contribution, we investigate the crossover phase transition into an hybrid compact stars by means of an equation of state which incorporates hadronic matter, composed by nucleons, hyperons and  $\Delta$ -isobars degrees of freedom, and a color superconducting quark phase with massive strange quarks. In this framework, we analyze the role of the strangeness content related to the bulk properties of the compact star.

[1] J.I. Kapusta, T. Welle, Phys. Rev. C 104, L012801 (2021)

[2] D. Blaschke, E.-O. Hanu, S. Liebing, Phys. Rev. C 105, 035804 (2022)

### Internet talk

No

### Is this an abstract from experimental collaboration?

No

### Name of experiment and experimental site

N/A

### Is the speaker for that presentation defined?

No

### Details

N/A

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