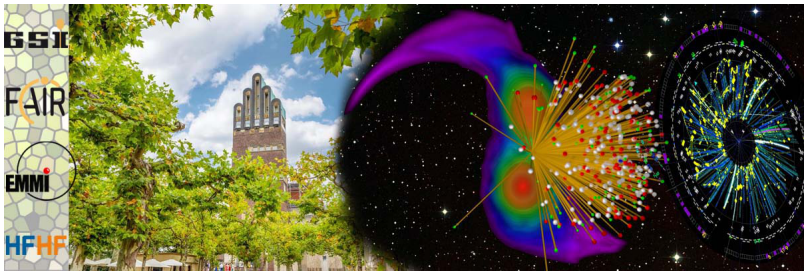

Contribution ID: **31** Type: **Poster**

Dense matter within relativistic Hartree-Fock approaches

Wednesday, September 20, 2023 10:10 AM (3 minutes)

In this talk, I will address the question of the understanding of dense matter from a model incorporating properties from quantum chromodynamics (QCD). QCD is a fundamental theory that poses challenges when applied to low-energy nuclear physics, such as finite nuclei and neutron star matter, due to its non-perturbative nature. While solving QCD numerically on a lattice is possible, it currently lacks the capability to handle large finite densities.
I am developing a model which captures some important aspects of the fundamental theory. I will present a relativistic mean field approach that incorporates two key features of low-energy QCD: chiral symmetry breaking and color confinement. I will show that by including effects beyond the simplest Hartree mean field, e.g. Fock terms, nucleon finite size and short range effects via the Jastrow ansatz, the model predictions get closer to the empirical properties of dense matter around saturation density. The value of the spin-isospin parameter g'is also improved. In this way, I will show that considering a Lagrangian with nucleons and interactions fields, the careful treatment of many-body terms provides a satisfying approach.

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