
Contribution ID: **19** Type: **not specified**

# Neutron Stars from the Functional Renormalization Group

*Friday 23 April 2021 08:55 (25 minutes)*

Neutron star physics provides the unique opportunity to directly connect the theory of cold and dense matter with experimental observations. Despite the recent progress in particular on the experimental side, many theoretical questions still remain open, such as the possible existence of quark matter or the occurrence of strangeness in neutron star cores. To answer these questions one essential ingredient is the precise knowledge of the equation of state (EoS) of cold and dense, beta-equilibrated matter. Very often the EoS is evaluated in mean-field approximated models where important nonperturbative fluctuations are simply ignored. We improve on these issues by applying a nonperturbative functional renormalization group (FRG) approach on a two- and three-flavor quark-meson truncation of low-energy QCD. In this talk we discuss the impact of (quantum) fluctuations on macroscopic astrophysical properties such as mass-radius relations. Furthermore, we construct a hybrid star EoS and consider additional vector meson interactions.

**Author:** OTTO, Konstantin (Justus-Liebig University, Giessen)

**Presenter:** OTTO, Konstantin (Justus-Liebig University, Giessen)