PHYSIKALISCHES KOLLOQUIUM

des Fachbereichs Physik
der Johann Wolfgang Goethe-Universität Frankfurt

Mittwoch, den 09.12.2020, 16 Uhr c.t.

Virtuell via ZOOM: LINK
(Zoom ID: 920 2636 5795, Passwort: 268066)

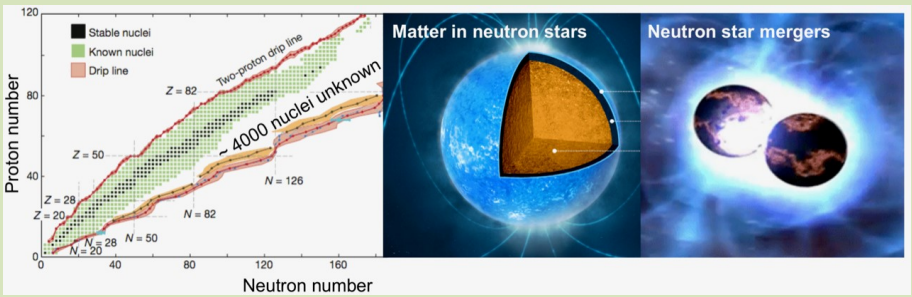
Prof. Ph.D. Achim Schwenk

TU Darmstadt

"From nuclei to stars - The strong interaction in the universe"

The strong interaction described by quantum chromodynamics gives rise to the formation of hadrons and nuclei that constitute the baryonic matter in the Universe and governs the densest matter in neutron stars and highest temperatures reached in compact object mergers. Combined with the electroweak interaction, it determines the structure and properties of all nuclei in the nuclear chart in a similar way as quantum electrodynamics shapes the periodic table of elements. However, big science problems of the strong interaction remain unsolved, especially regarding the structure of extreme neutron-rich matter in the laboratory and stars.

New facilities for rare isotopes will discover over a thousand new isotopes, getting as close as possible to the nuclei in the Universe's heavy-element nucleosynthesis pathway. On the theoretical side, there are impressive advances towards a unified description of all nuclei and matter based on effective field theories of the strong interaction combined with powerful many-body methods. In this talk, we will discuss the advances, status and challenges in understanding and predicting strongly interacting matter, with a focus on how the nuclear chart emerges from nuclear forces and on the physics of neutron stars and neutron star mergers.



Die Dozenten der Physik

local host: Prof. Dr. Dirk Rischke | drischke@th.physik.uni-frankfurt.de