UNIVERSITÄT DUISBURG ESSEN

PHYSIK E=

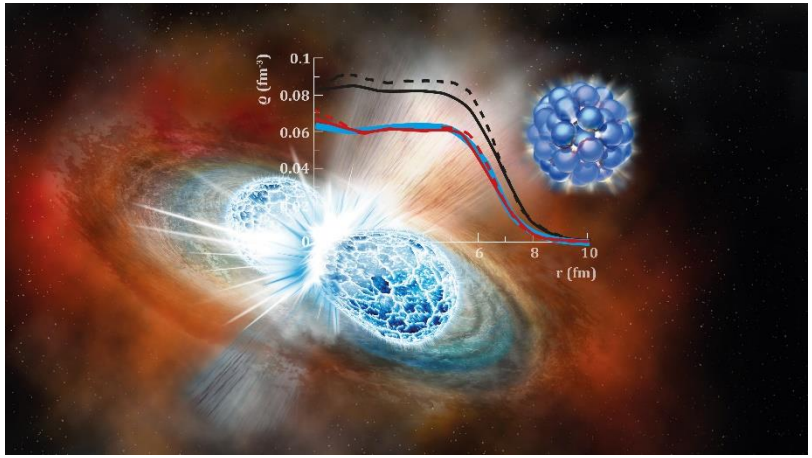
Physikalisches Kolloquium

Mittwoch, 15.06.2022
13:00 Uhr
Nur per Zoom

https://uni-due.zoom.us/j/61481460592?pwd=NTBkdk1xNWtFdnk1TTdtZkI0UllzUT09 (gilt für alle Vorträge)

Bridging Heaven and Earth: the Equation of State of Nuclear Matter

Prof. Dr. Concettina Sfienti, Johannes Gutenberg Universität Mainz



What are the properties of nuclear matter which lead to the spectacular phenomena of supernovae explosions? What is the nature of neutron stars? How does subatomic matter organize itself? These and other fundamental questions about the nature of some of the most fascinating astrophysical objects as well as the characteristics of dense nuclear matter are determined by the nuclear equation of state (EoS).
After the first famous observations of two colliding neutron stars, the emergent gravitational astronomy field will provide us with
new ways to constrain the EoS and the properties of neutron-
rich matter. Even stronger constraints can be imposed combining
this information with complementary measurements.
Because it is impossible to reproduce the condition of a neutron star in a terrestrial laboratory , heavy nuclei provide a portal to study neutron-rich matter, in that they form a neutron-rich skin around the surface.
In spite of the disparity in length scales of the studied systems, these laboratory experiments have profound and exciting implications for the properties of neutron stars.

While a systematic and concerted experimental effort has been made to measure the neutron-skin thickness of heavy nuclei, a precise and model-independent determination remains elusive. The talk aims at presenting the relative merits of each experimental approach, a status of the field and the current efforts to move forward