

Plenarvortrag PV VII Do 9:00 HZ 1+2
Neutron-rich matter from chiral EFT interactions — ●KAI
HEBELER — TU Darmstadt, Darmstadt, Germany

Experiments at rare isotope facilities open the way to new exotic regions of the nuclear chart. In parallel, there are significant theoretical advances in our understanding of nuclear forces and their applications to nuclei and nucleonic matter. The physics of neutron rich systems is key for the nucleosynthesis of heavy elements and provides important insights to nuclear forces. In this presentation I will give an overview of

recent ab initio calculations of properties of neutron-rich matter and the nuclear symmetry energy based on nuclear interactions derived within chiral effective field theory. In addition, I will show how these results can be used to extract model-independent constraints on the pressure of matter at high densities and on radii of neutron stars. Motivated by the exciting role of 3N forces, I will also discuss current developments on the next-order three-nucleon forces in chiral effective field theory, which are completely predicted and therefore crucial for tests and improved precision of the theory.