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Neutron stars in the lab

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Because of their extreme density, neutron stars are made of unique states of matter that are difficult, or even impossible, to create on Earth. Extremely neutron-rich nuclei, nuclear superfluids, strange matter, deconfined quarks and colour condensate are some examples. Despite this difficulty, an important number of accelerator-based experiments try to reproduce some of these exotic matter states, or to provide micro-physics inputs required in neutron star modelization. Moreover, accreting neutron stars and neutron star mergers are responsible for the nucleosynthesis of heavy chemical elements in the Universe. In this talk I will review some of the experiments investigating the properties of neutron-rich nuclei, the equation of state of asymmetric nuclear matter, the role of short-range correlations in the formation of superfluid nucleon-nucleon pairs or the characterization of baryon-hyperon interaction.

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