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Nuclear symmetry energy and neutron stars

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The understanding of neutron star properties from fundamental physics is still far from being completed. One of the reasons is that the theory for strong force, QCD, does not apply simply to neutron star matter at a few times the nuclear saturation density. At low density, chiral effective field theory is fixing a limit which can be incorporated in the description of the crust of neutron stars. Above saturation density, the question of phase transition(s) and the onset of new degrees of freedom are extremely important since it impacts the properties of the core of neutron stars. Astrophysical observations (gravitational wave, x-rays, radio) and nuclear physics experiments can be employed to constrain the equation of state for neutron stars, including the symmetry energy. Prospects for future detections will also be discussed.

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Classification de Session: Heavy ion collisions

Classification de thématique: Nuclear Astrophysics