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Neutron stars: probing ultra dense (and hot) matter (online)

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Observed for the first time in 1967 as pulsars, neutron stars represent the most extreme bodies known in our universe. Relict of the gravitational collapse and subsequent supernova explosion of a massive star at the end of his life, they gather a mass of up to twice that of our sun in a sphere with a radius of about 10 km. Their phenomenology is very rich and complex. Modelling requires many different fields of physics such as general relativity, nuclear physics and solid state physics. During this talk, after an introduction, I will discuss some examples of how the confrontation of observational data with neutron star models allows to probe properties of ultra-dense and hot matter. Future prospects to improve our understanding and in particular to pin down the potential existence of a phase transition in dense matter with constraints from gravitational wave detections will be discussed, too.

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