

Lorenzo Gavassino - The role of General Relativity in the Glitch Theory

Thursday, 13 June 2019 10:40 (20 minutes)

Neutron stars are the hottest laboratory of ultracold matter in the universe and pulsar glitches, sudden spin-up events observed in many pulsars, may constitute the most energetic manifestations of fermionic superfluidity. As these are very compact systems, however, it is necessary to account for general relativity when modelling such events and interpreting astronomical data. In this talk, I will discuss how to do this, and present a fully general relativistic hydrodynamical model for pulsar glitches, based on the formalism developed by Carter and collaborators to describe relativistic superfluids. In particular, I will focus on the effects of time-dilation and frame dragging and show that they can significantly affect calculations of the glitch rise time. Such effects should thus be included in theoretical models to accurately constrain neutron star parameters and the equation of state from glitch observations.

Primary author: GAVASSINO, Lorenzo (Nicolaus Copernicus Astronomical Center (Warsaw))