

## PHAROS Conference 2019: the multi-messenger physics and astrophysics of neutron stars



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### **Bayesian two-sample test for the mass distribution of neutron stars in binary systems and glitches**

In the interior of a mature neutron star, the differential rotation of the neutron superfluid star with respect to the normal component allows to store angular momentum, which is released during a pulsar glitch. Recent studies show how it is in principle possible to estimate pulsar masses from observations related to their timing properties. In this talk we will compare the mass estimates made with this method with the masses of neutron stars in binary systems, measured with standard observational techniques. In particular, we conduct a Bayesian analysis to test if the two samples come from the same underlying statistical distribution. We consider different samples of measured masses, according to whether they have undergone accretion or not, in order to test if glitches are close to their birth mass. Finally, we also test different models for the theoretical mass estimate of the pulsars, by employing equations of state with different stiffness or limiting the superfluid reservoir to a small spherical layer.

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