

## 12th Iberian Gravitational Waves Meeting



Contribution ID: 20

Type: **Contributed Talk (20 minutes)**

# How neutron star mergers and astrophysical observations could constrain dark matter properties

*Tuesday 7 June 2022 10:25 (20 minutes)*

We study the impact of asymmetric fermionic Dark Matter (DM) on Neutron Stars (NS). We show how the DM component affects the star's evolution and properties, e.g. mass, radius and tidal deformability parameter. We present the conditions under which the DM particles tend to create an extended diluted halo or a dense core inside a NS. The presence of DM in both configurations affects how a NS is tidally disrupted in a merger, leading to modifications of the tidal deformability parameter which can be further constrained by future gravitational wave detections. Using the constraints coming from GW170817 event along with the existing astrophysical constraints we set a new limit on the mass and fraction of the DM particles.

### Which topic best fits your talk?

GW Theory and Fundamental Physics

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