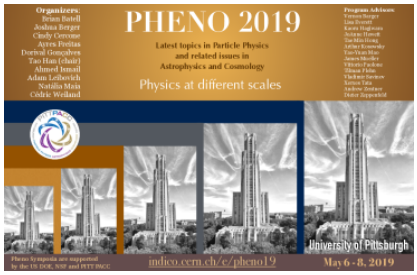

Contribution ID: **783** Type: **parallel talk**

Boson Stars from Repulsive Scalar Theory and the Gravitational Wave Signature

Tuesday 7 May 2019 16:45 (15 minutes)

Ultra-light scalar theories with repulsive self-interactions admit boson stars with large compactness. I will show the origin of the maximum mass of spherically symmetric stable boson stars, which manifests only in the full equations of motion in curved space-time, but not in the approximated Schrödinger-Newton equations. The backreaction of the curvature on the scalars acts as an additional source of attraction and can overcome the repulsion, resulting in a maximum star mass and compactness. In addition, I will show that the potential in a UV completed particle physics model of light scalar dark matter is generally more complicated than the widely used \phi^4 interaction, which shows up as a modified mass profile relevant for LIGO detection. In the context of LISA, EMRI involving a boson star can be distinguished by the small mass of the infalling object, as well as tidal disruption. Using LISA's sensitivity, I show the parameter space of the underlying scalar theory where the infalling boson stars can be distinguished from all other compact objects.

Summary

The talk will be mainly based on 1810.01420 and 1904.07871

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