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Constraining bosonic asymmetric dark matter with neutron star mass-radius measurements

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The presence of asymmetric dark matter (ADM) in neutron star interiors has been shown to affect the global properties of neutron stars, namely their masses and radii. Since the neutron star interior is poorly understood, the most conservative approach to a Bayesian analysis of their interiors is to allow all equation of state (EoS) parameters to vary. In this work, we use synthetic neutron star mass-radius measurements to infer the possible constraints on bosonic ADM cores, i.e., the spatial regime where bosonic ADM has accumulated in the interior of neutron stars. We find that ADM cannot be excluded, and the inclusion of bosonic ADM in neutron star cores relaxes the constraints on the baryonic EoS. If the baryonic EoS were more tightly constrained independent of ADM, we find that statements about the ADM EoS parameter space could be made.

Mini Symposia (Invited Talks Only)

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