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Neutron star heating by inelastic dark matter

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Dark matter can deposit energy in neutron stars and heat them to temperatures that could be detected by upcoming infrared telescopes like James Webb Space Telescope (JWST). These observations have a potential to complement and outperform terrestrial direct detection in a large range of dark matter masses. The difference is particulalrly striking for inelastic dark matter. Electrons are also present in neutron stars in significant proportion. Capture due to electrons can aid with the capture of leptophilc dark matter. Ultrarelativistic nature of these electrons make the calculation challenging. In this talk, I will discuss the fomulation of this capture calculation and its interesting consequences for inelastic dark matter.

Summary

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