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Can we use "climate change" on Neutron Stars to detect dark matter?

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The presence of dark matter has been ascertained through a wealth of astrophysical and cosmological phenomena and its nature is a central puzzle in modern science. Elementary particles stand as the most compelling explanation. They have been intensively searched for at underground laboratories looking for an energy recoil signal and at telescopes sifting for excess events in gamma-ray or cosmic-ray observations. In this talk, we show a detection method based on spectroscopy measurements of neutron stars. We outline the luminosity and age of neutrons stars whose dark matter scattering off neutrons can heat neutron stars up to a measurable level. We show that in this case neutron star spectroscopy could constitute the best probe for dark matter particles over a wide masses and interactions strength.

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