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Exploring Physics Beyond the Standard Model via Temperature Observations of Neutron Stars

Monday, January 27, 2025 5:15 PM (25 minutes)

I will talk about how temperature observations of neutron stars provide a unique window to explore physics beyond the Standard Model of particle physics. The presence of hypothetical particles such as axions and dark matter, predicted by theories that extend the Standard Model, could alter the cooling behavior of the neutron stars. Axions, for example, increase cooling rates, while dark matter interactions could lead to additional heating. By comparing revised theoretical predictions with observed temperature evolution, we might explore signs of these elusive particles. The talk will be based on the following papers: arXiv:2309.02633, 2308.16066, 2204.02413, 2204.02238, 2008.03924, 1905.02991, 1904.04667, 1806.07151.

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