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Quantum Sensors for Direct Detection of Sub-GeV Dark Matter

Wednesday, June 15, 2022 11:10 AM (20 minutes)

Over the last 20 years, searches for dark matter above the proton mass have advanced significantly across direct and indirect searches, but sub-GeV dark matter has until recently been comparatively unprobed. In this talk, I will discuss prospects for applying quantum measurement techniques to lowering mass thresholds for new searches with event thresholds at the eV-scale. I will then discuss synergies with ongoing research in materials science and quantum information science. The goal over the next decade is to run background-free dark matter searches at gram-year exposures with meV-scale thresholds, an exciting challenge that requires a broad range of expertise, and comes with enormous scientific discovery potential.

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