

The Windchime Project

Saturday, April 1, 2023 10:45 AM (15 minutes)

The Windchime Project seeks to exploit advances in quantum sensing technologies in order to search for dark matter in the laboratory, based on its gravitational interaction alone. The Planck mass ($\sim 10^{19}$ GeV or 20 micrograms) is a particularly well-motivated mass range to search for dark matter. At this mass, the dark matter flux at Earth is still large enough to be experimentally accessible, while at the same time, tracks left by the gravitational pull from Planck-mass particles could be detected with a sensitive array of accelerometers. This talk will present the basic idea together with predicted sensitivities for accelerometers with quantum-enhanced readout. In addition to the high-mass range near the Planck mass, the Windchime array of accelerometers is also sensitive to a variety of ultralight dark matter candidates. The status of the project with preliminary results from a number of prototype setups will be presented.

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Session Classification: SESSION 18: Direct detection: Light DM & Ultra-Light DM (Axions, ALPs, WISPs) searches-2 (CHAIR: Sebastian Baum- Stanford University)

Track Classification: Non-directional direct dark matter detection