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Jason Arakawa "Detection of Bosenovae with Quantum Sensors on Earth and in Space"

Tuesday, 7 November 2023 16:10 (25 minutes)

In a broad class of theories, the accumulation of ultralight dark matter (ULDM) with particles of mass 10^{-22} eV $< m_\phi < 1$ eV leads to the formation of long-lived bound states known as boson stars. When the ULDM exhibits self-interactions, prodigious bursts of energy carried by relativistic bosons are released from collapsing boson stars in bosenova explosions. I will show the potential reach of terrestrial and space-based experiments for detecting transient signals of emitted relativistic bursts of scalar particles. The ULDM is coupled to photons, electrons, and gluons in an EFT framework, encapsulating a large space of theories. These bursts of relativistic scalars could be detected by a host of different detectors, such as a nuclear clock and space based interferometers.

Session Classification: Short talks