

## Probing the wave nature of light new physics

*Sunday, 19 April 2026 17:10 (15 minutes)*

Many well-motivated UV theories contain bosonic light degrees of freedom, which can exhibit various wave-like behaviors at low energy. This leads to many new ideas and novel observables in recent years to probe new physics in astrophysical and laboratory setups alike. In this talk, I will briefly review a few examples in leveraging the wave-like features to test axions and ultralight dark matter. These include the axion-induced supernova remnant radio echo, the soliton-imprinted galaxy rotation curves, axion-induced neutron star X-ray signals. I will end with a new axion-photon resonant conversion mechanism induced by spatially varying magnetic field background and show its phenomenological consequences to the LSTW experiments and solar axion searches.

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