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Collective axions in chiral media: an effective field theory approach

Monday, 13 March 2023 14:30 (20 minutes)

The IR pole of the anomalous triangle diagram indicates that a system of massless fermions may support a collective pseudoscalar mode. At finite axial density, this mode controls the low-energy dynamics of the system and becomes the sound wave of the anomalous hydrodynamics. In this talk, I will discuss how this mode is affected by fermionic interactions, and show that the low-energy dynamics is sufficiently universal, depending only on the equation of state. The resulting EFT describes a collective axionic mode in a variety of systems of massless fermions. I will also briefly touch the potential phenomenological implications for Weyl and Dirac semimetals.

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Session Classification: New perspectives on chiral transport