

APCTP Workshop: Field Theory and Geometry in Fractional Quantum Hall and Flat Band Systems

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Carroll fermions

Tuesday 2 December 2025 15:50 (50 minutes)

Motivated by recent applications of Carroll symmetry, various Carroll-invariant field theories have been constructed and studied. Two distinct Carrollian theories, commonly referred to as magnetic and electric, can be obtained. In this talk, I will present the Carroll limits of relativistic spin-1/2 Dirac fermions in arbitrary spacetime dimensions. I will explain the subtlety that arise with fermions due to the first order nature of their Lagrangians, and how one can nevertheless obtain two different Carrollian limits. I will also briefly discuss possible generalisations to higher-spin Carroll fermionic fields.

Presenter: MELE, Lea