UCLA NUCLEAR PHYSICS SEMINAR

The role of the chiral anomaly in polarized deeply inelastic scattering

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I will discuss the role of the chiral "triangle" anomaly in deeply inelastic scattering (DIS) of electrons off polarized protons employing a worldline formalism, which is a powerful framework for the computation of perturbative multi-leg Feynman amplitudes. I will demonstrate how the triangle anomaly appears at high energies in the DIS box diagram for the polarized structure function $g_1(x_B, Q^2)$ in both the Bjorken limit of large Q^2 and in the Regge limit of small x_B. I will show that the operator product expansion is not required to extract the anomaly in either asymptotics, and the infrared pole in the anomaly arises in both limits. The leading contribution to g_1, in both Bjorken and Regge asymptotics, is therefore given by the expectation value of the topological charge density.

Wednesday • Sept 9, 2020 • 2 PM

Zoom: https://ucla.zoom.us/j/99142946553

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