Contribution  $\mathsf{ID}:\mathbf{6}$ 

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## Spin-orbit entanglement in QCD

Monday, 5 May 2025 15:00 (60)

Spin-orbit coupling is a ubiquitous phenomenon across many areas of contemporary science. I discuss aspects of the spin-orbit coupling of quarks and gluons orbiting inside hadrons. In the first part, I derive a novel momentum sum rule where the spin-orbit correlation plays a crucial role. This is the momentum version of the Jaffe-Manohar spin sum rule. In the second part, I point out the connection to quantum entanglement. I show that the spin and orbital angular momentum of individual partons at small-x are maximally entangled, forming the Bell states. The extension to finite x will also be discussed.

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