Border posts: transverse spin and the study of color confinement at the Electron Ion Collider (EIC)
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Quantum chromodynamics (QCD) contains an important border that separates hadronic physics into two distinct realms. There is a short-distance realm where the interactions of quarks and gluons can be understood by perturbation theory, and a long-distance realm in which individual hadrons interact with other hadrons through non-relativistic potentials. The border separating these disparate regimes is defined by what is universally assumed to be a fundamental property of QCD, the strict confinement of the color charges of the underlying SU3 gauge theory. The Electron Ion Collider, (EIC), a potential future experimental facility whose full capabilities are still being refined, offers the prospect for precision measurements that can study, in detail, emergent quantum structures associated with the dynamical constraints imposed by color confinement both within stable hadrons and within QCD jets. In particular, measurements involving spin asymmetries enlist the tomographic capabilities of spin-orbit dynamics to empower future experiments at the EIC to open avenues for unique discoveries about the nature of confined QCD systems.