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## Exploring Gluonic Matter with Electron-Ion Collisions

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Heavy nuclei probed in deep inelastic scattering and diffraction with leptonic probes in the high-energy (small- $x$ ) regime open a new precision window into answering fundamental questions in QCD.

The proposed electron-ion collider at BNL (eRHIC) will be a new high-energy and high-luminosity electron-ion/proton machine. The design offers unprecedented access to study the nature of QCD matter and strong color fields.

In particular, the new collider will allow us to explore the properties of gluon saturation, which is one of the fundamental outstanding problems in QCD.

The compelling physics case for the electron-ion collider is presented with a focus on studying saturated gluonic matter in the context of the initial condition of the high-energy heavy-ion collisions at RHIC and LHC.

In this talk, we will discuss how selected key measurements - dihadron correlation and exclusive diffractive vector meson production can be used to probe and characterize the gluonic matter produced at small- $x$  in eA collisions.

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