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Physics opportunities at the future Electron-Ion Collider

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Content

The 2015 US Nuclear Physics Long-Range Plan endorsed the realization of an Electron- Ion Collider (EIC) as the next large construction project in the United States. With its high luminosity (> 1033 cm−2s−1), wide kinematic reach in center-of-mass-energy (45 GeV to 145 GeV) and high lepton and proton beam polarization, the EIC is an unprecedented opportunity to reach new frontiers in our understanding of the internal dynamic structure of nucleons. This new collider will provide definite answers to the following questions: How are the sea quarks and gluons, and their spins, distributed in space and momentum inside the nucleon? How the nuclear environment modifies these quark and gluon distributions? At what scale the growth in the distribution of of gluons saturates? What is the role of the orbital motion of sea quarks and gluons in building up the nucleon spin? This presentation will highlight several key high precision measurements from the planned broad physics program and the expected impact on our current understanding of the spatial structure of nucleons and nuclei, and the transition from a non-saturated to a saturated state.

Session

Proton structure, small and large x physics

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