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Physics Opportunity with an Electron-Ion Collider

Understanding the emergence of nucleons and nuclei and their interactions from the properties and dynamics of quarks and gluons in Quantum Chromo-Dynamics (QCD) is a fundamental and compelling goal of nuclear science.
A high-energy, high-luminosity polarized electron-ion collider (EIC) will be needed to explore and advance many aspects of QCD studies in the gluon dominated regions in nucleon and nuclei.

The federal Nuclear Science Advisory Committee unanimously approved a high-energy electron ion collider to explore a new frontier in physics research. In fact, the committee calls the collider the country's next "highest priority"in new facility construction, and is one of four main recommendations contained in its 2015 Long Range Plan for Nuclear Science.
Two proposals for the EIC are being considered in the U.S.: one each at Jefferson Laboratory and at Brookhaven National Laboratory.

In this presentation I will provide an overview of the physics opportunities an EIC presents to the nuclear science community in future decades and review the Jefferson Lab proposal and its implementation plan.

Summary

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