Contribution ID: 14

Type: not specified

Electron Ion Collider: The next QCD frontier for Understanding the Glue that Binds Us All

Thursday 13 October 2016 14:00 (1 hour)

Despite many decades of theoretical and experimental effort around the world, some of the most important questions in QCD remain unanswered: How does a proton get its spin? What roles do spin alignment and orbital angular momenta of the gluons play in this? Similarly, on the high energy frontier: What happens to gluon densities of nucleons and nuclei at very high energy? Does the glue in nucleon and all nuclei show identical behavior at high energy and form a unique form of gluonic matter, the so called, "Color Glass Condensate"? How would we investigate this experimentally? What can we learn about Confinement in QCD based on investigations of gluons in nucleons and nuclei? These are the sort of questions that form the backbone of the science case for the future Electron Ion Collider (EIC), that no other current or proposed facility can address with high precision. The EIC was recently recommended by the US Nuclear Science Advisory Committee (NSAC) as the highest priority future facility to built in the US after the completion of FRIB (The Facility for Rare Isotope Beams, currently under construction) in the US. In this talk, I will present a brief review of selected physics topics and their associated measurements, and the road map for the realization of this Collider.

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