

A U.S.-Based Electron-Ion Collider

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An Electron-Ion Collider (EIC) in USA is currently discussed as a next-generation facility for high-energy nuclear physics. The main goal of the EIC is to study fundamental questions of Quantum Chromodynamics, which include the origin of the nucleon mass and spin and the three-dimensional structure of the nucleon in terms of quarks and gluons, the emergent properties of dense systems of gluons, and influence of nuclear matter on distributions of quarks and gluons and propagation of color charges through it. The EIC machine designs are aimed at achieving variable center of mass energies of 20-100 GeV, upgradable to 150 GeV, high degree of polarization (~70%) of beams of electrons, protons and light nuclei, high collision luminosity of 10^{33-34} cm⁻²s⁻¹, and ion beams from deuteron to heaviest (Lead) nuclei. The talk will present the current status of the EIC project, its physics program, and proposed designs of EIC realization.

Primary author(s) : GUZEY, Vadim (University of Jyväskylä, Finland & Petersburg Nuclear Physics Institute, Russia)

Presenter(s) : GUZEY, Vadim (University of Jyväskylä, Finland & Petersburg Nuclear Physics Institute, Russia)

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