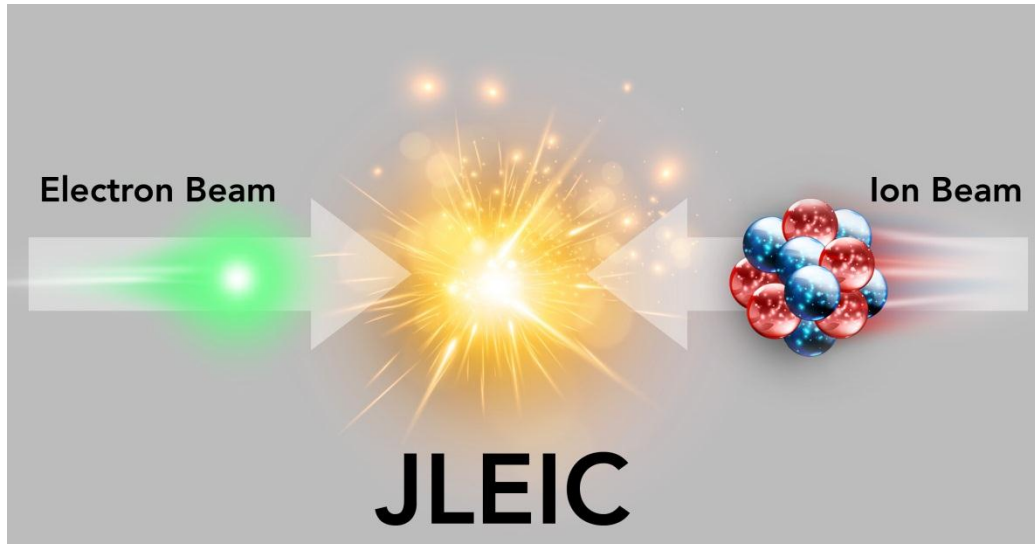


JLEIC – An Electron-Ion Collider Proposal at Jefferson Laboratory

JAI – Oxford, Accelerator Science Seminars 2018

Dr. Andrew M. Hutton

18th of January at 4.15pm in the Dennis Sciama lecture theatre



Abstract

The design of the Jefferson Laboratory Electron-Ion Collider (JLEIC) proposal is based on a ring-ring collider. High repetition rate, high focusing and low emittance result in luminosity in excess $10^{-34} \text{ cm}^{-2}\text{s}^{-1}$ per interaction point, and the figure-8 configuration ensures polarization in excess of 80% for both the electron and ion beams. The JLEIC design supports two detectors integrated with the accelerator in the interaction regions. It uses the recently upgraded CEBAF as a full energy injector, while the ion complex would be new.

While the design strategy has been stable since 2009, the JLAB accelerator team, including collaborating institutions in the US and abroad, has made significant progress in optimizing the JLEIC design. Initial designs exist for all the major components: electron ring (based on design and components of PEP-II), the ion complex (including sources, a SRF linac, booster and ion collider ring), and the interaction regions. The bunched beam cooler design is making good progress. The overall goal is to be ready to deliver a pre-CDR and later a CDR to respond to the Nuclear Physics critical decision process for an EIC.

Principal Researcher at Jefferson Lab, Newport News, Virginia; Andrew has more than 40 years' experience in all aspects of forefront accelerator projects. He came to Jefferson Lab to lead the commissioning of CEBAF, a 6 GeV, recirculating superconducting electron accelerator, then established and led CEBAF operations for nuclear physics research. Andrew became the Associate Director, Accelerators in 2007, heading a Division of 150 accelerator scientists, engineers and technicians. The Accelerator Division recently commissioned a major upgrade of CEBAF, doubling the energy to begin a new era of nuclear physics research. Andrew has now stepped down as Associate Director to concentrate on the design of the next accelerator at Jefferson Lab; an Electron-Ion Collider.

