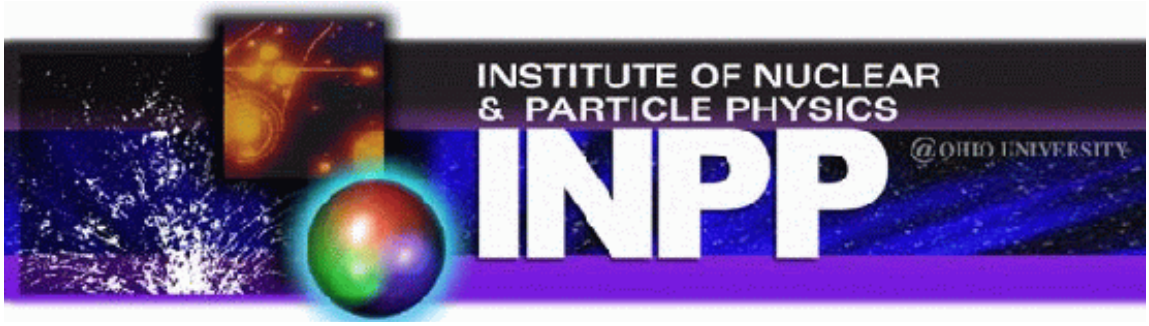

Light-ion physics with EIC: Nuclear structure meets high-energy processes

Christian Weiss
Jefferson Lab

The Electron-Ion Collider (EIC) will enable a novel physics program in high-energy electron scattering on light ions (^{2}H, ^{3}He, ...) at CM energies ~20-100 GeV/nucleon, including measurements with detection of the low-energy nuclear breakup state (spectator nucleons, fragments). Such experiments offer new possibilities for extracting the quark distributions in the neutron, exploring the QCD substructure of nuclear interactions, and revealing the dynamics behind nuclear shadowing at small x. The nuclear scattering processes are characterized by an interplay of high-energy scattering on the nucleons and low-energy nuclear structure. The analysis requires theoretical input from low-energy nuclear structure in the form of nuclear spectral functions, decay functions, polarization measures, etc. and poses new challenges for nuclear theory. The detection of the nuclear breakup states will be performed with the EIC far-forward detectors (magnetic spectrometer, zero-degree calorimeter) and drives the development of these systems. The seminar will present an overview of the emerging program, including motivation, theoretical description, far-forward detection, simulation results, and future developments. Special emphasis will be placed on explaining the role of nuclear structure theory in the analysis of the experiments.

Tuesday, October 10th, 2023

4:00 pm

Lindley Hall room 321