Argonne NATIONAL LABORATORY

PHY Seminar

Physics Division Seminar

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Imaging the Proton at an Electron Ion Collider

Host: Whitney Armstrong

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Although the proton has long been known as a basic building block of nuclei, it still carries many mysteries. The proton is known to consist of quarks and gluons, which interact according to quantum chromodynamics (QCD), but its exact composition and structure are only partially known. Where does the proton's mass come from, when the quarks and gluons comprising it are nearly massless? How is its spin shared among its constituents, and how much of it is due to orbital motion? The Electron Ion Collider (EIC) will pursue answers to these questions through hard exclusive electro-production reactions, including deeply virtual Compton scattering (DVCS), which give access to the three-dimensional structure of the proton in terms of its constituent quarks and gluons. I will discuss these questions, how the EIC will address them, and the results of ongoing model calculations that will be used to make predictions for DVCS at an EIC.