

## Multidimensional partonic imaging at the future Electron-Ion Collider

*Tuesday, 17 October 2023 11:00 (30 minutes)*

With the project to build a future Electron-Ion Collider (EIC) at BNL, equipped with a new state-of-the-art detector (ePIC), and advancements in theory and further development of phenomenological tools, we are now preparing for the next step in subnuclear tomographic imaging. The EIC's large range of center-of-mass energies in combination with high luminosity and polarization of both the lepton and the hadron beams, will open a unique opportunity for high precision measurements of both cross sections and spin-asymmetries in  $e+p(A)$  collisions. Generalized parton distributions (GPDs) describe the multi-dimensional partonic structure of a nucleon in coordinate space, while Transverse-Momentum Dependent parton distributions (TMDs) lead us to 3D imaging in momentum space. Thus, a precise extraction of both GPDs and TMDs will allow us for a detailed investigation of the partonic substructure of hadrons in multi-dimensions, providing new information about the internal dynamics of quarks and gluons inside free nucleons and nuclei.

Measurements hard exclusive processes, like Deeply Virtual Compton Scattering (DVCS) and Hard Exclusive Meson Production (HEMP), with all related probes, are the best way in constraining GPDs and achieve precision spatial partonic tomographic images. Instead, TMDs are constrained by precise measurements of SIDIS and jets. This talk will highlight key experimental challenges, ongoing and future simulation efforts and finally discuss the EIC's expected impact over the current knowledge of GPDs and TMDs.

### Parallel Session

Nucleon Structure in DIS

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