

## **Probing the gluonic structure of matter at a future Electron-Ion Collider**

The probing of nuclei and nucleons via deep-inelastic and diffractive processes in the high-energy (low- $x$ ) regime will open a new precision window for the investigation of the gluonic structure of matter.

Studies of  $e+p$  collisions at HERA and especially  $d+Au$  collisions at RHIC have found tantalizing hints of saturated gluon densities, a phenomenon with substantial impact on the physics of heavy-ion collisions. Unveiling the collective behavior of densely packed gluons under conditions where their self-interactions dominate will require an Electron-Ion Collider (EIC): a new facility with capabilities well beyond those of any existing accelerator. Such a collider could be sited either at BNL or JLAB.

In my talk I will outline the compelling physics case for  $e+A$  collisions with a focus on the opportunities for small- $x$  physics. I will discuss the related key measurements and give a brief status of machine concepts, detector design, and timeline.