

## Unraveling non-linear parton dynamics at small $x$ through high energy $ep$ and $eA$ scattering

*Thursday 5 May 2022 09:40 (20 minutes)*

The LHeC and the FCC-he will measure DIS cross sections in an unprecedented range of small  $x$  where the non-linear dynamics expected in the high energy regime of QCD should be relevant in a region of small coupling. In this talk we will demonstrate the unique capability of these high-energy colliders for unravelling dynamics beyond fixed-order perturbation theory, proving the non-linear regime of QCD, saturation, to exist (or to disprove). This is enabled through the simultaneous measurements, of similar high precision and range, of  $ep$  and  $eA$  collisions which will eventually disentangle nonlinear parton-parton interactions from nuclear environment effects.

Reference: P. Agostini et al. (LHeC Study Group), The Large Hadron-Electron Collider at the HL-LHC, J. Phys. G 48 (2021) 11, 110501, e-Print: 2007.14491 [hep-ex].

### Submitted on behalf of a Collaboration?

Yes

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**Session Classification:** WG6: Future Experiments

**Track Classification:** WG6: Future Experiments