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Nuclear structure from energy frontier DIS (15' + 5')

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The LHeC considers electron-ion operation at 0.8 TeV cms energy which extends the kinematic range in deep inelastic lepton-nucleus scattering by 3 orders of magnitude in terms of the 4-momentum transfer Q^2 and $1/x$. This also exceeds by far the energy reach of a low energy electron-ion colliders currently under study. The very high energy and luminosity have the potential to thoroughly alter the understanding of the dynamics of nuclear interactions. Specifically, it will provide key information to put our quantitative understanding of the QGP on solid QCD grounds and solve the question of whether there is a saturation of the gluon density at the small x achievable in present and future high-energy hadron colliders. For the first time, nuclear parton distributions can be completely resolved, independently of proton PDFs and in a huge Q^2, x range. The talk will briefly also cover i) diffractive and exclusive observables in eA and the possibilities which these offer for constraining nuclear GPDs and for disentangling the mechanism of non-linear dynamics in nuclei; and ii) prospects for jet physics and for studies of QCD radiation in the nuclear medium, of much relevance for ultra-relativistic heavy-ion collisions.

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