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## High-energy DIS at CERN: The Large Hadron-electron Collider

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### Summary

The Large Hadron-electron Collider (LHeC) is a proposed upgrade of the LHC at CERN. An Energy Recovery Linac in racetrack configuration will provide 50-60 GeV energy electrons to collide with the HL-LHC proton and ion beams and, eventually, with those from the HE-LHC and the FCC-hh. Such configurations will yield electron-proton (nucleus) collisions with per nucleon centre-of-mass energies 1.3-3.5 (0.8-2.2) TeV and luminosities  $\sim 10^{34(33)} \text{ cm}^{-2}\text{s}^{-1}$ . The LHeC has a far reaching physics programme, as on QCD, electroweak or top physics, a large discovery potential and competitive prospects for precision Higgs physics. It thus strengthens the exploitation of the LHC. Energy frontier deep inelastic scattering (DIS) provides the necessary insight into the structure and dynamics inside hadrons which is crucial for interpreting physics at the LHC and its possible higher energy hh collider successors. Realising future high-energy DIS scattering is vital for the future of particle physics in general. In this talk we will review the status of the accelerator and detector designs, present the physics programme and discuss the prospects for its realisation.

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