

Expected physics reach for the High-Luminosity LHC

The High-Luminosity Large Hadron Collider (HL-LHC) project, a planned upgrade to the Large Hadron Collider (LHC) at CERN, is scheduled to begin colliding protons at unprecedented instantaneous luminosity later this decade. The HL-LHC will deliver an unprecedented proton-proton collision dataset to the LHC experiments at a center-of-mass energy of 14 TeV. The experiments - ATLAS, CMS, LHCb, and ALICE - have planned a series of major detector upgrades to prepare for the higher instantaneous luminosity and center-of-mass energy, as well as the increase in simultaneous collisions (or pileup) foreseen for the HL-LHC program. These upgrades will allow the experiments to maintain or improve physics performance, despite the more challenging environment. Using the HL-LHC dataset, we will be able to improve on statistically-limited Standard Model measurements, and extend the sensitivity of searches. In this talk, we present a selection of physics prospects for the HL-LHC, including Higgs boson properties, searches for Standard Model Higgs pair production, and searches for new physics beyond-the-Standard-Model.

Career stage

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