

## Abstract

The HERA electron–proton collider has collected  $100 \text{ pb}^{-1}$  of data since its start-up in 1992, and recently moved into a high-luminosity operation mode, with upgraded detectors, aiming to increase the total integrated luminosity per experiment to more than  $500 \text{ pb}^{-1}$ . HERA has been a machine of excellence for the study of QCD and the structure of the proton. The Large Hadron Collider (LHC), which will collide protons with a centre-of-mass energy of 14 TeV, will be completed at CERN in 2007. The main mission of the LHC is to discover and study the mechanisms of electroweak symmetry breaking, possibly via the discovery of the Higgs particle, and search for new physics in the TeV energy scale, such as supersymmetry or extra dimensions. Besides these goals, the LHC will also make a substantial number of precision measurements and will offer a new regime to study the strong force via perturbative QCD processes and diffraction. For the full LHC physics programme a good understanding of QCD phenomena and the structure function of the proton is essential. Therefore, in March 2004, a one-year-long workshop started to study the implications of HERA on LHC physics. This included proposing new measurements to be made at HERA, extracting the maximum information from the available data, and developing/improving the theoretical and experimental tools. This report summarizes the results achieved during this workshop.