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## The LHCspin project

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The LHCspin project aims to bring both polarized and unpolarized physics at the LHC through the installation of a gaseous fixed target at the upstream end of the LHCb detector. The forward geometry of the LHCb spectrometer ( $2 < \eta < 5$ ) is perfectly suited for the reconstruction of particles produced in fixed-target collisions. The fixed-target configuration, with center-of-mass energies ranging from  $\sqrt{s}=115$  GeV in pp interactions to  $\sqrt{s_{NN}}=72$  GeV in collisions with nuclear beams, allows to cover a wide backward rapidity region, including the poorly explored high  $x$ -Bjorken and high  $x$ -Feynman regimes. The project has several ambitious goals regarding new-era quantitative searches in QCD through the study of the nucleon's internal dynamics in terms of both quarks and gluons degrees of freedom. The first fundamental step of installing the unpolarized target has been already reached in LHCb with the SMOG2 system.

The status of the project is presented along with a selection of physics opportunities.

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