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The Landscape of Polarized Sea and Glue

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The origin of the intrinsic spin of the nucleon is a topic of active experimental and theoretical research. In the 1980's the European Muon Collaboration used a high energy beam of polarized muons from the CERN SPS and a target with polarized protons to make polarized deep-inelastic scattering measurements covering an extensive kinematic range. The observed spin-dependent cross-section, or the inclusive spin structure function of the proton, was found to be smaller than expected from constituent quark models. The data, when combined with information from baryon octet β -decays, lead to the conclusion that the total quark spin constitutes about 20% of the spin of the nucleon. This nonintuitively small total quark spin contribution to the nucleon spin has, to a large extent, motivated the spin physics programs at CERN, DESY, SLAC, JLAB, and RHIC, and continues to be a strong motivation for further research. The gluon spin contribution to the nucleon spin and the role of the polarized sea are natural questions and form main goals of the current generation of experiments. This presentation will focus on recent advances and discuss prospects for the future.