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Beller Lectureship Talk: Theoretical status and advances in understanding the role of polarized gluons¹

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The contribution of quarks and gluons to the spin of the proton has been a puzzle since the first precise polarized measurements performed 20 years ago. In this talk, after summarizing the current knowledge on spin dependent parton distributions, I will present the results of a global QCD (NLO) analysis of all available polarized data. The inclusion of the recent proton-proton RHIC data, plus the DIS inclusive and semi- inclusive measurements allows attempting for a more precise determination of the gluon polarization. I will put special emphasis on the value obtained for the first moment of the gluonic distribution, the actual contribution of gluons to the spin of the nucleon.

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