The Future of Spin Physics at BNL

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The Relativistic Heavy Ion Collider (RHIC) at BNL is the world's only polarized proton-proton collider.[1] Collisions at center-of-mass energies up to 500 GeV and beam polarizations approaching 70% (longitudinal or transverse) are provided to two experiments, STAR[2] and PHENIX,[3] at luminosities $\geq 10^{32}/\text{cm}^2/\text{sec}$. Transverse polarized beam has also been provided to the BRAHMS experiment.[4] Measurements that bear on the important question of the spin content of the nucleon are beginning to appear.

Over the next 10 years, as the performance of polarized proton running at RHIC is further developed, the Spin Physics program at RHIC will provide definitive measurements of the contributions to the proton's spin of the gluon, the sea quarks and the orbital motion of the partons in the proton's wave function.[5] We plan to extend the reach of our study of the role of spin in QCD with the development of "eRHIC," which will provide polarized e-p collisions to a new detector.[6]

The talk will discuss the evolution of RHIC and its spin physics program.

[1] [http://www.bnl.gov/rhic/]
[2] [http://www.star.bnl.gov/]
[3] [http://www.phenix.bnl.gov/]
[4] [http://www.rhic.bnl.gov/brahms/]
[5] [http://www.bnl.gov/henp/docs/spinplan0205.pdf]
[6] [http://www.bnl.gov/henp/docs/e-ion_whitepaper_0202.pdf]