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Next stages of PHENIX for enhanced physics with jets, quarkonia, and photons

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The PHENIX collaboration at BNL-RHIC has been developing detector upgrade plans for an enhanced physics program utilizing the improved luminosity of RHIC to explore the properties of the Quark-Gluon Plasma in the strong coupling regime in a way to complement the heavy ion programs at the LHC.

The next stage, referred to as sPHENIX, provides focused physics programs through a series of aggressive detector upgrades. The present PHENIX central arms are to be replaced with a former BaBar superconducting solenoid, and electromagnetic and hadronic calorimeters with a uniform coverage in the mid-rapidity, aiming at much enhanced jet measurements. Additional tracking layers and an electromagnetic preshower are under a discussion to enable the program to include quarkonia, and neutral mesons and direct photons across a wide range of transverse momentum up to 40 GeV/c.

The physics capabilities of the sPHENIX program will be presented, along with the detector designs and the time lines, as well as the planned staging toward an electron ion collider detector, called ePHENIX.

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