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High-p_T Physics with the STAR Experiment at RHIC

KATHLEEN TURNER, Brookhaven National Laboratory, FOR THE STAR COLLABORATION — QCD predicts that at sufficiently high energy density there will be a transition from hadronic matter to a deconfined state of matter: the quark-gluon plasma (QGP). The RHIC facility will collide ions from protons to gold at $\sqrt{s}_{NN}$ up to 500 GeV (p) and 200 GeV (Au). At these energies, the rate of high-p_T processes which are reliably calculated in pQCD becomes high for the first time in heavy ion collisions. The STAR experiment is a TPC-based, general purpose detector designed to obtain charged particle spectra, with an emphasis on hadrons, over a large phase space. An electromagnetic calorimeter provides measurement of e's, γ's, π^0's and jets in the same region. A predicted signal of QGP formation is a change in energy loss of high-p_T partons relative to that of confined hadronic matter. This can be studied by comparing pQCD predictions to measured high-p_T inclusive hadron spectra, leading hadrons and their correlations (jets), and direct-γ's correlated with leading hadrons. STAR's investigation of techniques and signals to observe and measure the QGP using high-p_T probes will be described.

[X] Prefer Oral Session
[ ] Prefer Poster Session

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