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Abstract for an Invited Paper for the HAW05 Meeting of the American Physical Society

## Probing the QGP at RHIC: Lessons and Challenges

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Recent data taken at the Relativistic Heavy-Ion Collider has provided strong evidence for the creation of a strongly interacting deconfined phase of quarks and gluons, often referred to as the strongly coupled Quark-Gluon-Plasma (sQGP). In the first part of my talk I will highlight the major findings which have lead to the discovery of the sQGP. However, the quantitative analysis of sQGP properties and their connection to QCD at high energy density is still in its infancy. The second part of my talk will focus on the key challenges faced by QGP theory in characterizing the bulk properties and dynamical evolution of the sQGP phase. In particular I will discuss success, limitiations and future perspectives of the hydrodynamic model, parton recombination as standard model of hadronization, and recent transport theory calculations on photons and electromagnetic probes.