Seminario Departamento de Física Teórica

"The equation of state and deconfinement in QCD"

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Abstract:

The low-energy phase of the theory of strong interactions, Quantum Chromodynamics (QCD), features a remarkable property of confinement the spectrum contains composite, color-neutral states, while states with non-zero color charge are not observed. At high temperatures and/or densities the strongly interacting matter undergoes a transition into the deconfined phase called Quark-Gluon Plasma (QGP). The properties of QGP are being studied experimentally at the Relativistic Heavy-Ion Collider (RHIC) at BNL and the Large Hadron Collider (LHC) at CERN. On the energy scales accessible to the experiments the theory is still strongly coupled and lattice gauge theory provides a non-perturbative approach for solving it with stochastic methods. I review recent progress in understanding the thermodynamics of QCD: properties of the transition into the deconfined phase, signatures of deconfinement and restoration of the chiral symmetry, and the equation of state of QGP at high temperature and density.

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