Kent State University Physics Colloquium

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Exploring Hot QCD in Magnetic Fields

The investigation of the effects produced by a magnetic field in the phase diagram of strongly interacting matter became a subject of great interest in recent years. The recent motivation stems mainly from the fact that strong magnetic fields may be produced in noncentral heavy-ion collisions. Strong magnetic fields are also present in magnetars and might have played an important role in the physics of the early universe. At zero temperature, the great majority of effective models for Quantum Chromodynamics (QCD) are in agreement with respect to the occurrence of the phenomenon of magnetic catalysis (MC), which refers to the increase of the chiral order parameter represented by the (light) quark condensates with the strength of the magnetic field. On the other hand, at finite temperature such models fail to predict the inverse magnetic catalysis (IMC), an effect discovered by lattice QCD (LQCD) simulations, in that the pseudo-critical temperature for chiral symmetry restoration decreases as B increases. In this talk I will present recent results where I advocate that asymptotic freedom plays a key role in the recently observed discrepancies between results of lattice QCD simulations and quark models regarding the behavior of the pseudocritical temperature for chiral-symmetry restoration in the presence of a magnetic field B.

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1:30 PM
SMITH HALL 111
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