

FAKULTÄT für PHYSIK
LUDWIG-MAXIMILIANS-UNIVERSITÄT
MÜNCHEN/GARCHING

PHYSIK-DEPARTMENT
TECHNISCHE UNIVERSITÄT MÜNCHEN
MÜNCHEN/GARCHING

MLL-KOLLOQUIUM

Donnerstag, 29.11.2012, 16¹⁵ Uhr

Hörsaal der LMU in Garching, Am Coulombwall 1
Treffen zum gemeinsamen Kaffee 16 Uhr

Dr. Bertram Klein

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Finite-Volume effects in QCD

Quantum Chromodynamics as the theory of the strong interaction underpins our description of nuclear physics. The non-perturbative phenomena of confinement of elementary color charges and spontaneous breakdown of chiral symmetry are essential for understanding hadronic matter. The transition of QCD at high temperature from hadronic matter to a quark-gluon plasma phase is probed in relativistic heavy-ion collision experiments. Non-perturbative methods such as lattice QCD are essential for a theoretical understanding of the thermodynamics of QCD and the physics of the chiral and deconfinement phase transitions. Lattice QCD simulations are performed in finite space-time volumes. The spontaneous breakdown of chiral symmetry and the presence of the light pions make QCD simulations particularly sensitive to finite-volume effects. A careful assessment of such effects is therefore important. On the other hand, the presence of these effects can be turned into an analytical tool and give important insights into the nature of the transition. I will give a brief overview of finite-volume effects in QCD and discuss implications of finite-volume effects for the phase diagram and the analysis of the critical behavior at the chiral phase transition.

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