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CENTER FOR THEORETICAL PHYSICS



ASC-PhD-Colloquium

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Gauge/Gravity approach to the quark gluon plasma and condensed matter systems

Abstract:

In this talk we explore the effects of chemical potentials or charge densities inside a thermal plasma. This plasma is microscopically described by strongly coupled gauge theory, i.e. by a quantum field theory in the non-perturbative regime. We make use of the AdS/CFT duality, or more generally of the gauge/gravity duality, which is used to translate this non-perturbative problem in the strongly coupled gauge theory into a feasible perturbative gravity calculation. In this sense extensions of the original gauge/gravity duality can be used to study the strong coupling behavior of the quark gluon plasma, which is currently produced at the RHIC heavy ion collider and later at the LHC. We also relate our results to predictions from QCD, the quantum field theory describing the strong interaction, at strong coupling. Possible signatures at colliders are discussed. Furthermore the connection of these investigations to condensed matter systems will be drawn. In this context we briefly review recent gauge/gravity results for dual superconducting systems.

Wednesday, 23th July 08, 11:15 h, Room 348 / 349, Theresienstr. 37 / III

Prof. D. Lüst