

Hauptvortrag

PV VII Di 12:15 RW 1

Entropy Creation in Heavy Ion Collisions — ●ANDREAS SCHÄFER — University of Regensburg, 93040 Regensburg, Germany

Extremely rapid isotopization and thermalization in Heavy Ion Collisions are crucial to deduce information on the QCD phase diagram from such reactions. Whether it occurs and in which respect (ideal thermalization being only an asymptotic limit for infinitely long times) is, therefore, one of the most important questions in this field. At the same time for theory it is a truly challenging question. QCD is time-reversal invariant such that information should be conserved and there should not be any entropy production prior to the experimental measurement process which occurs only long after the reaction is over. To the extend

that AdS/CFT duality holds thermalization is equivalent to black-hole formation and the sketched problem is identical to the famous information problem in black-hole physics, where the consensus shifted in recent years towards the believe that information is conserved (implying that no entropy is produced) but that it is contained in quantum mechanical phases which cannot be accessed experimentally. We analyzed the problem of entropy production in high-energy heavy ion collisions with various approaches which all led to comparable conclusions: If the unavoidable coarse-graining imposed for any subsequent measurement by the uncertainty principle is taken into account, thermalization happens indeed on very short time scales (supported by BMBF).