Abstract for GR-TR Conference on Statistical Mechanics and Dynamical Systems

Talk Invited Invited Talk

On the foundations of statistical mechanics: Extensivity of the nonadditive entropy Sq, and generalized central limit theorems

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The (additive) Boltzmann-Gibbs-von Neumann-Shannon (BG) entropy is extensive in the thermodynamical sense for say classical short-range-interacting and other relatively standard systems. The situation is more subtle for complex systems such as quantum entangled ones, long-standing quasi stationary states in classical long-range-interacting Hamiltonian systems, optical latices, plasma, among others. The nonadditive entropy Sq (S1 being the BG entropy) appears to be extensive for a special value of the index q which differs from unity. This class of systems is discussed,. as well as their connections to the Central Limit Theorem, which mathematically grounds BG statistical mechanics.

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