

The phase diagram in T- μ -Nc space

We argue that a so far neglected dimensionless scale, the number of neighbors in a closely packed system (N_n , $N_n \sim 10$ in our world), is relevant for the convergence of the large number of colors (N_c , $N_c=3$ in our world) expansion at large chemical potential.

Using a highly simplified but universal model, we demonstrate that the $N_c \gg N_n$ limit is qualitatively different from our world's $N_c \ll N_n$. In particular, the relationship between deconfinement and percolation, and the in-medium modification of baryonic wavefunctions, are very different in these two regimes.

We explore phenomenological consequences of these findings, particularly in regard to the new "Quarkyonic" phases conjectured from large N_c arguments and the problem of chiral symmetry breaking at high chemical potential

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