

Peter Petreczky, "Supercomputing the Matter at Extremes: From Hadrons to Quarks"

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Supercomputing the Matter at Extremes: From Hadrons to Quarks

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At very high temperatures the strongly interacting matter is expected to undergo a transition to a new state, where the dominant degrees of freedom are quarks and gluons instead of hadrons. I will discuss this transition and the properties of the new form matter based on large scale numerical calculations within lattice regularized Quantum Chromodynamics (LQCD). In particular, I will discuss equation of state, Debye screening and fluctuations of conserved charges. I will show how the fluctuations of conserved charges can be used to understand the transition from hadrons to quarks. I will also compare the numerical LQCD results with picture based on weakly interacting gas of quarks and gluons.

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