

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

**Report of Contributions**

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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.

**Presenter(s) :** Prof. PETRECZKY, Peter (Brookhaven National Laboratory)