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**Lattice QCD at finite temperature and density from Taylor expansion**

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In the first part, I present an overview of recent Lattice QCD simulations at finite temperature and density. In particular, we discuss fluctuations of conserved charges: baryon number, electric charge and strangeness. These can be obtained from Taylor expanding the QCD pressure as a function of corresponding chemical potentials. Our simulations were performed using quark masses corresponding to physical pion mass of about 140 MeV and allow a direct comparison to experimental data from ultra-relativistic heavy ion beams at hadron colliders such as the Relativistic Heavy Ion Collider at Brookhaven National Laboratory and the Large Hadron Collider at CERN. In the second part, we discuss computational challenges for current and future exascale Lattice simulations with a focus on new silicon developments from Intel and NVIDIA.