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Warm dense QCD matter in strong magnetic fields

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Finite magnetic field is relevant for both systems where QCD matter can be studied in practice - heavy ion collisions and neutron stars. It was shown recently, that in sufficiently strong magnetic fields and at moderate baryon densities a new phase of QCD matter appears: a crystalline condensate of neutral pions named the chiral soliton lattice. This phase might be relevant for magnetars; however, in order to assess its relevance for heavy ion collisions, finite temperature has to be taken into account. In this talk, I will describe the effects of quantum fluctuations and finite temperature recently calculated within chiral perturbation theory. The obtained results on the QCD phase diagram for varying temperature, baryon chemical potential and magnetic field will be presented.

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