

Background magnetic fields and the QCD phase diagram

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Strongly interacting quarks and gluons exposed to a background magnetic field reveal a rich physical structure. This topic has recently become of interest, both because it challenges our understanding of the underlying theory (QCD) as well as due to a wide range of phenomenological applications, from neutron star physics to heavy-ion collisions.

A particularly interesting aspect of this theory is the response of the order parameter (the quark condensate) to the magnetic field and the structure of the corresponding phase diagram. In this talk, I summarize our current knowledge about the mechanisms that are relevant for this response within a variety of settings: effective theories, low-energy models of QCD and lattice QCD simulations.

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