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Chiral superfluidity in QCD

Tuesday 20 May 2014 16:30 (2 hours)

In this talk I will discuss new effects due to the appearance of the chiral superfluidity in two regimes of QCD. First, at low temperatures and finite density, where the cold pion condensate under rotation and in electromagnetic fields develops string-like defects with anomalous currents flowing along them. Second, at low density and high temperatures, slightly above the deconfinement transition, where the quark-gluon plasma (QGP) can be described as a two-component fluid with the fermionic zero-modes forming the “superfluid” component carrying all the chiral properties of the QGP. The anomalous phenomena under consideration include the chiral magnetic, chiral vortical, axial vortical, chiral electric, chiral separation and other effects. I will also comment on the nature of their temperature dependence in both regimes.

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