

Scale invariance: super-cooling and Dark Matter

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If the electroweak sector of the Standard Model is described by classically conformal dynamics, the early Universe evolution can be substantially altered. In particular, one generically has a significant period of super-cooling, often ended when quark condensates form at the QCD phase transition. This scenario is potentially rich in cosmological consequences, such as renewed possibilities for electroweak baryogenesis and gravitational-wave production. In the second part of the talk we will focus on Super-cool Dark Matter, a new mechanism of generation of the cosmological Dark-Matter relic density: super-cooling can easily suppress the amount of Dark Matter down to the desired level. This mechanism generically takes place in old and new scale-invariant models.

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