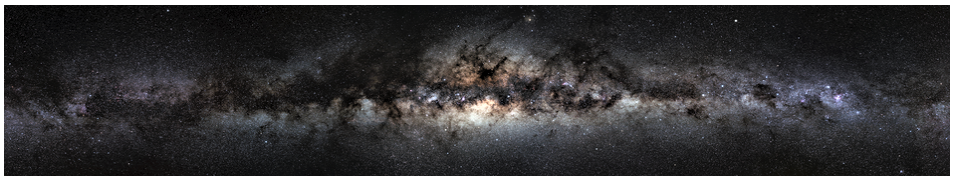

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Fermion-induced Electroweak Symmetry Non-restoration via Temperature-dependent Masses

Tuesday, 7 December 2021 08:20 (30 minutes)

In certain extensions of the Standard Model, the interactions between some new scalars and SU(2)_L Higgs doublet(s) can cause the electroweak(EW) symmetry to remain broken at temperatures well above the EW scale. We found that new fermions from renormalizable models can also induce this EW symmetry non-restoration effect, provided that they have the appropriate temperature-dependent masses. These masses can arise naturally from the interactions between the new fermions and scalar fields. I will present the novel thermal histories of these models. Certain cases predict that the EW phase transitions are strongly first-order and occur at temperatures much higher than the EW scale. The stochastic gravitational-wave background from these cosmological phase transitions may be visible at future gravitational wave observatories, such as BBO and DECIGO.

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