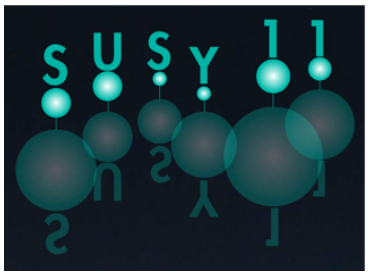

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Dark radiation from the axino solution of the gravitino problem

Monday, 29 August 2011 15:30 (20 minutes)

Current CMB observations could confirm an increase of the effective
neutrino degrees of freedom after primordial nucleosynthesis but before
photon decoupling. We show that, if the gravitino problem is solved
by a light axino, dark (decoupled) radiation emerges naturally in this
period leading to a new upper bound on the reheating temperature < 10^10 GeV. In turn, successful thermal leptogenesis predicts such
an increase. The LHC might endorse this opportunity. We identify
several consistent cosmologies.

Summary

It is a absolutely new opportunity to determine the amount of radiation in the Universe from the CMB alone. Recent (first) publications of observations give mean values larger at the time of photon decoupling than at the time of primordial nucleosynthesis. As other explanaitions are missing we should search for explanaitions from particle physics. To our knowledge we provide the first possibility that is motivated from problems of the Standard Model and cosmology. We observe an astonishing coincidence for parameter values motivated by completely disconnected reasons. It is remarkable that we can obtain a consistent comology, e.g. also dark matter, at the same time.

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