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SU(2) Yang-Mills thermodynamics and Cosmology

Thursday 5 July 2018 13:00 (30 minutes)

We review the postulate that an SU(2) Yang-Mills theory of scale 10ˆ(-4) eV describes extended thermal photon gases. In particular, we discuss a number of implications for the Cosmic Microwave Background which, in turn, imply a change in the high-z cosmological model. Due to the nontrivial, deconfining thermal ground state of this theory a Planck-scale axion field acquires a potential, and we speculate that galaxy sized U(1) vortex cores of this field represent dark matter when in isolation and dark energy when occurring in percolated form. Much work is needed to match this idea to observations on galaxy clustering, lensing, and the phenomenology of spirals, and to learn about the precise equation of state of the percolate.

Primary author: Dr HOFMANN, Ralf (ITP, Uni Heidelberg)

Presenter: Dr HOFMANN, Ralf (ITP, Uni Heidelberg)

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