## **Department of Theoretical Physics**



## Subodh Patil Niels Bohr Institute, Copenhagen What's left to learn from the CMB (from a phenomenological point of view)? Friday, 29 December 2017, 11:30 Room A304

To date, the Cosmic Microwave Background has been our cleanest probe of the physics of the early universe. It is in principle limited in its information content. We survey the prospects for gains in our phenomenological understanding of the early universe from exhausting observations of temperature and polarization anisotropies (and possibly measuring spectral distortions) in the near to mid term. We then present an amusing observation that tensor modes, if ever observed, can be used to bound the hidden field content of the universe. This is because a large number of hidden fields can resum to potentially observable logarithmic runnings in the context of single field inflation, courtesy of a 'large N' expansion. Thus, one can translate ever more precise bounds on the tensor to scalar consistency relation into bounds on the hidden field content of the universe, with implications for phenomenological constructions that address naturalness with a large number of species.



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