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Title: Solving cosmology puzzles with holographic cosmology and transition to standard RD cosmology

ABSTRACT:

Abstract: Currently, the standard paradigm in cosmology is inflation at early times, with Λ -CDM now. Yet, inflation is a weakly coupled gravity + scalar theory, and there is no a priori justification for it. We can envision an extension of this paradigm into the strongly coupled regime, via the gauge/gravity duality (extension of the AdS/CFT correspondence). In particular, a phenomenological model of holographic cosmology with a non-geometric (strongly coupled gravity) phase was found, that matches the CMBR data as well as the standard paradigm. Here we show that the usual problems of Hot Big Bang cosmology can also be solved by holographic cosmology, differently and in a sense better than inflation. We also describe the analog of reheating, transitioning holographic cosmology to the usual, radiation dominated (RD) cosmology. This allows us to understand better the cosmological constant, and to connect the phenomenological approach to possible top-down ones. Finally then, holographic cosmology is found to be as good as inflation, extending the paradigm into new corners.