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Matilde Marcolli* (matilde@caltech.edu), 1200 E. California Blvd, Pasadena, CA 91125, and
Elena Pierpaoli. *Early universe models from Noncommutative Geometry.*

We analyze cosmological applications of particle physics models based on noncommutative geometry. The peculiar aspect of these models is a coupling of matter with gravity where the coefficients of the gravitational and cosmological terms in the Lagrangian depend upon the Yukawa couplings of the particle physics content of the model, and therefore run with the renormalization group flow. This provides a cosmological model of the early universe (between the unification and the electroweak epochs) with a running effective gravitational constant and a running effective cosmological constant. We analyze the effects on gravitational waves and on the evaporation law of primordial black holes, and resulting Linde type models of negative gravity in the early universe. We also discuss inflationary mechanisms related to a Higgs based slow-roll potential and to the running effective cosmological constant. (Received September 01, 2009)