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Swampland Bounds on Cosmology

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Consistency with quantum gravity can have important implications for Particle Physics and Cosmology. Recently, a great deal of activity has been devoted to determining the constraints that any EFT must satisfy to be consistent with a UV embedding in quantum gravity. I will revisit some of the most important constraints implied by the Swampland conjectures and discuss their implications. For instance, the Distance Conjecture can be used to constrain the field ranges in inflationary models. Consistency of the conjecture at any energy scale also implies constraints on the scalar potentials consistent with quantum gravity. Furthermore, generalizations of the Distance Conjecture and the Weak Gravity Conjecture can be used to provide an upper bound on neutrino masses in terms of the cosmological constant. More generally, they support the existence of light fermions in de Sitter space, providing new insights into naturalness issues.