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Inflation meets dark energy: α-attractor quintessential inflation in the era of Euclid

Over the last few years, a large family of cosmological attractor models has been discovered, which can successfully match the latest inflation-related observational data. Many of these models can also describe a small cosmological constant Λ. In this talk, I will present a recently discovered class of α-attractor models with dynamical dark energy, including the cosmological constant Λ as a free parameter. Predominantly, the models with $\Lambda > 0$ converge to the asymptotic regime with the equation of state $w = -1$. However, there are some models with $w \neq -1$, which are compatible with the current observations. In the simplest models with $\Lambda = 0$, one has the tensor to scalar ratio $r = \frac{12\alpha}{N^2}$ and the asymptotic equation of state $w = -1 + \frac{2}{9\alpha}$. For example, in the seven disk M-theory related model with $\alpha = 7/3$ one finds $r \sim 10^{-2}$ and the asymptotic equation of state is $w \sim -0.9$. Future observations, including large-scale structure surveys such as Euclid as well as B-mode detectors will test these, as well as more general models that I will present in this talk. I will also discuss gravitational reheating in models of quintessential inflation and argue that its investigation may be interesting from the point of view of inflationary cosmology. Such models require a much greater number of e-folds, and therefore predict a spectral index n_s that can exceed the value in more conventional models by about 0.006. This suggests a way to distinguish the conventional inflationary models from the models of quintessential inflation, even if they predict $w = -1$.

Summary

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