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Testing Inflation with Dark Matter Halos (Primordial Non-Gaussianity in Large-scale Structure)

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Cosmic inflation provides a mechanism for generating the early density perturbations that seeded the large-scale structures we see today. Primordial non-Gaussianity is among the most promising of few observational tests of physics at this epoch. At present non-Gaussianity is best constrained by the cosmic microwave background, but in the near term large-scale structure data may be competitive so long as the effects of primordial non-Gaussianity can be modeled through the non-linear process of structure formation. I will discuss recent work modeling effects of a few types of primordial non-Gaussianity on the large-scale halo clustering and the halo mass function. More specifically, I will compare analytic and N-body results for two variants of the curvaton model of inflation: (i) a tau_NL" scenario in which the curvaton and inflaton contribute equally to the primordial curvature perturbation and (ii) ag_NL" model where cancellations vanish the usual quadratic f_NL term in the potential, but give rise to a large cubic term.

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