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Probing New Physics through the Cosmological Collider

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The correlation functions of primordial cosmological perturbations encode valuable information about the early universe. In particular, higher-order correlations, known as non-Gaussianities, can reveal additional insights, including the mass and spin of heavy particles, through characteristic oscillatory signatures. Remarkably, such particles can have masses as large as the Hubble scale during inflation, far beyond the reach of terrestrial experiments. This approach to uncovering new particles through primordial non-Gaussianity is known as the cosmological collider program, and it has emerged as a promising avenue for probing physics beyond the Standard Model. In this talk, I will briefly outline the cosmological collider framework, comment on some recent developments, and discuss my own contributions to this growing field.

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