Future measurements of primordial non-Gaussianity (NG) can reveal the mass and the spin information of cosmologically produced particles with masses of order the inflationary Hubble scale, $H_{\text{inf}}$, which can be as high as $10^{13}$ GeV. In this talk, I will describe how such NG measurements can be used as an on-shell probe of, a) Grand Unified Theories and, b) low scale gauge theories that get “heavy-lifted” to $\sim H_{\text{inf}}$ scales. I will also discuss a simple alternative to the standard inflationary paradigm, involving a curvaton field, that can allow NG signals orders of magnitude larger compared to standard inflation. This brings various motivated particle physics signatures, such as loops of heavy gauge-charged scalars and fermions, within future observational reach.