Summary of Discussion Session #1 (November 5, 2012)

"What does single-field inflation actually predict? How about soft limits?"

Question: Are we ready to declare that all single-field(*) models of inflation are ruled out if the local-form f_{NL} is found?

(*) The definition of "single-field inflation" here is the inflation models in which one field (or one field direction) is solely responsible for the accelerated expansion AND the creation of curvature perturbations.

Answer: Yes, provided that:

1. The curvature perturbation does not evolve outside the horizon due to a decaying mode. In other words, the attractor solution has been reached, and there is only one adiabatic growing mode. (The adiabatic decaying mode has already decayed to a sufficiently small amplitude.)

2. No large (much bigger than the slow-roll parameters) sub-horizon correlations between long- and short-wavelength modes exist. Initial conditions are set such that sub-horizon correlations are small (Bunch-Davies vacuum).

Other remarks:

- The squeezed-limit bispectrum and the local form do not necessarily mean the same thing. The local form is convenient only because the dominant contributions to the signal-to-noise ratio come from the squeezed configurations, and it is scale invariant. In this sense it is the most convenient template for the squeezed-limit bispectrum.

- Are we sure that detection of the local-form bispectrum means detection of the squeezed-limit bispectrum? In other words, have we exhausted and excluded all the possible bispectrum shapes that can mimic the local-form bispectrum even within the framework of single-field inflation? *The answer seems yes.* At least, there are no self-consistent explicit single-field examples available so far that can generate non-Gaussianity which mimics a large local-form f_{NL}.

- The most squeezed configurations that can be probed by measurements of the cosmic microwave background and the large-scale structure of the universe are $k_{long}/k_{short} \sim 10^{-3}$. The μ-distortion of the thermal spectrum of the cosmic microwave background may allow us to reach $k_{long}/k_{short} \sim 10^{-8}$.