Q&A II :: Thu 22nd Sept 2016 :: theory/conceptual questions welcome! Of course, any question counts and should be raised! ;-)

1. What is a tensor coupling which often appears in EFT theories but as far as I know not in the SM. Are there more coupling structures possible beyond scalar, vector, tensor?
2. What are open loops?
3. There are two main mechanisms for the ttH production (tt fusion and higgsstrahlung). Which one is more relevant at the LHC13? The angles between tops and higgs are likely to be different, on average, in the two cases, e.g. dPhi(t,h) may be smaller for higgsstrahlung. Are the current analysis strategies really catch-all, or are targeting only one of the two topologies?
4. The interference between signal and background in resonance searches has been considered only for a specific model to set limits to the coupling with the standard model. Isn't the interference effect important also in the previous results, in the previous limits setted? (for example the interference move the "expected peak" from the actual mass value of the particle, do this impact the limit evaluation?)
5. Which criteria should be used when creating control regions to constraint modelling systematics in the signal region? Can we assume e.g. that the choice of the QCD scale for the modelling of a background can be constrained from a control region and still hold in the signal region?
6. In the context of previous question (5), what about validation region?
7. What is the difference between unfolding to parton or particle level? In which cases would you do either?
8. How to interpret a limits plot? (e.g. the SUSY limits)
9. What is the difference between coupling of vector-like quarks and normal quarks to gauge bosons?
10. The renormalization procedure is used to remove divergences in QED. Why it cannot be applied in the Higgs boson case when we speak about its mass (huge correction to Higgs mass due to top quark loops)?
11. In an EFT, does only the combination C/Lambda^2 determine whether a specific model is valid and perturbative, or is it C and Lambda separately? Fight!

- Future: we need a 'speaking stick' so only one person talks at a time.

nbiQ&A I :: Tue 20th Sept 2016

Anonymous:) Questions:

1. Why…?
2. What is…?
3. How does..?
4. How do I calculate..?
5. How do I measure..?
6. I did not understand. ..

1. is the definition of “fiducial regions” fixed for each detector or the definition of theses regions depend on the analysis and so it defers from one analysis to another ?
2. in experimental analysis with multi leptons final state “missing energy” variable represents all neutrinos at the event but is there a recipe that can be used to calculate the contributions from each neutrino? if yes How ?
3. How do I better calculate hadronization and colour reconnection?
4. What is a difference between m_{t} pole and MS_bar mass? How do I know the correct value of its difference?
5. I didn’t understand how works the variable-R method, which jet definition do I use to calculate the jet pT and decide the jet radius?
6. How are systematic uncertainties related to a boosted top tagger calculated? Does exist an uncertainties related to the efficiency (like b-tagging uncertainties) ?
7. I didn’t understand what is the boosted top resummation (basic ideas are sufficient :))
8. I (still) don’t understand in what contexts the pole mass, MC mass or running mass appear. Does any of them correspond to the mass you would get by reconstructing the decay products? Which one is measured to be ~173 GeV? Which decides if our universe is stable?
9. Why are the modelling uncertainties in single-top mass measurement so different between ATLAS and CMS? :)
10. I understand that tt charge asymmetry (lhc, pp) causes a difference in rapidity distributions. However I have had it argued to me that even in the full phase space (hypothetical full solid angle detector) you end up with a different number of t to tbar, surely that is only the case in a fiducial volume?
11.