Questions from September 14 Nuclear Lunch Presentation

1. Is the Hoyle state the only way to produce Carbon in our universe? Does that mean that it is responsible for life on Earth? What is "the anthropic principle"? **Cody**

2. Is it possible to perform an experiment where 3 Helium nuclei go in and Carbon comes out? If not, then what are the experimental constraints on the individual stages of the process envisioned by Hoyle for the production of Carbon? **Harsha**

3. What are the most recent experimental parameters for the Hoyle state? How are they determined? **Sushil**

4. The paper claims an "*ab initio*" or "first principles" calculation. What do they mean? **Alina**

5. What are the other *ab initio* methods which have been applied to Carbon-12? What results (if any) have they claimed for the Hoyle state? Is the "lattice EFT" calculation the best way of computing the Hoyle state's properties? **Chen**

6. Can Lattice EFT be applied to nuclei other than Carbon-12? What about other *ab initio* methods? **Dilu**

7. Are there any "just lattice" calculations, not "lattice EFT" calculations? If so, how do they differ from what was described here? What are the matter and fields which are "put" on the lattice in a lattice calculation? **Brian**

8. What determines the choice of numbers for a & L? **Shamim**

9. Why can't we go to t=∞ in the lattice calculation? Since we can't get to t=∞ how do we decide that we have reached a stable value for the energy of a nuclear state? **Linda**

10. Explain further the diagrams used in this EFT calculation. **Youngshin**

11. What is the difference between an "S-wave contact interaction" and a "P-wave contact interaction"? **Azamat**

12. Epelbaum et al. modified their NLO etc. calculations in order to improve the results between their 2010 and 2011 PRLs. How? Did the results of calculations for other nuclei get better? Worse? **Anthony**

13. Why (and how) do Epelbaum et al. use SU(4) in the lattice calculation? **Nowo**

14. What parameters govern the "four-nucleon contact interaction". How does each parameter get set, and how does the resulting interaction contribute to the binding energies of the different nuclei considered? **Mongi**