Nuclear Lunch Questions

1. Why is it experimentally "impossible" to measure the cross section of the reaction and what is lifetime of Hoyle state (i.e. excited C^{12})? **(Chirag Rathi)**

2. What is RANSAC fitting technique? How is it used in the context of the paper? **(Yenuel)**

3. Why is ^{12} C* viewed as three alpha particles? In other words, why is the Hoyle state composed of only 3 alpha particle but not 6 ^{2}H or 2 ^{6}Li particles? **(Shyam)**

4. Why is there a plateau from 8.2-8.34 MeV? What is the cause for the fast drop-offs in the plot in Fig. 4? **(Joseph Foy)**

5. What is R-matrix? In Fig. 3, why show the neutron upscattering and proton upscattering ? **(Alexandra)**

6. How does the Active Target Time Projection Chamber work? **(Justin Bryan)**

7. In the paper, it is mentioned that "at high temperatures proton upscattering will dominate and can have a significant impact on nucleosynthesis". How does this impact nucleosynthesis? Give some more detailed explanation on this. (Other than Red Giant as discussed in class.) **(Joseph Derkin)**

8. How relevant would this effect be in a star with the s-process occurring in its core? **(Michael J.)**

9. Why did Hoyle hypothesize that ^{12}C in red giants has to be produced via an excited state of ^{12}C that was at the time unknow? (Bradley)