

## Nuclear Lunch Questions

October 31-November 7, 2012

1. Why did it take so much time (from 2001 to 2009) to start operations? What sort of technical problems did they have? Are there already any experimental results achieved at NIF until now? Does it do nuclear weapons testing? (**Sushil**)
2. How did they increase energy by 40 times compare to the previous laser system? Why other facilities could not do this before? (**Bing**)
3. For how long can they run without burning holes in the gold capsule? Why can fusion only occur under the conditions of extreme temperature and pressure? How can they replicate the conditions of extreme temperature and pressure? (**Andrea**)
4. How do they distinguish  $\gamma$  and x-rays within few nanoseconds? How are the detectors arranged and how do they work? (**Nowo**)
5. Why they do not compress the target by lasers directly? Why do they need spherically symmetric x-ray radiation to compress the target? How does this affect the fusion reaction happening in the experiment? (**Harsha**)
6. Why do they need the following fusion reaction to produce energy rather than any other possible  
$${}^3\text{He} + {}^2\text{He} \rightarrow {}^4\text{He} + {}^0\text{n} + 17\text{MeV?}$$
 (**Arbin**)
7. How do you detect neutron capture? (**Dilu**)
8. NIF uses ICF, but magnetic confinement fusion (MCF) was also mentioned. What are these two methods (ICF and MCF) and how are they different from each other? Is there any facility that uses magnetic confinement to fuse elements? (**Bijaya**)
9. How did they decide that the number of lasers equal to 192 was an optimal one? (**Shamim**)
10. How does the power amplifier work? (**Linda**)
11. What is the optical switch and how does it work at such high energies? (**Anthony**)