Nuclear Lunch Questions to be discussed on 09/24/2014

Antineutrino Monitoring for Heavy Water Reactors

1). How does a water (H_2O) act as a moderator? Why would changing the moderator from heavy water to regular water be a safety concern? There are other reactors that use light water. Are they somehow different? **(Sudhanva)**

2). How do they distinguish between the antineutrinos from the reactor and the natural antineutrinos? Due to various cosmic events, background antineutrino showers might change. **(Rekam)**

3). Are antineutrino oscillations an important consideration when monitoring reactors? **(Andrea)**

4). In Fig. 2, there is a small drop in the blue line after the grey region. What does that indicate? **(Cody)**

5). How does a plastic scintillator work? How is it different from liquid? **(Nick)**

6). How does a nuclear reactor produce the power? **(Arbin)**

7). What happens to the used fuel rods in the nuclear reactor? **(Bijaya)**

8). How does continuity of knowledge (COK) work for the IAEA? **(Taya)**

9). What are the methods to detect the plutonium? What are the other uses of plutonium? **(Tyler)**

10). What is the cross section for antineutrinos interacting with protons to give a neutron and a positron, for an antineutrino energy of 5 MeV? What thickness of water would attenuate a 5-MeV antineutrino beam by 50% (considering only this process)? **(Brian)**