

Nuclear Lunch Questions from 31 August 2016

INPP NUCLEAR LUNCH SERIES

September 1, 2016

1. What is the motivation behind the search for sterile neutrinos? (**Mamun**)
2. Why are sterile neutrinos predicted to interact only via gravity, but not the weak interaction? (**Sudhanva**)
3. Mongi listed a few anomalies (e.g., reactor neutrino anomaly, etc.). Are there any other hypotheses that address the issues posed by the anomalies listed? (**Matt**)
4. IceCube looked at the disappearance of ν_μ only. Why? Would the result be different had they looked at the disappearance of ν_e or ν_τ ? (**Doug**)
5. How is the third plot in Fig. 1 of the paper generated? Explain. (**Rekam**)
6. What are the main sources of background? How is the effect of background reduced in the detector? (**Kristyn**)
7. How well do we know about the atmospheric neutrinos? Explain in the context of the Super-K neutrino detector. (**Tyler**)
8. Why was ice chosen as the transparent material for the detector? Why do they need neutrinos to travel through something as dense/big as the Earth? (**Shiv**)
9. What sets the experimental energy resolution of the IceCube Experiment? (**Nick**)
10. What is meant by a blind analysis of the data? (**Bishnu**)
11. Why are only 10% data increments (10, 20, 30, ...) used in the analysis? (**Gula**)
12. What is the Solar Neutrino Problem? Is it solved? Has the search for sterile neutrinos been carried out for solar neutrinos? (**Abinash**)