

Nuclear Lunch Questions for October 10, 2012

Dark Matter / XENON100 Paper

1. What exactly does the term dark matter mean? Why do people think that WIMP's might be dark matter particles? What is the exact reaction that they are looking for? **Linda**
2. What is the "Dark Matter Miracle" ? **Arbin**
3. What does "scattering rate" mean? Why is it so low for WIMP's? What theory predicted the WIMP nucleon cross section shown in Fig. 5? Why does the XENON-100 cross section has a minimum at 30 GeV? **Sushil**
4. What improvements were made going from XENON-10 TO XENON-100? **Anthony**
5. What is cryogenic distillation? Why is the size of the detector important? Would it help to increase the amount of Xenon in the detector? **Cody**
6. What is a TPC? What does a veto PMT do? **Andrea**
7. How is it possible to get a 3-mm resolution for the (x, y) position from 1-square-inch PMT's? **Dilu**
8. Why were the high energy WIMP's ignored? Why is there an energy acceptance upper limit? **Shamim**
9. How did they decide whether or not the three observed events were WIMP's? Why were the other events rejected? Are there other sources that give similar nuclear recoils in the lower bound of energy acceptance? **Azmat**
10. Since they have only three events, are they going to get more statistics, make improvements to their detector, look at other mass regions, etc... Or are they going to give up and try something else? **Harsha**
11. Are there other ways of detecting dark matter particles? **Nowo**
12. What does RAMBO stand for? **CRB** will handle this one. It stands for **R**obust **A**ssociation of **M**assive **B**aryonic **O**bjects. Historical aside: the similarly-themed term "Schrammbo" was the nickname of the late astrophysicist David Schramm.