Nuclear Lunch Questions

Dark Matter with Pseudoscalar-Mediated Interactions

April 8 2015

• Is the galaxy rotating with respect to its dark-matter halo? If so, how did this happen? (Taya)

• What is the typical velocity of the solar system with respect to the dark-matter halo? (Sudanva)

• What is a pseudoscalar particle? How do the properties of the pseudoscalar affect the dark-matter-nucleon interaction? (Yuanzhi)

• How do the authors infer that the mass of the pseudoscalar is 52 MeV? (Sushil)

• How was the nuclear recoil measured in these experiments? (Nick)

• What are Bayesian statistics? Why are they used in this case? What is meant by the ‘S’ subscript on the 99% confidence limit? (Linda)

• In Fig. 1, what is the difference between the two bubbles? Why do we look at the right bubble and not the left bubble? (Nadyah)

• What are the symmetries of the DM-Nucleon interaction? (Shamim)

• In the DM-nucleus scattering process, is it assumed that the DM particle interacts with a single nucleon? (Cody)

• How sensitive to the nucleon spin content numbers is the conclusion that $g_p$ is much bigger than $g_n$? (Andrea)