Nuclear Lunch: October 3, 2018

Decay of the Nuclear Isomer $^{229}$Th($3/2^+$, 7.8 eV) in a Dielectric Sphere, Thin Film, and Metal Cavity

Presenter: Abinash
Moderator: Kristyn

Questions:

1. What is meant by a metal stable state? How could something with a half-life of 31 years be considered metastable? Robert
2. How does the Purcell Effect work? In this process, do the number of final states change or stay the same to enhance the density of states? Mahesh
3. Why use LiSrAlF$_6$ specifically for the experiment? Joey
4. Is the gamma activity for spontaneous decay always exponential? Why exponential and not some other dependence? Doug
5. What are the different types of gamma transitions? What physical change in the nucleus do these transitions correspond to? Kaelyn
6. Are there other ways to change the decay rate of an element? Ibrahim
7. What are the boundary conditions applied to the system? Yenuel
8. How does the shape of the cavity affect this experiment and why did they choose a sphere? Taya
9. Why is $f_M$ suppressed in the cavity but not in vacuum? Sudhanva