Discovery of $^{72}\text{Rb}$: A Nuclear Sandbank Beyond the Proton Drip Line


March 21, 2018

1. What is the Nilsson model? What is a Nilsson proton quasiparticle? (Som)

2. How is the difference between the expected and observed counts used to get the particles’ half-life in Fig. 2? Why do we only have an upper limit for $^{73}\text{Rb}$? (Abinash)

3. What is the working principle of ZeroDegree Spectrometer? How is it different from other common spectrometers used in other experiments? (Robert)

4. What are mirror nuclei? How reasonable is the assumption of mirror symmetry? (Bishnu)

5. What is an X-ray burst? Why are waiting point nuclei in the (r p) process important for the X-ray burst phenomenon? (Kristyn)

6. What is the deformation parameter ($\beta_2$)? How does its value affect the ground state spin and parity of a nucleus? (Mamun)

7. What is the difference between the proton and neutron drip lines? What physical phenomenon could be the reason that $^{72}\text{Rb}$ has a longer half-life than $^{73}\text{Rb}$? Could “pairing” of BCS type be a reason? (Sudhanva)

8. What more information can we get from the proton-delayed $\gamma$-rays and the $\beta^-$ which are detected in the EURICA array? (Mahesh)