

## *Heisenberg's Uncertainty principle, Illustration - Gamma ray microscope*

### **QB:**

1. Using Heisenberg's uncertainty principle (HUP) arrive at the expression for spectral linewidth ( $\Delta\lambda$ ). If the excited state lifetime is  $\Delta t=10\text{ns}$ , find the spectral width  $\Delta\lambda$ .
2. Explain the non-existence of electron inside the nucleus using HUP.
3. Compare the energy-time uncertainty relation for a gamma photon. Given: wavelength of gamma photon is  $\lambda=1\text{pm}$ .
4. Explain the role of Heisenberg's uncertainty principle in magnetic field wave.