





Transition!



No Transition



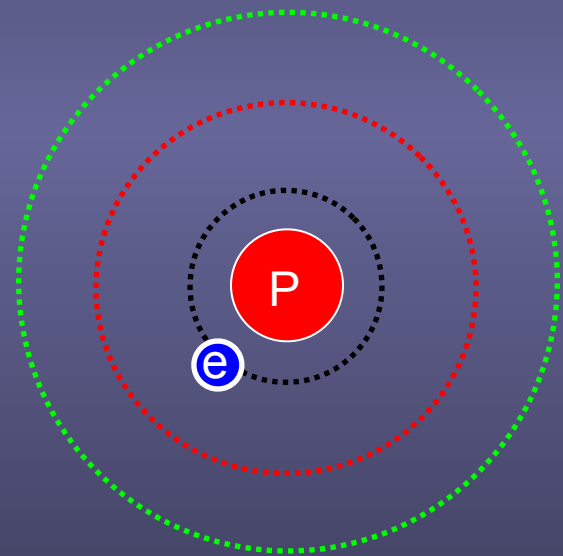
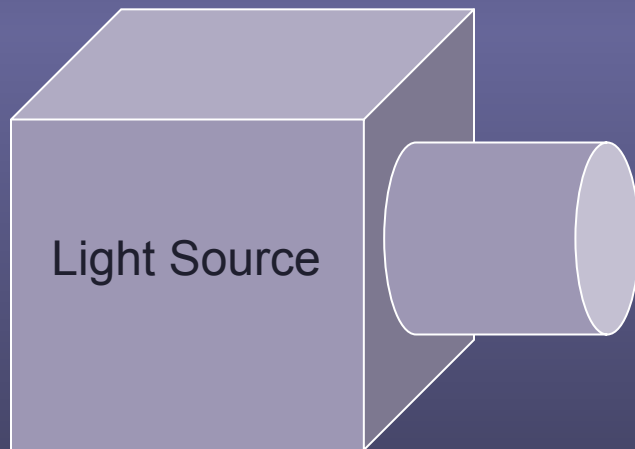
A 3D diagram featuring a purple rectangular prism on the left and a purple cylinder on the right. The prism is labeled "Light Source" on its front face. The cylinder is positioned to the right of the prism, with its circular end face facing right. The entire scene is rendered in a simple, clean style with white outlines and a light purple color scheme.

Light Source



How do we study atoms?

- Spectroscopy – the use of light emission and absorption to study matter
- First, we excite an atom using light
- Energy of a photon proportional to frequency (color); $E=h\nu$



Light must have the right frequency to result in a transition

How do we study atoms?

- An atom in the excited state then decays, producing fluorescence
- We detect the light using a photomultiplier tube (PMT)
- Intensity of the light indicates the population of atoms in the excited state