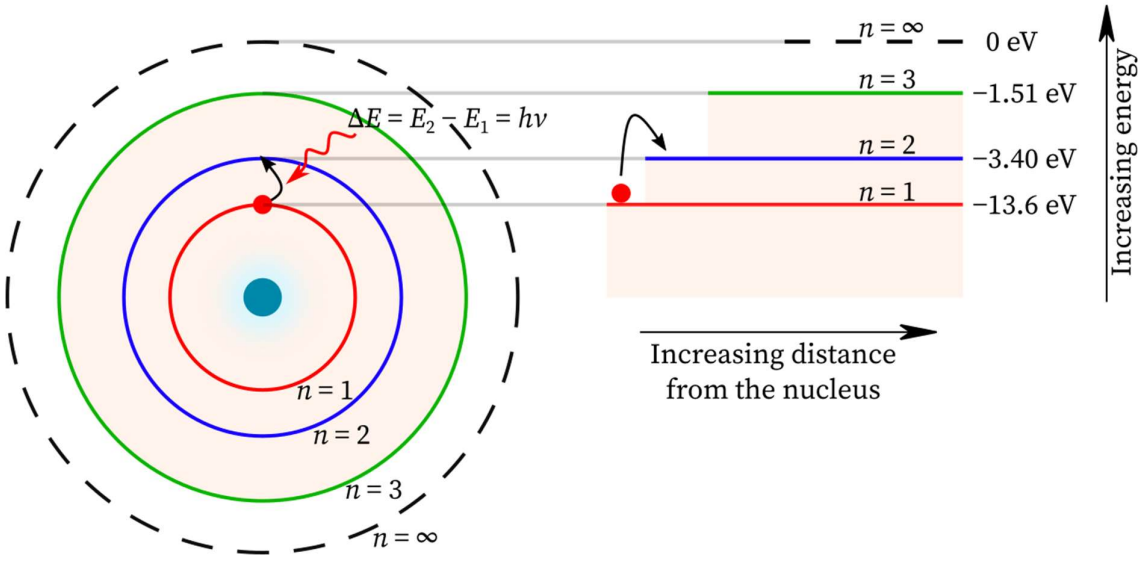
Quantization of angular momentum in the Bohr model for hydrogen

Bohr developed a model for hydrogen that was able to explain the emission and absorption spectra of hydrogen.

His model assumed discrete orbital paths in which electrons orbit the nucleus, in a similar way to planets orbiting stars.

The orbits were quantized in terms of their allowable angular momentum (rotational momentum).

Therefore, the orbital radii and energies are also quantized.



The energy of the orbit is the energy required to ionize (remove) an electron and can be given through the following equation in relation to the order of orbit (n)

$$E_n = -R_H \left(\frac{1}{n^2} \right)$$

n (principal quantum number) = 1,2,3,…

R_H (Rydberg constant) = 2.18×10^{-18}J