

Optical Spectroscopy of Hydrogenic Atoms

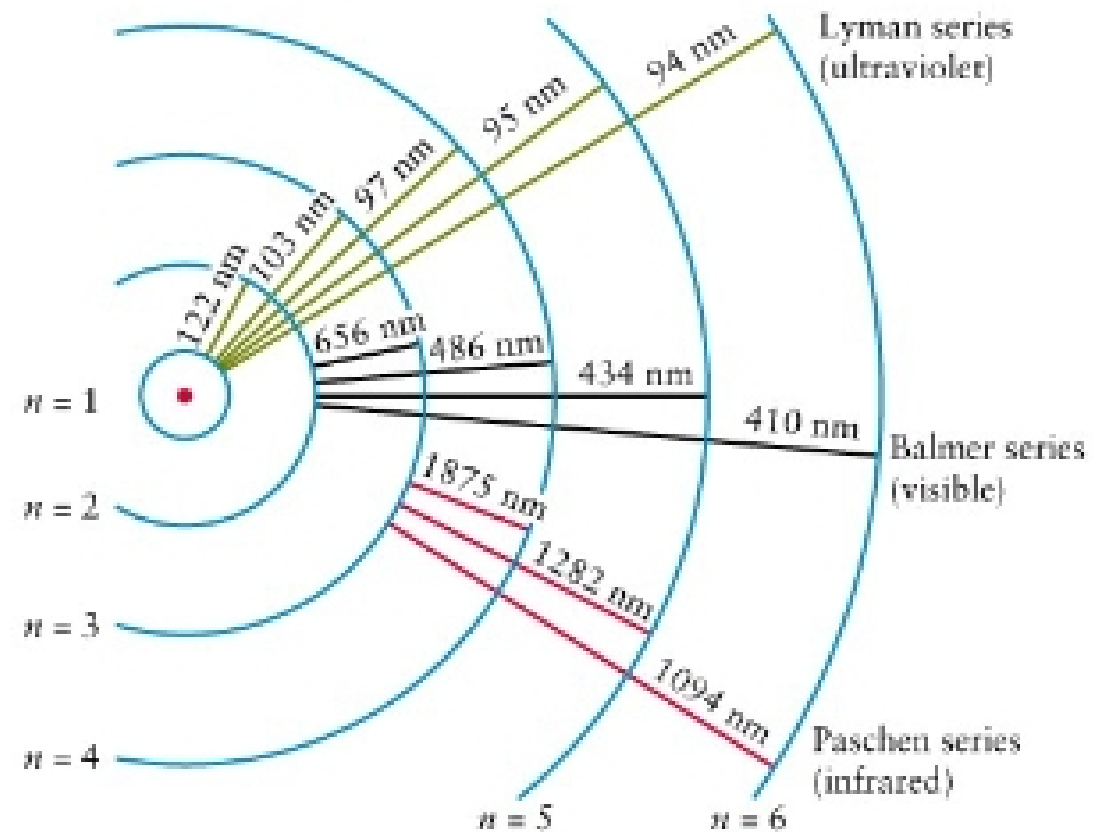
Scott D. Morrison

In this presentation...

- Theory: Energy levels of hydrogen
- Hypothesis and experimental procedure
- Raw data, discussion of sources of error
- Error analysis
- Results
- Discussion

Energy levels of hydrogen

- Energy of n^{th} level of atom:
 - $E_n = \frac{-E_i}{n^2}$
- Energy of transition from m to n :
 - $\frac{hc}{\lambda} = E_i \left(\frac{1}{n^2} - \frac{1}{m^2} \right)$
- Rearrange and introduce $R_H = \frac{E_i}{hc}$:
 - $\frac{1}{\lambda} = R_H \left(\frac{1}{n^2} - \frac{1}{m^2} \right)$



(E_i = hydrogen ionization energy, λ = wavelength,
 R_H = Rydberg constant)