

# Physics II

## Quantum Mechanics

Equations of the Bohr model

Radius of an orbit  $r = \frac{n^2}{Z} a_0$ , where  $a_0 = 0.529 \times 10^{-10} \text{ m}$

Energy level of a hydrogenic atom  $E = -\frac{Z^2}{n^2} (13.6 \text{ eV})$

Emitted wavelength for an electronic transition:

$$\frac{1}{\lambda} = Z^2 \left( \frac{1}{n_2^2} - \frac{1}{n_1^2} \right) R_y, \text{ where } R_y = 1.09 \times 10^7 \text{ m}^{-1}$$

**Problem 1.-** What is the ionization potential of  $\text{He}^+$ ?

**Problem 2.-** Calculate the wavelength of the light emitted by a hydrogen atom when it changes from the  $n=4$  state to the  $n=3$  state. What kind of radiation is this, ultraviolet, visible, or infrared?