

Work each of the following problems. SHOW ALL WORK.

1. Hydrogen produces the following atomic emission spectral lines: 410.1 nm, 434.0 nm, 486.1 nm, 656.2 nm. For each of these wavelengths, determine the corresponding frequency

a. 410.1 nm

b. 434.0 nm

c. 486.1 nm

d. 656.2 nm

2. Based on what you know about the Doppler effect, if the atomic emission spectrum of a star has the spectral lines 414 nm, 438 nm, 491 nm, and 663 nm, in which direction is the star moving relative to the telescope?

3. Neon has many atomic emission spectral lines in the orange and red areas of the visible spectrum. What does this indicate about the difference between energy levels in a neon atom?
