HR DIAGRAM ANALYSIS LAB - 2021

A local astronomer takes the following data on specific stars.  They used a light sensor to find apparent brightness, parallax to find the distances, and a spectrometer to find the peak wavelength of each star.  Place their data in a table and graph how a star’s temperature affects its luminosity.

Use the following equations to calculate a star’s temperature and luminosity based on the data you are given.

**λ\*T = 2.90\*10-3 m\*K**

**b = L / (4πd2)**

**1 ly = 9.461\*1015 m**

**1 AU = 1.496\*1011 m**

b = apparent brightness (Intensity), measured with light sensor (W/m2)

L = luminosity (E output per second), cannot measure directly (W)

d = distance to star, measured in light-years (ly) or astronomical units (AU) using parallax (must convert to meters)

λ = wavelength of light, data collected with spectrometer (nm), must convert to meters  
1m = 1x109 nm

Steps:

1. Organize raw data into data tables.
2. Average raw data.
3. Calculate temperature and luminosity based on the averages of the raw data.
4. Organize processed data (temperature and luminosity) into a data table.
5. Graph temperature vs. luminosity.