

Phys 10 Homework 2 (Deadline Extended Due Jan 24)

Assigned: Jan 15 (*Hint added to problem 2.4 Jan 22*)

2.1 Look at figure 5.19 on page 164 of *The Cosmic Perspective*. When viewed by the human eye,

- a) what color does the 15,000K star appear to have, compared with our sun?
- b) what color does the 3,000K star appear to have, compared with our sun?

Hint: Think about which color in the visible spectrum appears with the highest intensity.

2.2 Suppose an astronomer sees a familiar pattern of spectral lines, except the wavelength of each feature is shifted in the blue direction by 1%, as compared with the familiar pattern observed in the lab. How fast is the observed object moving, and in what direction?

Hint: Use the formula for “Doppler shift” discussed in lecture and on p. 167 of The Cosmic Perspective. You can get an answer without knowing the actual wavelength because I give the shift as a %.

2.3 **Chapter 5** Problem 50 in the text (page 172) *Hint: pay close attention to the units*

2.4 **Chapter 5** Problem 55 (page 172) *Hint: For part a., please interpret “how much more thermal radiation” as “how much more power”. Also, Math Insight 5.2 is useful for this problem. **Hint: There is no single right answer for part c. Just write a sentence or two stating what you think and why. Answers that show you have thought about the impact of parts a) and b) of this question will get full credit.***