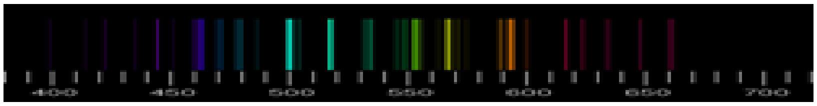
Unit 4: Classification of Stars



Read Section 7-2, pages 135 - 137 & do Review Questions 12 & 14 on pages 144 - 145, and Problems 1, 3 & 4 on page 145.

Review Questions	Solutions
12. Why does the amount of blackbody radiation emitted depend on the temperature of the object?	A high temperature means particles are moving faster (more kinetic energy) & they will have more collisions. More collisions means that there will be more energy released during the collisions. If more energy is released, the blackbody radiation increases.
14. Why do hot stars look bluer than cool stars?	The atoms of the blue stars are moving faster. They have higher energy corresponding to a higher frequency of light. (E & v are directly related)
Problems	**Solutions**
1. Human body temperature is about 310 K. At what wavelength do humans radiate the most energy? In which part of the electromagnetic spectrum (gamma-ray, X-ray, UV, visible light, IR, microwave, or radio) do we emit?	$\lambda = \frac{3.0 \times 10^6\ nm}{T} = \frac{3.0 \times 10^6\ nm}{310\ K}$ = 9677 nm Infrared, IR
3. If a star has a surface temperature of 20,000 K, at what wavelength will it radiate the most energy? Is this a cool or hot star?	$\lambda = \frac{3.0 \times 10^6\ nm}{T} = \frac{3.0 \times 10^6\ nm}{20,000\ K}$ = 150 nm Hot Star
4. Infrared observations of a star show that the star is most intense at a wavelength of 2000 nm. What is the temperature of the star's surface?	$\lambda = \frac{3.0 \times 10^6\ nm}{T}$ $T = \frac{3.0 \times 10^6\ nm}{\lambda} = \frac{3.0 \times 10^6\ nm}{2000\ nm}$ = 1500 K