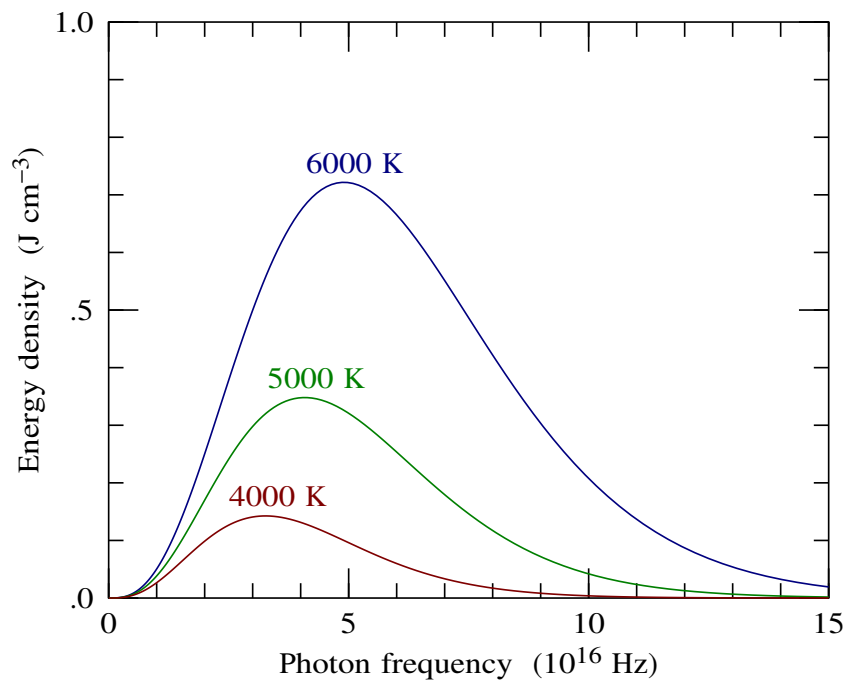


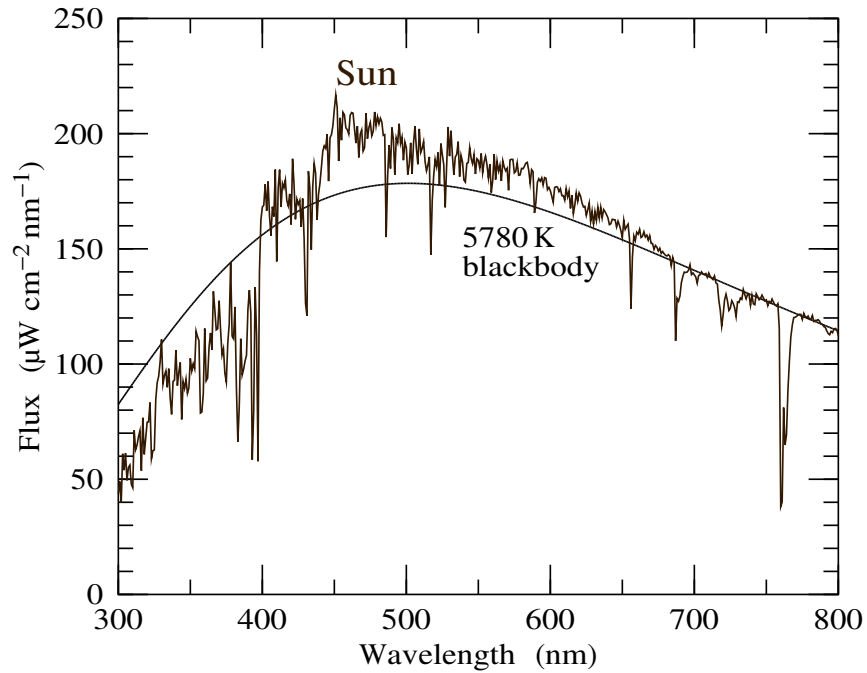
Scribe's name:

Names of other members of the group:

Spectra



1. The above graph shows blackbody spectra at various temperatures. On the graph, mark the ranges of visible, infrared, and ultraviolet light (the human eye can see light over wavelengths 750–380 nm, corresponding to frequencies $4\text{--}8 \times 10^{16}$ Hz). Explain, with reference to the plots of blackbody spectra, why there is a relation between the temperature of a hot dense object (like a glowing light bulb, or the Sun) and its color. [Recall that absolute temperature is a measure of the mean energy of random motions of particles.]



5. The Sun's visible spectrum shown above (from Kurucz, Furenlid, Brault, & Testerman 1984 "Solar Flux Atlas from 296 to 1300 nm") can be characterized as a near blackbody (shown as a smooth line) with many superposed absorption lines. The most prominent absorption lines are the lines labeled A–K by Fraunhofer (1814):

Line	Absorber	Wavelength (nm)
A	Earth atmospheric O ₂	760
B	Earth atmospheric O ₂	687
C	H α	656
D	Na	589
E	Fe	527
F	H β	486
G	Fe & Ca	431
H	Ca	397
K	Ca	393

Mark on the plot the positions of the H (hydrogen) absorption lines. Which of the H lines is the pink one, which the cyan (blue-green) one? Mark on the plot the infrared and ultraviolet parts of the spectrum (the human eye can see wavelengths 380–750 nm).

