PHSX815_Project4:
Determining surface temperature based on spectral distribution

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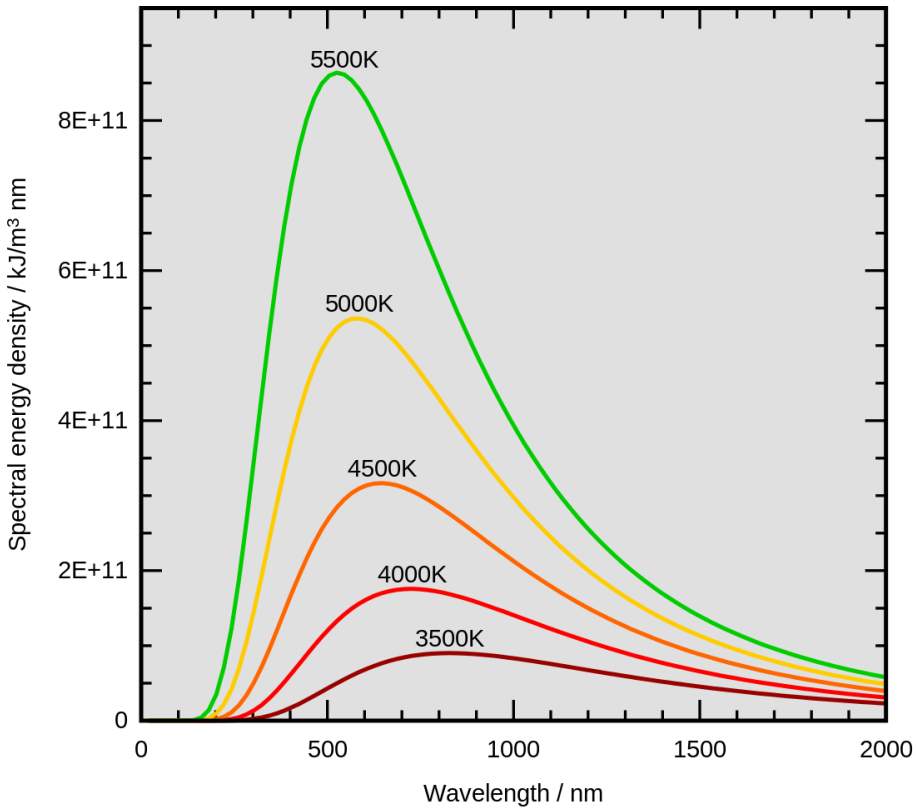
1 Introduction for Peer Review

For Project 4, I plan on using two techniques we learned in class to simulate spectral measurement of black-body radiation used to determine the surface temperature of stars. I will need to use function minimization as well as plotting a probability distribution of a function. I should be able to use Wien's displacement law

$$\lambda_{peak} = \frac{b}{T} \tag{1}$$

where b is Wien's displacement constant to determine the temperature of a spectral energy distribution by finding the function maximum as λ_{peak}. The concept of Wien's law is visualized in the figure below.



By using a function where spectral energy density is a function of wavelength, I am using wavelength as a function parameter similar in concept to project 3. I plan on simulating the experiment using

Planck's law

$$\mu(\lambda, T) = \frac{2hc^2}{\lambda^5} \frac{1}{exp(hc/\lambda kT) - 1} \tag{2}$$

to produce the distribution as a function of wavelength.

I plan on simulating an experiment by assigning a probability density of equation (2) as a function of wavelength, where temperature of equation (2) is a parameter that alters said probability density. The temperature will be determined for a given data set by finding the distribution that best matches said set of data.

One thing I am currently working on is how to write the code that would simulate data for the probability distribution matching equation (2). So far I have used simpler distributions (normal, uniform) so I need to consider how to simulate a generalized probability distribution.

Thanks for any ideas/comments!