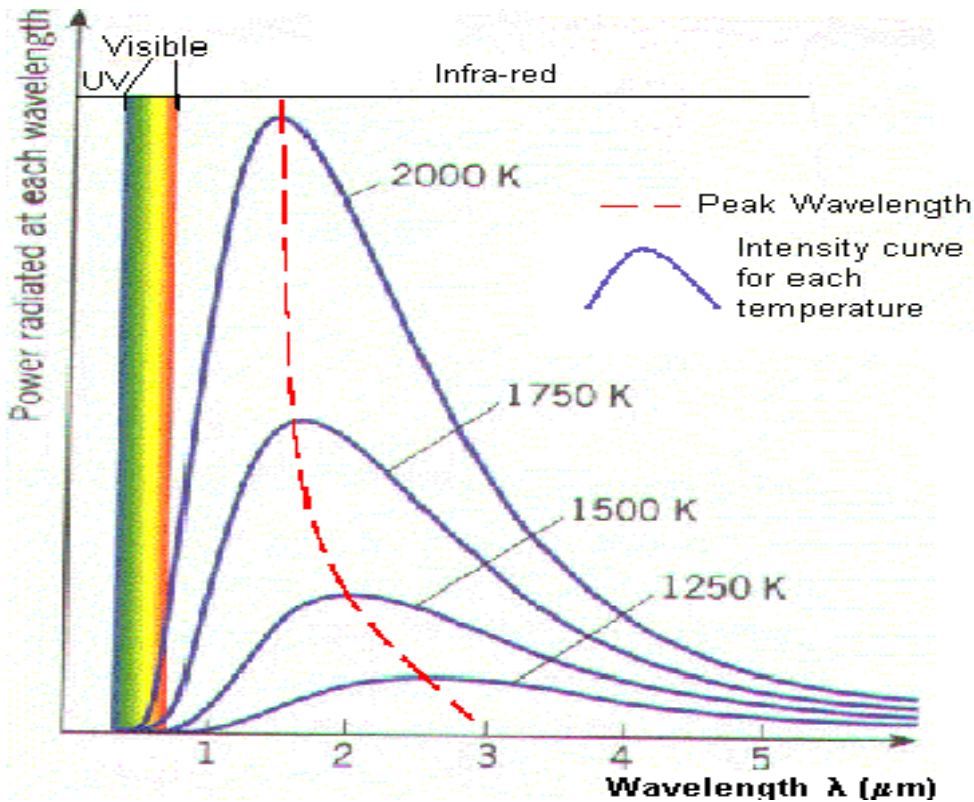


**Physics 195C  
Extra Credit Assignment-- (5pts).**

**Black body curves are plots of radiation intensity versus wavelength. The sun can be treated as a black body. Below are some temperature dependent black body curves:**



**The mathematical expression for Black Body curves was formulated by Max Planck:**

$E(\lambda, T) = \frac{2\pi hc^2}{\lambda^5 (e^{hc/\lambda kT} - 1)}$ <p>where <math>[E] = \text{W/m}^2/\text{m}</math></p>	$\lambda$ ... Wavelength	$[T] = \text{Kelvin}$
	$c$ ... Speed of light	$[c] = \text{meters}$
$k$ ... Boltzmann's constant	$h = 6.626 \times 10^{-34} \text{ Js}$	
$h$ ... Planck's constant	$c = 2.998 \times 10^8 \text{ m/s}$	
$e = 2.718$ ... Base of Natural Logarithms	$k = 1.381 \times 10^{-23} \text{ JK}^{-1}$	

**Correction:  $h = 6.626 \times 10^{-34} \text{ Js}$**

**By applying the calculus of maxima and minima, show that the Planck expression transforms to Wien's Law (pg 643 of your text). You will need to use numerical approximations to complete the derivation.**