

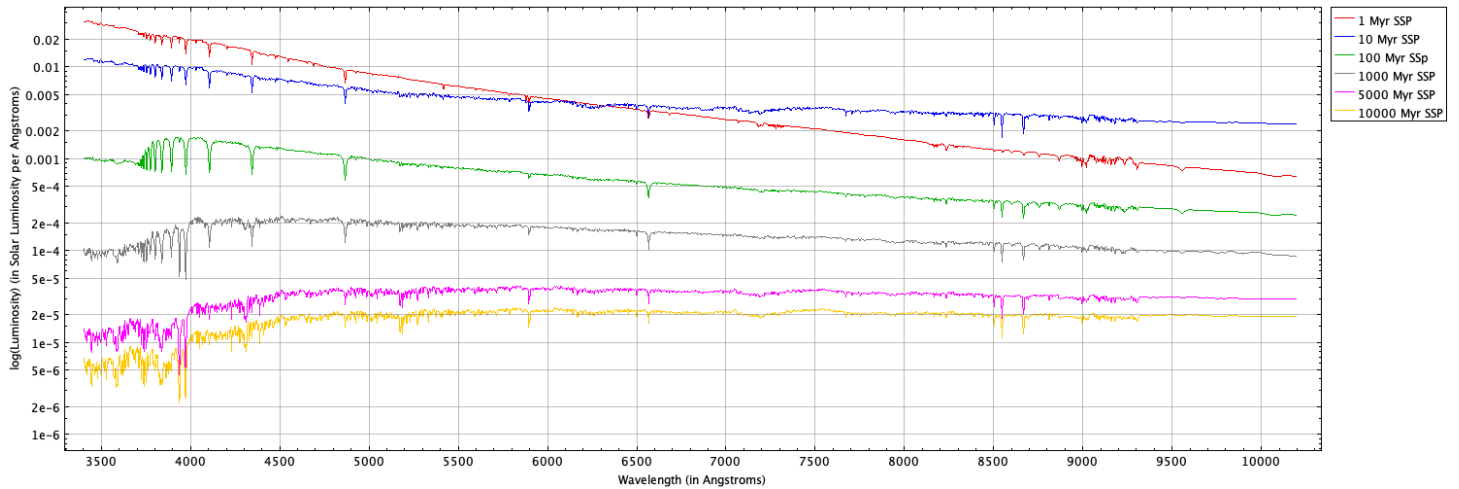
02/09/2025

Astronomy 330 - Homework 2

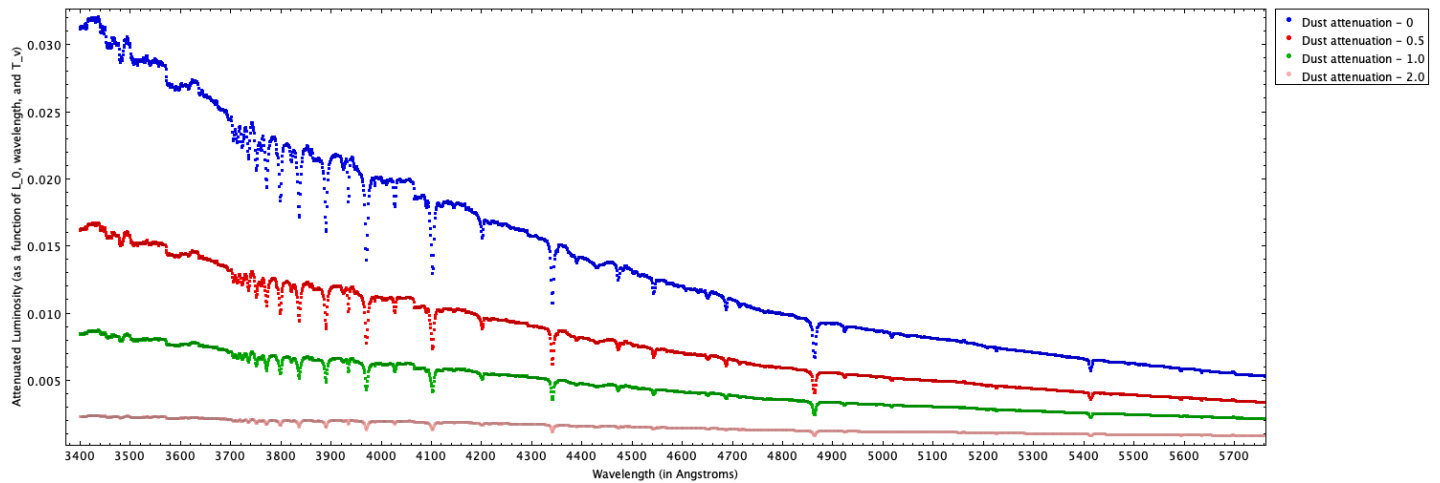
Riya Kore

Part 1: Class 4 Exercise

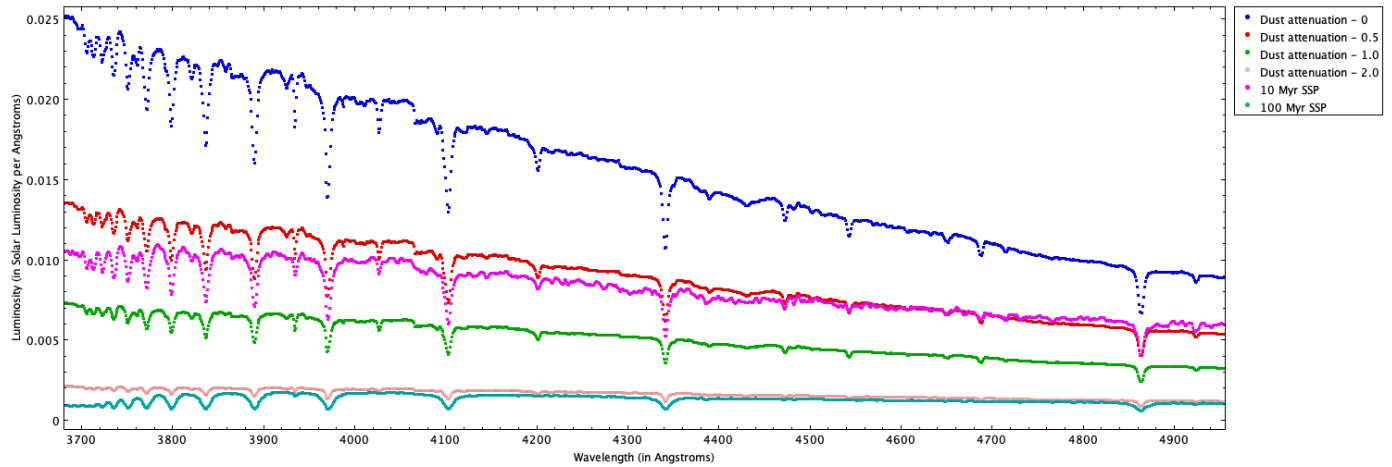
1. Color plot of the 6 SSPs - Log(Luminosity) as a function of wavelength



2. Interstellar Dust Attenuation on Galaxy Spectra plot for different values of the V-band dust attenuation for the 1 Myr SSP.

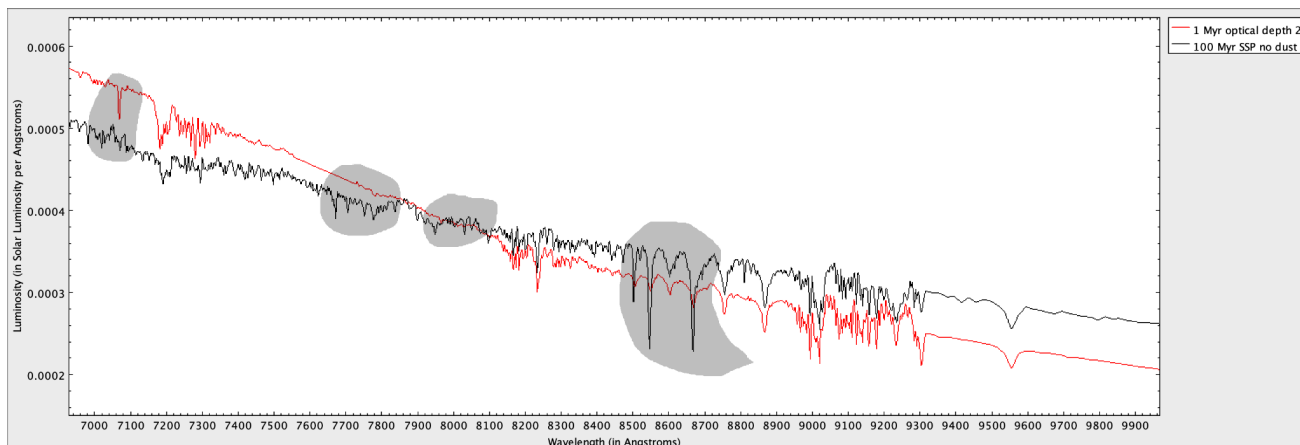
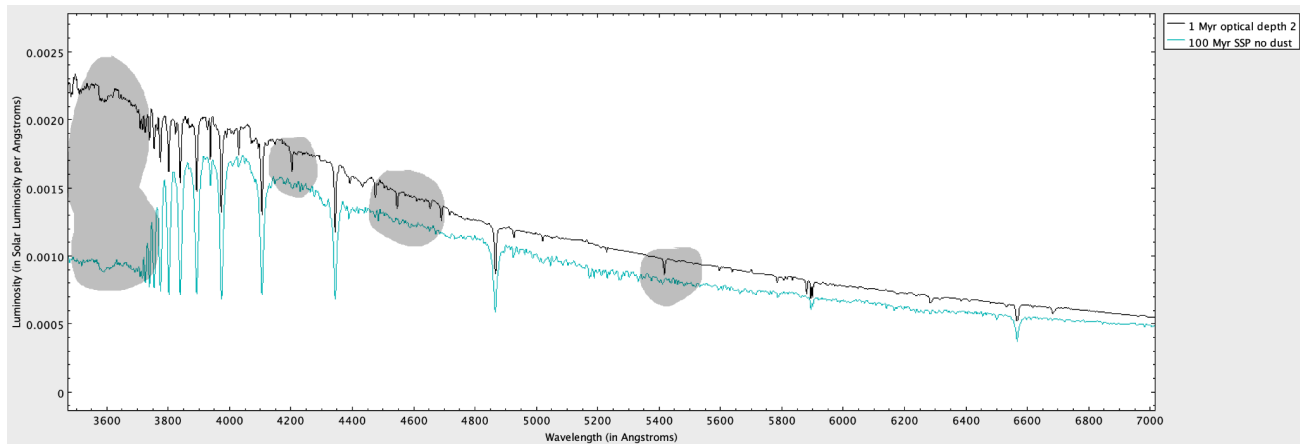


3. Plotting the 10 Myr SSP and the 100 Myr SSPs without dust attenuation along with the plot from question 2.

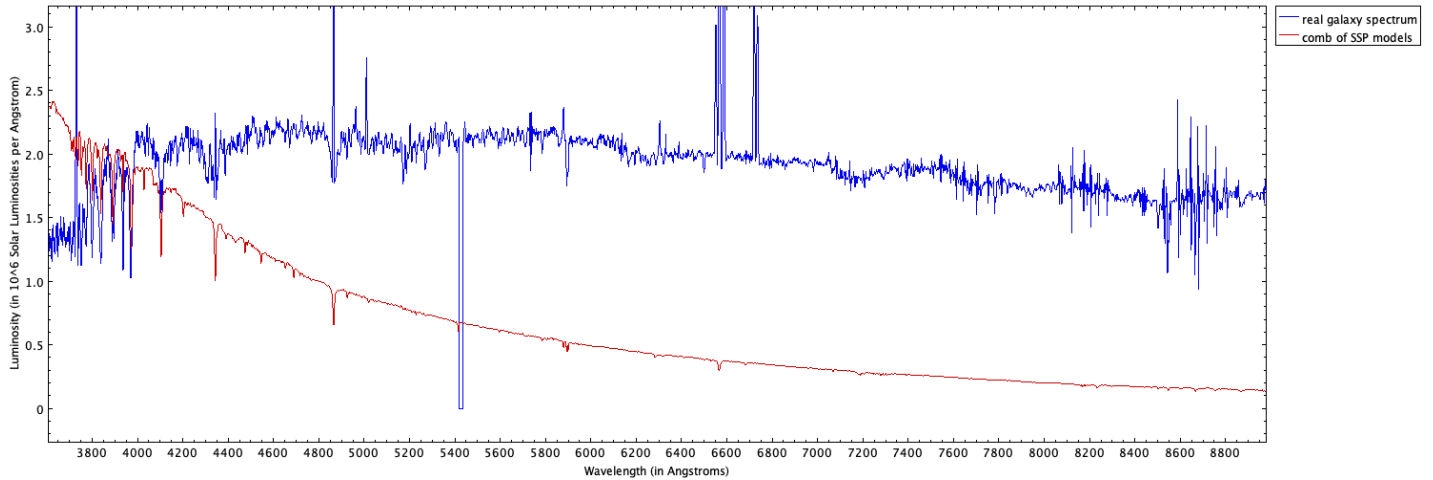


Upon comparison, a value of $\tau_v = 2.2$ would make it difficult to distinguish between a 1 Myr SSP with dust attenuation from a dust-free 100 Myr SSP. This is because after experimenting with a bunch of τ_v values, I found 2.2 aligns best with the 100 Myr SSP line.

4. Annotated plots for comparing the 1 Myr SSP with $\tau_v = 2$ to the dust-free 100 Myr SSP. The annotations show the mismatched spectral features from both the plots. I made two plots: the first one is for all the wavelengths below 7000 Angstroms and the second one is for all the wavelengths above 7000 Angstroms.



5. Comparing a real galaxy spectrum with a linear combination of models with some reddening. For this plot, I used 4 SSPs (1 Myr, 100 Myr, 1 Gyr and 10 Gyr). This question was particularly challenging because I didn't know what the final plot is supposed to look like, but here are my results:



Part 2: The IMF and Population Synthesis

1. Complete the table below with the values found:

Constant	Multiples	Value
c1	1 Myr SSP	15.0
c2	10 Myr SSP	16.0
c3	100 Myr SSP	25.0
c4	1 Gyr SSP	30.0
c5	10 Gyr SSP	6.4
Tv	Dust Attenuation	0.1