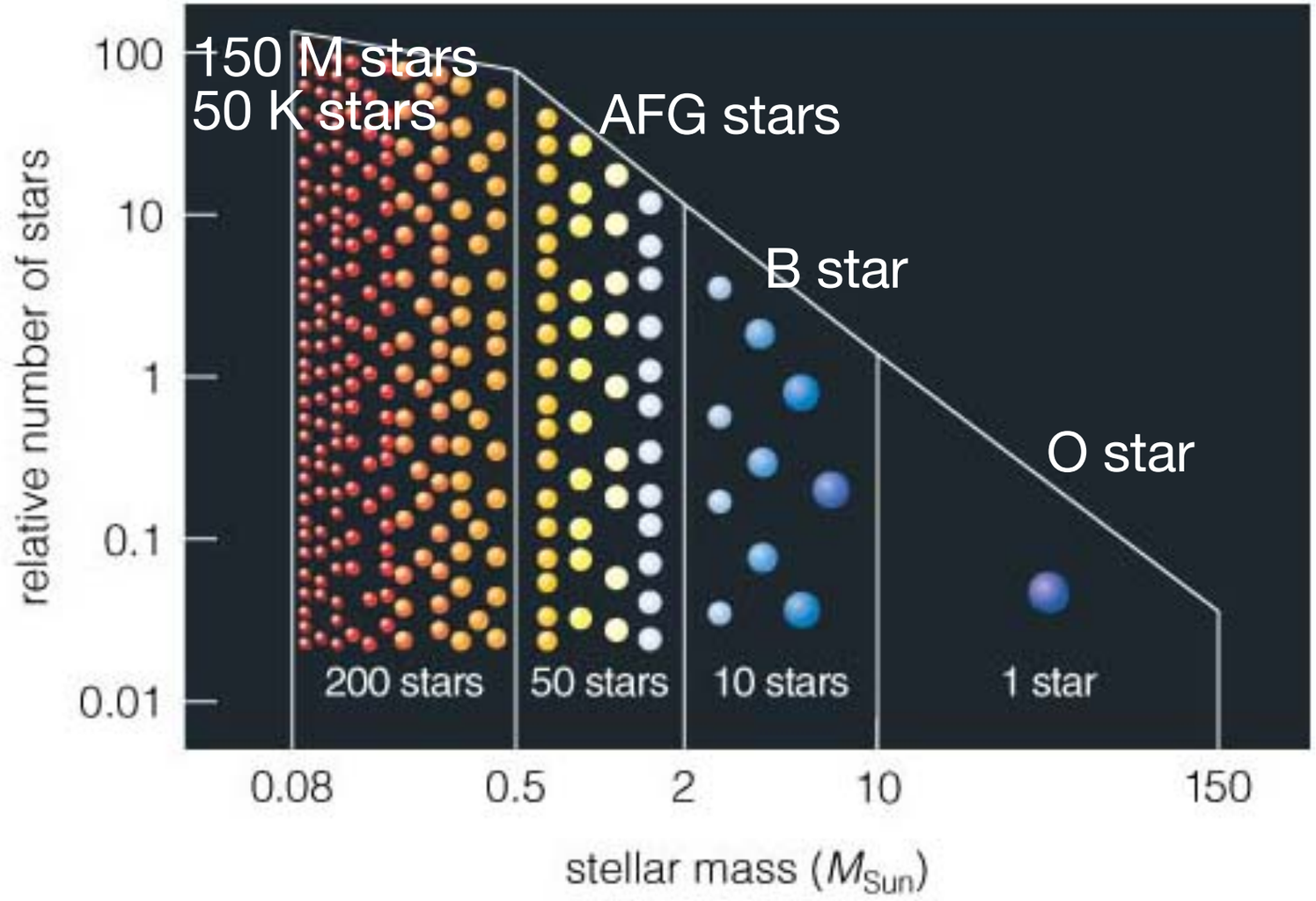
Exercises — 2

Building your own “galaxy” spectra

1. You have ascii files of different spectra for different stellar types (wavelength [A], flux density [erg/s/cm^2/A], arbitrary distance, solar Z). Plot the spectra in one figure (scale flux if needed). Recap the difference of the star spectra.

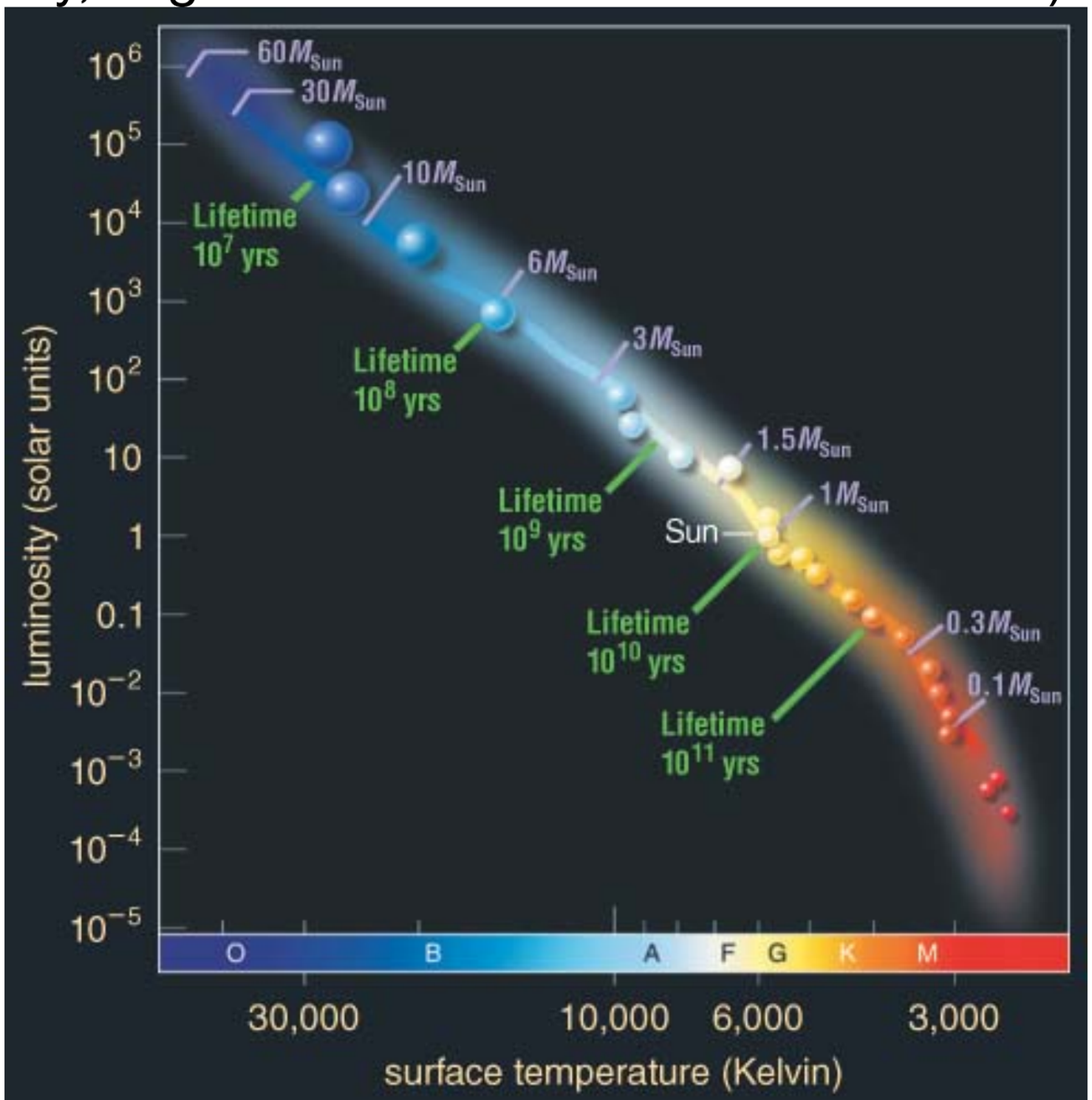
2. Now assume you have a stellar population of age 0 Gyr and solar metallicity. Compute the composite stellar spectrum by following the distribution of individual stars in the graph below (IMF-like):



Exercises — 2

Building your own “galaxy” spectra

3. Continue to consider the life time of stars on the MS (as schematically visualised below), and compute the spectra for an SSP of 0.1 Gyr, 1 Gyr and of 10 Gyr (for simplicity, neglect emission from stars off the MS)



Exercises — 2

Building your own “galaxy” spectra

3. Assume a galaxy is mainly composed of SSPs of age 0 Gyr, of age 0.1, 1 Gyr and of age 10 Gyr, each with a relative contribution of 0.1, 0.1,0.3, and 0.5 to the total spectrum (to weight the flux when summing up). How does the spectrum look like?

4. How does the spectrum change if the galaxy consists only of SSPs older than 1Gyr?

5. Look at the two real galaxy spectra below. What can you conclude about their stellar populations and galaxy properties?

6. What are the “line features” in galaxy one? And which general simplifications have we made in points 1-4 compared to reality?