

**Topics:** Finishing up the ISM: H II regions, thermal balance, radio observations

**Reading:**

- Read the rest of Ch. 16 (pp. 384 - 391).
- (Re-)read my notes on Ch. 16 (linked from the website).

**Summary of work to submit:**

- Nothing to submit for Tuesday's class

In sec. 3, please pay special attention to the concept of the Stromgren sphere and the physics behind the expression for the size (radius) of a Stromgren sphere. Make sure you're comfortable with what  $Q_*$  represents. Does it make sense that that quantity is also equal to the total number of photoionization events per second in the entire nebula?

Pay attention also to the heating and cooling in these so-called H II regions. Note that the photoionization itself leads to heating but that the primary cooling mechanisms doesn't have to do with the hydrogen and its ionization and recombination, but rather is based on the collisional excitation of electrons in "metals" (things like carbon and oxygen). Make sure you're clear about how this atomic process leads to cooling. And make sure you understand how Fig. 16.6 enables us to visualize the thermal equilibrium of a nebula – and further note that the equilibrium depicted there is a *stable* equilibrium.

**Commentary on the reading:**

See the combined set of notes for this class and the next (listed above; posted on the website). We'll cover whatever we didn't get to last Thursday.