Topics: Finishing up the background physics – Saha equation (in combination with Boltzmann), spectral classification, HR diagram

Reading:

- LeBlanc, Ch. 1 (the second half, from the middle of p. 17 through the end of the chapter)
- M. Redmond's notes on spectral classification, with a little history as well as quite a few actual spectra: *http://spiff.rit.edu/classes/phys301/lectures/class/class.html*
- Read over the four-page handout you got in seminar in week 1. See if you can complete the first page (review of my discussion at the board about solid angle, etc); use p. 3 to simply remind yourself about color index and the Planck function. And on pp. 2 and 4, there are problems we may work, together, at the board during week 2's seminar. So, think about these two problems, bring notes so you're ready to solve them in seminar.

Summary of work to be produced:

- Hand in your solutions to the warm-up questions (QW2, QW5) by Thursday at 12:30 pm in the box on the wall outside my office. I'll make some comments on them and ask you to pick them up and look them over well before coming to seminar on Friday.
- Bring solutions to seminar on Friday for all the (non-warm-up) numbered problems. Bring a xeroxed copy to give to me at the beginning of class, and expect to take notes on your original solutions.
- And bring notes related to the handout from week 1 and notes and questions about *anything* from Ch. 1 and the first two weeks of material. You won't hand these in, but we may do the equilibrium temperature and eyeball problems together in seminar.

Process: In our second meeting we'll have much more student-led problem solving.

Scope: We'll focus on student-led problem solving but also continue with our close reading of the introductory material in Ch. 1 of LeBlanc. We'll also answer any remaining questions about optical depth, mean free path, solid angle...anything that came up during week 1. And we'll solve some of the problems I handed out during week 1...on the fly, in seminar this week.

Questions etc.:

Q1 Problem 1.9.

QW2 Problem 1.10.

Q3 Problem 1.11.

Q4 Problem 1.12.

QW5 Problem 1.13.

Q6 Look at this sequence of stellar spectra: *http://ned.ipac.caltech.edu/level5/ASS_Atlas/Figures/05_BO.jpg*. Which line intensity trends as a function of temperature are evident in this sequence? Describe the trends you see that you can relate to the curves in Fig. 1.9.

Q7 Next take a look at this luminosity class sequence (note that they all have the same spectral subtype): *http://ned.ipac.caltech.edu/level5/ASS_Atlas/Figures/LE_B1.jpg*. What is the physical cause of the line *width* trend? (You may want to consult Ryden and Peterson.) Note that this URL and the one for the previous problem are linked from the class website for your convenience.

Q8 Problem 1.14.