Announcements

• **Reading quiz.** There is no reading quiz due for tonight, Tuesday February 26. The next one is assigned for this week’s reading (see assignment below), and is due next Tuesday night (March 4) at 11:55 PM. It will become available to take at the textbook website at 12:05 AM Wednesday, February 27.

• **Excellent astronomy podcasts available online.** For those who are interested, I have come across an *excellent* set of astronomy related podcasts that are available (for free!) at:

  http://www.astronomycast.com/

These podcasts can also be accessed using iTunes: Search on “Astronomy podcast” at the iTunes store, and then click on the top hit, “Slacker Astronomy Podcast”. A link will also be made available at the course web-site to them.

The format of each podcast is question and answer, with questions posed by a very interested reporter and answered by Prof. Pamela Gay of Southern Illinois University. I have listened to a bunch of these, and have found them to be very informative, and right at the level appropriate for this class. The conversation typically goes beyond what we will have covered in class on a particular topic, and will definitely help to satisfy those of you who leave class with questions! In this and future reading assignments, I may assign one or more of these podcasts as optional listening/reading (transcripts are also available at the web-site).

Reading Guide and Homework Assignment

(Week #6 On-Line Reading Quiz Due: Tuesday, March 4, 11:55 PM)

Light. Nearly everything that we know about the physical universe beyond the Earth comes from an analysis of the light that we receive from it. Thus, understanding light is critical to astronomy, and chapter 4 of your text introduces you to its study. Be forewarned that this is very condensed reading: a physics major spends the better part of a full year studying the material presented herein (albeit in somewhat more detail), so pay close attention in class! Note that we shall ultimately be reading all of chapter 4, but it will be spread out over the next three weeks, and the assigned reading will not be in the order the material is presented in your text. The order of the reading assignments below follows the presentation order given in class.

1. → **Optional Astronomy Podcast: Episode 1: Pluto’s Planetary Identity Crisis.**
   Available at http://www.astronomycast.com/ (scroll down to get to the first, “Episode 1”, podcast), and through iTunes.
   
   As discussed above in the Announcements section of this handout, occasionally I will recommend an optional astronomy podcast to listen to that is relevant to the week’s reading. These podcasts are completely OPTIONAL, and will never contain any additional material that you are responsible for that is not also covered by the required reading assignment.

   This particular podcast should satisfy those of you who desire more information on just how Pluto was “downgraded” from its planet status two years ago.

2. **Text — Chapter 4, Section 4.4.1 and 4.4.2: The Structure of the Atom: “Probing the Atom”, and “The Atomic Nucleus”.

   What is matter made up of? At its most basic level, matter consists of atoms, and these two sections of the text describe the basic model to have in mind when you think of an atom. It should cover fairly familiar territory for those of you who had high-school chemistry and/or physics.
3. **Text: Chapter 4, Section 4.3: Spectroscopy in Astronomy.**

We begin our study of the optical properties of light with a description of the types and value of spectra. Note in particular the discussion of the three different kinds of spectra: continuous, absorption-line (or dark-line), and emission-line (or bright-line). These are the types of spectra that are described by “Kirchoff’s Laws”, as discussed in class (your text does not apply this label to the three types of spectra, but, rather, just describes how each is produced).

4. **On-line tutorial:** On the “Week6_tutorial” section of the textbook website, look at the Astronomy Exercise called “Stellar Atomic Absorption Lines”.

This shows the different absorption (“dark”) lines that are produced for various elements typically found in the atmospheres (i.e., the outermost layers) of stars like our sun. Notice that the strength of these lines (i.e., how dark they are) depends on the relative abundance of that element in the star’s atmosphere; we shall later learn that it also depends sensitively on the temperature of the star’s atmosphere, as well.

5. **On-line tutorial:** On the “Week6_tutorial” section of the textbook website, look at the Active Figure called “Kirchhoff’s Laws”.

This provides a good exercise to understand how each of the three types of spectra are produced. There is also an explanation given that explains exactly what produces each type of spectrum; this is drawn from material (about atoms) that will be covered next week. Note that the explanation as to what is physically occurring to produce the three spectra came 60 years after Kirchoff first described the three type of spectra. Sometimes the true explanation for physical phenomena takes a while to figure out!

6. **On-line reading quiz (Due: 11:55 PM, Tuesday, March 4):** Take this week’s reading quiz by clicking on the “Week6_quiz” assignment at the on-line textbook web-site. The Reading Quiz will become available to you at 12:05 AM, Wednesday, February 27. It consists of 10 multiple choice questions. You must complete this on-line quiz by 11:55 PM Tuesday, March 4. As always, you may take the quiz twice.

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Blind Willie Johnson (only known photograph)