January 20, 2012

Handouts from first class

Astronomy in the news:

Russian mission to Mars moon Phobos failed in orbit, crashed into the Pacific off the coast of Chile on Tuesday.

Leap Year.

Leap Second to be added June 30. Meeting convening to decide whether to keep the Leap Second or not. Earth is slowing, atomic clocks do not. Computer types would like to eliminate the Leap Second, only use atomic clocks. Astronomers tend to want to keep Leap Seconds and use the Earth's rotation.

- Handouts
- Syllabus/Schedule
- Webpage: http://www.as.utexas.edu/astronomy/education/fall2011/wheeler/309n.html (also blackboard)
- Book: Cosmic Catastrophes (second edition)
- Five exams
- Grading: plus/minus grading will be used for the final grade; for example: 79.5 – 83.3 B-, 83.4 – 86.6 B, 86.7 – 89.4 B+. (do not drop lowest exam -- but extra credit!)
- Grades are not curved: 90 - 100 A, 80 - 90 B, etc.
- Review Sessions - Thursday, 5 - 6 PM

Extra Credit

On exams (2 points):

Astronomy in the News,
NASA's Astronomy picture of the day
http://antwrp.gsfc.nasa.gov/apod/astropix.html

Sky Watch Project - details on web site, in handout. Log of observations: up to 5 points on each exam. Due at each hourly exam.

Keep an eye on Betelgeuse in Orion, also locate Sirius A, the Crab Nebula, Cassiopeiae A, Cygnus X-1, Sagittarius A, others. **1) Record enough information so that I can tell you actually went out at night and tried to see something. 2) Give a brief summary of why they are important.** Some of these can be seen with the naked eye, some not. Some can be seen now, some later in the term. Some in the morning, some in the evening. **Beware clouds!**

Book - electronic copy available through University library

http://catalog.lib.utexas.edu/search/X?SEARCH=Cosmic+Catastrophes

Access with uteid and password. You can download the book for 24 hours, then be prompted to download the book again. Can only print 20%.

Download Adobe Digital Editions onto your computer.

Downloading an EBL book enables you to access the book offline and transfer it to a device that supports Adobe Digital Editions.

At this time Kindles are not compatible with Adobe Digital Editions and EBL books.

Reading: Chapters 1 thru 5 for background plus Chapter 6 - Supernovae

Chapters 1 & 2 - AST 301

- Particles, forces, neutrinos
- Charge repulsion
- Pressure -
  - Thermal
  - Quantum
- Nuclear Reactions

Chapters 3, 4, & 5

- Binary Star Evolution
- Accretion Disks
- White Dwarfs

Will refer to as needed

Schedule - start with Chapters 6
Leave room for Chapters 13 and 14 and extra stuff

One minute exams

Peer interaction

Discussion

The Universe is a strange place!

It began in a Big Bang, the creation of space and time as we know them.

It has been expanding for 14 billion years.

It is full of dark matter, unlike protons, neutrons, electrons, our stuff, that nevertheless gravitates.

It currently seems to be accelerating in the grip of some anti-gravitating “dark energy.”

On the microscopic scale, which can determine events on the cosmological scale, nature follows the laws of quantum theory, probability not certainty, quantum jumps, wave-like properties of particles.

Study the stars - see where that leads…

Background Check

What is a main sequence star?

What is a red giant star?

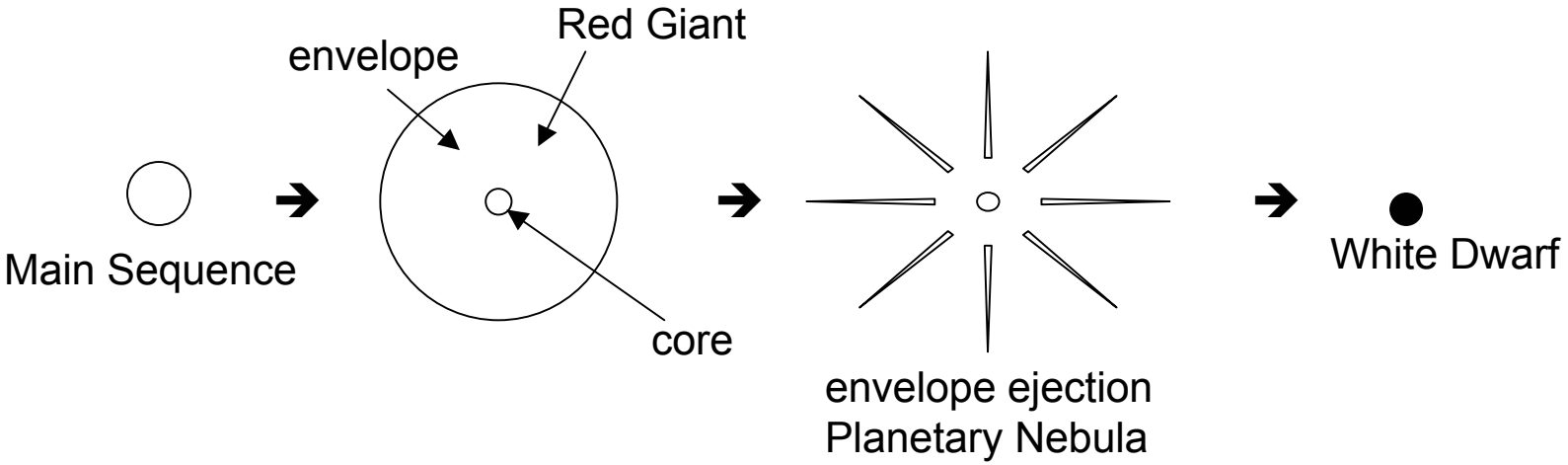
What is a white dwarf?

Write a few sentences, talk with your neighbors.

Concept Check

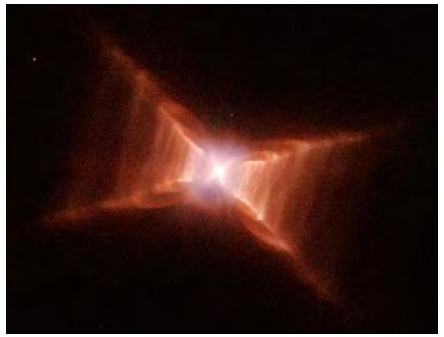
What's on the cover of the book?

White Dwarfs (Section 5.1)



White dwarfs are the most common stellar "corpse." Come from low mass stars → plentiful.

Examples of planetary nebulae surrounding new-born white dwarfs



Sky Watch Extra Credit:.

Find red giant Betelgeuse in Orion Constellation

Other red giants

Find Constellation Draco, site of the Cat's Eye Nebula

Other planetary nebulae.

Can't see nebula with naked eye, but can find Draco

Other planetary nebulae

Also Moon, Mars, Venus, Jupiter, Big Dipper for orientation, NSEW, learning to use a star chart, links on web page.