Monday, January 26, 2015

Facebook (optional); Twitter posts (not classroom related).

Astronomy in the news?

Asteroid passing near Earth today, about three times the distance to the Moon.

Concept Check

What's on the cover of the book?

Background Check

What is a main sequence star?

What is a red giant star?

What is a white dwarf?

Write a few sentences.



White dwarfs are the most common stellar "corpse." They come from low mass stars \rightarrow plentiful.





Examples of planetary nebulae surrounding new-born white dwarfs





White Dwarfs (Section 5.1)

White Dwarf – dense core left behind by low mass stars (less than 8 solar masses) after red giant and planetary nebular phase.

White dwarfs live a long time. Essentially every white dwarf formed since beginning of the Galaxy is still here 10-100 billion of them (about 100 billion stars total), but a few white dwarfs have blown up.

Most white dwarfs are dim, undiscovered, we see only those nearby, none naked eye

Sirius, brightest star in the sky, has a white dwarf companion. Can't see the white dwarf with the naked eye, too small, dim, but Sirius is easy if you look for it at the right time. Discussion Point:

Why are red giants called red giants?

Why are white dwarfs called white dwarfs?

Sky Watch Extra Credit:.

Find red giant Betelgeuse in Constellation Orion

Other red giants

Find Sirius, a bright main sequence star.

Other main sequence stars.

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

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

Other planetary nebulae

Sirius has an orbiting companion, a white dwarf.

Other white dwarfs

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

Check out links: Whole Sky Chart



SUPERNOVAE

Catastrophic explosions that end the lives of stars,

Provide the heavy elements on which planets and life as we know it depends,

Energize the interstellar gas to form or inhibit new stars,

Produce exotic compact objects, neutron stars and black holes,

Provide yardsticks to measure the history and fate of the Universe.

Reading:

Chapter 6 Supernovae, §6.1, 6.2, 6.3

Background:

Chapter 1 Introduction, §1.1, 1.2.1, 1.3.1, 1.3.2

Chapter 5 White dwarfs, §5.1

One type of supernova is powered by the *collapse* of the core of a massive star to produce

a neutron star,



or perhaps

a **black hole**



The mechanism of the explosion is still a mystery.

The other type of supernovae (Type Ia) is thought to come from a white dwarf that grows to an explosive condition in a binary system.



Chandra X-ray Observatory image Of Tycho's supernova of 1572



These explode completely, like a stick of dynamite, and leave no compact object (neutron star or black hole) behind.