2/3/06

Exam 1: Week from Today

Chapters 1 - 5, Friday, February 10, 30 multiple-choice questions

Review sheet will be posted on web site next week

Review session Thursday 5 PM RLM 4.102 [NOTE different room than help sessions].

Astronomy in the news?

Pic of the Day - Cosmic Tornado from Spitzer orbiting infrared Great Observatory, magnetic jet from proto-star

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 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

Also § 2.1, 2.2, 2.4 & 2.5 for background

Issues to look for in background:

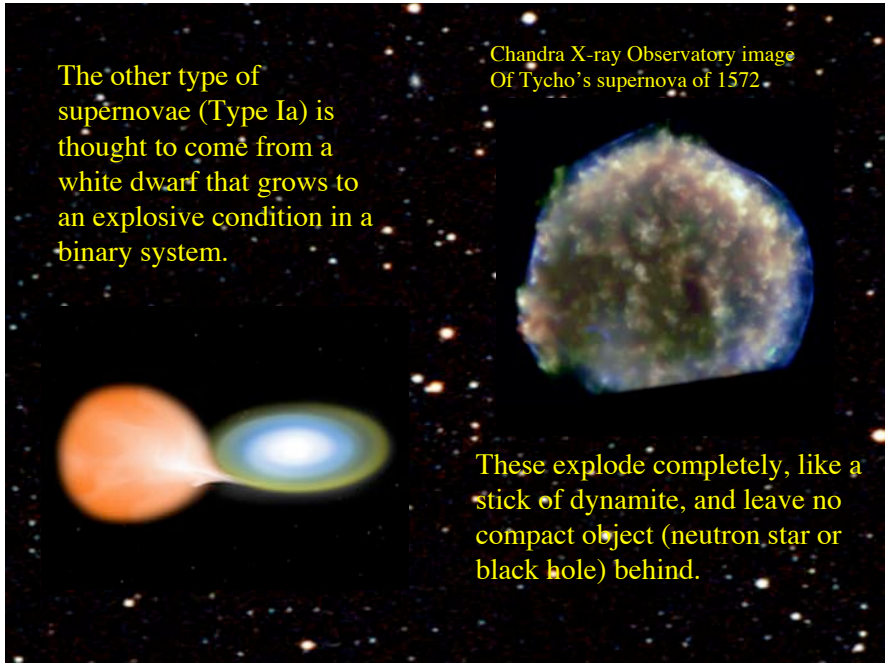
Why is it necessary for a thermonuclear fuel to get hot to burn - charge repulsion § 2.1 & 2.2

Core Collapse § 2.4 & 2.5

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***

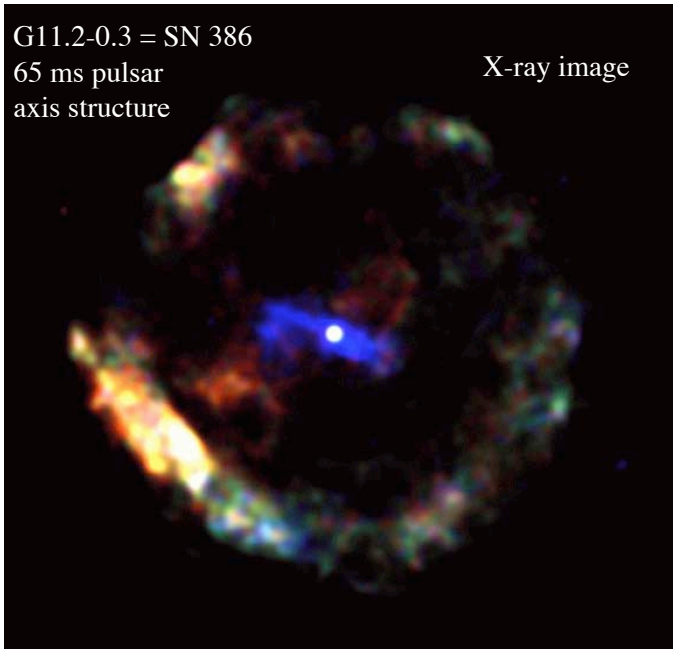
The mechanism of the explosion is still a mystery.

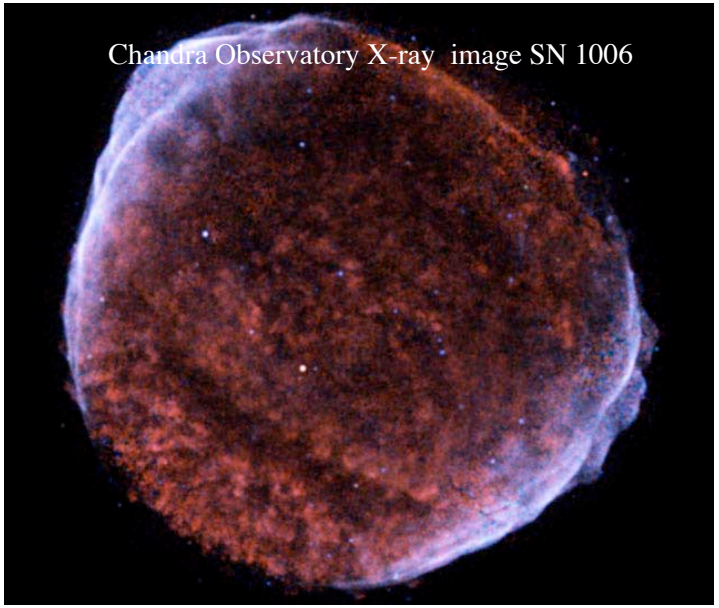


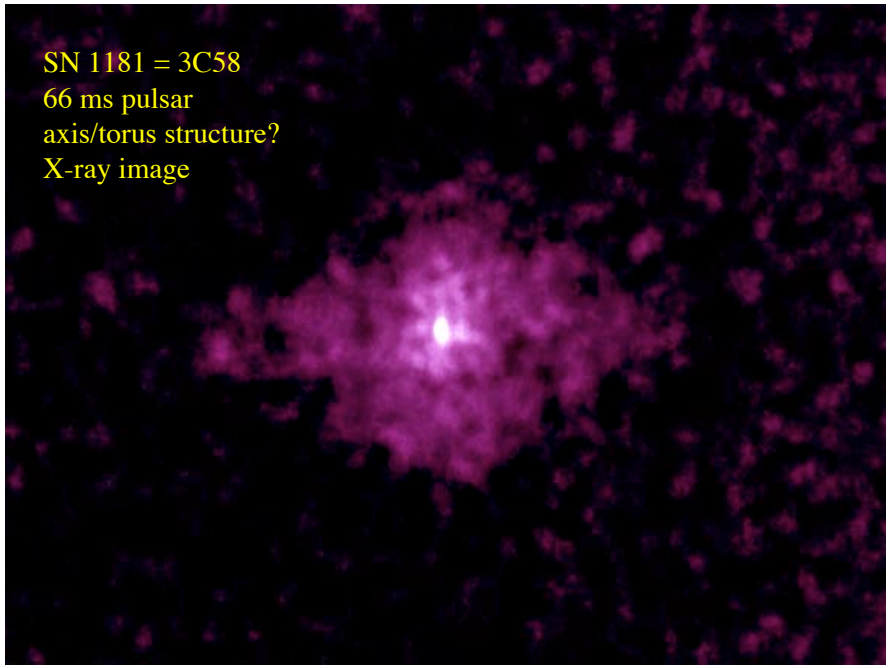
Chapter 6 Supernovae

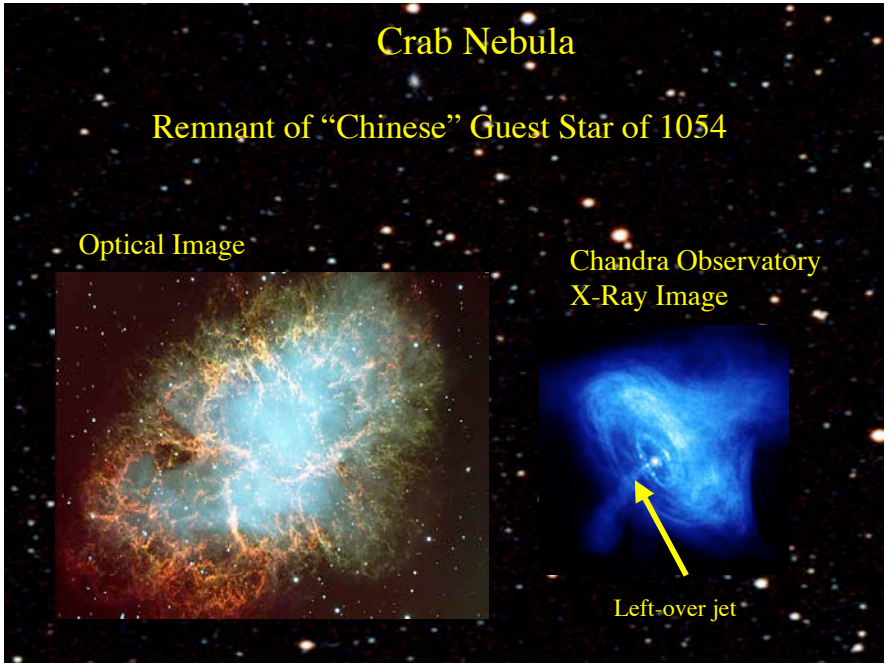
Historical Supernovae - ***in our Milky Way Galaxy*** observed with naked eye over 2000 years especially by Chinese (preserved records), but also Japanese, Koreans, Arabs, Native Americans, finally Europeans.

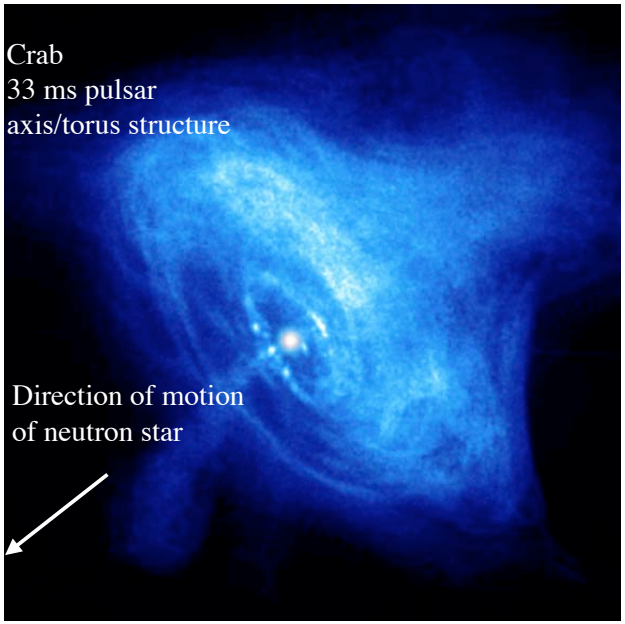
SN 386	earliest record	NS, jet?
SN 1006	brightest	No NS
SN 1054	Crab Nebula	NS, jets
SN 1181	(Radio Source 3C58)	NS, jets
SN 1572	Tycho	No NS
SN 1604	Kepler	No NS
~1680	Cas A	NS? jets
SN 1987A	nearby galaxy	NS? jets
Vela	10,000 years ago	NS, jets

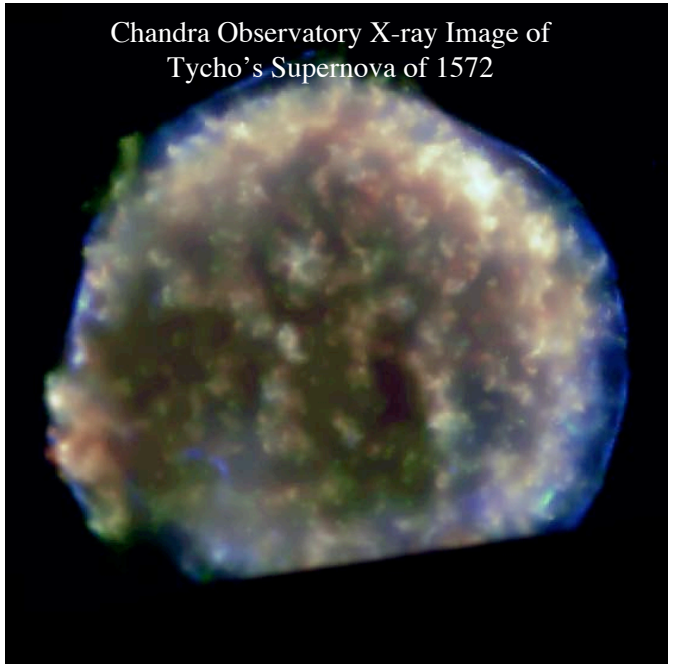


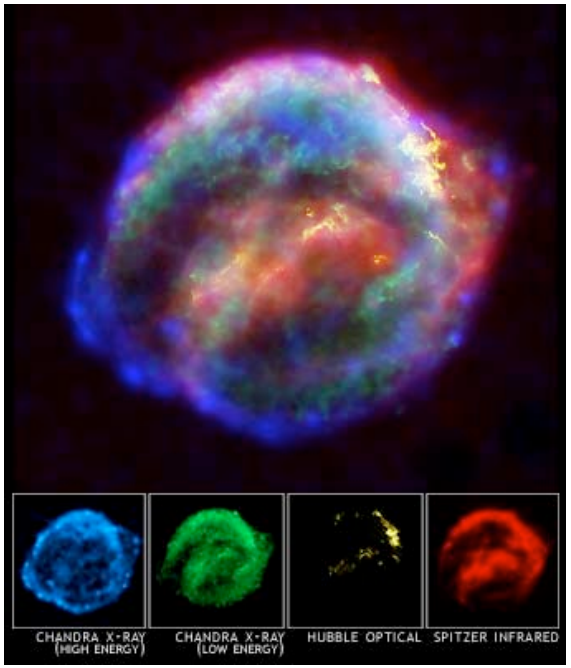



SN 1181 = 3C58
66 ms pulsar
axis/torus structure?
X-ray image


Crab Nebula
Remnant of "Chinese" Guest Star of 1054
Optical Image
Chandra Observatory
X-Ray Image
Left-over jet


Crab
33 ms pulsar
axis/torus structure
Direction of motion
of neutron star


Chandra Observatory X-ray Image of
Tycho's Supernova of 1572



Great Observatories composite of Kepler's supernova 1604

No sign of neutron star

"sideways" alignment?