

9/20/06

Exam 1: Friday

40 multiple-choice questions

Review sheet on web site

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

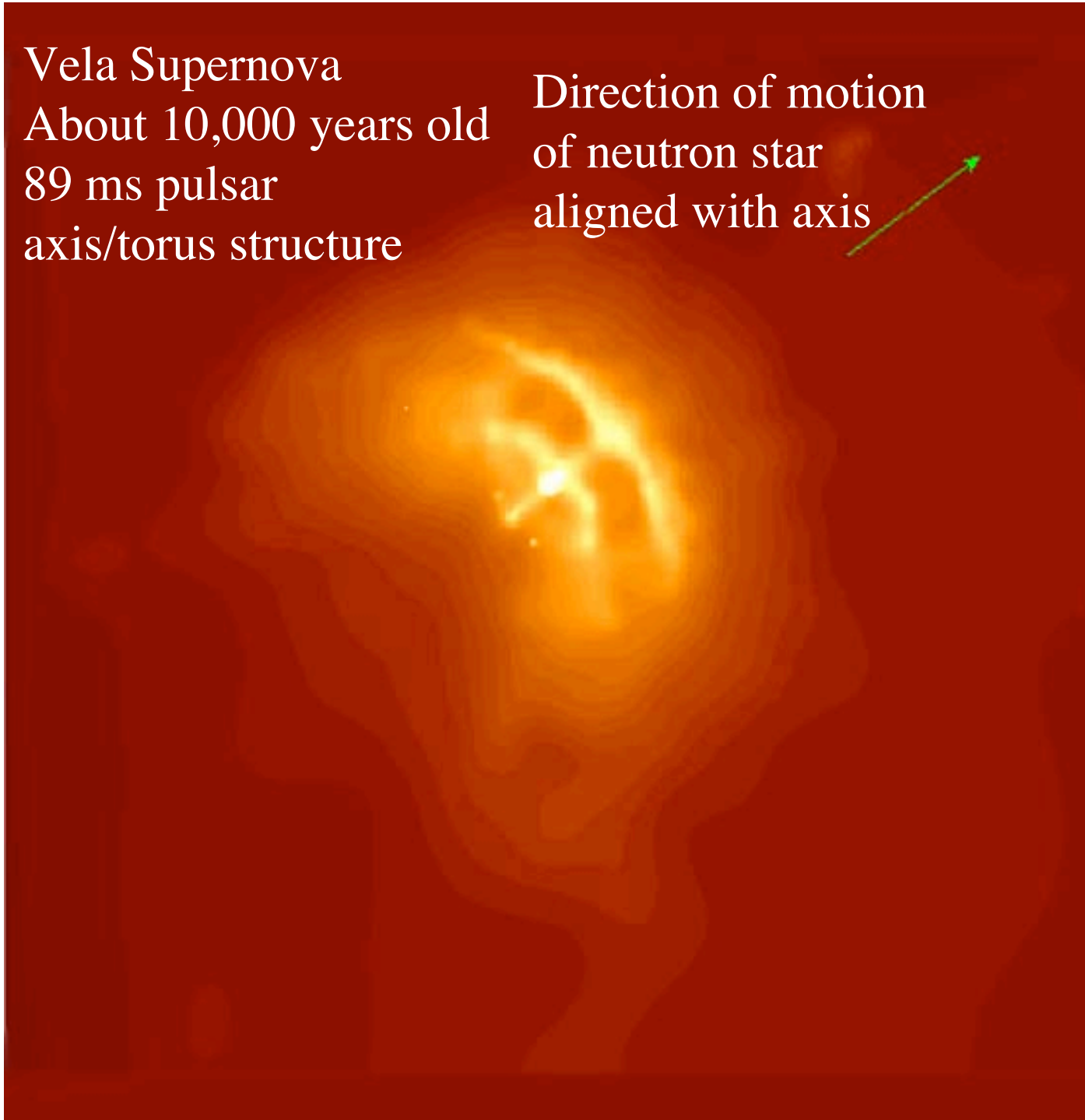
Astronomy in the news? Space junk near Shuttle

Pic of the Day - Space Station with new arms



Vela Supernova
About 10,000 years old
89 ms pulsar
axis/torus structure

Direction of motion
of neutron star
aligned with axis



All SN since 1680, since invention of telescope, modern astronomy, have been discovered in other galaxies.

Our Galaxy is overdue for another!

Recognition (early in the 20th century) that some “novae” were in distant galaxies and hence were 10,000 to 100,000 times brighter than classical novae in the Milky Way.

Led to the recognition and naming of “super” novae.

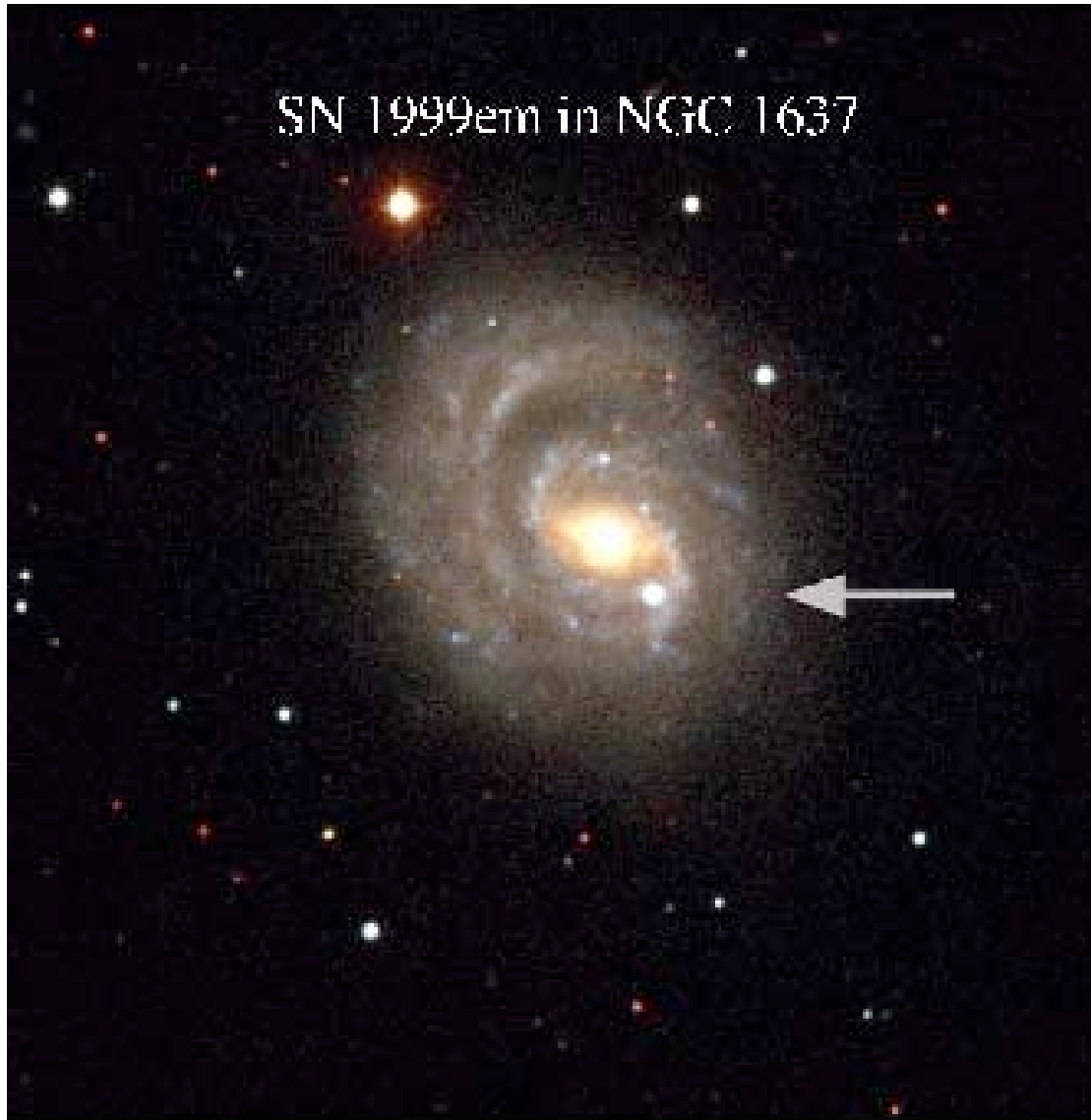
Web site of recent bright supernovae:

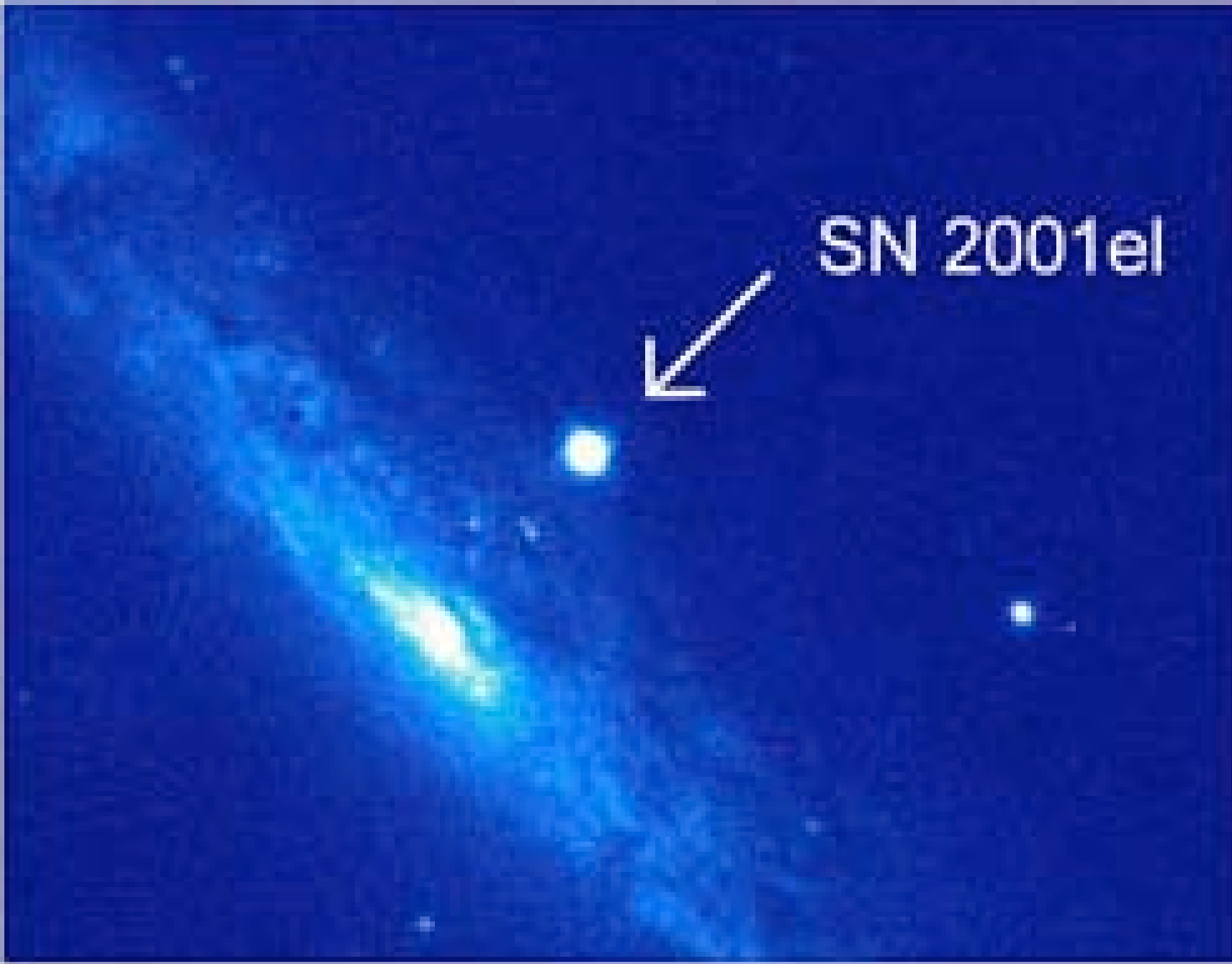
<http://www.rochesterastronomy.org/snimages/>

SN 1994D in the Whirlpool Galaxy



SN 1999em in NGC 1637





SN 2001el

Extra Galactic Supernovae: the basis for modern astronomy of supernovae

Cannot predict which galaxies will produce a supernova, so watch lots of galaxies

We found two dozen per year prior to SN 1987A, but with new attention and use in cosmology, now find over 100 per year, most at great distances, more difficult to study.

Nomenclature: A-Z, aa-az, ba-bz, etc.

SN1987A - 1st of '87 (also most important, but that is not what the "A" means).

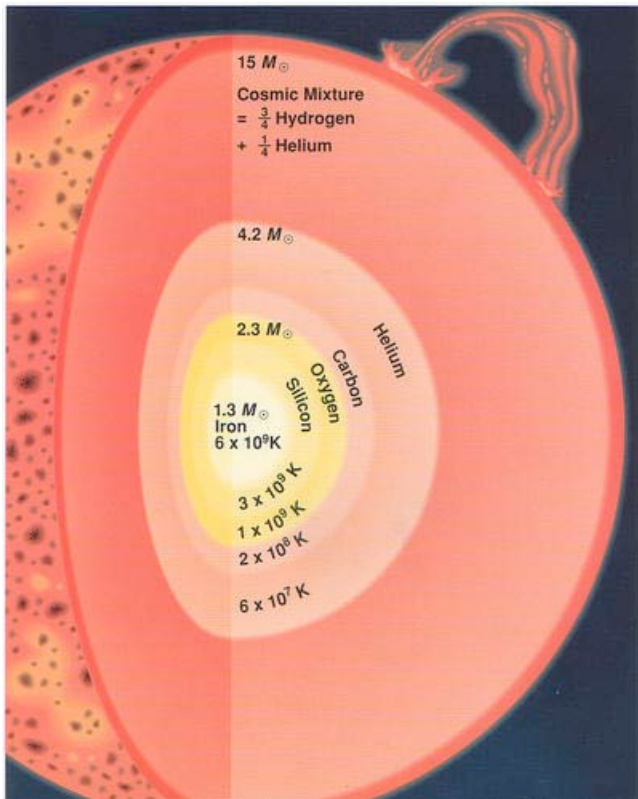
This year latest, discovered Tuesday - SN 2006gj 192nd of 2006 - discovered by amateur.

One Minute Exam

Tycho's supernova of 1572 shows no sign of a compact object left over in its center. This suggests that:

- A) It made a jet
- B) It was formed by the collapse of a massive star
- C) It was formed by an exploding white dwarf

Physics: in massive stars (more than about 12 - 15 times the Sun) the core of Helium or heavier elements, Carbon, Oxygen, Magnesium, Silicon, Calcium, finally Iron, continues to be hot even as it gets dense,
 ⇒ always supported by thermal pressure
 ⇒ continues to evolve, whether the Hydrogen envelope is there or not.



H → He (2 protons, 2 neutrons - Chapter 1, figure 1.6)

2 Helium → unstable, no such element

3 Helium → Carbon (6 protons, 6 neutrons)

4 Helium → Oxygen (8 protons, 8 neutrons)

6 Helium → Magnesium (12 protons, 12 neutrons)

7 Helium → Silicon (14 protons, 14 neutrons)

Common elements forged in stars are built on building blocks of helium nuclei