

10/6/06

Reading - Chapter 6, also look at posted revised Chapter 6 on web site (under “Second Edition) for discussion of polarization, jets, etc., in new section 5.

Second exam, Friday October 20, Chapters 6, 7.

News? New planets across the Galaxy

Pic of the day - Reflection nebula by the Spitzer Space Telescope



What jets do -

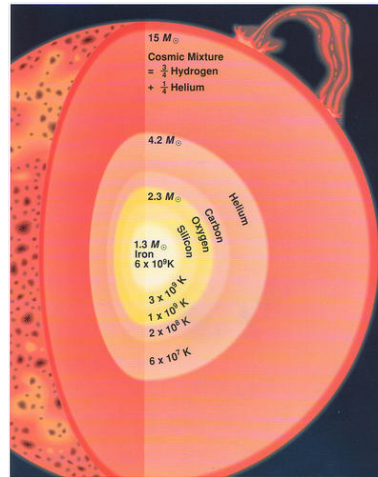
Bagel and breadstick, jet/torus shape “natural.”

Strong enough jet can explode the star, but neutrinos probably also play a role - complicated problem!

Account qualitatively for out-of-round polarization.

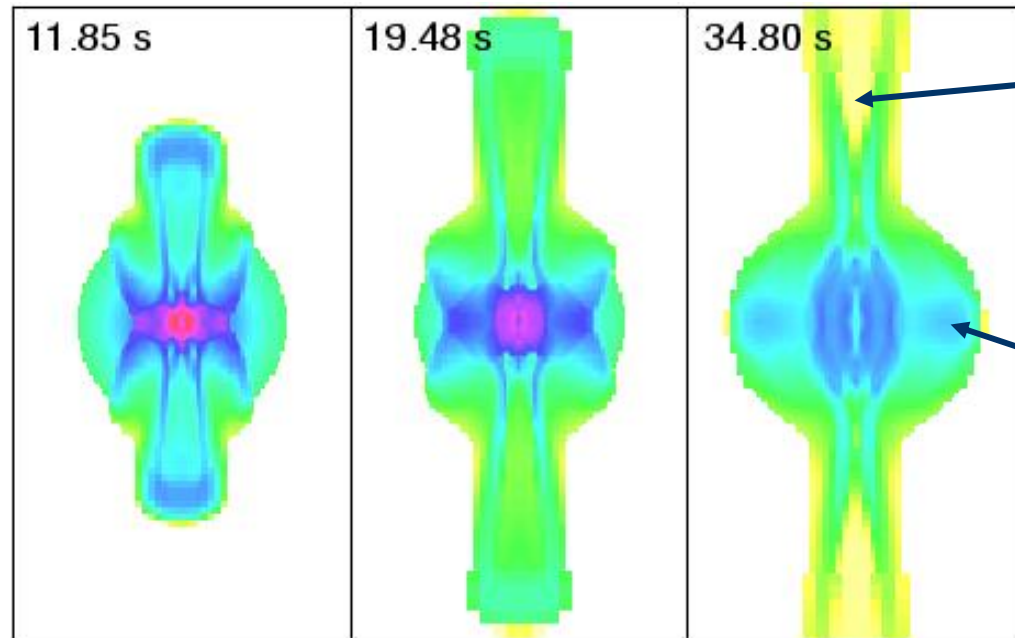
Test for shape (jet/torus), prediction of different elements exploded in different directions.

Initially spherical model,

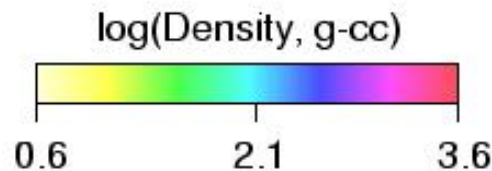


oxygen, silicon, calcium, and iron would be exploded in all directions

Axis/torus structure



jet
"iron"
bread
stick
torus,
O, Ca,
bagel

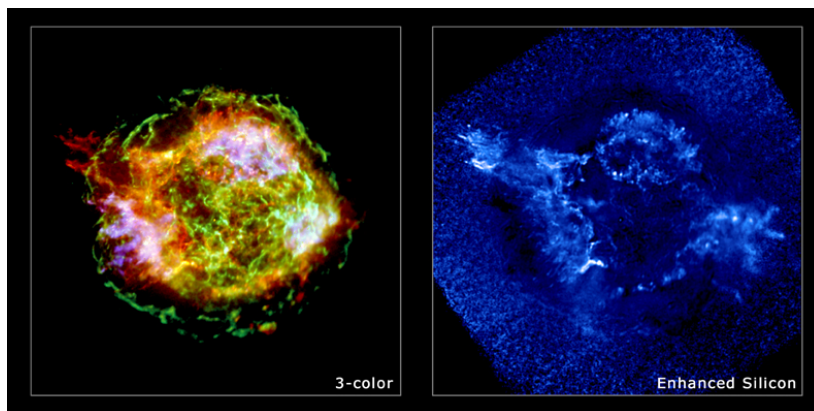
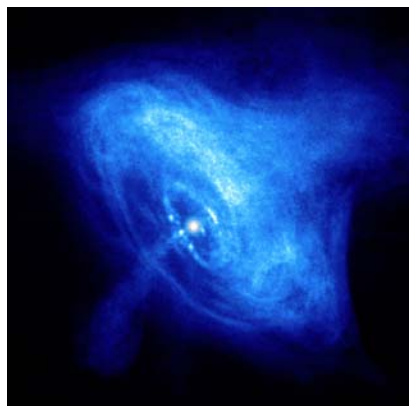


One Minute Exam

How do astronomers determine the shape of supernovae in distant galaxies

- A) Take a picture and look at the shape
- B) Measure the polarization of the light
- C) Measure the magnetic field of the supernova
- D) Measure the rotation of the supernova

Cautionary notes



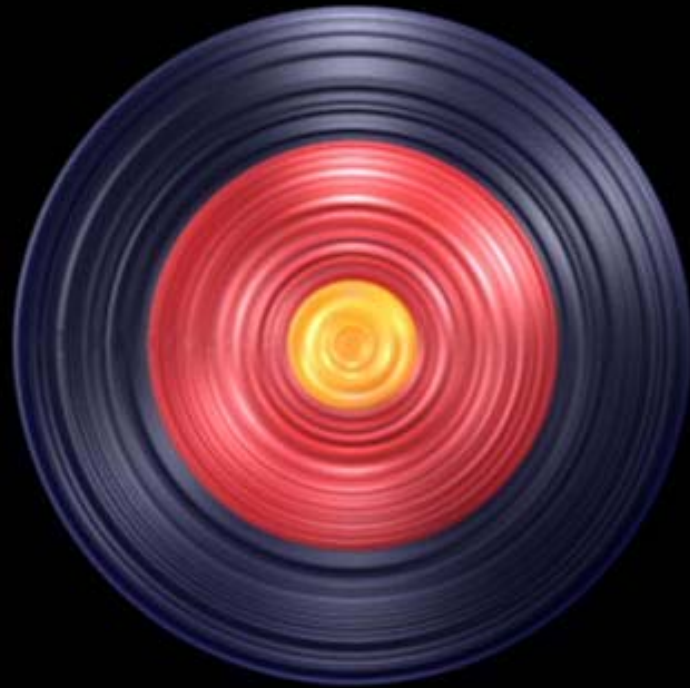
Left over
jet/torus,
but did jet
cause the
supernova?

Why is
the jet
silicon
not iron?

What
orientation?

Other physics - wobbling “hula hoop” instabilities of rotating neutron star could drive sound and magnetic waves outward toward stalled shock, re-energize it (Ott, Ou, Tohline, Burrows - Arizona and LSU)

TOP
VIEW



The new-born Neutron Star may be a strong,
magnetoacoustic wave-generating engine!!

Supernovae make a loud noise!

Major implications for supernova physics

Major implications for neutron star magnetic fields,
spin rates

Major implications for gravity-wave emission