2/25/08

Second Exam, FRIDAY.

Chapter 6: 6.1, 6.4, 6.5, 6.6, 6.7

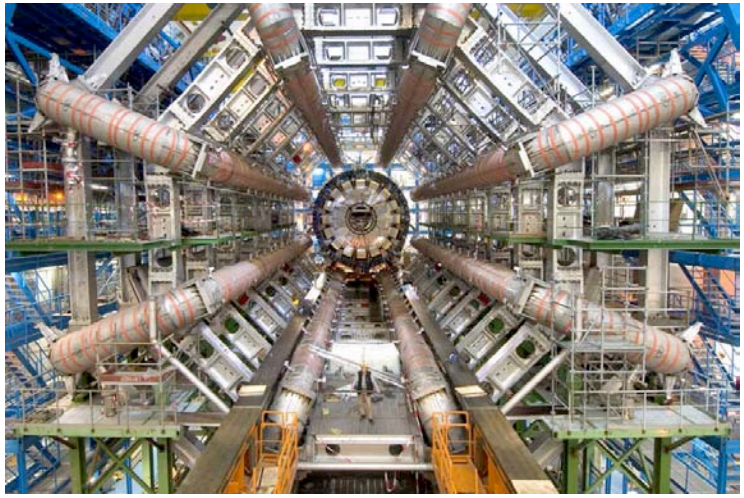
Chapter 7: all

Review Sheet posted today

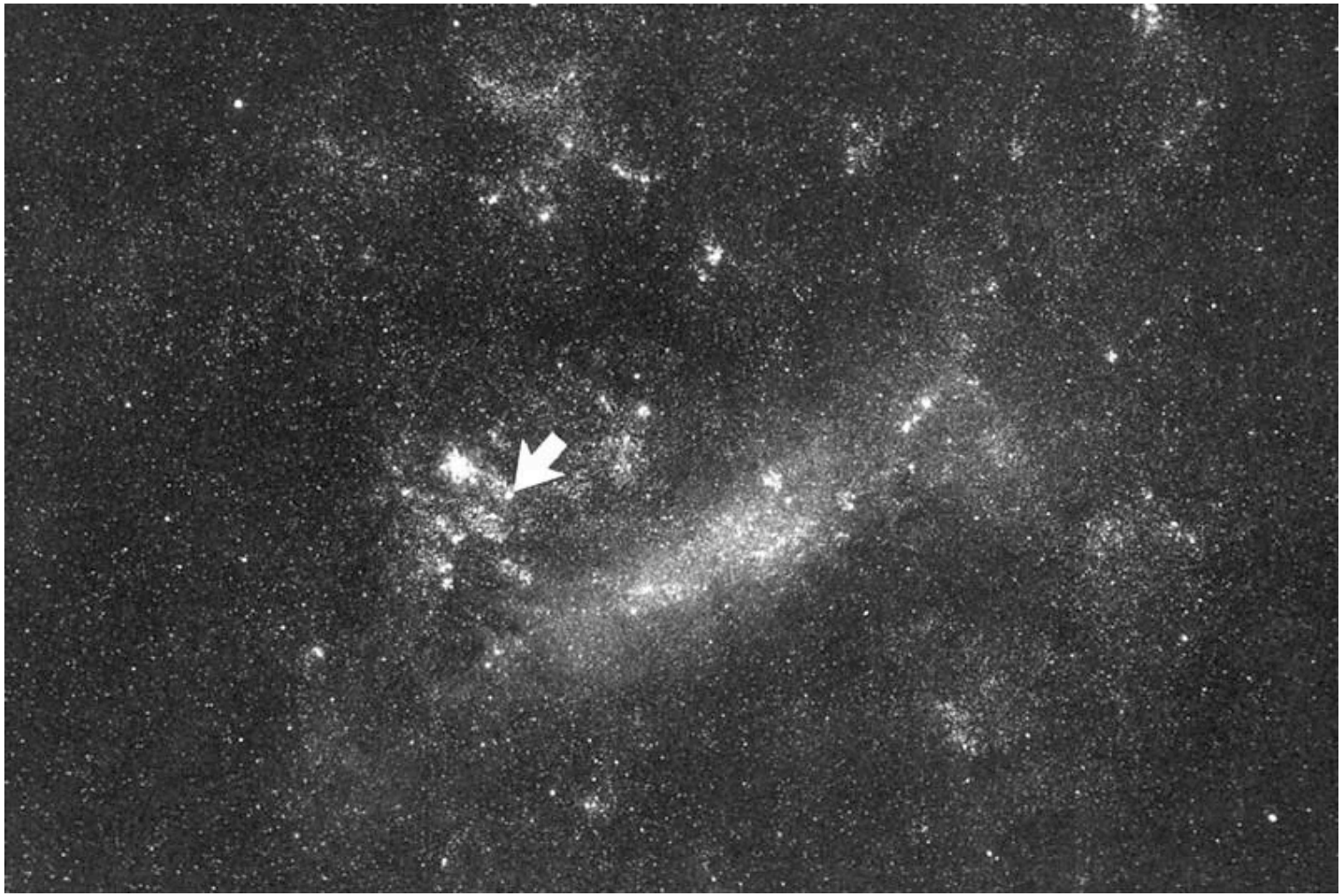
Review Session - Thursday, 5:00 PM RLM15.216B

Astronomy in the news?

Pic of the Day - Large Hadron Collider (LHC) about to start up at CERN.



LMC w/arrow



One Minute Exam

When SN 1987A exploded, where would have been a good place to have seen it with your naked eye?

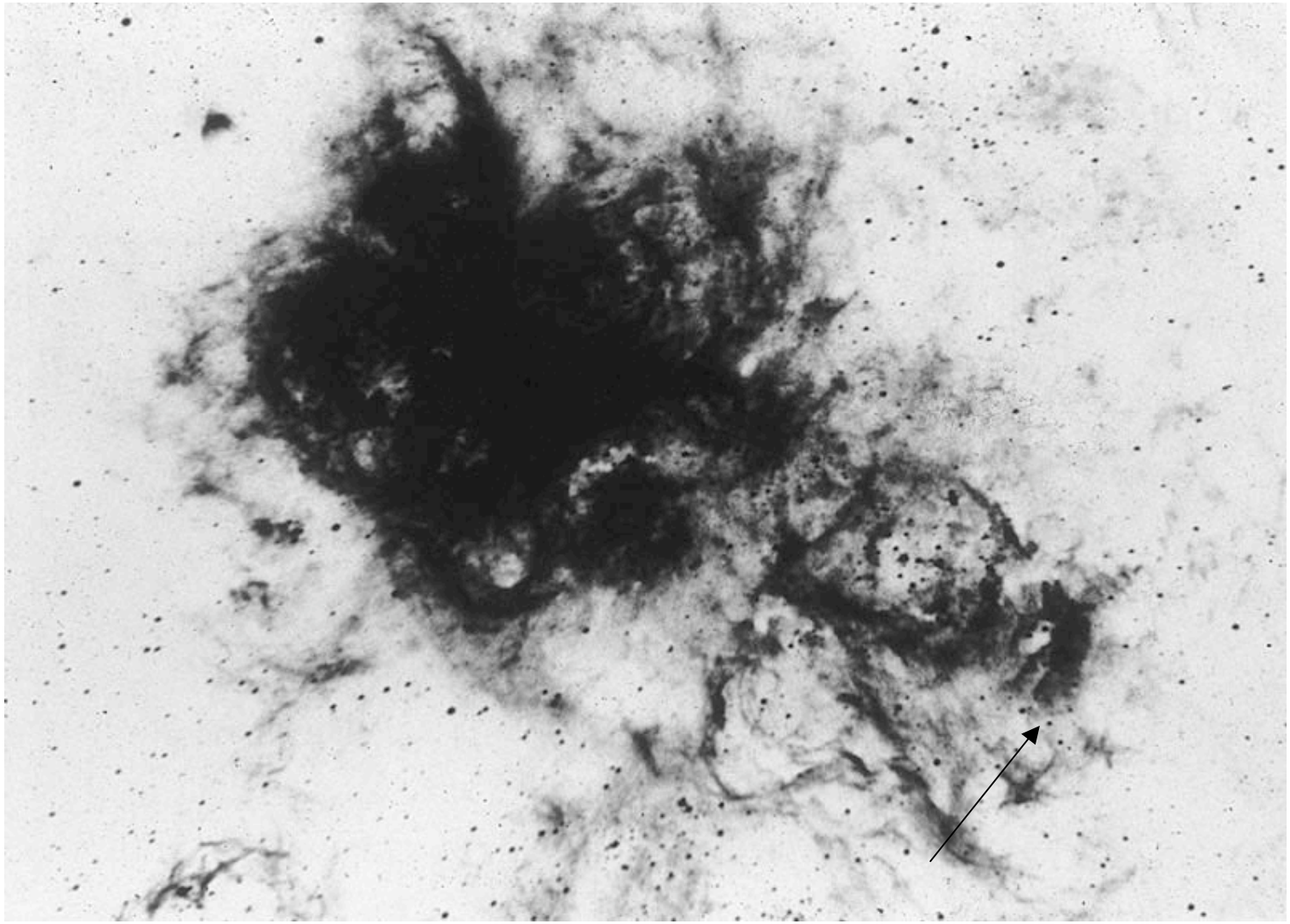
A) Texas

B) Japan

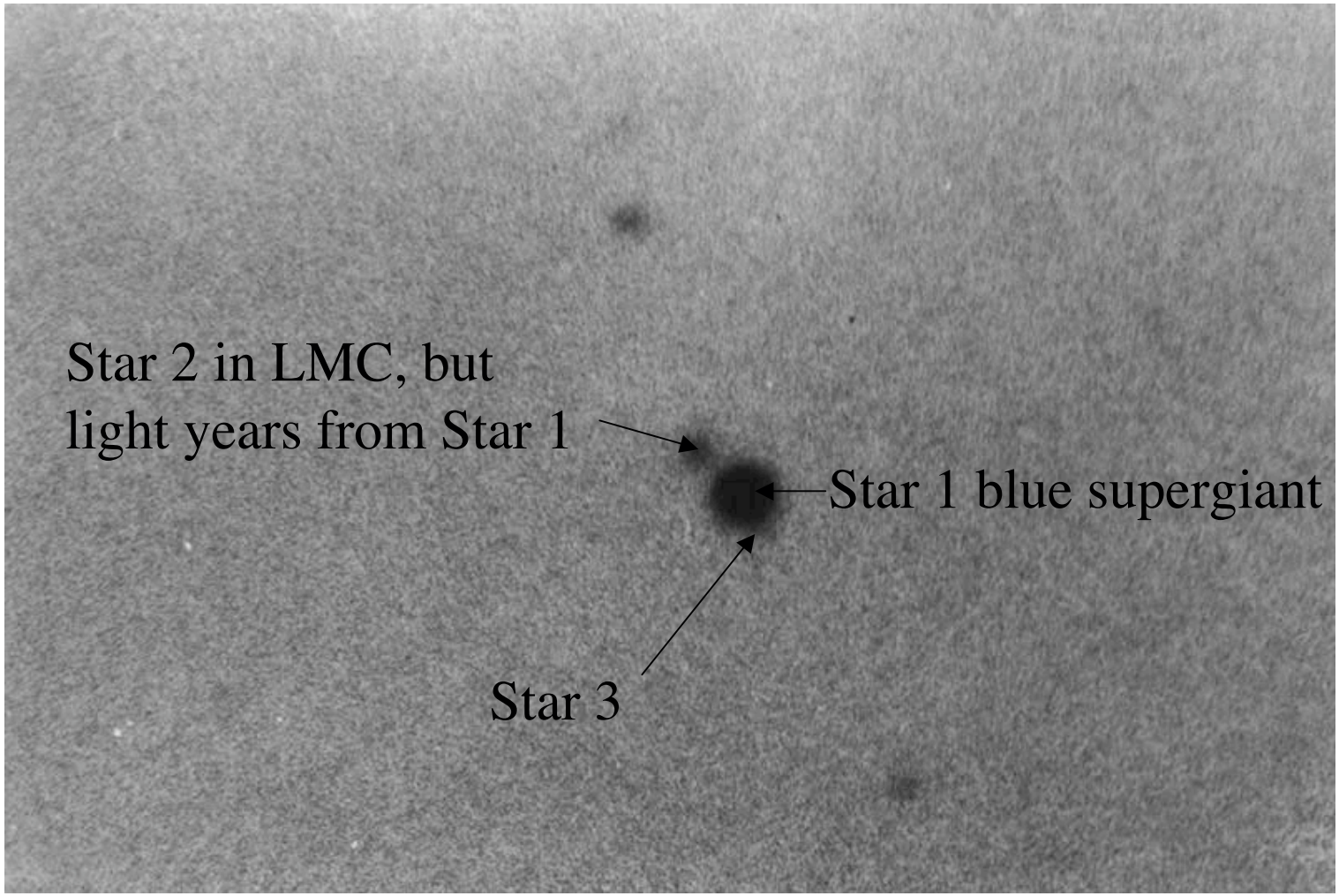
C) France

D) Argentina

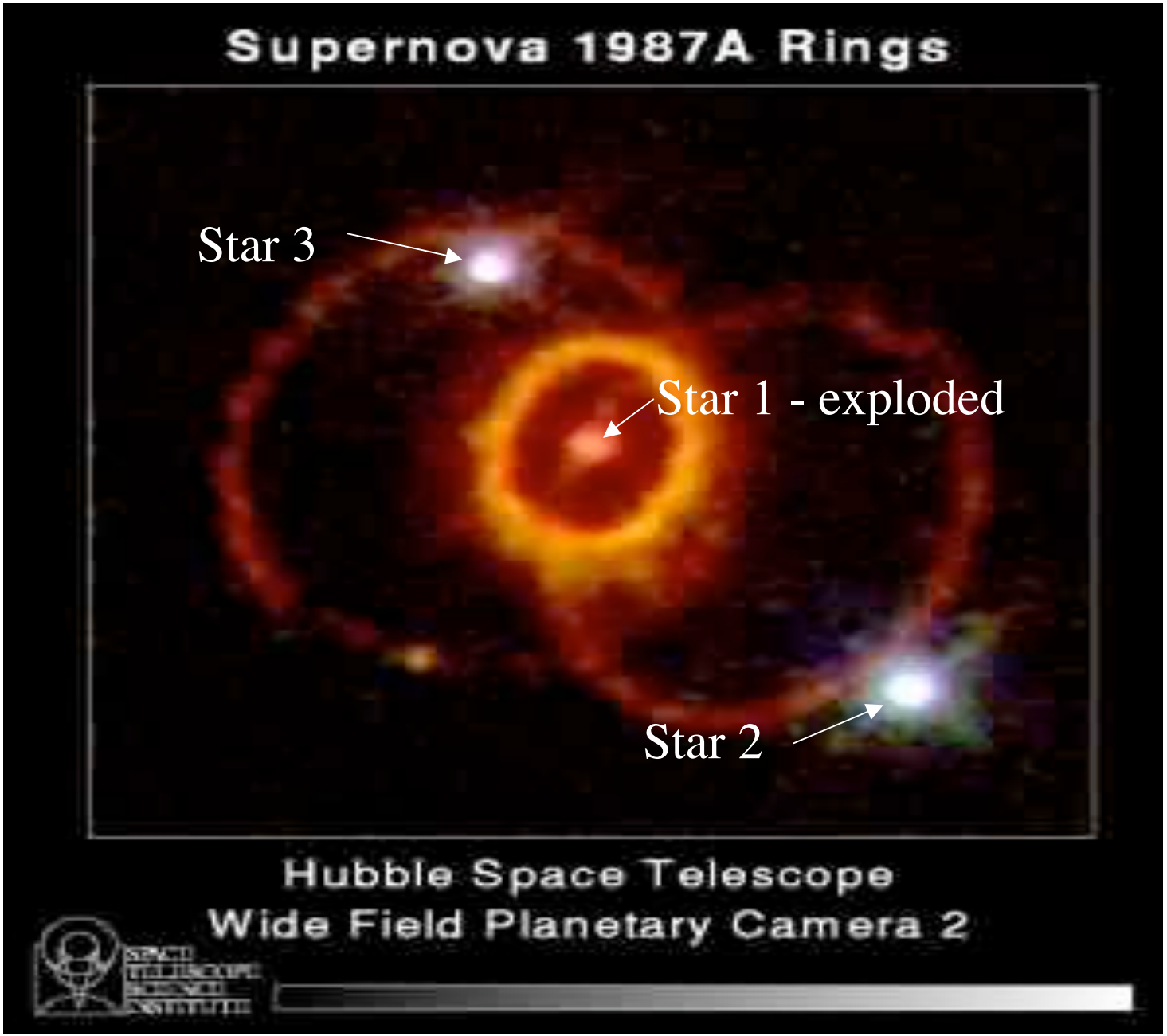
Photo of progenitor star (giraffe)

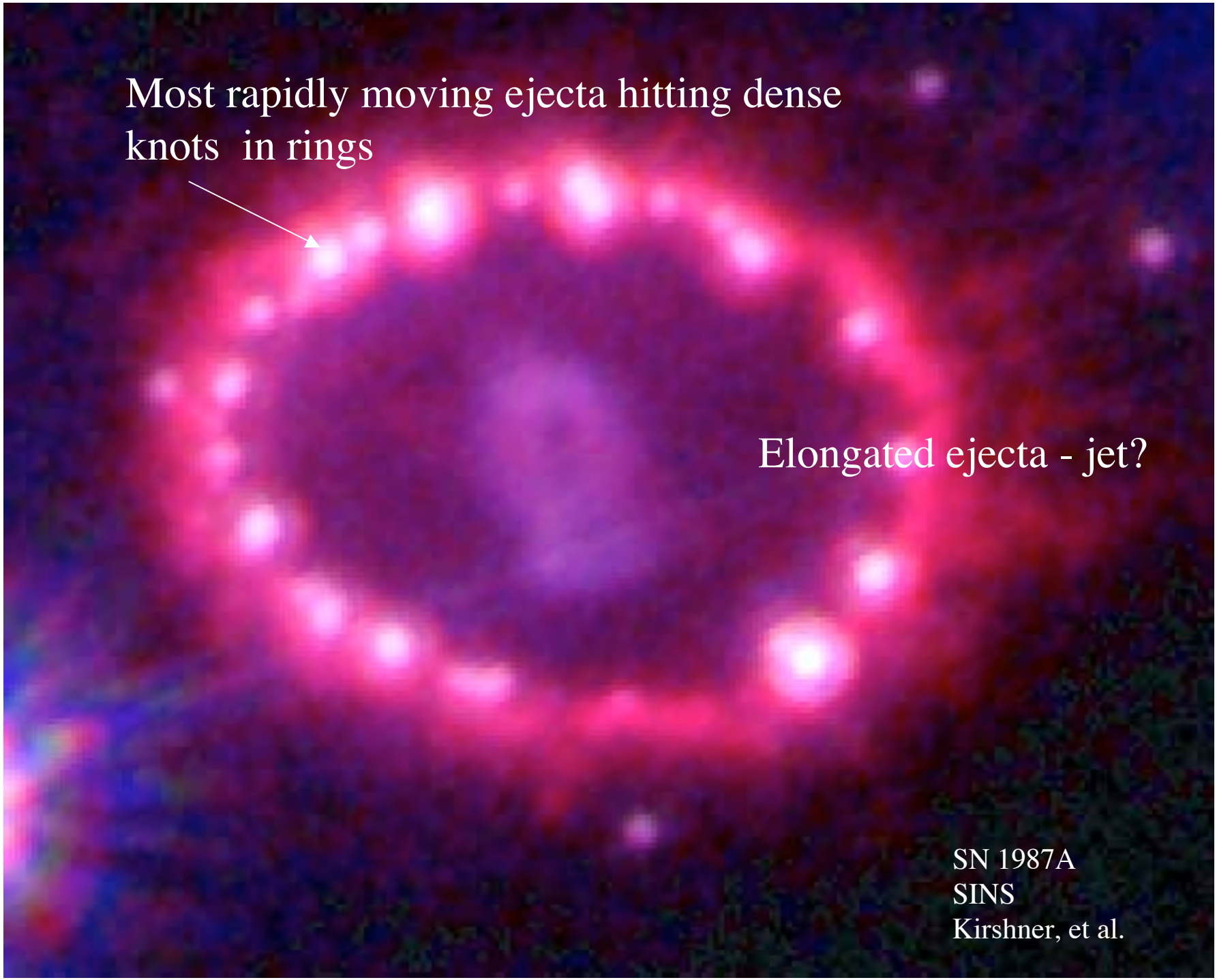


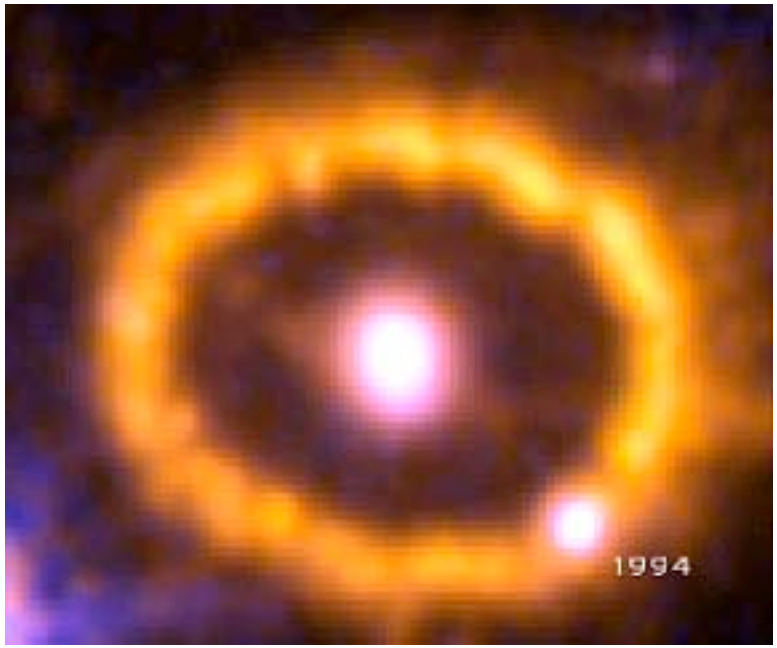
Stars 1, 2, 3

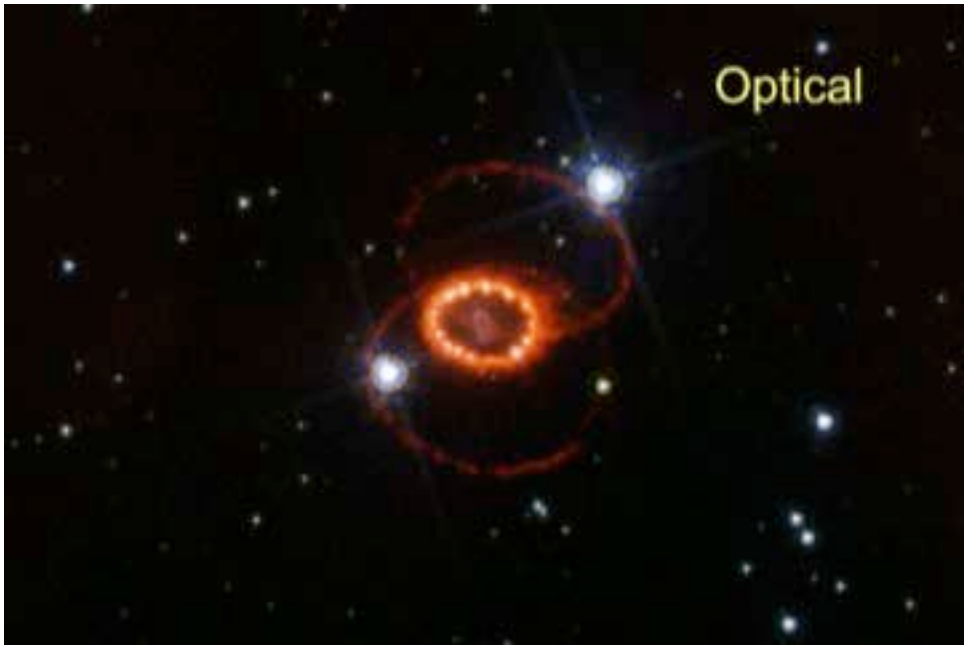


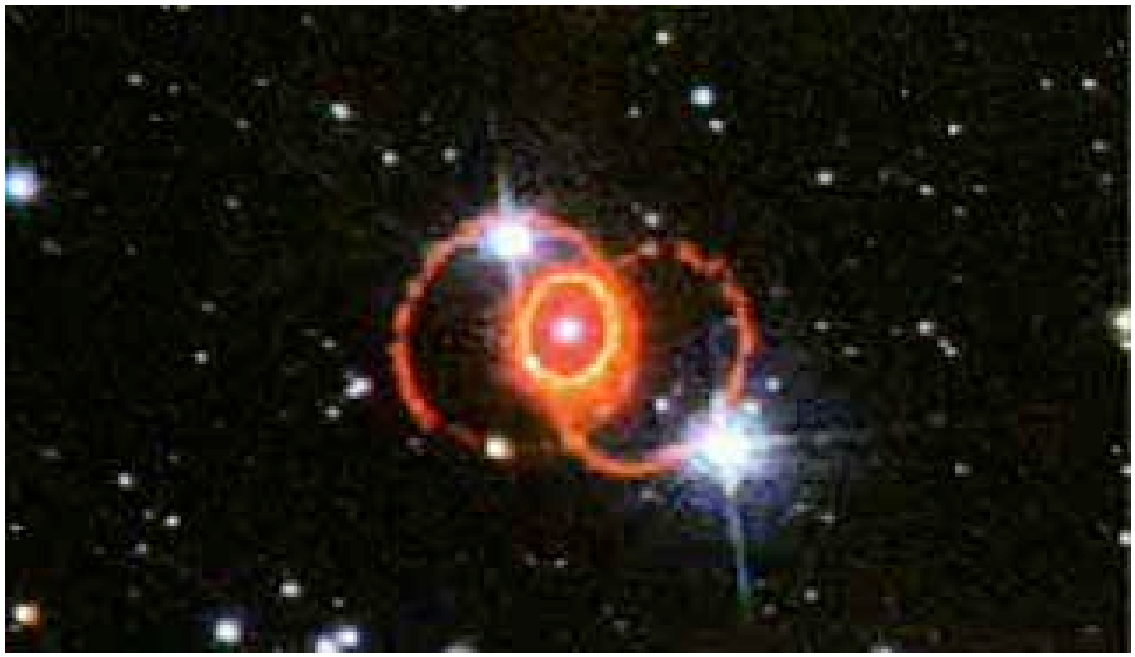
Close-up


Supernova 1987A Rings
Star 3
Star 1 - exploded
Star 2
Hubble Space Telescope
Wide Field Planetary Camera 2


Most rapidly moving ejecta hitting dense knots in rings
Elongated ejecta - jet?
SN 1987A
SINS
Kirshner, et al.


1994


Optical



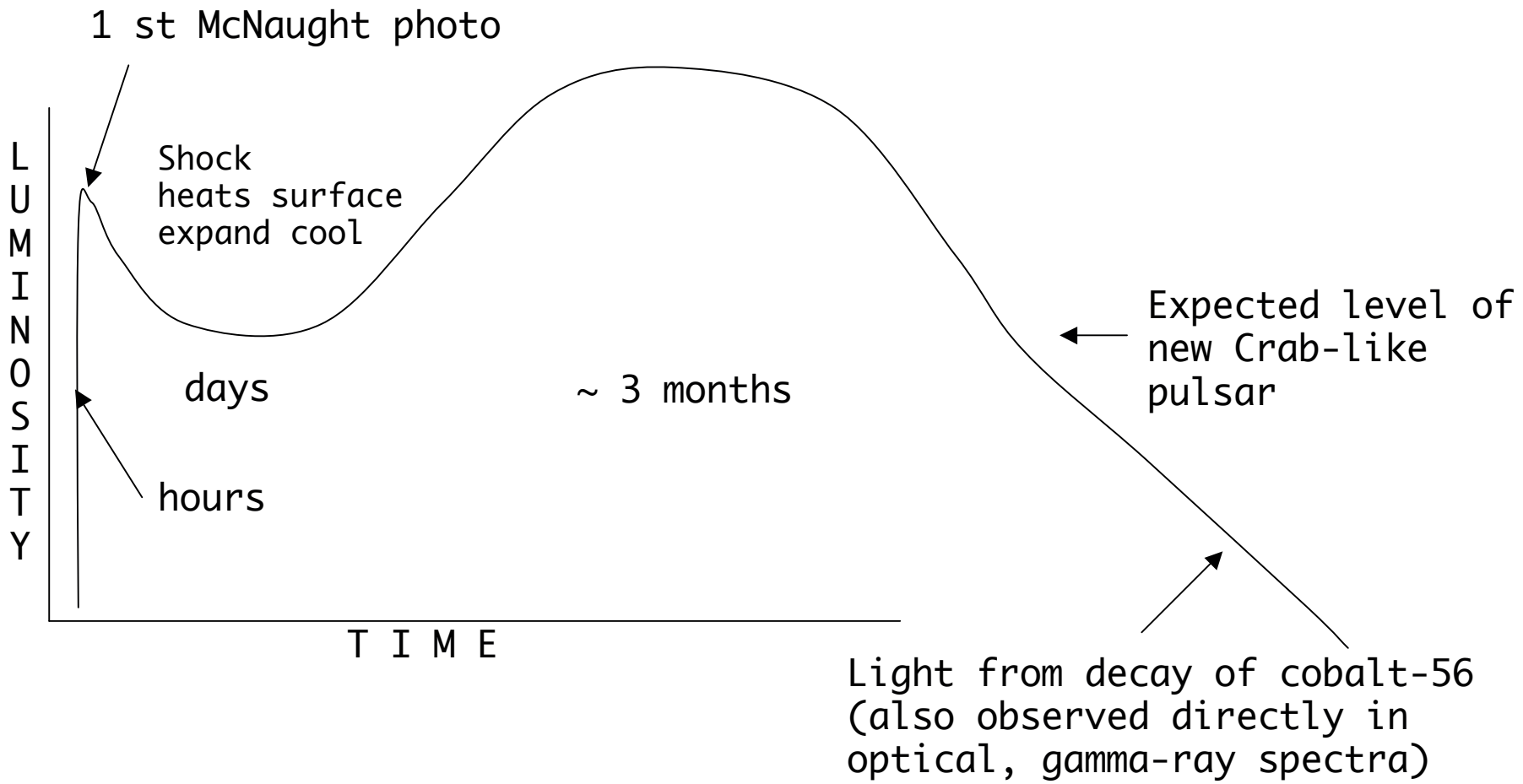
The single most important thing about SN 1987A is that we detected the neutrinos!

It was definitely a core-collapse event

10^{57} neutrinos emitted, most missed the Earth. Of those that hit the Earth, most passed though since neutrinos scarcely interact.

About 19 neutrinos were detected in a 10 second burst.

170,000 year history!

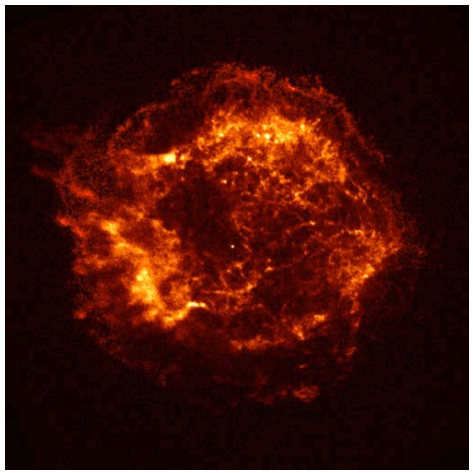


SN 1987A had a rather peculiar light curve because it was a relatively compact blue supergiant, not a red supergiant, brief shock heating, rapid cooling by expansion, no plateau, subsequent light all from radioactive decay

Neutrinos from SN 1987A proved a neutron star formed and lasted for at least 10 seconds while neutrinos were detected - where is it?

Expected to see it in ~ 1 year - still looking 21 years later

Any neutron star is dimmer by at least a factor of 10 than 1000 year-old Crab pulsar



If similar to object in Cas A, much too dim to detect
100 to 1000 × dimmer than Crab pulsar

Possibly black hole, not neutron star??
Don't know. Can't rule out.

Neutron star could be "hidden," or a slow rotator, or with a weak magnetic field, but counter to notion of jet - some evidence for jet

End of Material for Test 2