Monday, March 24, 2014

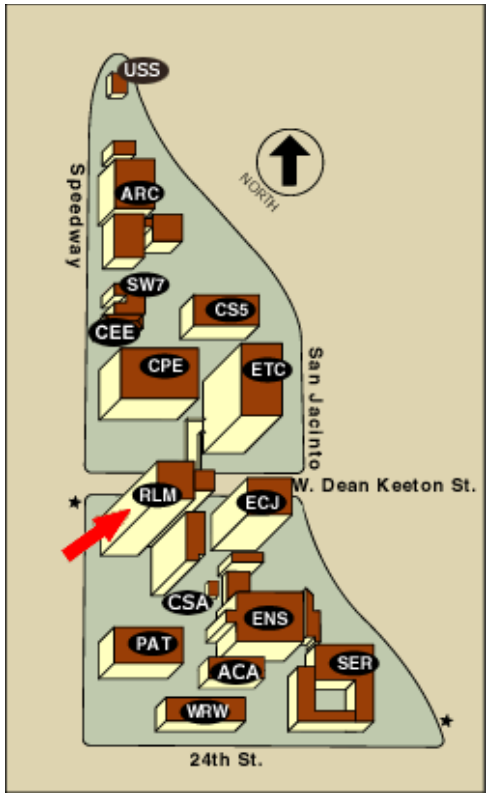
Exam 3, Skywatch 3, a week from Today, 3/31.
Review sheet posted this afternoon

Review session Thursday, 5 – 6 PM, RLM 7.104

Reading for Exam 3: End of Section 6.6 (Type Ia binary evolution), 6.7 (radioactive decay), Chapter 7 (SN 1987A).

Background: Sections 3.3, 3.4, 3.5, 3.10, 4.1, 4.2, 4.3, 4.4, 5.2, 5.4, binary stars and accretion disks.

Astronomy in the news:



Update on new “nearby” supernova SN 2014J in M82

Nothing to Report

Goal:

To understand the nature and importance of SN 1987A for our understanding of massive star evolution and iron core collapse.

Rob McNaught patrol photos - the day before

2-22-87

The first known photo of SN 1987A hours after shock breakout

2-23-87

One day later

2-24-87

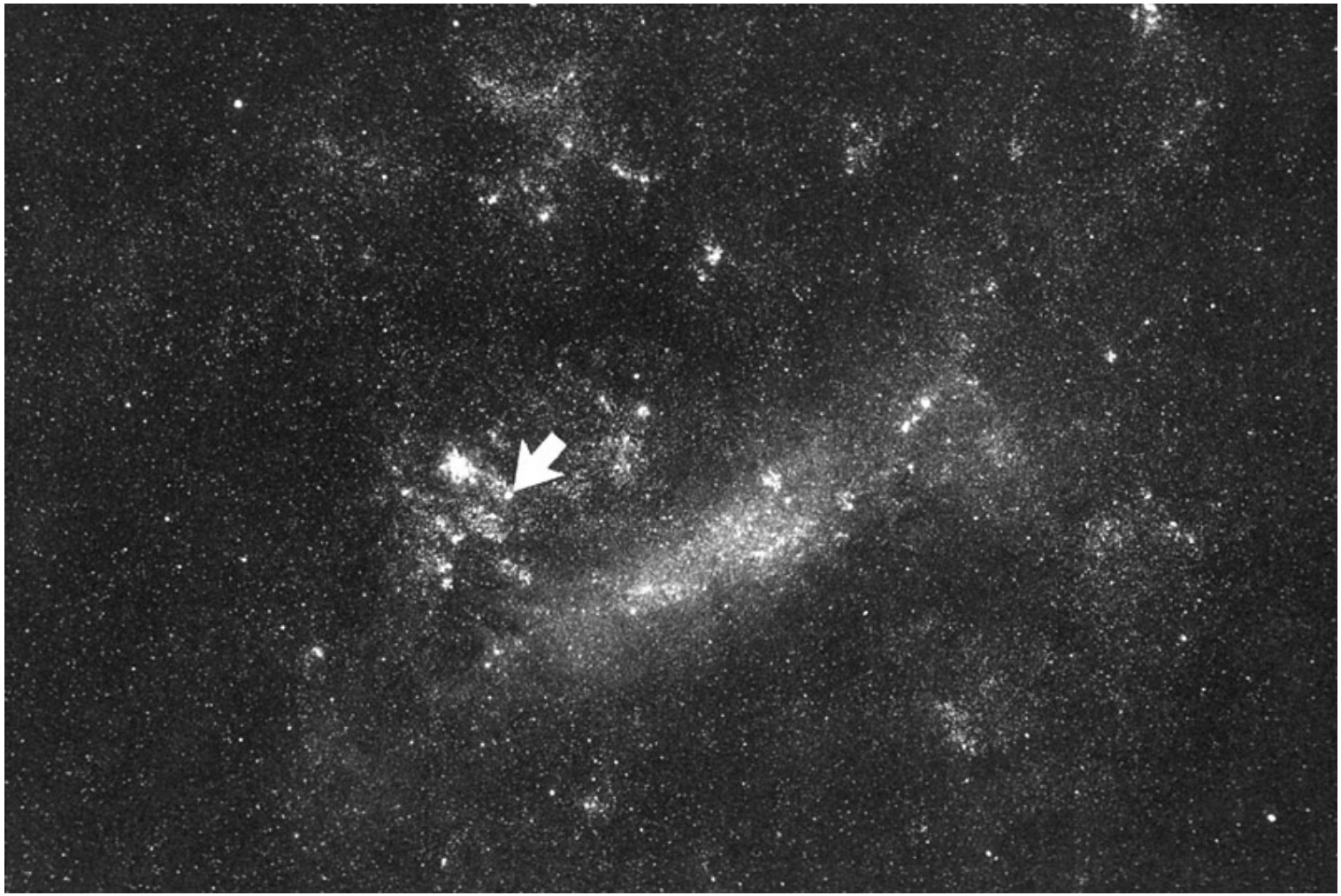
Near maximum light

5-20-87

About when I saw it

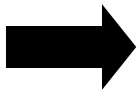
8-23-87

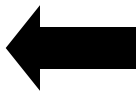
LMC w/arrow

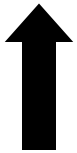


One Minute Exam

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

 Texas

 Japan

 Russia

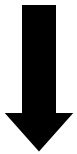
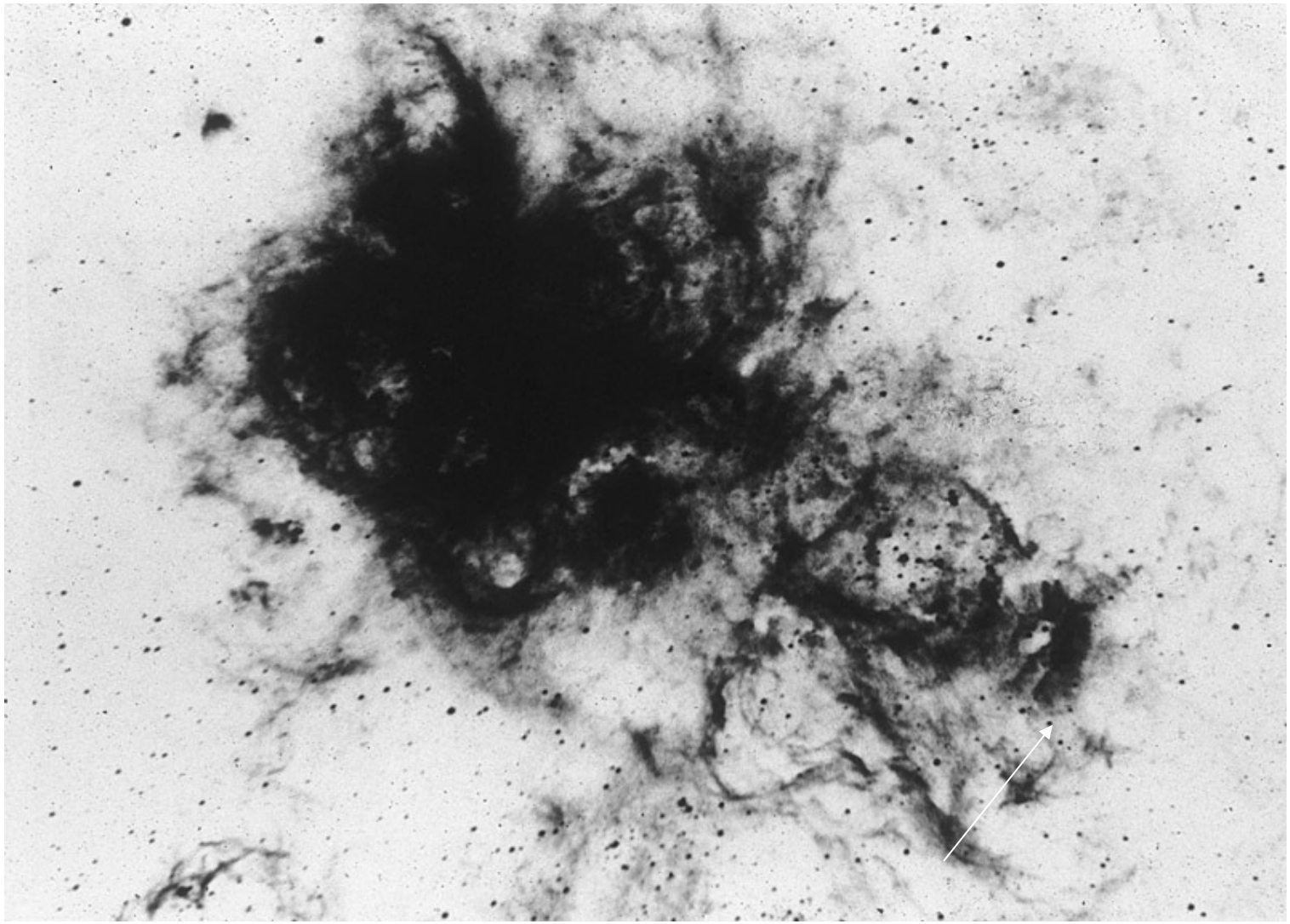
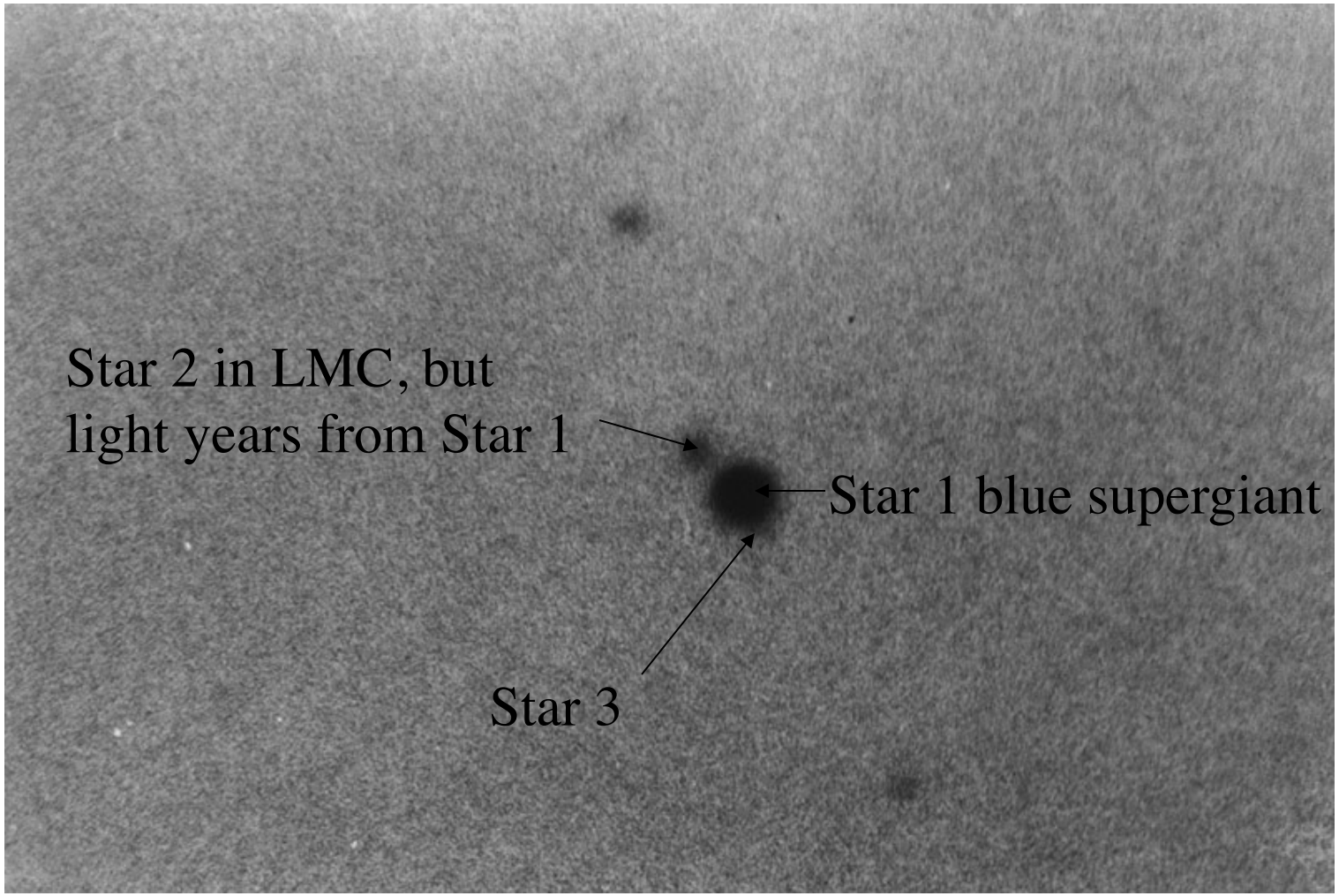
 South Africa

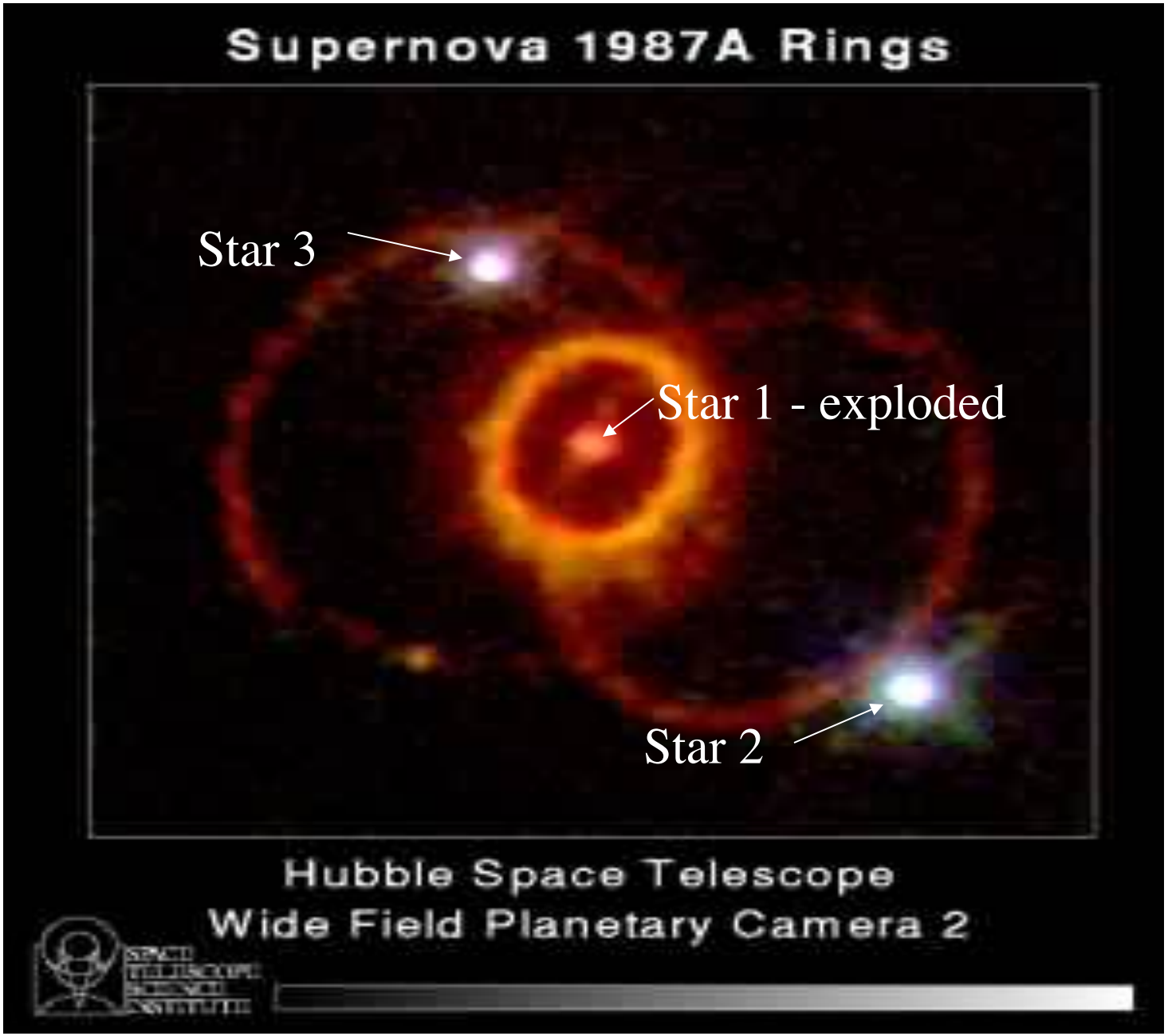
Photo of progenitor star (giraffe): Courtesy Yu Hua Chu

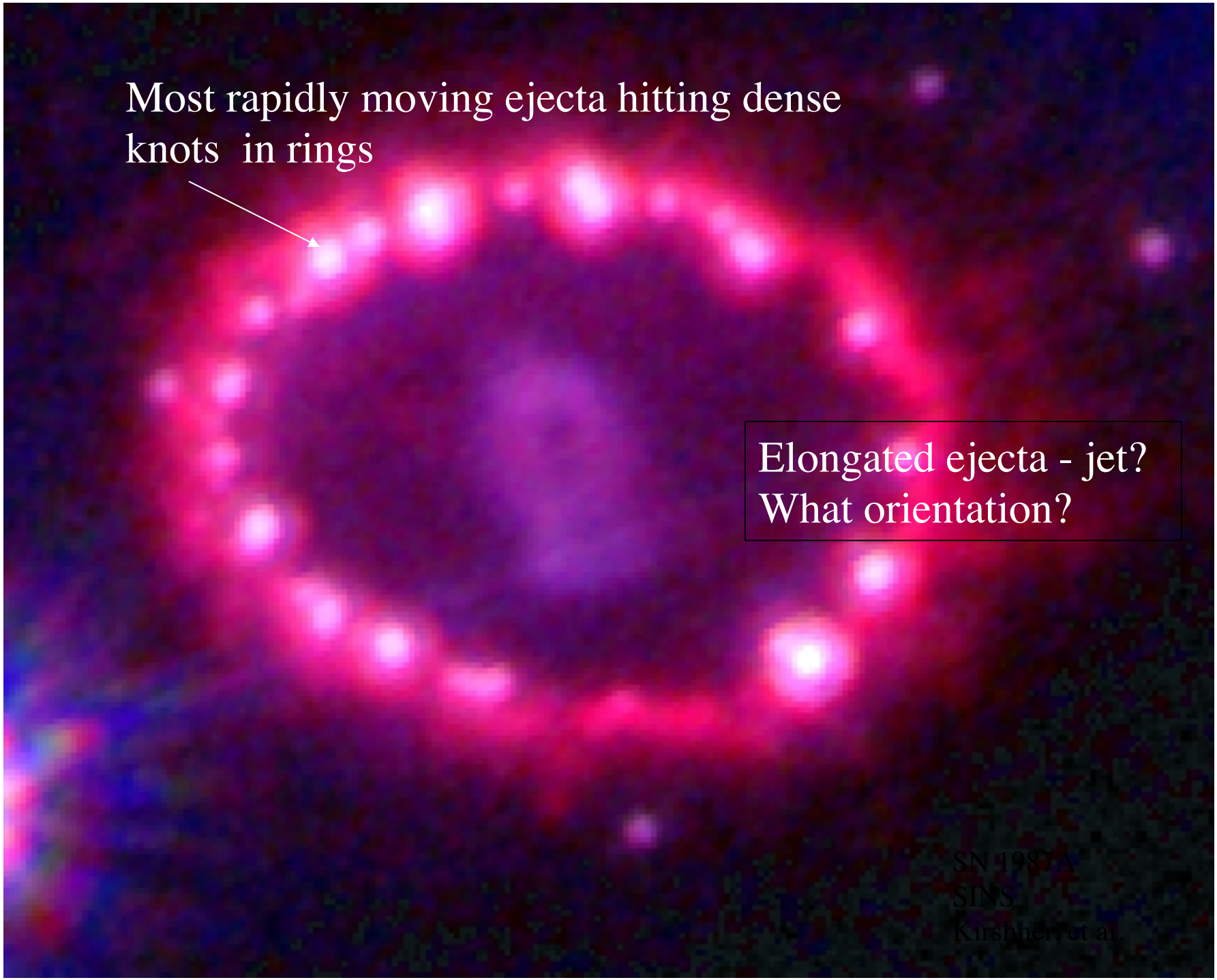


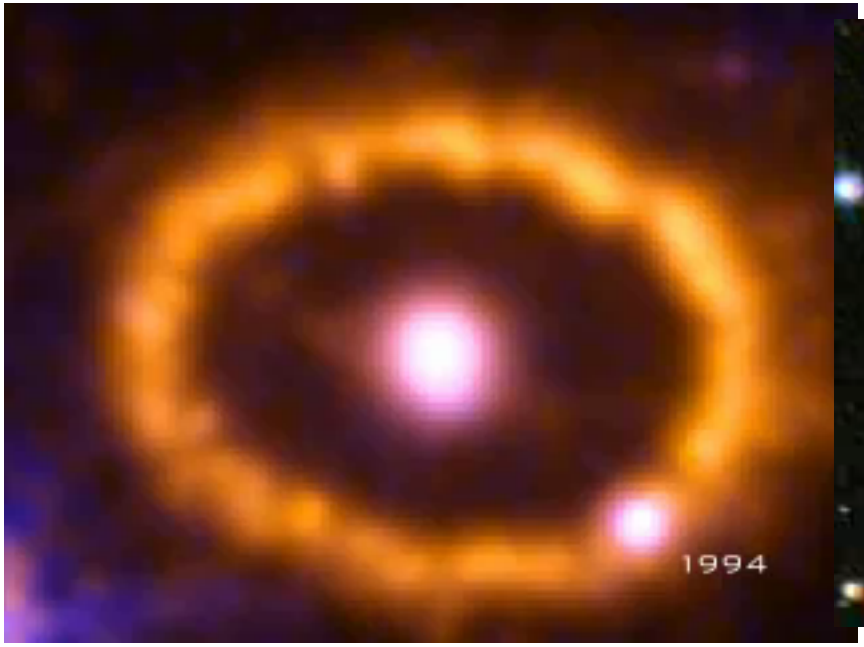
Stars 1, 2, 3: Courtesy Yu Hua Chu



Close-up

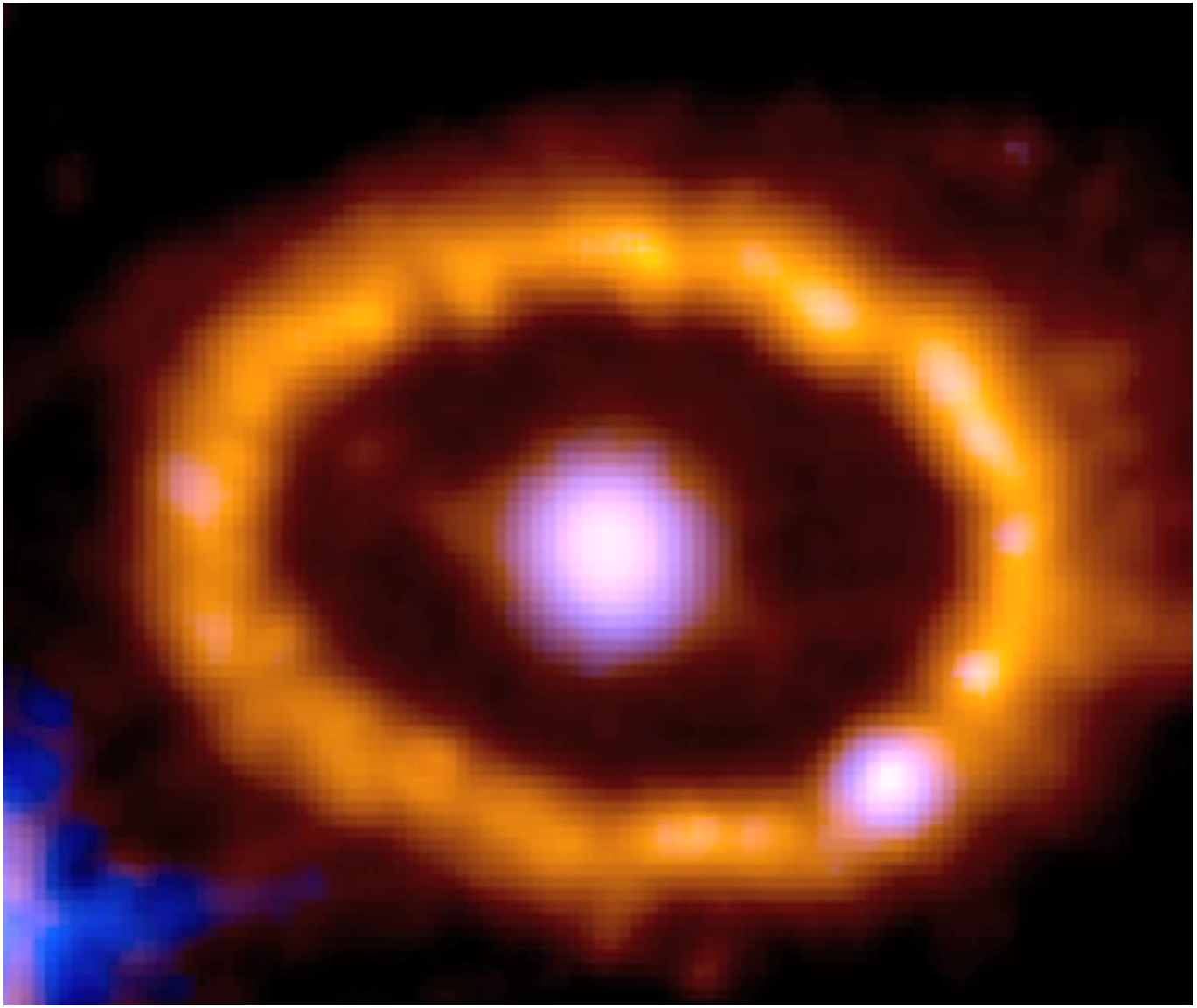

Supernova 1987A Rings
Star 3
Star 1 - exploded
Star 2
Hubble Space Telescope
Wide Field Planetary Camera 2


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


1994


Optical

Updated to 2010



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 of humanity!