

Wednesday, March 9, 2016

**There will be class on Friday**

Reading for Exam 3, April 1:

Chapter 7 (SN 1987A)

Astronomy in the news?

UT astronomer Andrew Mann and colleagues have discovered a planet in the Hyades star cluster, the closest open star cluster to Earth. The planet is about 4 times the size of Earth, about that of Neptune.



# Large Magellanic Cloud, closeup (color)



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



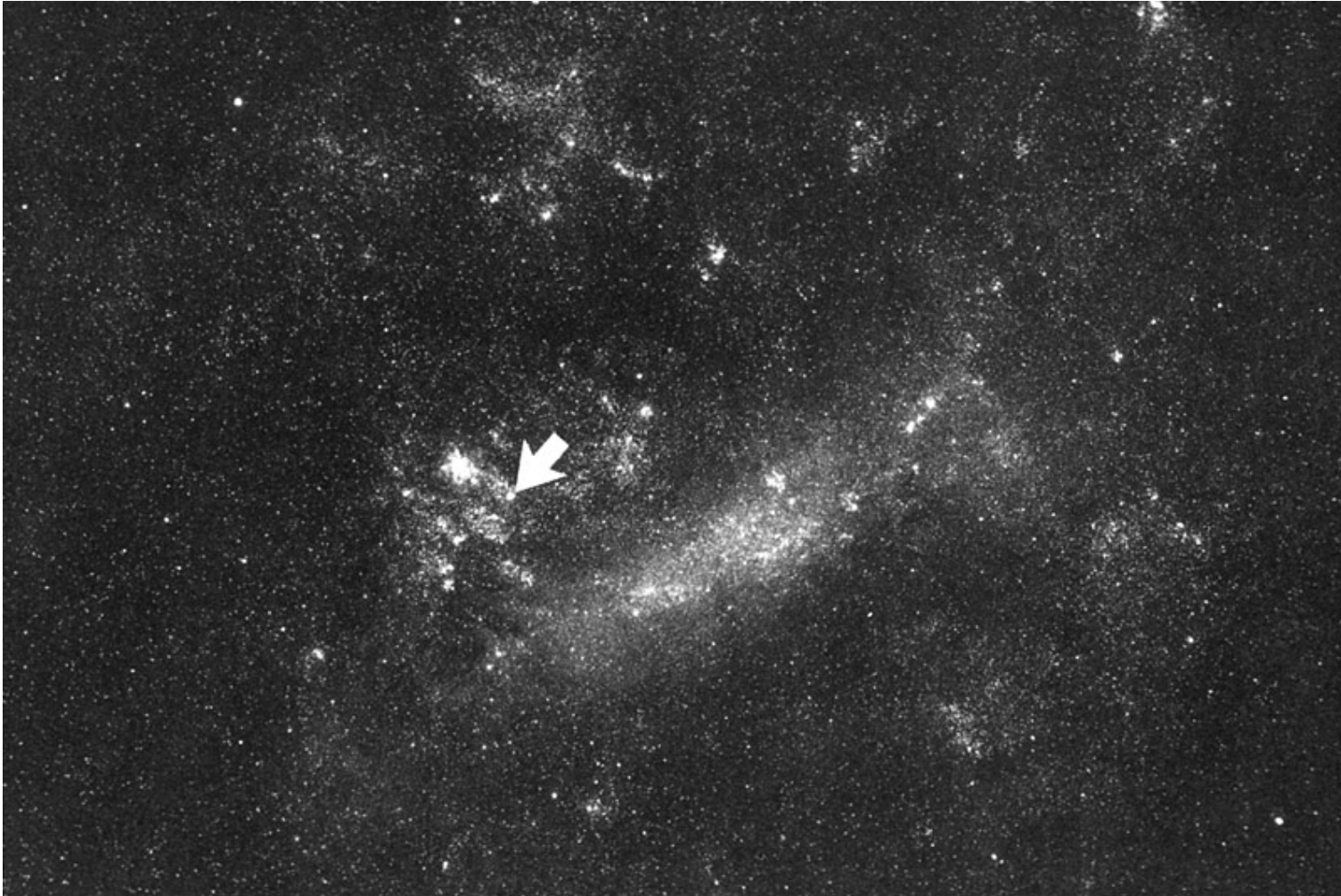
5-20-87

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

LMC negative

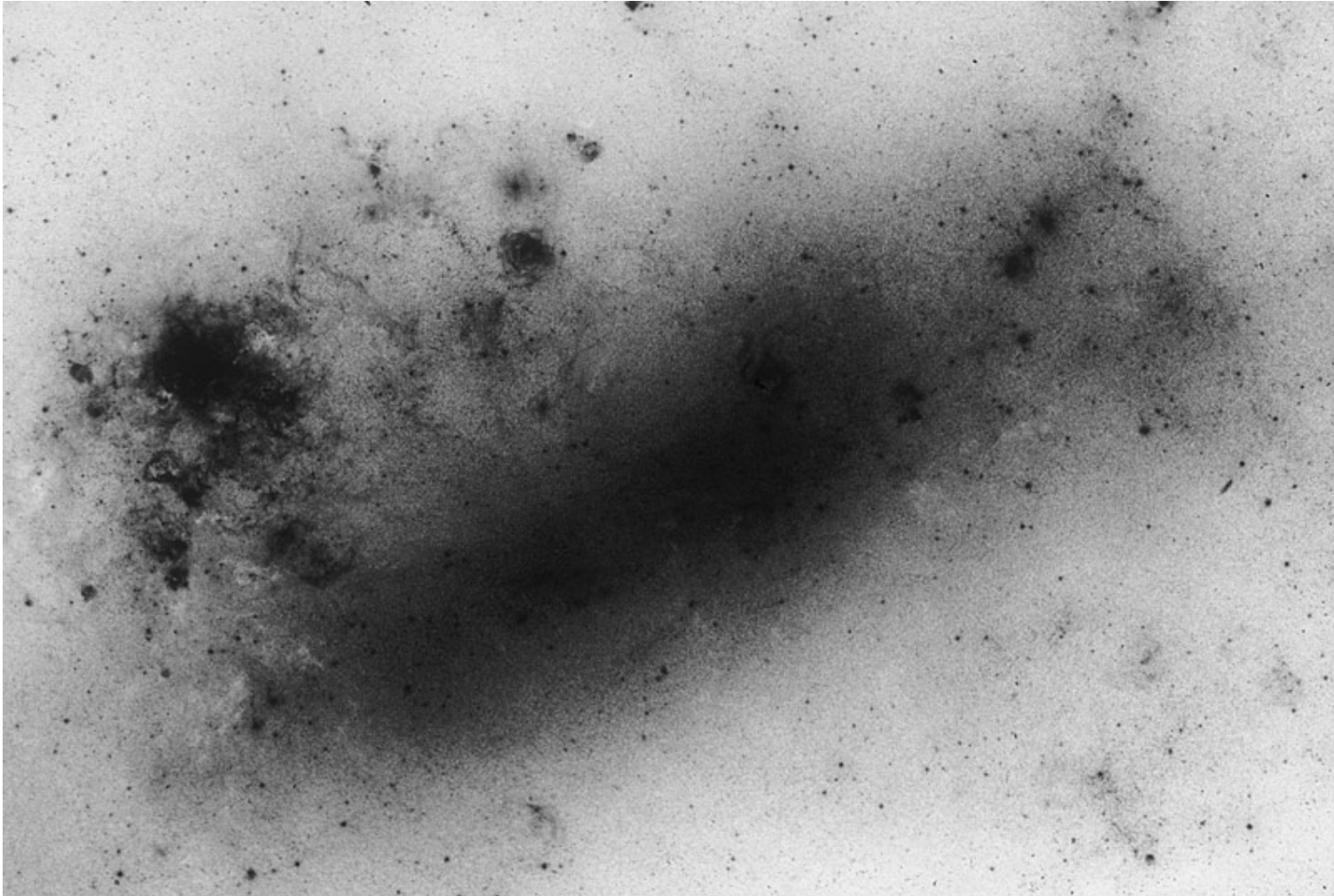
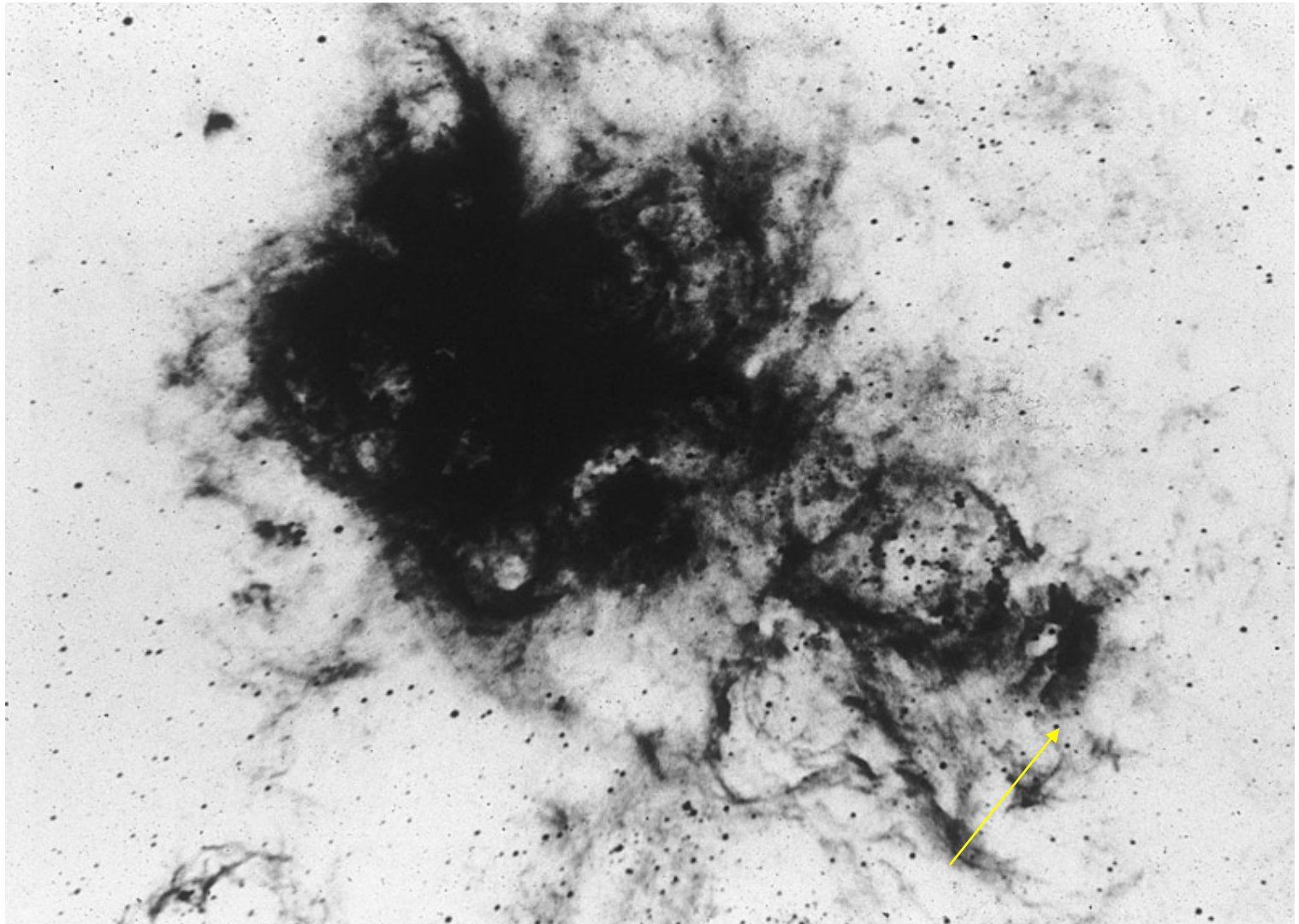
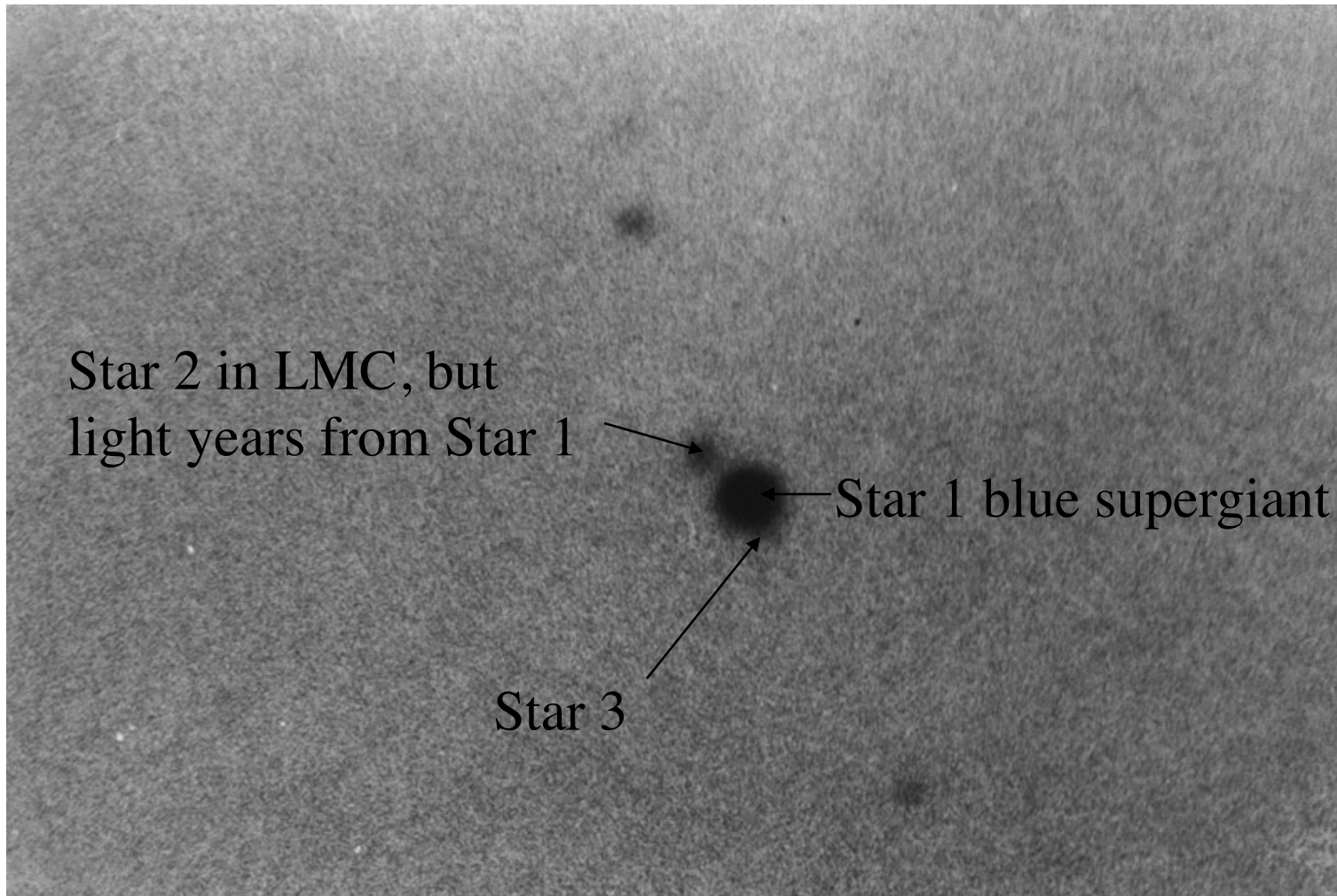


Photo of progenitor star (giraffe): Courtesy Yu Hua Chu

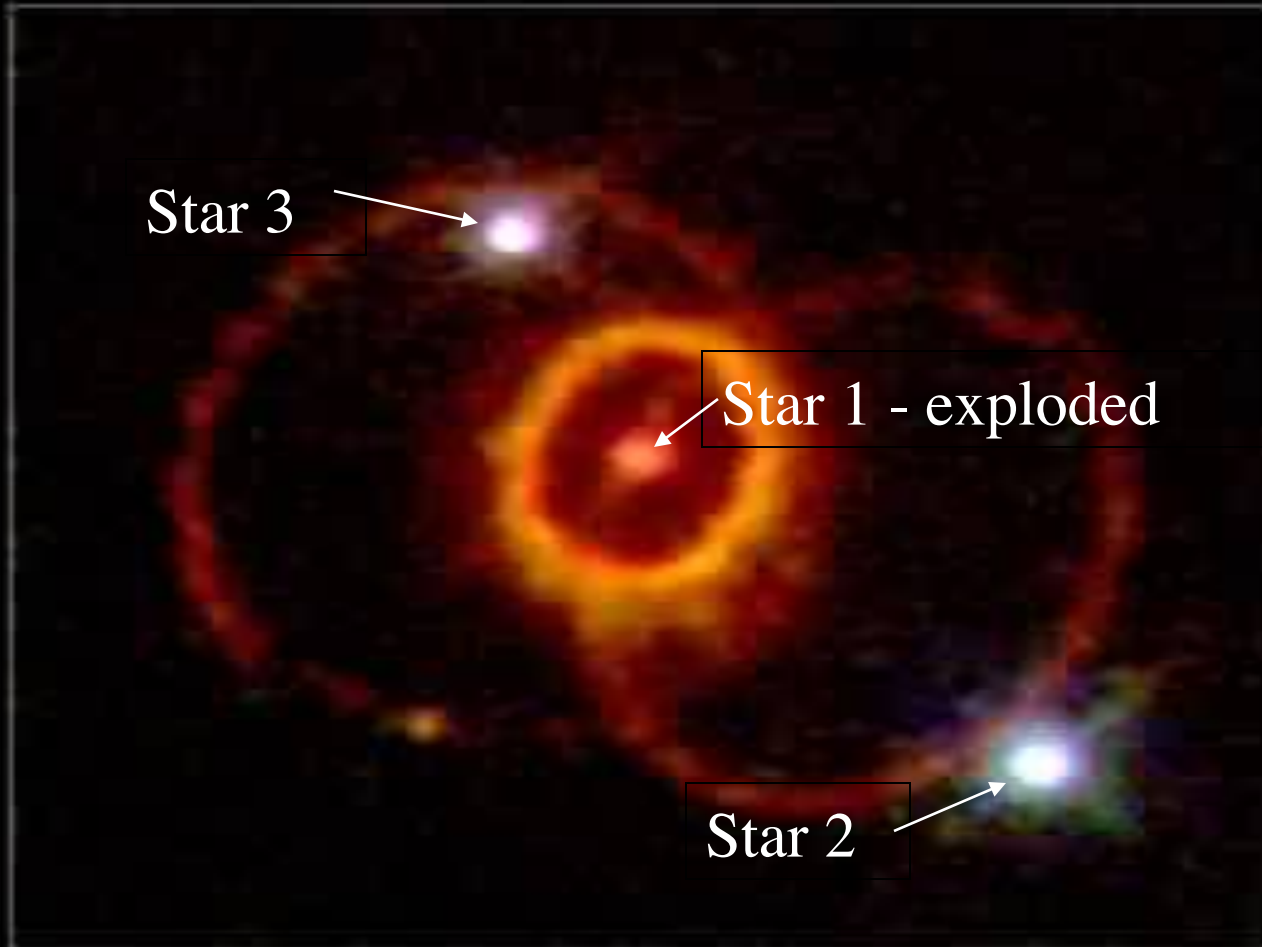


## Stars 1, 2, 3: Courtesy Yu Hua Chu



# Close-up

# Supernova 1987A Rings



Hubble Space Telescope

Wide Field Planetary Camera 2

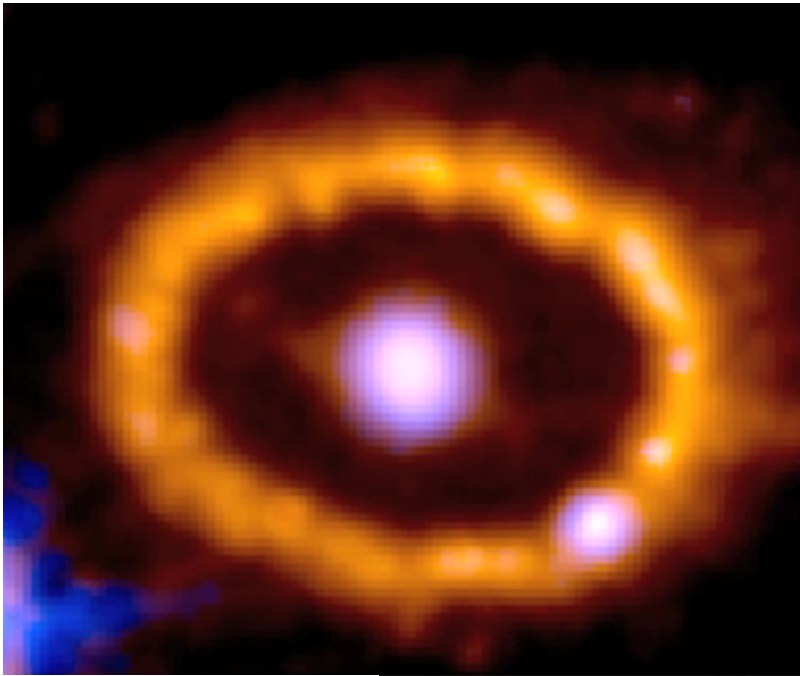


Most rapidly moving ejecta hitting dense  
knots in rings

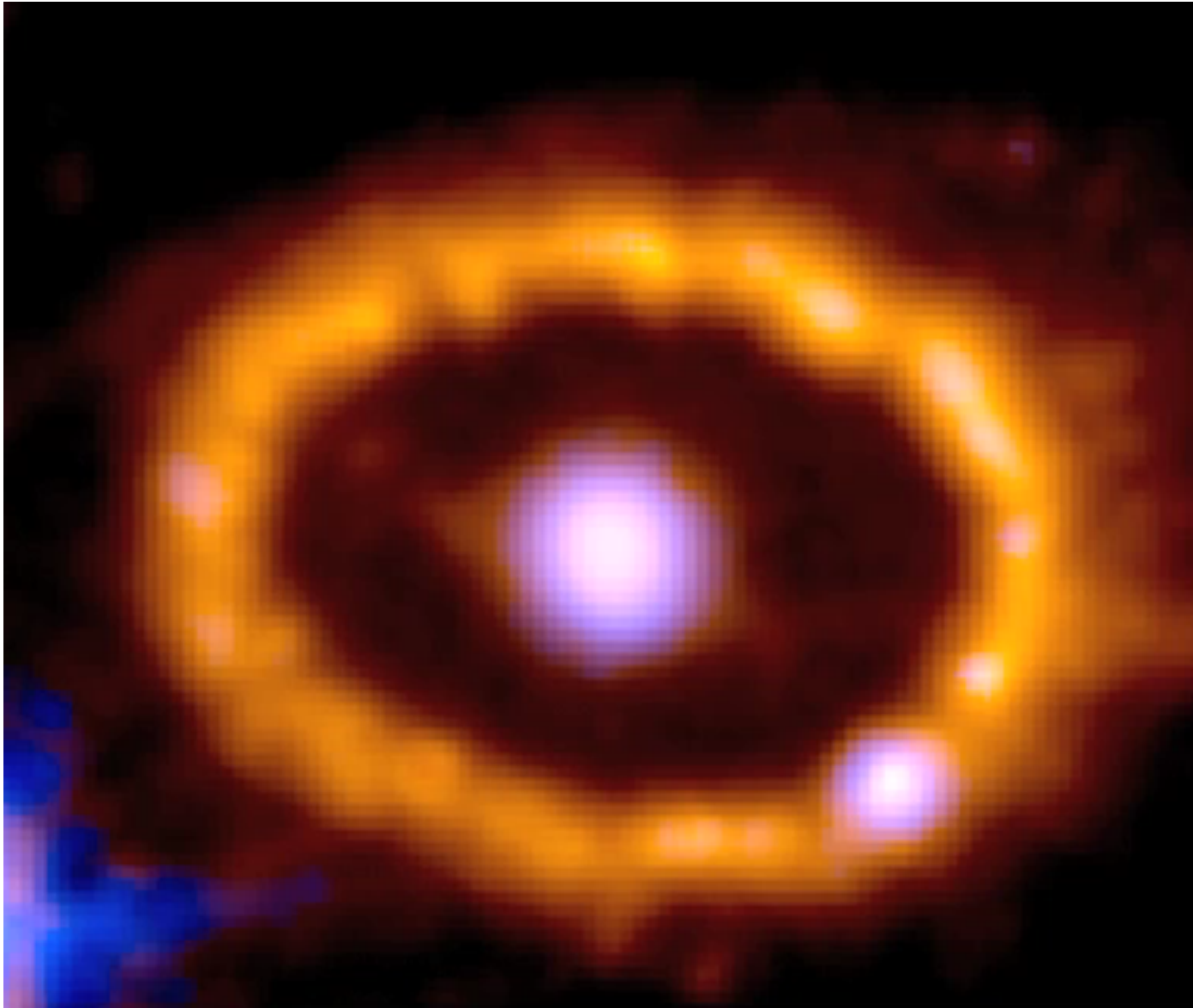


Elongated ejecta - jet?  
What orientation?

SN 1987A  
SINS  
Kirshner, et al.



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 through since neutrinos scarcely interact.

About 19 neutrinos were detected in a 10 second burst.

*170,000 year history of humanity!*