Stellar Evolution

ASTR 1220, Summer 2010

16 July 2010

Outline

Bennett Ch 17

Mass and stellar evolution

Evolution of low-mass stars

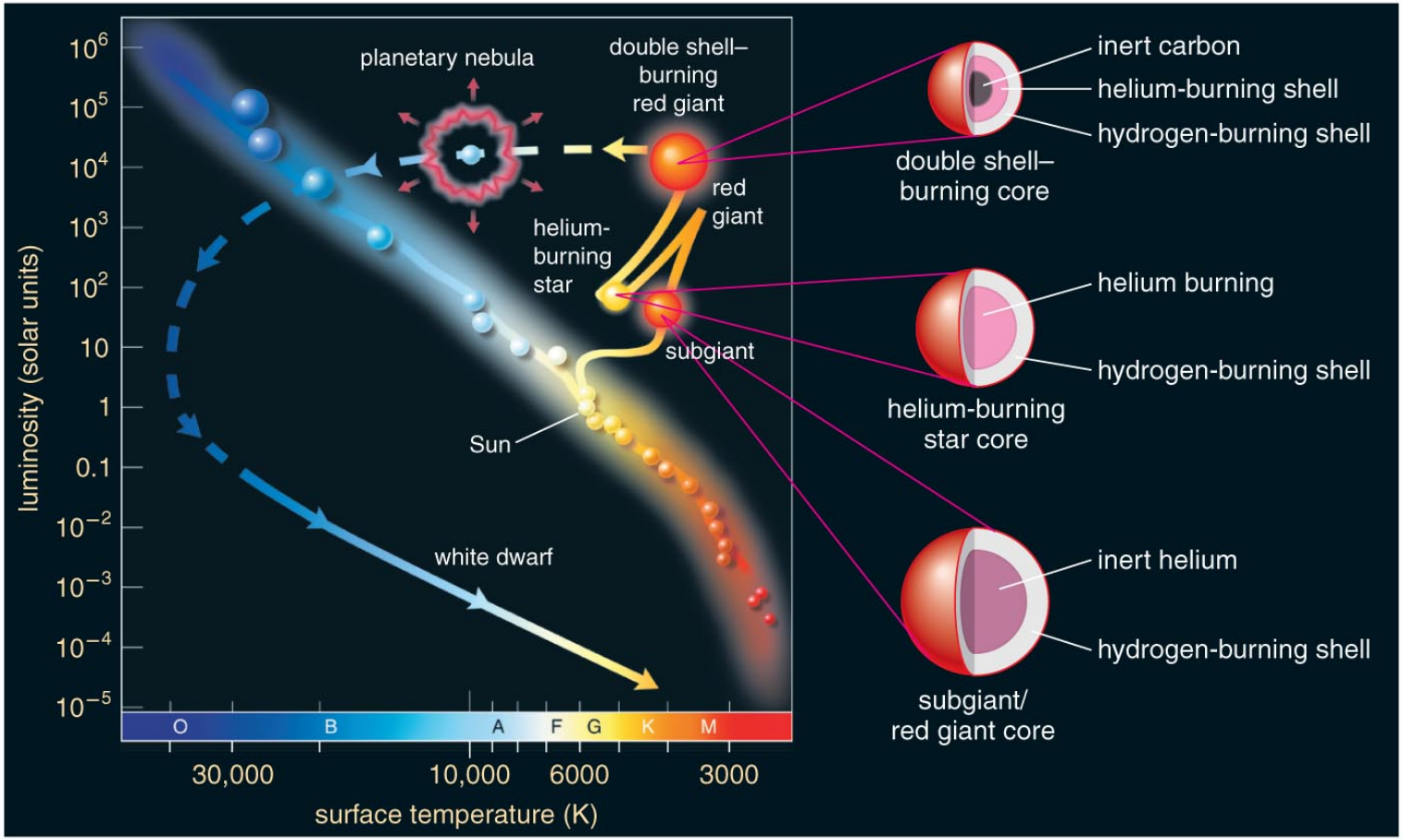
Evolution of high-mass stars

Observations of Supernovae

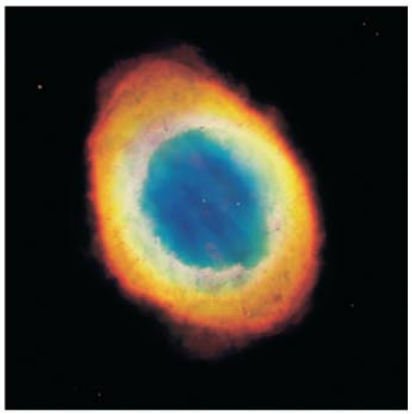
Goals

- How observing clusters of stars help us learn about the evolution of stars
- Understand the evolution of low- and high-mass stars and how they differ
- How we learn about supernovae

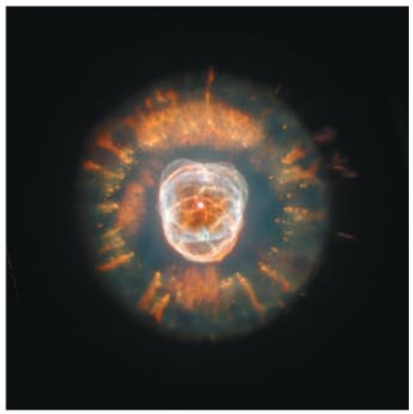
Evolution on the HR diagram: Low-mass stars



Planetary Nebulae

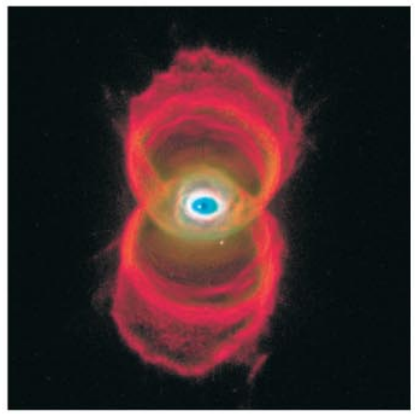


a Ring Nebula



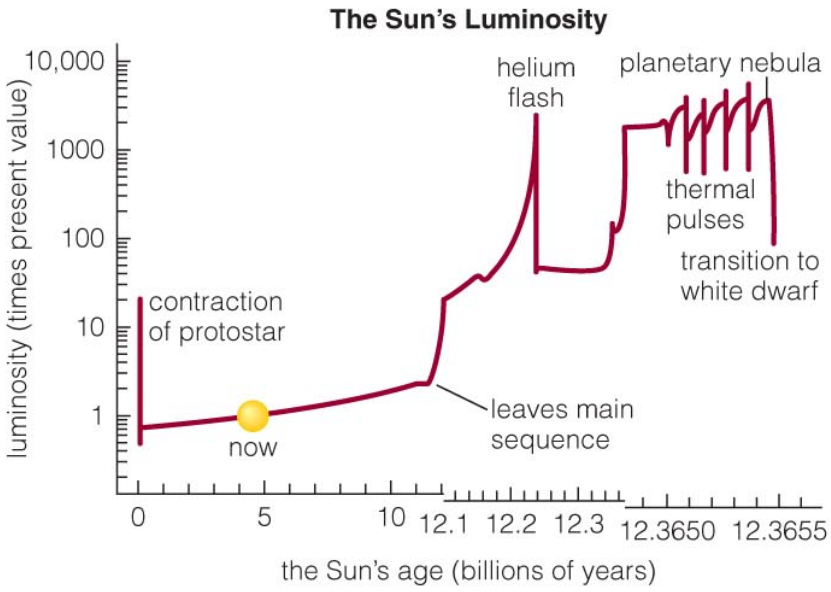
b Eskimo Nebula

c Spirograph Nebula

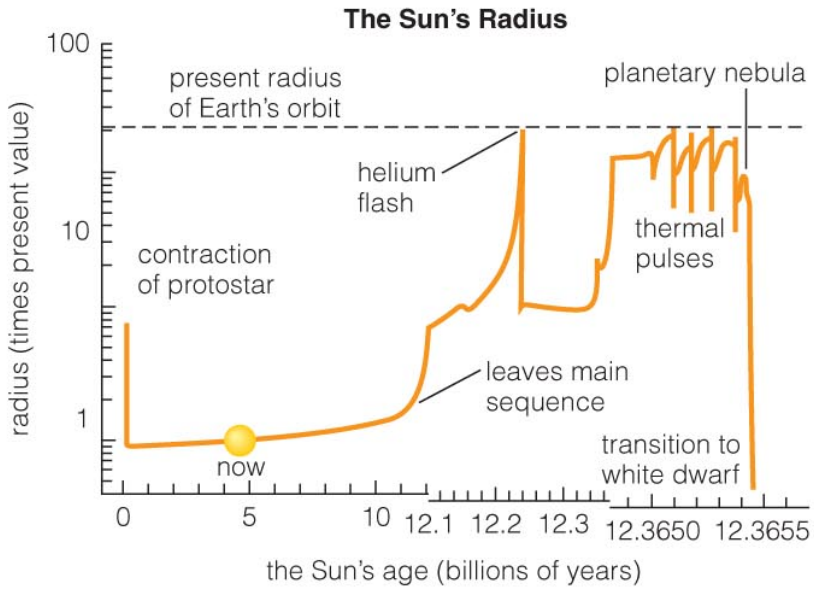


d Hourglass Nebula

Low-mass star properties throughout their lifetime



a Changes in the Sun's luminosity over time.

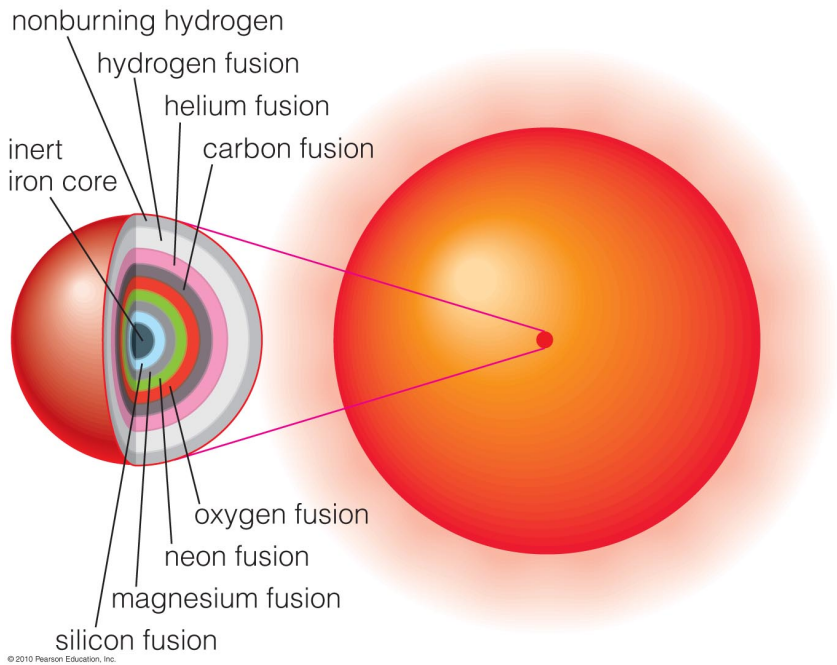


b Changes in the Sun's radius over time.

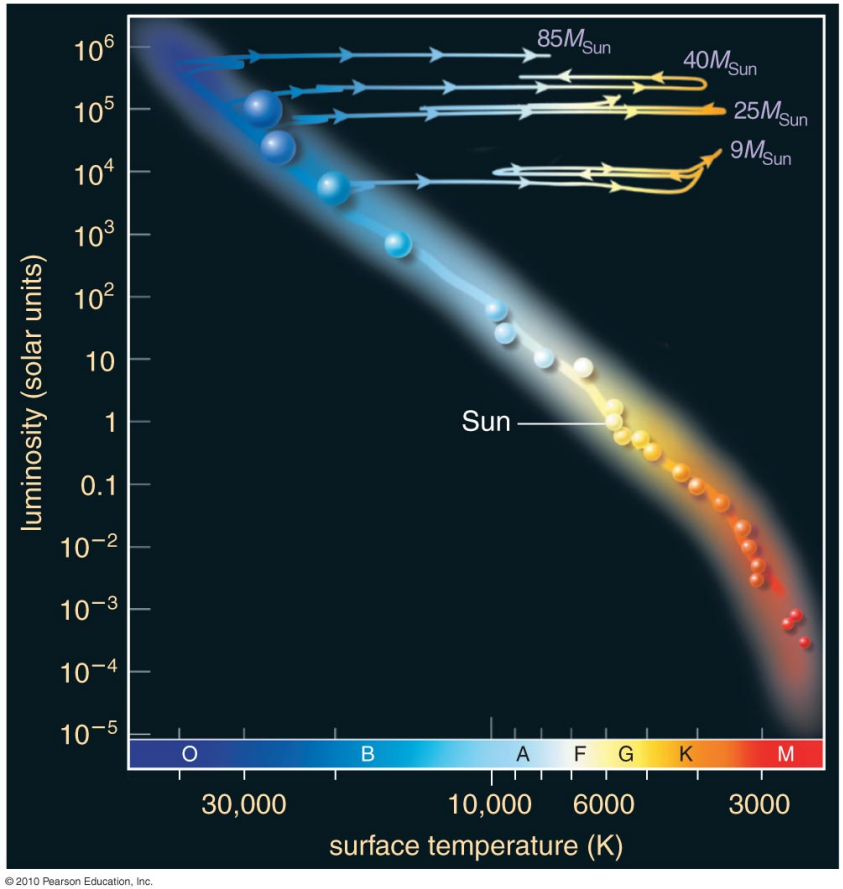
Movie of stellar evolution

Movies of the HR diagram and animations of the star's appearance

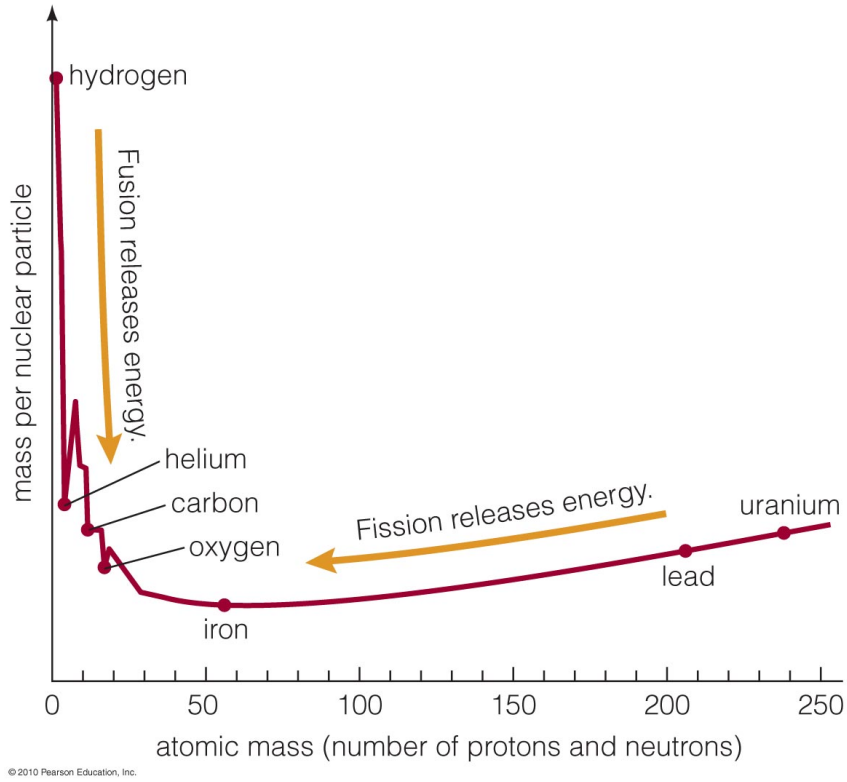
Structure of a massive star at the end of its life



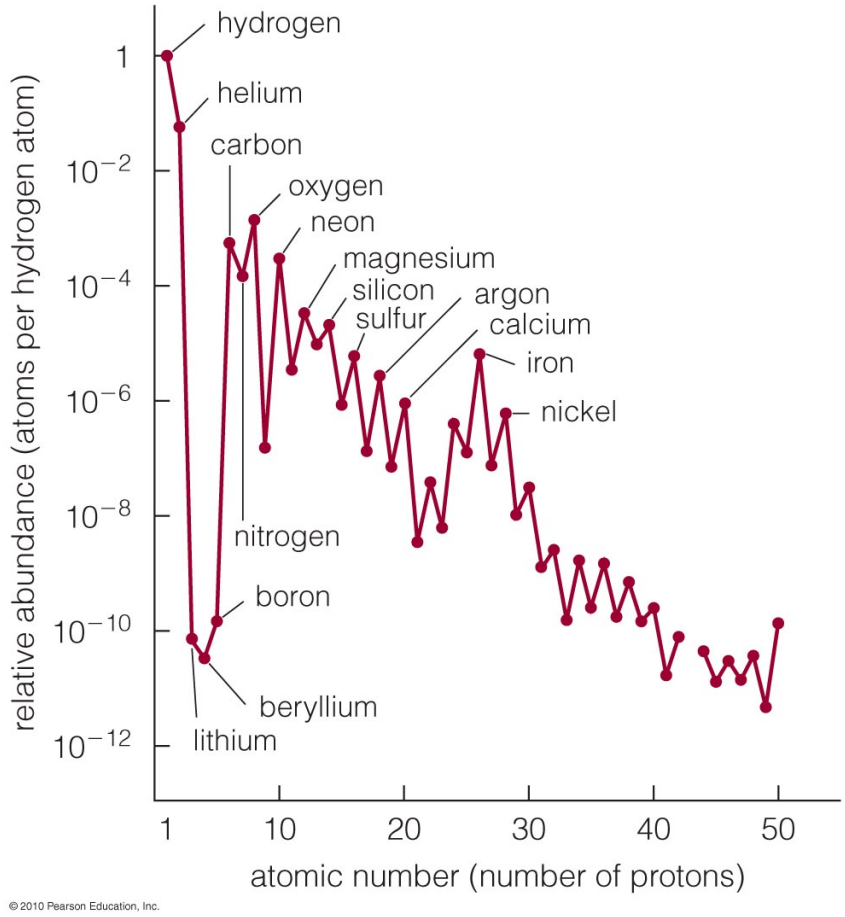
Evolution on the HR diagram: High-mass stars



Limits of fusion and fission



Cosmic Abundance



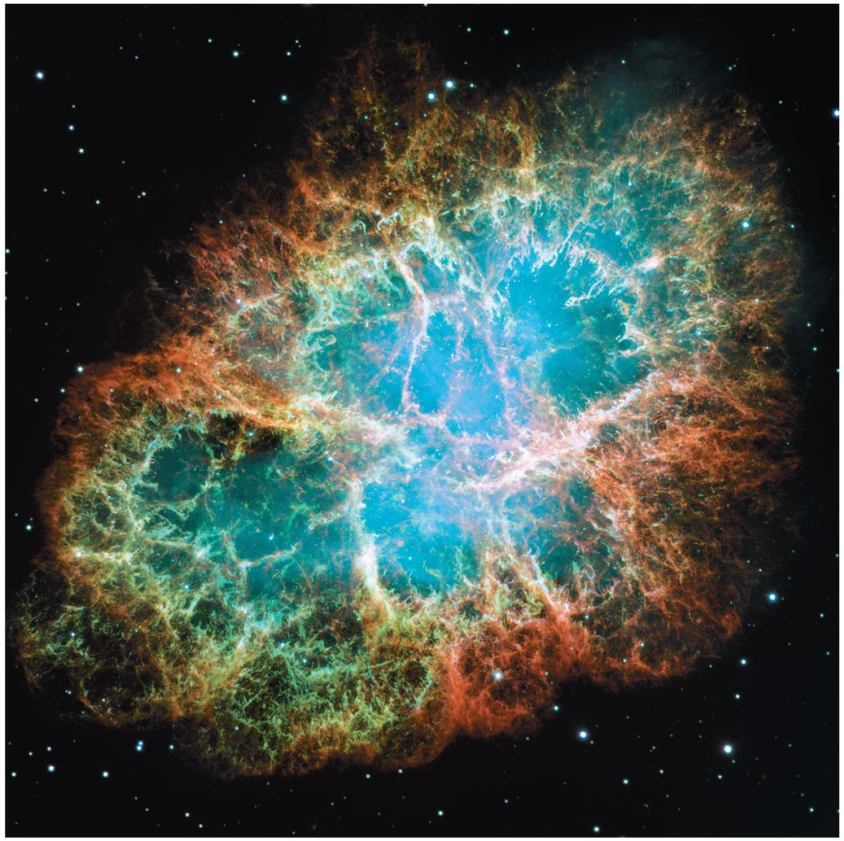
Massive star evolution

Movies of the HR diagram and animations of the star's appearance

Aging of a cluster

Aging of a star cluster

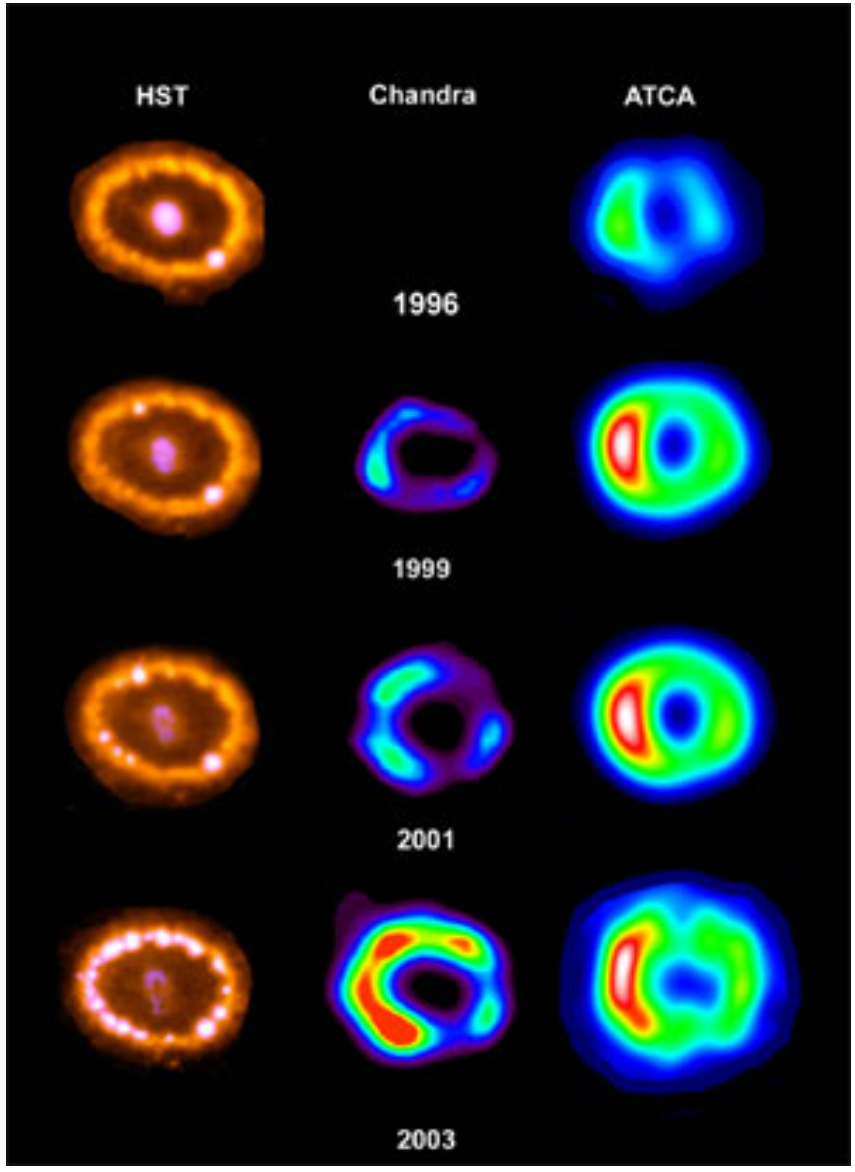
Crab Nebula (SN 1054)



SN 1987A

SN 1987A

SN 1987A evolution



Recent supernova: CBET 2366

Discovered 2010/07/11.005 by Tom Boles in a galaxy 310 million light-years away. SN image from Joseph Brimacombe.

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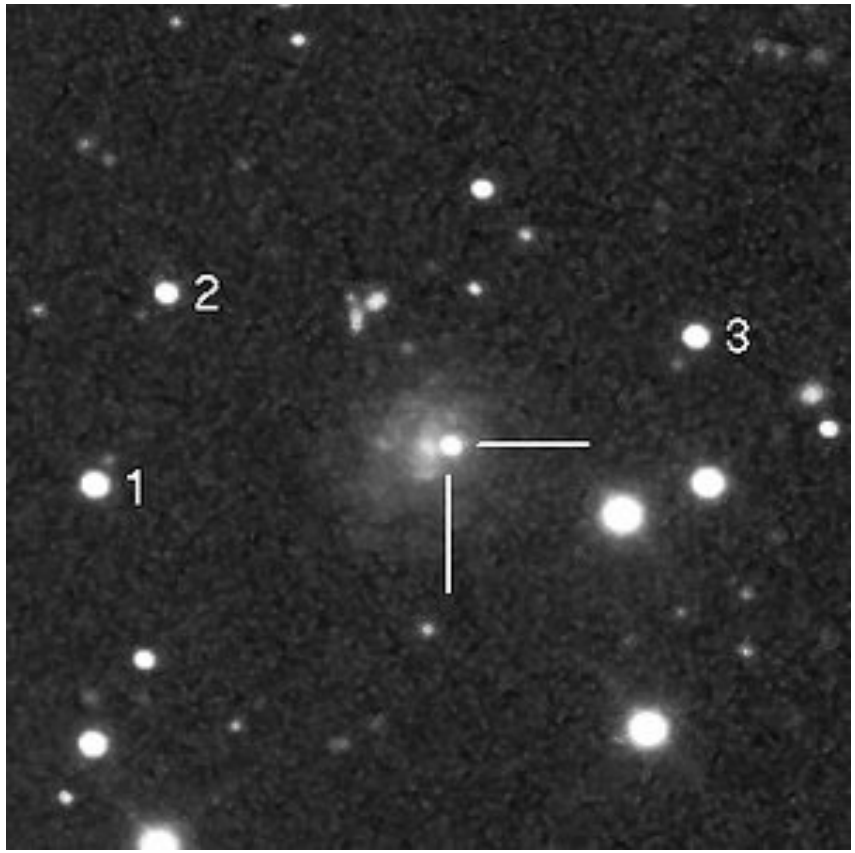

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