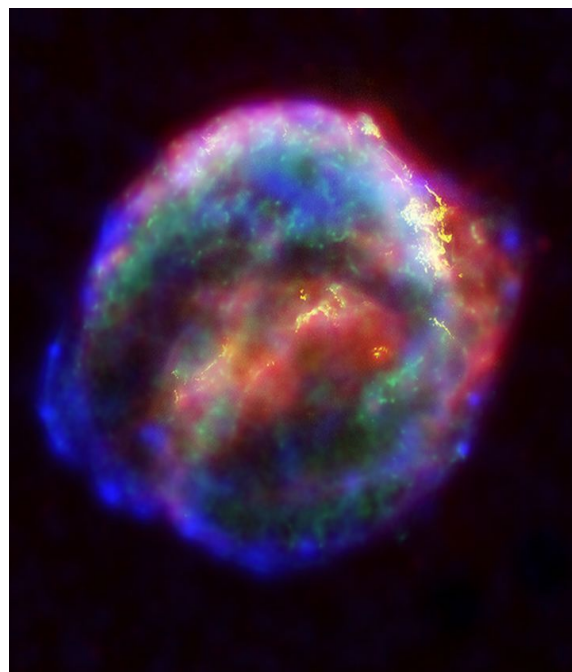
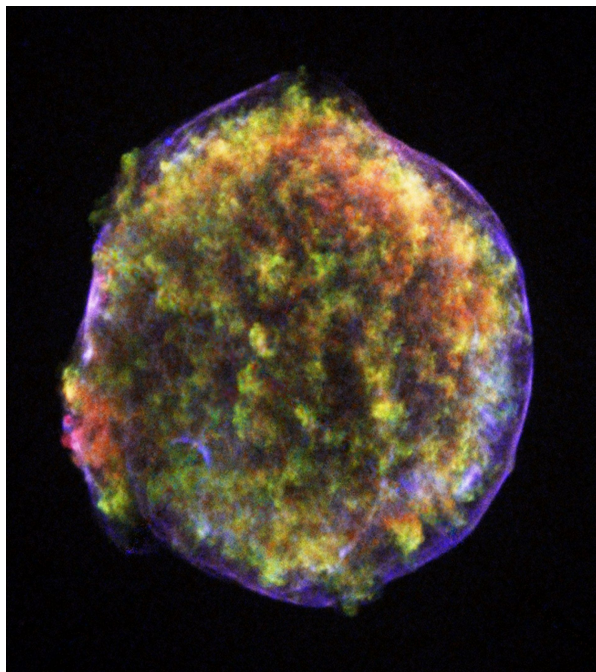
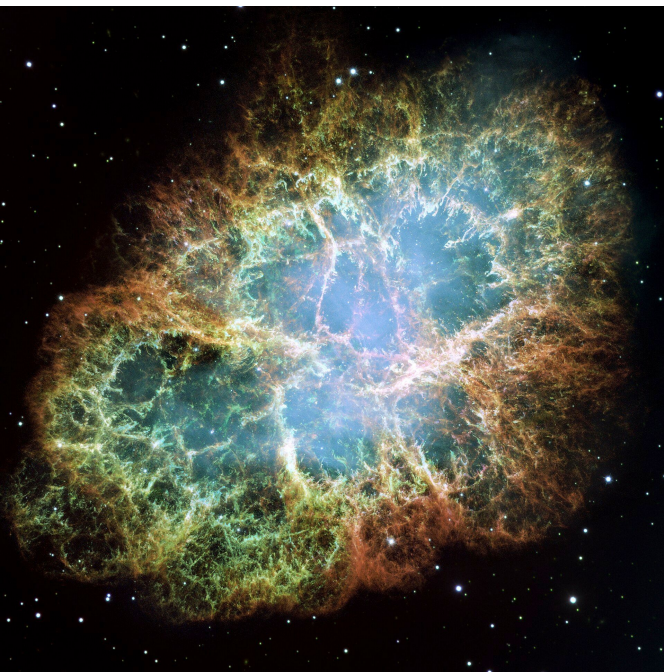
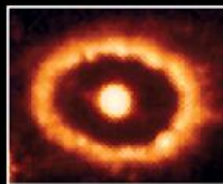


# ASTR702

Supernovae







Sep, 1994



Mar, 1995



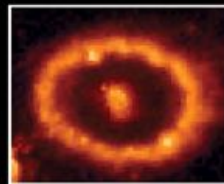
Feb, 1996



Jul, 1997



Feb, 1998



Apr, 1999



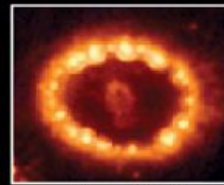
Nov, 2000



Dec, 2001



Jan, 2003



Nov, 2003



Sep, 2005



Apr, 2006



Dec, 2006



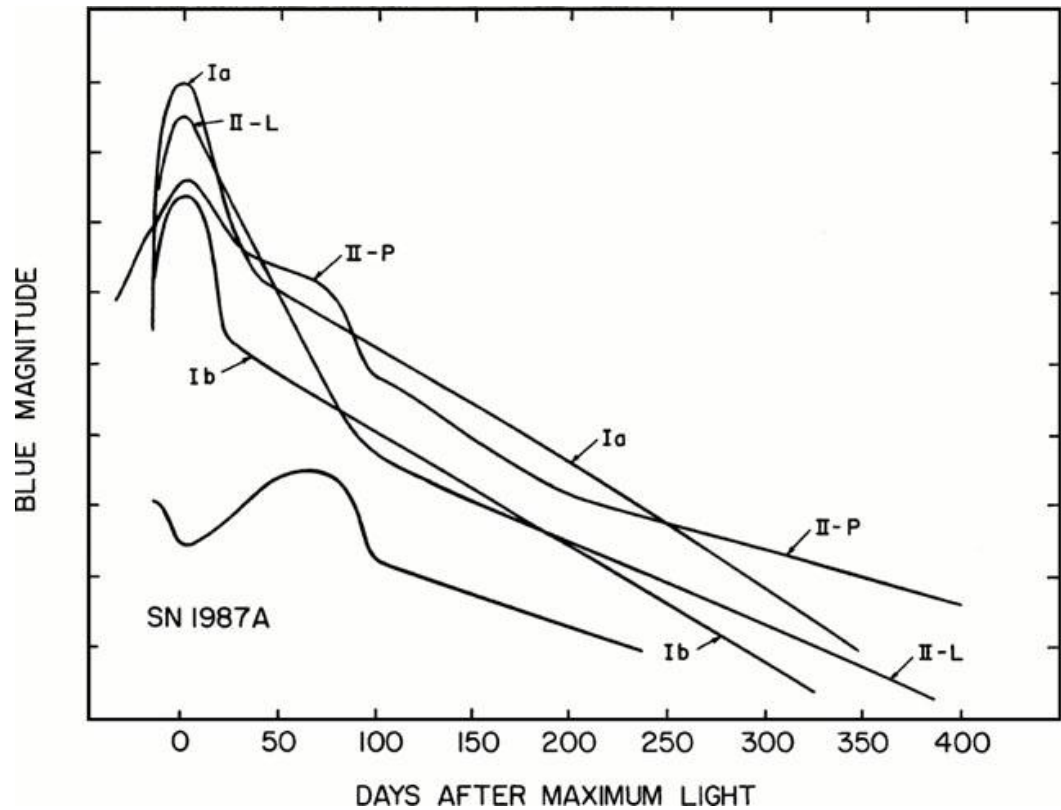
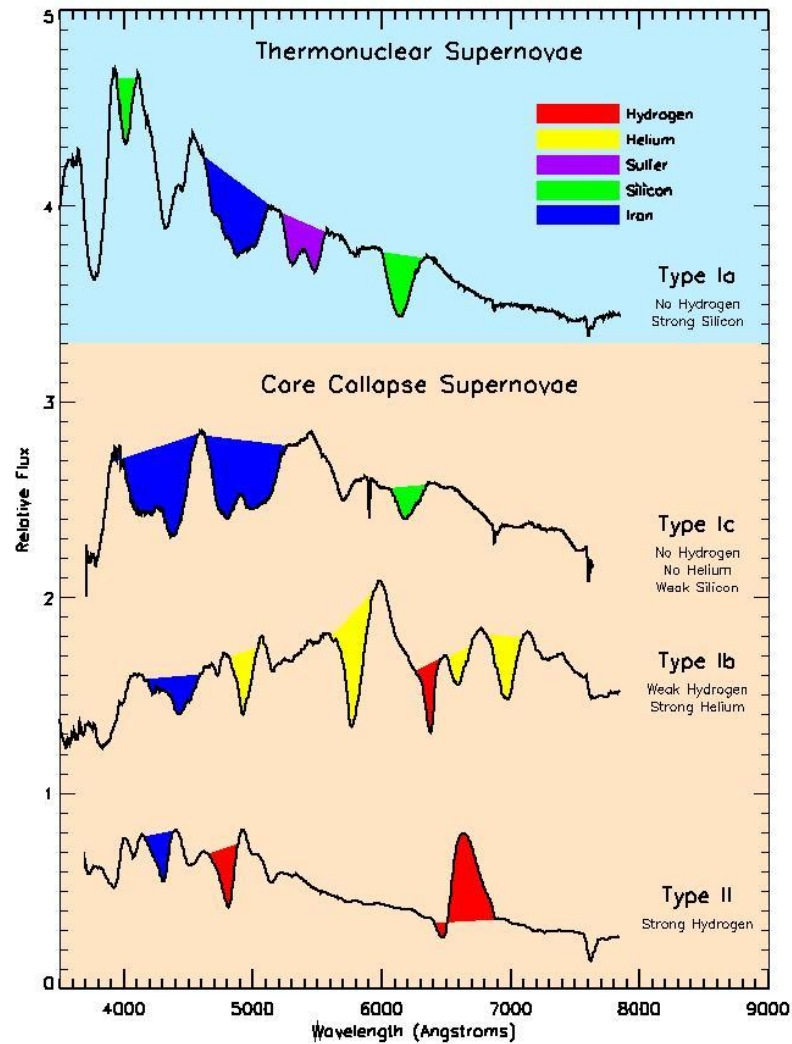
May, 2007



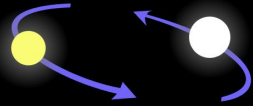
Feb, 2008



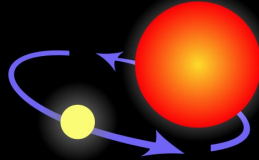
Apr, 2009



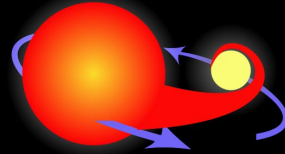
# The progenitor of a Type Ia supernova



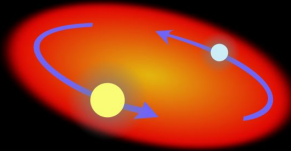
Two normal stars are in a binary pair.



The more massive star becomes a giant...



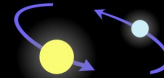
...which spills gas onto the secondary star, causing it to expand and become engulfed.



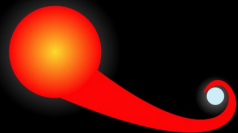
The secondary, lighter star and the core of the giant star spiral toward within a common envelope.



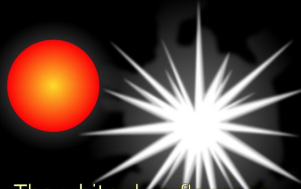
The common envelope is ejected, while the separation between the core and the secondary star decreases.



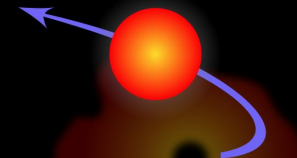
The remaining core of the giant collapses and becomes a white dwarf.



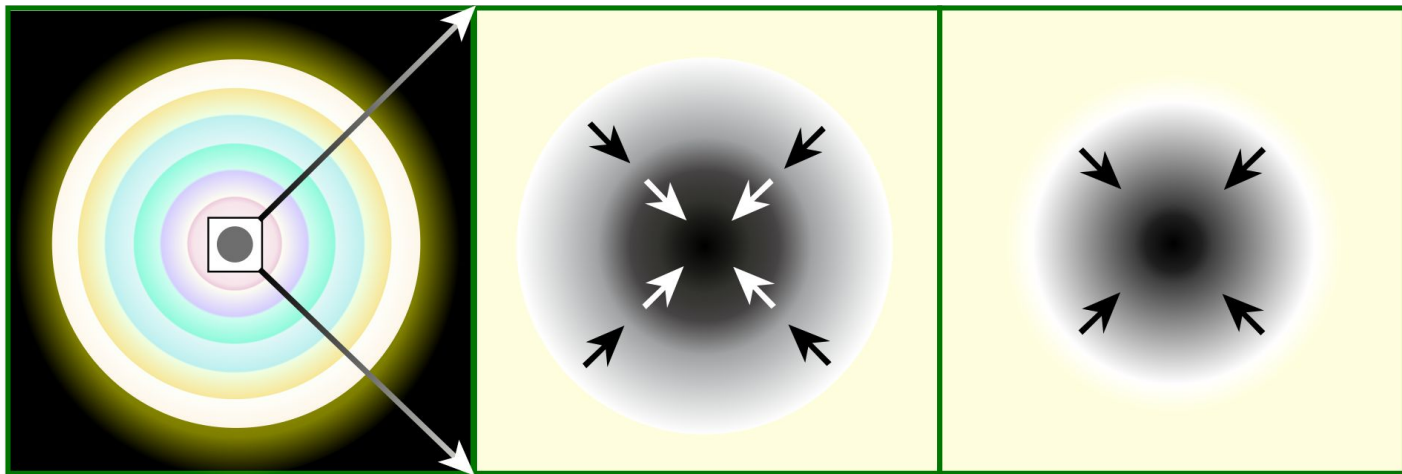
The aging companion star starts swelling, spilling gas onto the white dwarf.



The white dwarf's mass increases until it reaches a critical mass and explodes...



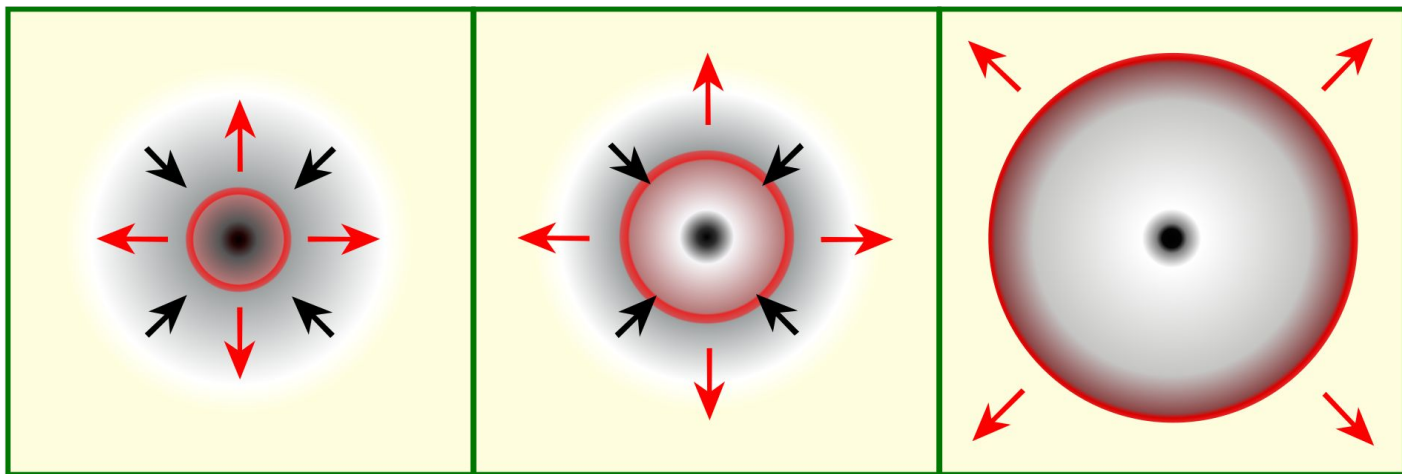
...causing the companion star to be ejected away.



a

b

c



d

e

f

# Remnants of massive single stars

