TMArtScience YouTube

Astronomy

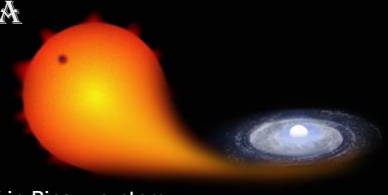
Novas and Supernovae

www.AdventureEarthScience.org

Star Death

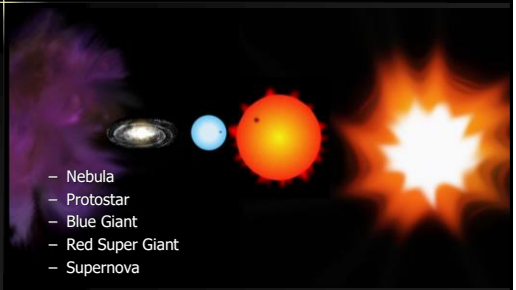
sometimes stars do interesting things when they Die...

NOVA



- ONLY in Binary system
- One becomes White Dwarf
- Companion dumps material on White Dwarf
- Hydrogen build up - re-start fusion
- 1000X brighter for several days
- May repeat

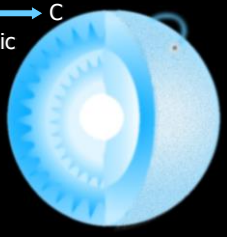
EVOLUTION OF MASSIVE STARS



- Nebula
- Protostar
- Blue Giant
- Red Super Giant
- Supernova

SUPERGIANT STAR

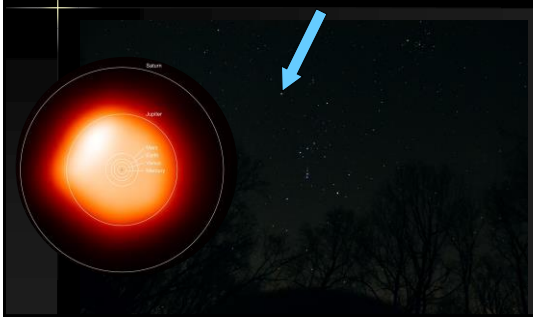
- Similar to normal star
  - Nuclear fusion H → He
    He → C
  - Reactions Exothermic
    - Temp $1X10^8$ K
  - Star expands
- Everything Faster



BETELGEUSE 430 LY

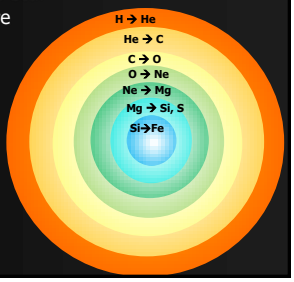
Red Super Giant

TMart and ESO image



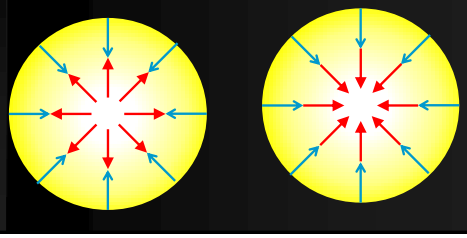
SUPERGIANT STAR

- With super massive star
  - Gravity and pressure increase
  - Core Temp rises
  - $6X10^8$- $2.7X10^9$ K
- Fusion continues



SUPERNOVA

- Iron fusion is Endothermic
  - (no longer gives off energy)



SUPERNOVA

- Star core completely collapses
- Atmosphere of star blown away violently (falls and bounces off core)
- Many heavy elements are fused by shockwave.
- For several weeks may be as bright as $1X10^9$ stars

SUPERNOVA 1987A

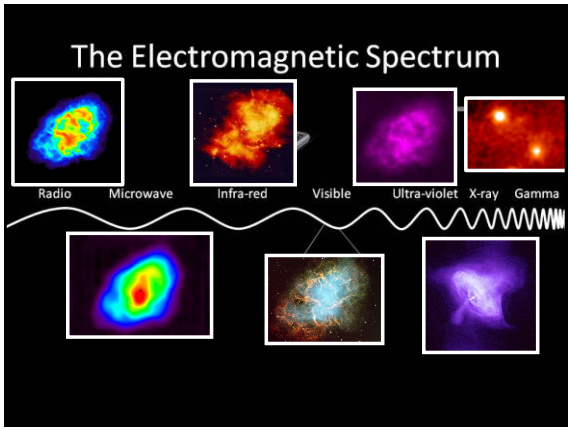
RECENT SUPERNOVAE

M 74 SN 2002 AP
35,000,000 ly

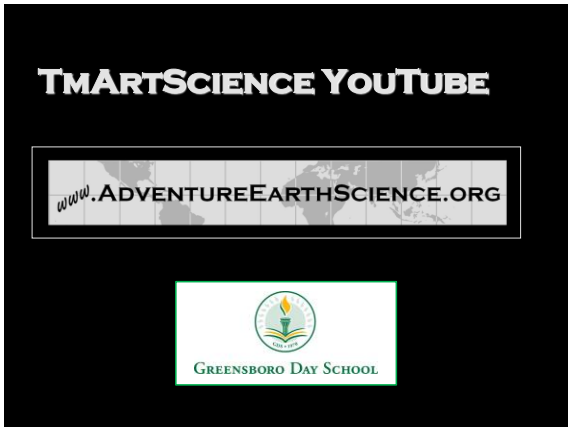
SN 1999 EM
NASA Image

SN 1054 CRAB NEBULA

NASA HST Image


The Electromagnetic Spectrum
Radio
Microwave
Infra-red
Visible
Ultra-violet
X-ray
Gamma


AFTER THE SUPERNOVA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