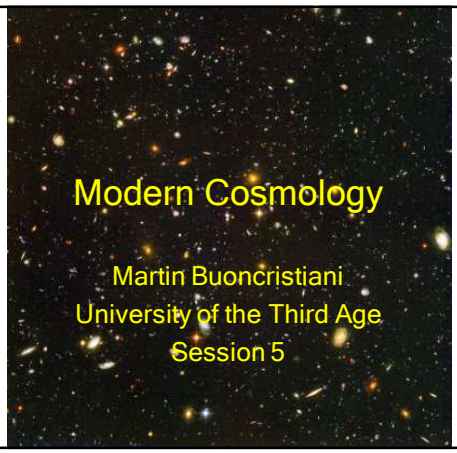
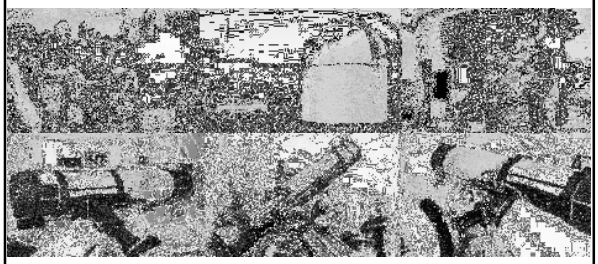
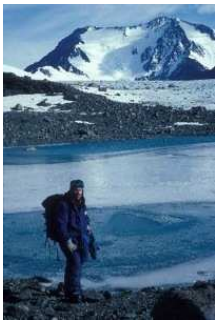


http://ThinkingAndLearningInConcert.org

News from Mt. Burnett Observatory



Monash Center for Astrophysics Public Lecture



Prof. Trevor Ireland
Associate Director
Research School of Earth Sciences
The Australian National University

Exploring Asteroids

6pm, Wednesday 9 May, 2012

Some Chronology

1639 - first prediction and observation of the transit Jeremiah Harrrocks.

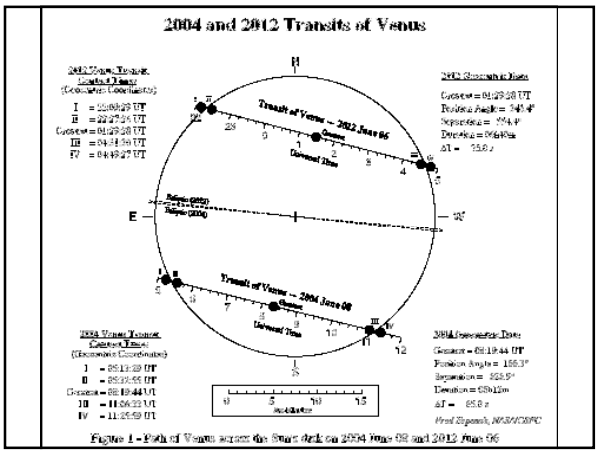
1677 William Halley - showed how a precise measurement of the earth's radius could be determined.

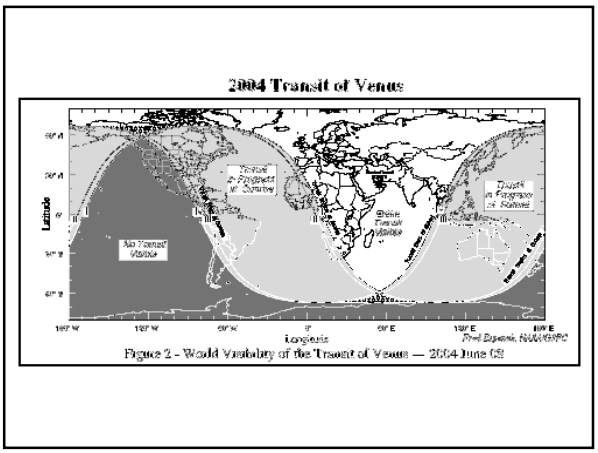
1761 - Lomonsov discovered Venus has an atmosphere

1769 - James Cook expedition sets up an observatory in Tahiti

2012 - June 6 C1 - 8:16:17
C2 - 8:34:15
C3 - 14:26:49
C3 - 14:44:40

2117 - Next occurence



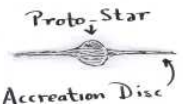


Stars are made from "dust"
- Hydrogen, Helium etc.
- remnants from dead stars
- Giant Molecular Cloud

Cloud of dust compacted by gravity

acquires rotational inertia (angular momentum)

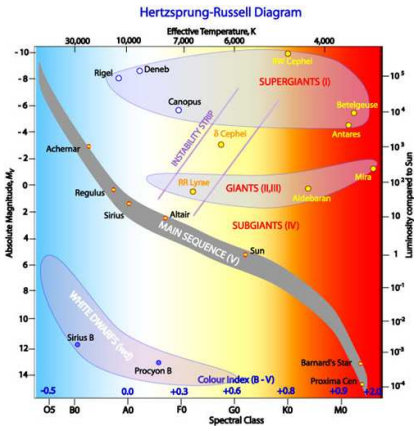
As gravity compacts the proto-star, particles are forced closer together and eventually they begin nuclear reactions
...leaving some matter apart



Mass of a star determines its Temperature, Brightness and Age

Mass → Temperature → Luminosity (brightness and color)
↓
Lifetime

1 M_{Sun} → 10 Billion years
2 M_{Sun} → 1 Billion years
30 M_{Sun} → 1 Million years

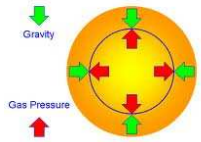


Processes in a Star

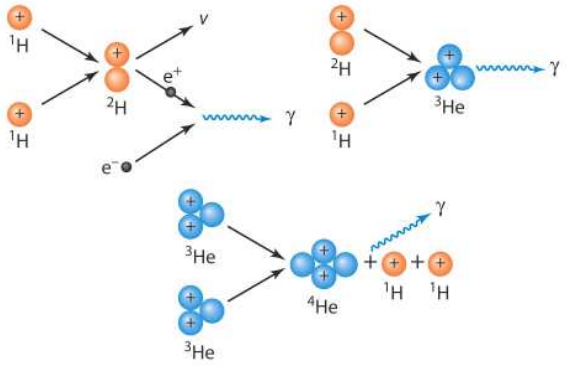
1) Gravitational Collapse
Gravity pulls matter toward the center, heating it.

2) Nuclear Reaction
Heat from the nuclear reaction increases the pressure from the center.

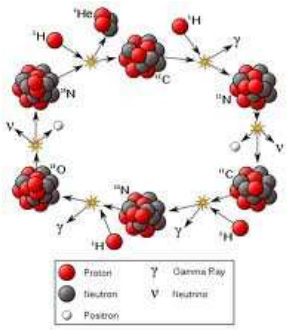
Hydrostatic Equilibrium



The Proton - Proton Reaction

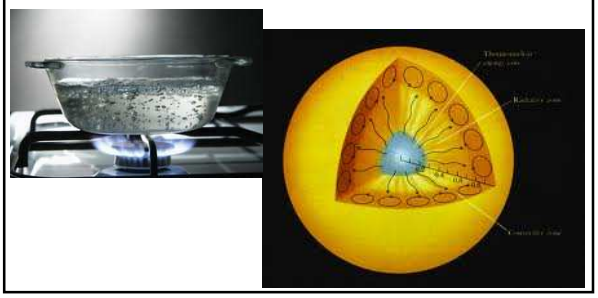


The Carbon Nitrogen Oxygen (CNO) cycle

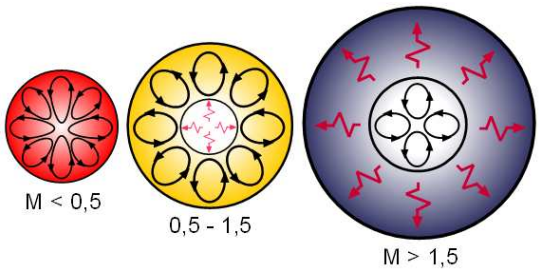


Processes in a Star

3) Convective Flow
Matter heated by radiation from nuclear reactions, expands and moves outward

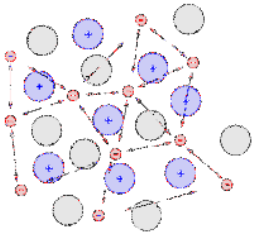


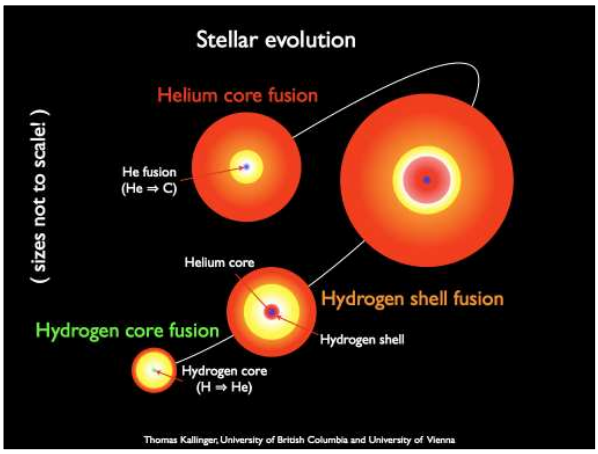
Convection in Different Stars



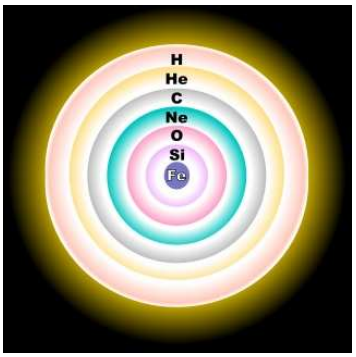
Processes in a Star

4) Electron degeneracy
Under compression electrons separate from nuclei and resist further compression.





A Large Star Moves to Other Sources of Fuel



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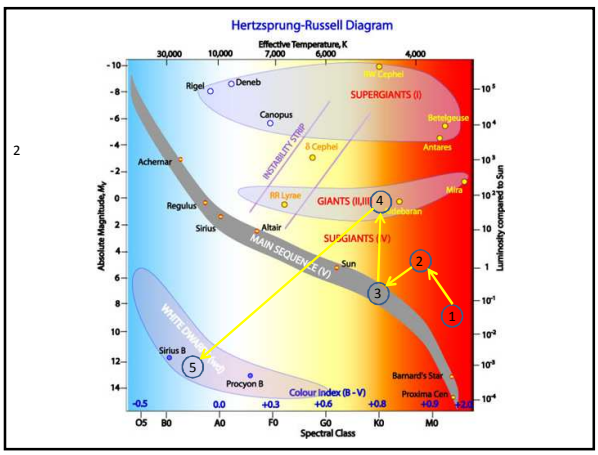
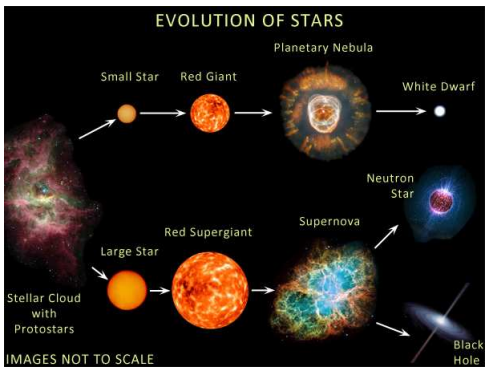
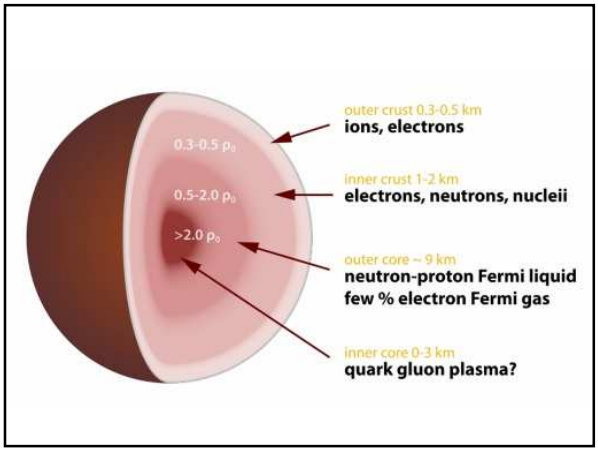
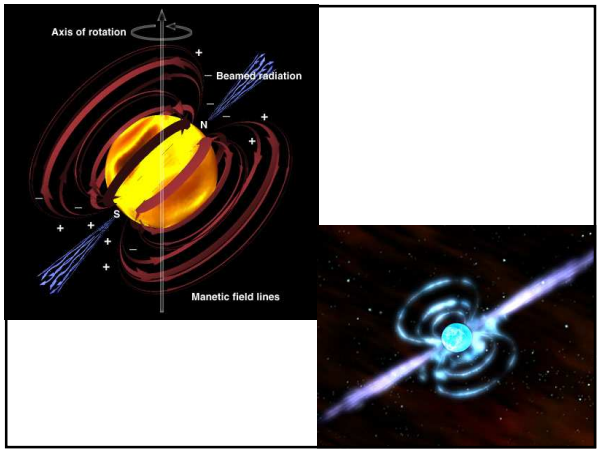
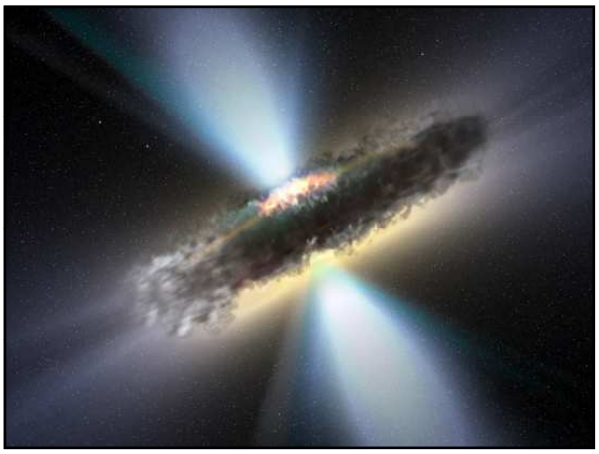


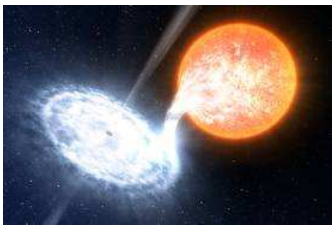
Two Main Evolutionary Paths



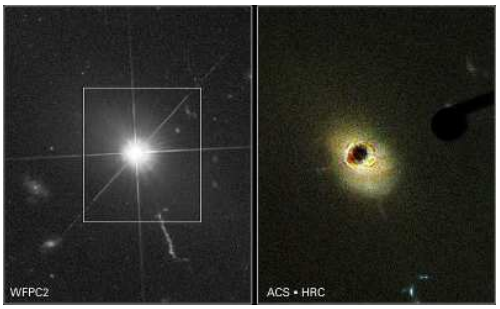








Quasi stellar radio source Quasar



Chandra X-Ray Image