



31185 Stellar Evolution Slide Set

Evolution of Solar Mass Stars:

1. H-R diagram illustrating early solar evolution from contraction of the solar nebula to the main sequence stage with time in years indicated.
2. Diagram illustrating the changing radius of the sun during its early contraction stage from the solar nebula through the T Tauri stage to the present with time in years indicated.
3. H-R diagram showing the evolution of the sun off the main sequence to the first red giant stage with the sun's age and diameter given.
4. H-R diagram showing solar evolution from the first red giant stage and helium flash with the red giant decreasing in size and luminosity; then increasing in size to the second red giant stage.
5. H-R diagram showing the last stage in solar evolution with descent from the second red giant stage to the formation of a planetary nebula and white dwarf.
6. Evolutionary tracks on the H-R diagram of three low mass red super-giant stars (3.0 to 0.8 solar masses) from the red giant branch through the planetary nebula stage and ending with the white dwarf stage.
7. Varying temperature conditions on Earth through the sun's evolution from the present through the white dwarf stage.

Evolution of Massive Stars:

8. Diagram relating contraction times to stellar masses and indicating when hydrogen burning begins.
9. H-R diagram comparing early evolution of the sun with stars of greater mass showing the collapse phase to the main sequence phase.

10. Internal structure of a star on the main sequence showing hydrogen burning core and hydrogen rich overlaying material.
11. Internal structure of a star in the first red giant stage just after the helium flash showing a helium burning core, a hydrogen burning shell, and an extensive hydrogen envelope.
12. Internal structure of a one solar mass star in the second red giant stage showing a carbon-oxygen core surrounded by a helium burning shell and core and a hydrogen burning shell.
13. Internal structure of a star of more than 3.0 solar mass in the late second red giant stage in which the carbon-oxygen core has burned to iron with adjacent burning shell of silicon, carbon, helium, and hydrogen and an extensive hydrogen envelope.
14. Cross section of an expanding supernova remnant and a central neutron star showing associated magnetic fields, synchrotron, and thermal radiation.



15. A map of the distribution of known pulsars over the entire sky showing a concentration along the galactic plane.
16. Two "light house" models of a rotating neutron star showing beams of radio waves emitted either along its magnetic axis or from the plasma surrounding the the star.
17. A graph showing the main light pulse and secondary light pulse of the Crab Nebula Pulsar over a period of 1/30 second.
18. Distribution of known x-ray sources in the galaxy including ei
known binary star
x-ray sources and showing their concentration along the galac
plane.
19. A painting by Dorothy Sigler of the x-ray binary star Cygnu
showing B-type supergiant distorted by its black hole companion and
matter flowing off the blue giant forming an accretion disk around
the hole.
20. Diagram showing how space is warped around a small, very massive
body and how light is bent when entering the gravitational field of the
massive body.
21. Light emitted from a 3 solar mass contracting body showing how light
is bent as it escapes, or goes into orbit in the photon sphere, or falls
back to the star. This slide illustrates the concept of the exit cone.
22. Model of a 3 solar mass black hole showing the photon sphere, th
event horizon, the Schwarzschild radius, and the hole's eff
incoming light.
23. Scale of the diameters of stellar types: red giant, sun, white dwarf
(to be used with slide #24).
24. Scale of the diameters of stellar types: white dwarf, neutron star,
black hole (to be used with slide #23).
25. H-R diagram of the young open star cluster NGC 2264 showing most of
the stars not yet on the main sequence and the location of numerous T
Tauri stars.
26. H-R diagram of the double open star cluster H and Chi Persei showing

