



## 31184 Stars in General

Before students embark upon a study of stellar astronomy, they should be exposed to the methods of determining basic stellar data, such as stellar distances, space motions, brightness, temperature, mass, and spectra. These methods are shown in this very important set of slides. In addition, several colorful H-R diagrams are included that show the stars of the solar neighborhood, plots of the 20 brightest stars, stellar diameter vs. temperature, and brightness. The set concludes with several slides showing the different methods of energy production in stars of various masses.

1. Trigonometric parallax of a star showing the method of determining the distance to a star by measuring the star's position six months apart.
2. Geometric relationship between the star's parallax and the astronomical unit that defines the parsec as a unit of distance.
3. Inverse square law of light showing how radiation traveling in spherical waves from a star spreads out to reduce its brightness per unit area by  $1/d^2$ .
4. Chart showing how the difference ( $n$ ) in apparent magnitude between two stars is related to their difference in intensity according to  $2.5^n$ .
5. Chart illustrating the apparent visual magnitude of various celestial objects, from the sun to the faintest star observable with the eye and telescope.
6. Photograph of the constellation Orion showing stars to the 6th magnitude. Several stars are labeled with their apparent visual magni-

tudes.

7. A list of the 20 brightest stars showing their names, apparent visual magnitudes, absolute magnitudes, spectral types, distances, and proper motions.
8. Radial motion (Doppler effect) of a star showing the compression and lengthening of the emitting light waves as the object approaches or recedes from the observer.
9. Three idealized spectra showing the shift in spectral lines toward the blue or red end as the star approaches or recedes from the observer and is compared to a spectrum of the star when stationary.



10. Diagram illustrating how the proper motion of a star varies with the star's direction of motion, velocity, and distance.
11. Space velocity of a star showing its relationship to the radial velocity, traverse velocity across line of sight, proper motion, and distance.
12. Big Dipper star 100,000 years ago, in the present, and 100,000 years from now demonstrating stellar motions.
13. Mass-luminosity relation showing stellar masses from 1/10 to 50 solar masses. Includes the positions of several bright stars.
14. Comparative sizes of 9 large stars with name, spectral type and diameter in terms of the sun given: Betelgeuse, Aldebaran, Arcturus, Antares, Alpha Hercules, Mira, Rigel, Deneb, and Canopus.
15. Hydrostatic equilibrium in a star showing the star's internal gravitational forces balanced by its internal gas pressure.
16. Model of a main sequence solar type star showing internal conditions of pressure and temperature from the core to the surface.
17. The Hertzsprung-Russell Diagram relating the luminosity of a star to its temperature / spectral type.
18. H-R Diagram for the 72 stars nearest to the sun showing a preponderance of red dwarf stars in the solar neighborhood (within 20 light years).
19. H-R Diagram for the 20 most luminous stars (absolute visual magnitude) showing all stars intrinsically more luminous than the sun.
20. Relative diameters of stars plotted on the H-R Diagram showing how stellar diameters increase on the main sequence as the temperature and luminosity increase.

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