11.18: Planispheres

Celestial objects are shown on planispheres, star charts and maps, and star atlases, as well as computer and tablet applications and programs. The printed planispheres and charts use different size “dots” to represent the object’s brightness. Many of the new star chart computer and tablet applications and programs are able to show star brightness without using a larger or smaller dot.

The charts, maps, and applications show the object’s apparent magnitude. The apparent magnitude scale is based on what we see, and does not truly compare a star’s true brightness to other stars. So astronomers devised a second scale: **Absolute Magnitude, M**. This scale defines brightness as if we moved all the stars to the same distance; 10 parsecs. These measurements, albeit hypothetical since we cannot move objects to a distance of 10 pc, are the measure of a celestial object’s intrinsic brightness. This allows astronomers and astrophysicists to directly compare star brightness’; *comparing apples to apples* .

Note:

Take our Sun, for example. It is so close, relative to the other stars and celestial objects, that it appears to be very bright, with an apparent magnitude -26. 74 Mv. Yet move the Sun to the hypothetical distance of 10 pc, and the Sun becomes a relatively faint 4. 83 M absolute magnitude object.

Comparing Some Apparent versus Absolute Magnitudes

Object

- Rigel
- Polaris (double star)
- Betelgeuse
- Vega
- Sirius
- Alpha Centauri (triple star)
- Sun
- Andromeda Galaxy, M31
- Black Eye Galaxy, M64

Apparent Magnitude, M_V

- 0. 12
- 1. 98
- 0. 42 (variable, 0. 3 to 1. 2)
- 0. 03
- -1. 4
- -0. 01
- -26. 74
- 3. 44
- 9. 36

Apparent Magnitude, Mv

- -7. 02
- -3. 6
- -2. 99
- 0. 6
- 1. 4
- 4. 3
- 4. 83
- -21. 5
- -21. 7