Some Basics

Equatorial Coordinate System

A celestial coordinate system widely used to specify the positions of celestial objects. The fundamental plane is the celestial equator. See Figure 1 and 2.

- Right Ascension (RA, α): The angle (typically in hh:mm:ss or in degree) measured in the plane of the celestial equator.
- Declination (DEC, δ): The angle (in degree) measured northward or southward from the celestial equator.

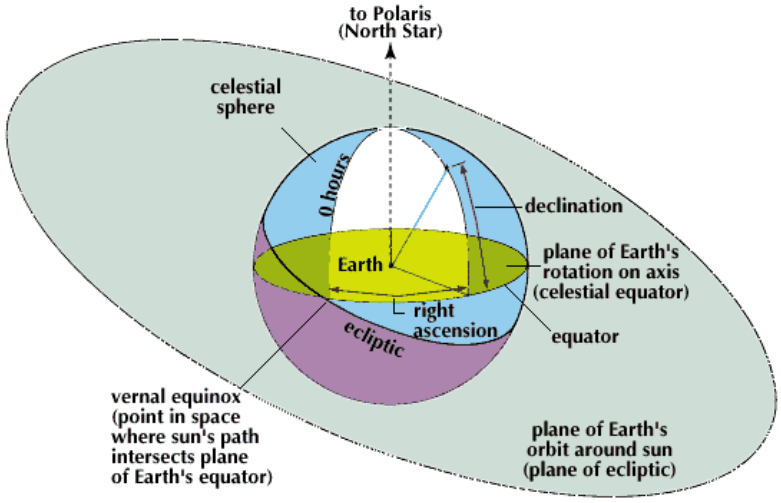

Figure 1. The equatorial coordinate system.

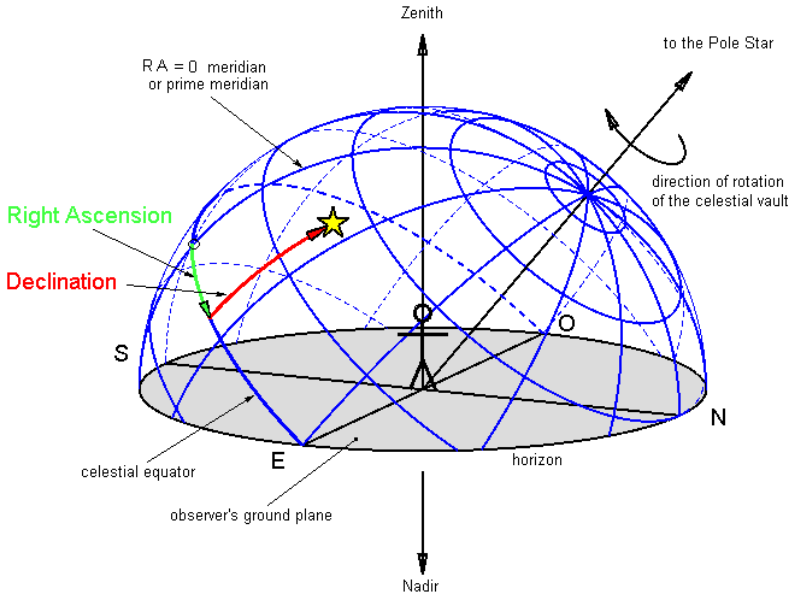

Figure 2. The equatorial system superimposed on the horizon system.

Diurnal motion

The daily motion of stars and other celestial bodies across the sky. This motion is due to the Earth's rotation from west to east, which causes celestial bodies to have an apparent motion from east to west.

Figure 3. Diurnal motion of stars.

Proper motion

Continuous changes in stellar position indicating a certain angular velocity relative to other stars. Proper motion is not entirely "proper" (that is, intrinsic to the celestial body or star), because it includes a component due to the motion of the Solar System itself.

Brightness of Stars (Magnitude)

- The higher, the fainter.
- Apparent magnitude (m): The brightness of an object as it appears in the night sky.
- Absolute magnitude (M): the luminosity of an object (or reflected light for non-luminous objects like asteroids); it is the object's apparent magnitude as seen from a specific distance, conventionally 10 parsecs (32.6 light years).

Astronomical Catalog

A list or tabulation of astronomical objects, typically grouped together because they share a common type, morphology, origin, means of detection, or method of discovery. Astronomical catalogs are usually the result of an astronomical survey.
Examples:
Messi: "M…"
NGC (New General Catalogue of Nebulae and Clusters of Stars): "NGC…"
Tycho: "TYC…"
and many more…

Telescope System

- Telescope Types (based on their optical design)

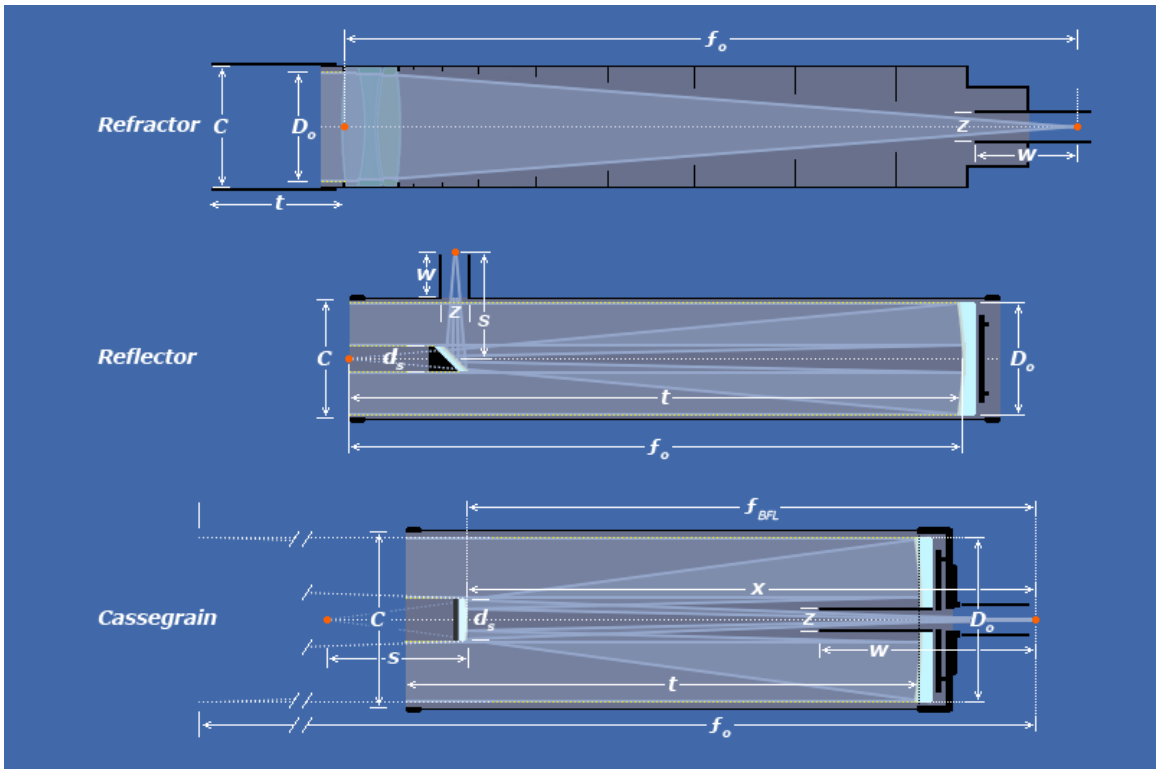

Figure 4. Optical telescope types: refractor, reflector, and Cassegrain.

Figure 5. Telescope parts (This figure is to provide a general information about telescope parts. The telescope for our class is different in some details).