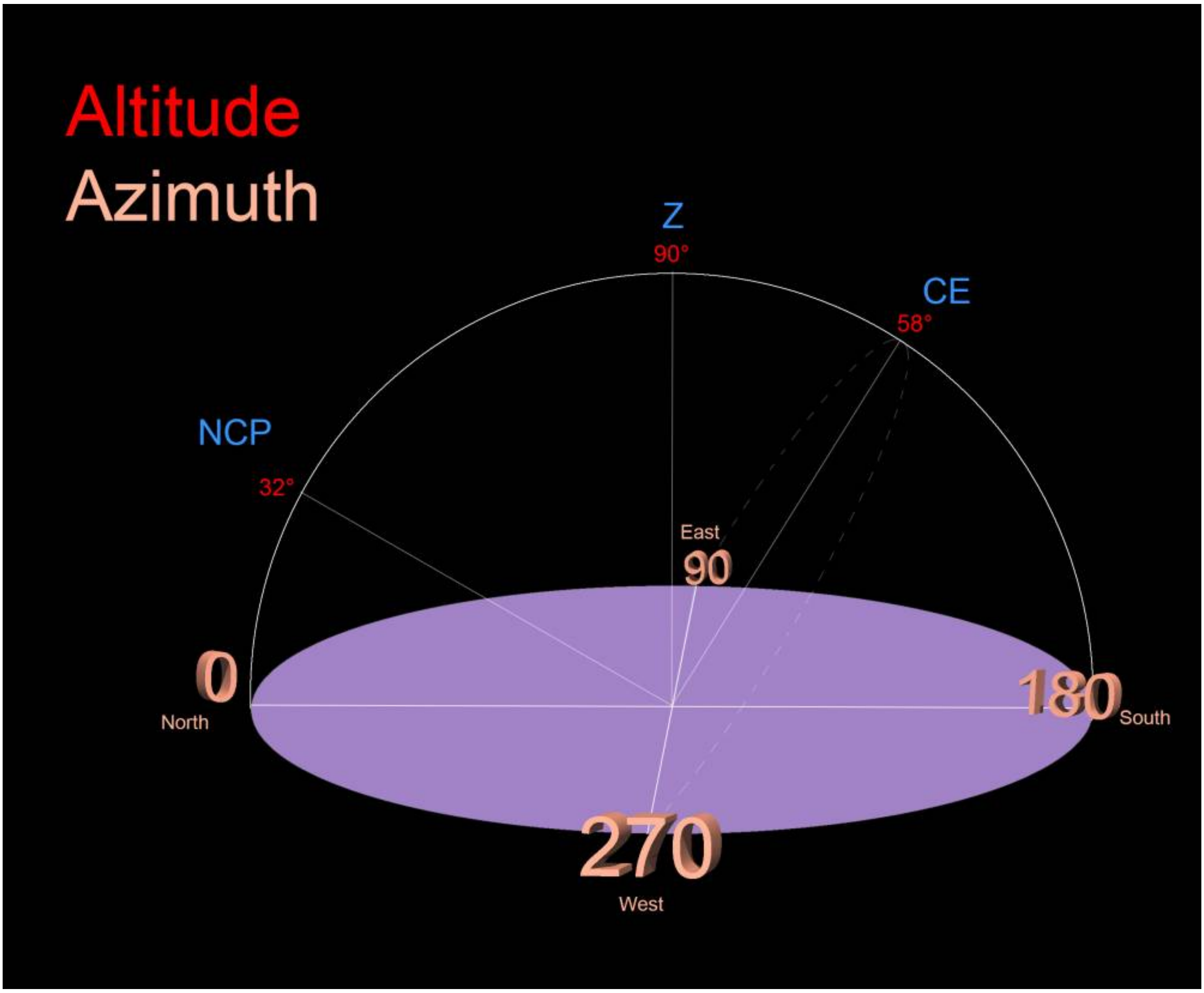
Celestial Coordinates

Please use the diagrams below to assist in pointing a telescope or understanding where something is in the sky.

Altitude, Azimuth

Typically for an equatorial mount, this coordinate system is used to point the telescope for engineering or maintenance purposes. Altitude (or synonymously Elevation) is the angle in degrees above the local horizon. Azimuth is the angle in degrees from the North point (going through East). For example due south is 180° Azimuth.



Hour Angle, Declination

On the celestial sphere Hour Angle (HA) is the angle from the local meridian measured along the Celestial Equator (CE) to a given point on the sphere at a particular right ascension (great circle that runs through the north and south celestial poles). Thus the meridian is zero with positive values being west of it and negative to the East. Since the subtended angle comes about by the rotation of the Earth the sexagesimal expression is the number of hours, minutes and seconds that the given point will/did cross the meridian. In this sense positive values of HA indicate the time that has elapsed since the passage through the meridian and negative values indicate the time remaining for the passage to occur. Declination is of course the measured angle north/south from the Celestial Equator.

Since this is a local coordinate system defined by location on the Earth, the meridian has an HA value of 0 and equal to the line of Right Ascension along which it (currently) outlines. This line of Right Ascension (RA) is the Local Sidereal Time (LST). Thus HA = LST - RA . Note that when the HA is 0… then RA = LST . This is useful for engineering purposes. Many telescope GUIs show LST in their heads up display. If you want to point the telescope to the meridian at a given declination simply input the LST value. For the Schulman telescope the park position has coordinates of (LST,-32). The LCOGT GUI allows switching between coordinate systems. "Apparent HA,Dec" is an available selection. The coordinates in this frame are (0,-32).

An attempt was made to show two arbitrary stars at an HA of 2. The limitations of the author's ability to create 3 dimensional images may be evident in the figure below.