AST101: Common Astronomical Definitions

Azimuth

The direction of an object, measured along the horizon, in degrees (0 to 360) beginning at north and moving toward east.

Altitude

Height of an object above the horizon, measured along a line from the zenith (overhead) through the object, and perpendicular to the horizon. Measured in degrees 0 to 90

Zenith Distance

The angular distance of an object from the zenith, measured in degrees. Zenith distance and altitude are complementary. That is, zenith distance + altitude = 90°.

Latitude

The location of a point on Earth above or below the equator. Measured in degrees north or south (N or S, + or -) from the equator. Latitude on the equator is 0°, at the poles is 90°. The latitude of East Lansing is 42°42' N.

Celestial Poles

The points on the celestial sphere toward which the Earth's rotation axis is directed. The North Celestial Pole is directly above the Earth's north pole, and the South Celestial Pole is above the Earth's south pole.

Celestial Equator

The circle on the celestial sphere that is halfway between the celestial poles, that is, 90° from the poles. It is in the same plane as the Earth's equator.

Longitude

The location of a point on Earth measured east or west of an arbitrary point that, by international agreement, has been chosen to be Greenwich, England. Measured in degrees (sometimes hours) east or west (E or W) of an imaginary line that runs from pole to pole through Greenwich. The longitude of East Lansing is 84°30' W (5h38m).

Declination

The location of a point on the celestial sphere measured in degrees above or below (N or S, + or -) the celestial equator.

Right Ascension

The location of a point on the celestial sphere measured in hours and minutes (alternately, degrees) eastward along the celestial equator from the vernal equinox. Measured from 0 to 24 hours (or 0 to 360°).

Meridian

An imaginary line drawn on the celestial sphere (across the sky) that passes through the south horizon point, the zenith, the celestial poles, and the north horizon point.

Transit

A celestial object crossing the meridian is transiting. At that moment it is due south and highest in the sky.

Hour Angle (Local Hour Angle, LHA)

The angular distance an object is from the meridian, measured in hours. Angles to the west of the meridian are positive (+). Angles to the east are negative (-). Measured from 0 to +12 and 0 to –12 hours.

Greenwich Hour Angle (GHA)

The hour angle of an object measured from the longitude of Greenwich. LHA at Greenwich.

Sidereal Time (Star Time, Local Sidereal Time, LST, Local Mean Sidereal Time, LMST)

The Right Ascension on the meridian. The Right Ascension of a star crossing the meridian. The hour angle of the Vernal Equinox. Measured from 0 to 24 hours. (LST = LHA + RA)

Greenwich Sidereal Time (GST)

The sidereal time as measured from the longitude of Greenwich. LST at Greenwich.

Apparent Solar Time (Local Apparent Solar Time)

The hour angle of the apparent (real) sun plus 12 hours. Measured 0 to 12 hours a.m. or p.m. Alternately, measured from 0 to 24 hours.

Mean Solar Time (Local Mean Solar Time, LMT)

The hour angle of the mean sun plus 12 hours. Measured 0 to 12 hours a.m. or p.m. Alternately, measured from 0 to 24 hours.

Greenwich Mean Time (GMT, Universal Time, UT, Coordinated Universal Time, UTC)

The mean solar time as measured from the longitude of Greenwich.

Standard Time

A convention adopted so that a range (zone) of geographic locations can use the same time. Places within a standard time zone must add or subtract a correction to their local mean solar time (LMT) to equal standard time.
For East Lansing, Eastern Standard Time = LMT + 38m