

ASTRONOMY VOCABULARY

Horizon and Geographic terms

Altitude (also elevation)	The number of degrees above the horizon a star is. A star on the horizon has an altitude of zero degrees. A star at zenith has a altitude of 90 degrees.
Azimuth	The direction along the horizon, measured to the right of north. North is zero degrees, east is 90 degrees, south is 180 degrees, and west is 270 degrees.
Angles – Degrees (°), Arcminutes ('), Arcseconds (")	The standard method of measuring apparent distances. There are 360 degrees in a complete circle. Degrees can be approximately measured by knowing that the fist subtends an angle of 10 degrees when the arm is outstretched. The pinky fingernail subtends about 1 degree. Each degree is subdivided into 60 equal parts, called arcminutes. (There are 60 arcminutes in one degree.) Similarly, each arcminute is subdivided into 60 arcseconds. An arcsecond is the apparent size of a dime at a distance of 1.3 miles. The apparent size of the Moon and Sun are about 30', or half a degree.
Celestial sphere	The imaginary sphere where all sky objects appear. Due to the Earth's rotation, the celestial sphere appears to rotate once every 23h 56m.
Latitude	The number of degrees north or south a location is compared to the Earth's equator. The latitude of the Earth's equator is zero degrees and the North and South Poles are plus and minus 90 degrees, respectively. Los Angeles is at a latitude of approximately 34 degrees.
Longitude	The number of degrees west of the Prime Meridian, which runs through Greenwich and London, England. LA's longitude is 118 degrees.
Polaris – The North Star	The (not so bright) star located almost directly above the Earth's north pole. It will not appear to move (much) throughout the night. It will appear as far above the horizon as your latitude (e.g. 34 degrees above horizon in LA.)

Sky terms

Celestial Equator	The projection of the Earth's equator onto the celestial sphere. The celestial equator intersects the horizon exactly east and west.
Declination	How far north an object is, relative to the celestial equator. Terrestrial equivalent is latitude. Polaris has a declination of 89 degrees.
Ecliptic	The path from <u>west to east</u> through the celestial sphere that the Sun takes
Meridian	As used in astronomy, this refers to the imaginary half-circle running from due north, through zenith, to due south. It divides the sky into east and west.
North Celestial Pole (NCP)	The projection of the Earth's north pole onto the celestial sphere. The NCP is directly above the Earth's north pole, and does not move in the sky as the Earth rotates. The declination of the NCP is 90 degrees, by definition.
Right Ascension (RA)	How far east an object is, relative to a point in the constellation Aries. It's terrestrial equivalent is longitude. RA is measured in time units (e.g. hours, minutes, seconds), unlike declination, latitude, and longitude.

Seeing	The term astronomers use to describe the size of point objects. Seeing is caused by turbulence in the atmosphere. Turbulence can be caused by air motion and temperature variations. Seeing will look like a wavy pattern when looking at an extended (non-point) object. Typical seeing on the El Camino math roof is several arcseconds. Seeing is also called “twinkling.”
Sidereal	Relative to the stars. Examples: sidereal time, sidereal day, sidereal month. These refer to cycle times as measured relative to the stars instead of the Sun.
Zenith	The point directly up – at an altitude of 90 degrees.
Zodiac	The constellations of the ecliptic, familiar to most who read horoscopes.

Telescope terms

Earth’s rotation rate	The earth completes one rotation relative to the stars in approximately 23 hours, 56 minutes. This is roughly equivalent to 15 degrees per hour, 15 arcminutes per (time) minute, and 15 arcseconds per (time) second. This is also equivalent to saying the Earth rotates 1 degree in 4 minutes, or 1 arcminute in 4 seconds.
Equatorial mount	A type of mount for a telescope that allows motion in two directions: right ascension and declination. The telescopes used in ECC’s astronomy laboratory all have equatorial mounts.
Altitude-Azimuth mount	The other kind of mount, besides the equatorial, is an altitude-azimuth mount, which is cheaper, but does not allow for easy tracking of objects as the Earth rotates. As the name suggests, it steers in altitude & azimuth, as opposed to a system attached to the celestial sphere.
Field of View	The total angular area visible when looking through a telescope.
Magnification	The ratio of the angular size of an object when magnified compared to an unmagnified size. Because you divide two identical units (e.g. mm / mm), magnification has not units, although typically it is given a “power.” Example: 400x means magnification of 400. For telescopes, magnification can be computed by dividing the telescope’s focal length by the eyepiece’s focal length. Magnification has no meaning without an eyepiece, since there is no apparent size of focused light. <u>Some questions to ponder:</u> what’s the focal length of a perfectly flat mirror (like the ones in most bedrooms/bathrooms)? If a telescope claims to be 200x and comes with a 25mm eyepiece, what do you know about the mirror system?