

ANCIENT SKY DEFINITIONS

ASTROLOGY: the study of the movements and relative positions of celestial bodies interpreted as having influence on human affairs and the natural world.

ASTRONOMY: a natural science that studies celestial objects and phenomena. It uses mathematics, physics, and chemistry to explain the origin and evolution of planets, moons, stars, nebulae, galaxies, and comets.

ARCHAEOASTRONOMY: The intersection of the above two fields with a focus on ancient practices and world views. Think of it as “the anthropology of astronomy” rather than the “history of astronomy.”

CELESTIAL EQUATOR: Earth’s equator projected out into space.

CELESTIAL SPHERE: Earth’s poles and equator projected out into space to form a gridded sphere. Good for locating particular stars and constellations.

SOLSTICE: longest (Jun 21) shortest (Dec 21) day of year. Two times when 1) sun’s apparent path is highest or lowest in sky. Also, 2) when tilt of earth’s axis is closest or furthest away from the intensity of sun’s rays.

STANDSTILL, SOLAR OR LUNAR: When sun (or moon) appears “to stand.” To us, sun and moon appear to rise in different places on the eastern horizon over the course of the year. At the north and south extremes, the sun or moon appear to pause (or stand in place) before reversing direction.

EARTH’S ORBIT: earth rotates around sun counterclockwise, taking 365 days (YEAR), and its axis stays tilted at 23.4 from vertical. It rotates around its axis every 24 hours (DAY), and the top of the axis wobbles a bit (which is why the pole star changes over time).

ECLIPSE: Solar eclipses result from the Moon blocking the Sun relative to the Earth; thus Earth, Moon and Sun all lie on a line. Lunar eclipses work the same way in a different order: Moon, Earth and Sun all on a line. In this case the Earth’s shadow hides the Moon from view.

ECLIPTIC: the (imaginary) plane of the earth’s orbit around the Sun (to many ancients, the ecliptic is seen as the Sun’s apparent path across the sky). At our latitude, 40 degrees north, the ecliptic cuts diagonally across the sky.

EQUINOX(ES) (from Latin, “equal” and “night”): the two days per year when length of night is same as length of day (~March 20 and Sept 22). Also, the two times the celestial equator intersects with ecliptic.

LUNAR PHASES:

As the Moon orbits around Earth and Earth orbits around the Sun, the angle between the Sun, Moon, and Earth changes. As a result, the amount of sunlight that reflects off the Moon and travels to our eyes changes every day. (The Moon itself produces no light of its own.)

LUNAR ORBIT: The moon’s orbital plane goes both up and down and side to side. It takes 18.6 years to cycle back to the same place. In addition, the moon’s axis is slightly tilted (~5 degrees). If the lunar orbital plane lined up exactly with the earth’s orbital plane, then we would have more eclipses.

PRECESSION OF EQUINOXES: over a 26,000 year cycle, the pull exerted by sun and moon make earth’s axis “wobble” out of alignment like a rotating top. Precession explains why pole star changes over time (it was Thuban (Draco) in 2800 BC, is Polaris now, will be Vega ca 4000AD).

The most useful website I have found for more detailed explanations of solar and lunar behavior is Deborah Scherrer’s chapter in Ancient Observatories, “Solstice, Equinoxes, and Zeniths, oh My!”:

<http://solar-center.stanford.edu/AO/Ancient-Observatories.pdf> (Stanford University Solar Center). She also provides a useful summary of some of the sites I am discussing, and lots more we don’t have time for!