

Celestial Sphere

Imaginary sphere surrounding the earth. Stars are on this sphere and appear to move in circles around a point close to the North Star.

Celestial Poles

- North Celestial Pole lies directly above the earth's North Pole.
- South Celestial Pole lies directly above the earth's South Pole.

Celestial Equator

- The celestial equator lies midway between the North and South Celestial Poles

Ecliptic

- The apparent path of the sun on the sky traces out a path on the celestial sphere known as the ecliptic. This path is 23.5 degrees away from the celestial equator (The earth is tilted 23.5 degrees). Summer happens when the sun is above the equator; winter happens when the sun is below the equator. Equinoxes happen when the sun crosses the equator.

Celestial Coordinates. These specify locations on the sky.

- Declination is like latitude. Declination is measured in degrees with respect to the celestial equator. The equator is zero degrees; the north pole is + 90 degrees; the south pole is – 90 degrees.
- Right Ascension is like longitude. Right Ascension is measured in hours, minute and seconds with respect to the vernal equinox.

Solstice

- Summer Solstice (June 21). Longest Day of the year. The sun is farthest above from the equator and reaches the Tropic of Cancer.
- Winter Solstice (December 21). Shortest Day of the year. The sun is farthest below the equator and reaches the Tropic of Capricorn.

Equinox

- Vernal Equinox. The sun crosses the equator from below the equator to above the equator. The first day of spring. March 21. Daylight equals night time.
- Autumnal Equinox. The sun crosses the equator from above the equator to below the equator. The first day of fall. September 21. Daylight equals night time.

Seasons

- The earth is tilted 23.5 degrees.
- The seasons result from the inclination of our planet's axis of rotation with respect to the plane of the orbit. Summer happens when the North Pole tilts toward the sun; winter happens when the North Pole tilts away from the sun.

Eclipse

- The sun and the moon line up precisely as seen from earth.
- When the sun and the moon are in exactly opposite direction, the earth's shadow sweeps across the moon, blocking the sun's light and darkening the moon in a LUNAR ECLIPSE. (The moon is darkened because of the earth's shadow.)

Eclipse

- When the moon and the sun are in exactly the same direction as seen from earth, the moon passes directly in front of the sun, turning the day into night in a SOLAR ECLIPSE.
- We will have a spectacular SOLAR ECLIPSE in August, 2017 when the sun will be darkened by the moon for approximately 2 – 3 minutes.