

THE SEPTEMBER EQUINOX

Because Earth's rotational axis is not perpendicular to its orbital plane, Earth's equatorial plane is not coplanar with the ecliptic plane (the apparent path of the sun and planets in the sky). It is inclined to it by an angle of about 23.4° , which is known as the obliquity of the ecliptic. **If Earth's equator is projected outward to the celestial sphere (celestial equator), it crosses the ecliptic at two points known as the equinoxes.** The name equinox comes from the Latin *aequus* (equal) and *nox* (night)

The Sun, in its yearly motion along the ecliptic, crosses these points in March (vernal equinox) from south to north (historically known as the first point of Aries), then six months later in September (autumnal equinox) from north to south.

The exact time this year was on September 22, at 14:21 UTC.. Although the equinox happens at the same moment worldwide, clock times will depend on individual time zones.

At the time of equinox, days and nights are approximately equal in length. In the Northern Hemisphere the sun will now continue to rise later, and nightfall comes sooner. South of the equator spring is about to begin and the Sun will rise earlier and set later each day.

At equinox, Earth's Northern and Southern Hemispheres are receiving the sun's rays equally.

The earliest humans spent more time outside than we do. They used the sky as both a clock and a calendar. They could easily see that the sun's path across the sky, the length of daylight and the location of the sunrise and sunset all shift in a regular way throughout the year.

Our ancestors built the first observatories to track the sun's progress. One well-known being Stonehenge a prehistoric monument in Wiltshire, England, another example is at Machu Picchu in Peru, where the Intihuatana stone has been shown

to be a precise indicator of the date of the two equinoxes and other significant celestial periods. The word Intihuatana, by the way, literally means for tying the sun.

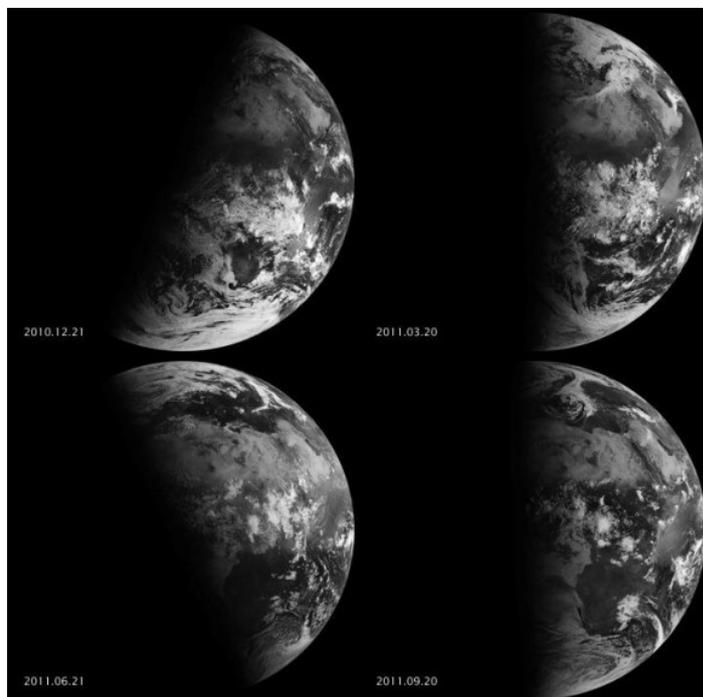
Today we know each equinox and solstice is an astronomical event caused by Earth's tilt on its axis and ceaseless orbit around the sun. Because Earth doesn't orbit upright, but is instead tilted on its axis by 23-and-a-half degrees, Earth's Northern and Southern Hemispheres trade places throughout the year in receiving the sun's light most directly.

At equinox the tilt of the Earth's axis and Earth's orbit around the sun combine in such a way that the axis is inclined neither away from nor toward the sun and the sun is overhead at noon as seen from the equator.

Night and day are approximately equal in length and the sun rises due east and sets due west for all of us.

Can you see signs of the equinox in nature here? At that time of the year the earlier dawns and the later sunsets each day and the sun drifting higher in the sky are very obvious signs.

AK with EarthSky Notes



In June and December Earth's Northern and Southern hemispheres are illuminated differently (Solstices), see left side display. But in March and September the Northern and Southern Hemispheres are receiving the sun's rays equally (Equinox), see right side display.



The Intihuatana stone – also called the Hitching Post of the Sun – at Machu Picchu in Peru. It was used to track the sun throughout the year. Photo via Imagesofanthropology.com.

