

3 minutes Astronomy

THE SEASONS

autumnal equinox – winter solstice – vernal equinox – summer solstice

During the year, the distance between the Earth and the Sun differs. From 147 to 152 mio. km.

But this difference is too small to have any influence on the seasons, which are a result of the inclination of the axes Earth relative to the Sun.

The North Pole always points in the same direction in space, close to the North Star, no matter where the Earth is in its orbit around the Sun.

Let us have a closer look at the four seasons.

21 December it was winter solstice. This is the day of the year where the North Pole tilts farthest away from the Sun.

If we move down to an Earth perspective, it makes it easier to see the effect.

On the northern hemisphere the Sun is not very high in the sky and the days, measured from sunrise till sunset, are short.

With less light and warmth from the Sun, it becomes colder, so this is what we call winter.

At the same time, in the southern hemisphere, the Sun is high in the sky and the days are long, so there it is summer.

Three months later, 20 March, we get to the vernal equinox.

The Sun is directly over the Equator and both hemispheres get the same amount of sun.

On this day both night and day last for nearly 12 hours all over the world.

After three more months we get to the summer solstice. Now the North Pole tilts towards the Sun and the South Pole tilts away from the Sun.

From an Earth perspective we now see that the northern hemisphere has the Sun high in the sky and the days are long. In other words, it is summer.

North of the Arctic Circle, the Sun stays above the horizon night and day. This phenomenon is called midnight sun.

At this time of the year the southern hemisphere gets less sunlight and it is winter there.

23 September it is the autumnal equinox. Once again, the Sun is directly over the Equator and night and day are nearly equally long.

When the Sun shines equally much on all latitudes, why are day and night not equally long?

As soon as the top curve of the Sun is over the horizon it is called day and thus the day becomes a bit longer.

Besides, the sunlight curves a little bit in the atmosphere so that it looks as if the Sun is a bit above the horizon when it actually is just below the horizon.