Astronomy Website

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Precession of the Earth

Independent of any change in the Earth's axial tilt, the Earth's axis of rotation changes its orientation relative to the "fixed" stars, such that over a period of 26,000 years, it scribes a circle in the sky.

This variation in the orientation of the Earth's axis of rotation is called precession. It's due to the gravitational tugs of the Sun and the Moon not acting directly on the Earth's center.

The precession of the Earth can be likened to a spinning top, that when slowing down tends to wobble under the influence of its weight. See this image.

This animation shows how the Earth has precessed in the last 5,000 years. Notice that about 3,000 BCE, the pole star was Thuban. Now, 5,000 years later, it is Polaris, the North Star.

One consequence of Earth's precession is that the Sun's apparent orbit around the Earth, the Ecliptic, moves ever so slightly from year to year, relative to the zodiacal constellations. Put another way, the moments when the Sun crosses the Earth's equatorial plane (the equinoxes) move relative to the zodiacal constellations. This movement of the equinoxes is called the Precession of the Equinoxes.

Here is another movie showing Earth's precession over the last 5,000 years, but with familiar northern hemisphere asterisms also shown. Notice how at the end of the movie, the outer two stars of the Big Dipper's cup point to Polaris.

Looking at the image above, it's clear that about 12,000 BCE, the pole star was Vega, and that Vega will be once again be the polestar in about 12,000 years.

Commenti

Non disponi dell'autorizzazione necessaria per aggiungere commenti.