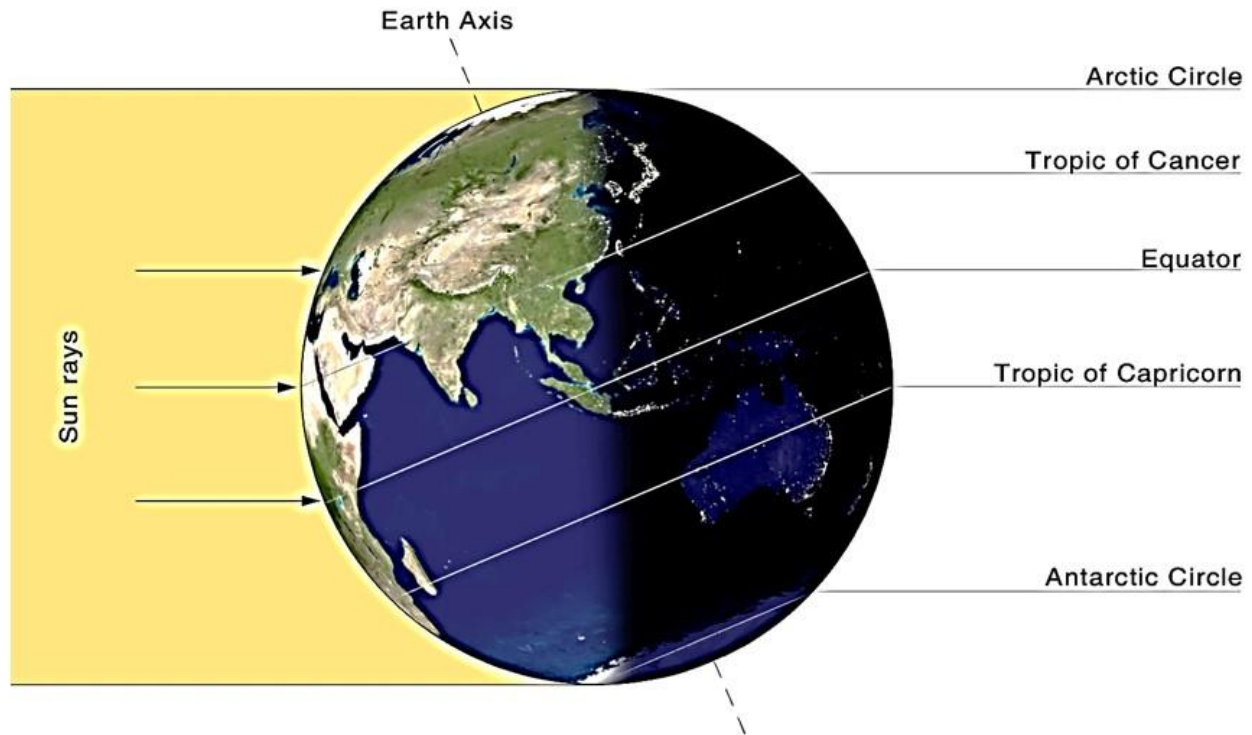


Chippewa Valley Astronomy Update June 2022

Figure caption: The summer solstice is on Tuesday, the most daylight of the year and when the sun reaches the highest altitude of the year. The sun will at noon reach directly overhead on the solstice for anyone at the latitude of the tropic of cancer (that latitude runs through places like Mexico, the Bahamas, Saudi Arabia, and India).

Image credit: NASA



How High Up Does the Sun Go In the Sky?

By Kevin Litten

Is the sun ever directly overhead? Not in Wisconsin. If you look at a globe of the world, such as you see in a school classroom, there are two lines circling the Earth. One line above the equator and a line circling below. These are called the Tropic of Cancer and the Tropic of Capricorn. Between those two lines the sun may reach directly overhead. We are a long way from there.

Our Earth's orientation to the sun is not square or straight up and down. It tilts about 24 degrees from the plane of its orbit, just like globes in classrooms. The imaginary pole the Earth spins around is known as its axis. The Earth spins around its axis every day, and that axis does not move much during our lifetime. As that axis direction in relation to the sun changes over the course of the year the amount of solar radiation or heat we receive changes. This gives us our seasons.

On many globes is a roughly shaped figure 8 with one end being much longer than the other.. This feature is known as the Analemma. It is a computing device. If you know the day of the year and your latitude, you can predict, with just addition and subtraction, how high in the sky

the sun will go. I've read those tiny instructions. For our latitude of about 45 degrees North, the sun should never rise higher than about 68 degrees above the horizon. Two "abouts" in one sentence is too much for many astronomers. If you know where you are and can find it on a map that displays latitude and longitude coordinates you can predict exactly how high in the sky the sun will go on any given day. If you have a GPS / Global Positioning Satellite device doing the math is even easier.

The Analemma has an interesting shape because Earth's orbit is slightly elliptical. It moves faster at some times and slower at others in its yearly journey around the sun. We don't feel this. Except sometimes Summer takes forever to leave and other times Winter just won't end. All I can offer is this: Nothing is so rare as a day in June.

-- Kevin Litten is a member of the Chippewa Valley Astronomical Society