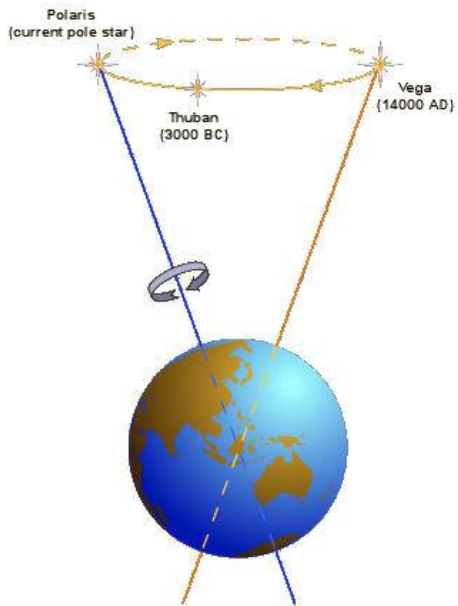


## Chippewa Valley Astronomy Update, Leader Telegram Nov. 18, 2022



**Figure caption:** Earth's rotation axis points from the north pole to a sky location called the north celestial pole. The north pole currently points toward Polaris, but the celestial north pole position will sweep out a circle among the stars because the Earth's rotation axis slowly sweeps through a circle. This means that Polaris will not always be at the center of the sky rotation in the north.

Photo credit: University of Hong Kong

### Is Polaris at the North Pole?

By John Schomburg

Is Polaris at the North Pole? The short answer is, no. But it's close. At the moment. And that makes it useful for finding north, as any good scout knows. We know it as the North Star.

So why is it only close?

Our earth spins like a ball on the finger of a basketball player. If we call the point touched by the player's finger the south pole, the north pole would be directly on the top of the ball.

If you were standing at the North Pole of the Earth looking straight up, you would see the stars circling around a point directly over your head over the course of a day (just like you'd see the ceiling circling above the basketball). The point in the sky directly above the North Pole is called the North Celestial Pole, and Polaris is close to that point. Polaris is one of those stars making a circle around that pole, but so close to it that it moves in a very tiny circle.

Hasn't Polaris always been the North Star?

Again, the short answer is, no.

The Earth is like a spinning top, and it's far from being a perfect sphere -- in fact, it's a little pear-shaped. So it will wobble, like a real spinning top does. The tugging from the sun and moon, together with its imperfect shape, will cause the Earth to wobble.

As the Earth wobbles, the North Celestial Pole makes a circle in the sky.

But it's a very slow wobble, and takes 26,000 years to make a circle.

And it's a very large circle. See the illustration, which shows Polaris at the top.

About 5,000 years ago, not long before the pyramids were built, the North Star would have been Thuban, a star in the constellation Draco the dragon. (Like most named stars, Thuban has an Arabic name, and its name means "large snake".)

And in 12,000 years, the star Vega in the constellation Lyra (the lyre or harp) will be the closest thing to a North Star.

You can see both of these stars in the early fall night sky. Vega is the bright star high in the western sky after dark this time of year. Thuban is straight off the dipper portion of the Little Dipper.

This all repeats in a 26,000 year cycle, so in 26,000 years Polaris will again be the North Star.

Polaris is a double star, as most stars are. (Some stars have even more companions.) Its larger star is a beautiful white star, the one you see at night. Its companion is a very tiny blue pinpoint of light, very close to it, and can be seen only through a telescope. There are not many close double stars that have such a difference in brightness where both can be seen, with a nice color difference thrown in!

So when you're out under the stars, imagine one of those other stars as the North Star, and wonder what the ancients might have called them.

-- John Schomburg is a member of the Chippewa Valley Astronomical Society

### **Astronomy in the Chippewa Valley:**

- “Ojibwe Sky Starmap” is the presentation tomorrow evening. Learn about Native American sky lore. This free public talk is Saturday, November 19, 2022 at 8pm in Hobbs Observatory at Beaver Creek Reserve. This is followed by stargazing and viewing through telescopes, if weather permits. Both Jupiter and Saturn are great targets this month. This is the last public observing opportunity of the year.
- The next Planetarium shows at UWEC are offered on the first three Thursdays in December, 2022. Shows begin promptly at 7 PM with doors opening at 6:45 PM. Admission is \$5 (cash), at the door. See [UWEC.edu/planetarium](http://UWEC.edu/planetarium) and the UWEC calendar. Group shows can be scheduled for the spring at (715) 836-5749.
- Watch Mars “wink out” as it gets covered by the moon on December 7<sup>th</sup>, 2022. This lunar occultation will occur at about 9pm CST (as seen in the Chippewa Valley) and last for over an hour before Mars re-appears. The moon will be full, and Mars also will be seen opposite from the sun (at opposition), so they will both be at brightest part of their orbits. Try using binoculars.