

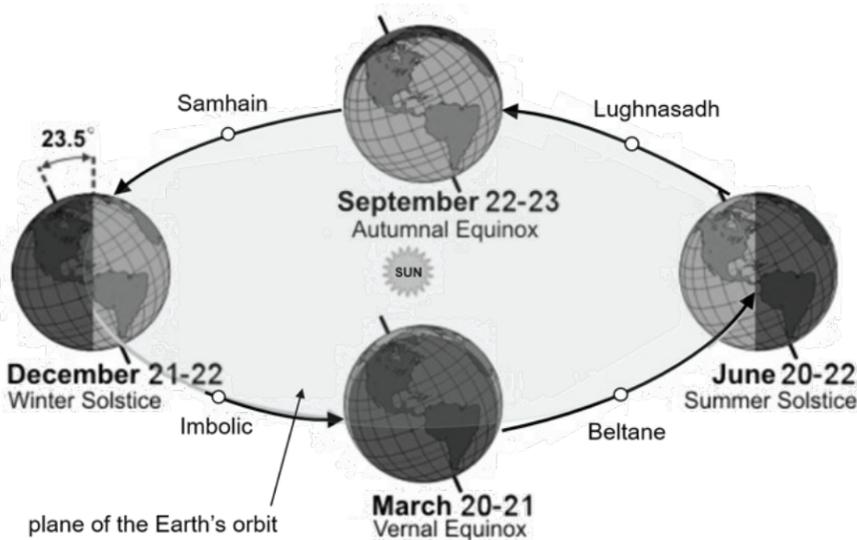


What's Up?



BY BARRY DECHRISTOFANO

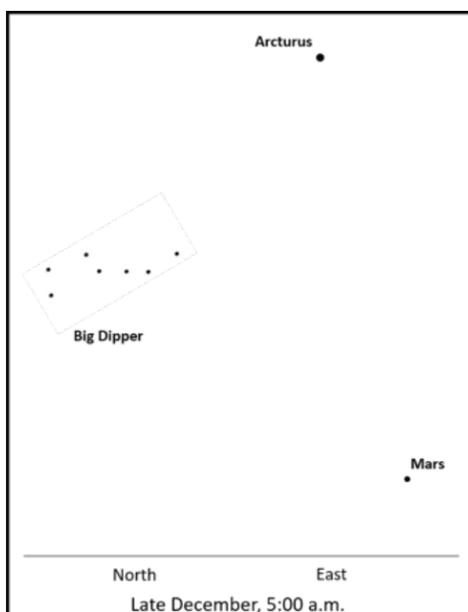
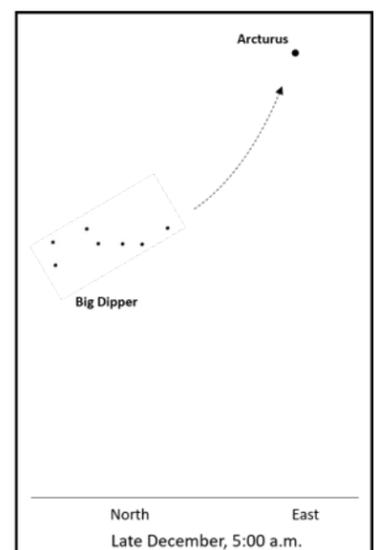
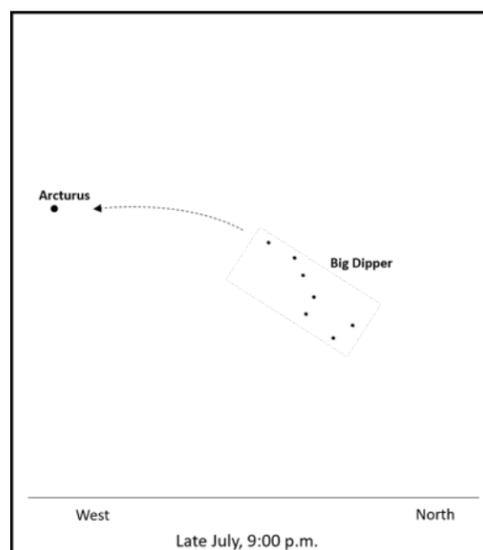
Hello! I hope that everyone is finding some time to relax and enjoy the company of loved ones during this holiday season. Since I last wrote a What's Up? column, we've passed the Winter Solstice. Back in September, when we passed the Autumnal Equinox, I explained that there are eight points along the Earth's orbit that we mark in relation to the seasons. The Winter Solstice is another one of these. The others are the Vernal Equinox, the Summer Solstice, and the cross-quarter points (there are four of them). Our planet's axis (the line from the South Pole to the North Pole) is tilted in relation to the plane that the Earth orbits the Sun in. When the north pole of the Earth is tilted as far as it can be towards the Sun, we are at the Summer Solstice. When the north pole of the Earth is tilted as far as it can be away from the Sun, we are at the Winter Solstice. In between these extremes, the times when the Earth's poles are at equal distances from the Sun, we are at one of the equinoxes – either the Vernal Equinox (Spring) or the Autumnal Equinox (Fall). The cross-quarter points are in between the solstices and equinoxes. In the diagram below, the cross-quarter points are marked with white circles. These eight points all mark different parts of our year.



This diagram is modified from one that I found at the National Weather Service website (<https://www.weather.gov/cle/seasons>). More than one date is shown for each of these events. The reason for this is twofold: the first part of the reason is that where we are on the Earth at the moment that the equinox or solstice occurs may put us into a different day than it is on the part of the Earth that can see the Sun at that moment, and the other is because the time that it takes the Earth to go once around the Sun is not exactly the 365 days that we count in our year (or, like in 2020, 366 days).

The cross-quarter points mark the mid-way positions of the Earth between the equinoxes and solstices. While it's likely that other ancient cultures noted these times of the year, the names that I'm familiar with come from the Celtic traditions. Their names are: Imbolc, Beltane, Lughnasadh, and Samhain. As cultural influence spread and combined over the centuries, we have descendants of these notable dates today – Groundhog Day, May Day, Lammas, and Halloween, respectively. Whatever they are called, and by whom they are called, these points serve the same purposes – to mark the times of the year that our planet is in certain spots along our way around the Sun.

What's in the sky now? Well, at a gathering in town a few weeks back, a couple of friends pointed out that their jobs prevent them from being able to stay up late and stargaze. So, for them and all the other early-morning folks out there, here's what you can see when you're getting up and out and starting your days! If you face towards the North around 5:00 a.m. at this time of the year, up high in the sky (about 3/4 of the way up from the horizon), you see the Big Dipper hanging "upside-down". In the East, about 1/2-way up in the sky is a bright, reddish star. That's Arcturus. Back in the first installment of What's Up? I explained how to follow the curve of the Big Dipper's handle and "arc to Arcturus". Even though the Big Dipper is in a different position in our sky, the relationships between stars' positions don't change. The diagram below is an illustration of this.



Much closer to the Eastern horizon you might see another reddish object – the planet, Mars. To find it, hold your fist out at arm's length with the bottom of your fist at the horizon. Mars will be near the top of your fist. Over the course of the coming year, Mars will rise earlier and earlier each day until, by September, it will be rising in the evenings. We'll talk about that when we get there. For now, try to compare the reddish-ness of Arcturus and Mars. Is one redder than the other? Also, try to compare the brightness of Arcturus and Mars. Which seems brighter to you? By how much? So, even if you're up before dawn, there is ALWAYS something to observe in our dark skies!

Keep looking up!

Barry

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