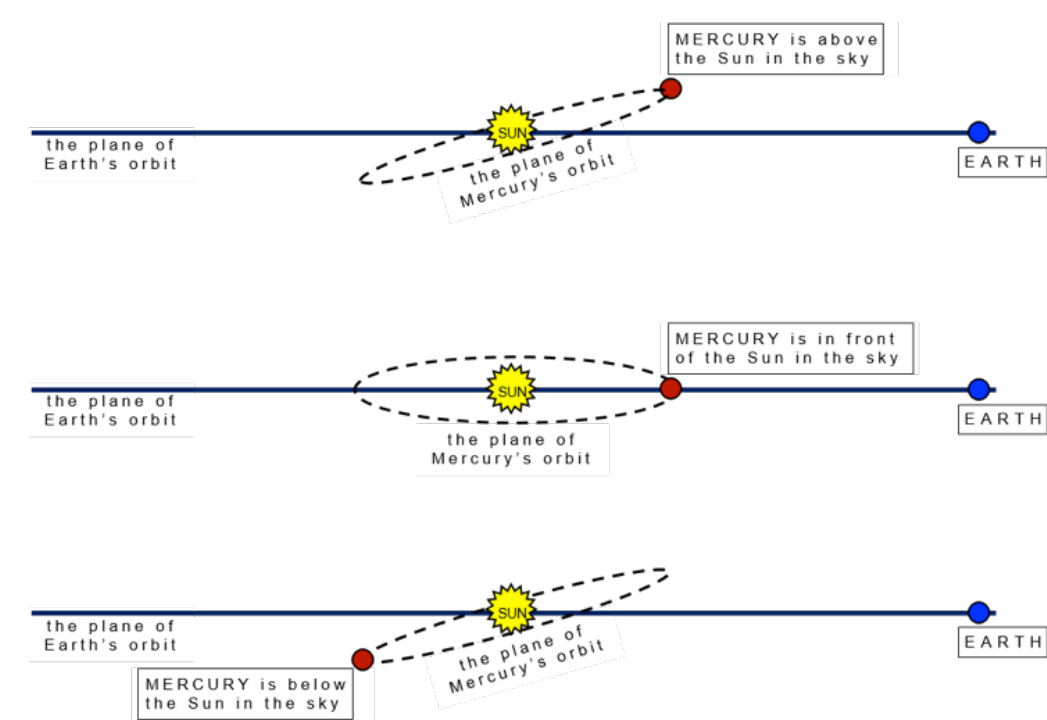


What's
Up?

BY BARRY DECRISTOFANO



Hi. November is here and as promised, I'll give you more details now on the upcoming transit of the planet Mercury. But first, did you look for Orionid meteors around the 21st of last month? I was outside from about 9:30 to 10:40 that night and managed to spot just one – a faint meteor streaking from the constellation Aries towards the constellation Pegasus. There was a lot of water vapor in the air at that time, and that scatters light in all directions. (Have you ever tried putting your car's high-beams on in the fog? Same effect.) The next two major meteor showers are the Leonids and the Geminids. Their peaks will be on the nights of November 16th-17th and December 13th-14th, respectively. But for both of these, the Moon will be just past full and will wash out all but the brightest meteors from these showers.



On to the transit of Mercury! A transit occurs when an object crosses the face of the Sun as seen from Earth. Since Mercury is closer to the Sun than the Earth, it passes between the Earth and the Sun on a regular basis. In fact, this happens every 116 days, on average. So, one might expect that every four months or so, we would be able to see Mercury transit the Sun. But we don't. The orbits of the Earth and of Mercury around the Sun don't lie in the same plane (they are tilted with respect to each other by 7 degrees). In our skies the Sun only takes up 1/2 of a degree so most times when Mercury passes between us and the Sun, it does so either above or below the Sun. These diagrams show what I'm talking about (they are not to scale).

Only when it passes between us and the Sun in the plane of our orb does Mercury line up so that we see it in front of the Sun. How often does that happen? The number of years between transits varies in a cycle. The time between transits varies a lot because Mercury's orbit around the Sun is very elliptical (oval). The time between the next several transits looks like this:

13 yrs / 7 yrs / 9 1/2 yrs / 3 1/2 yrs / 9 1/2 yrs / 3 1/2 yrs

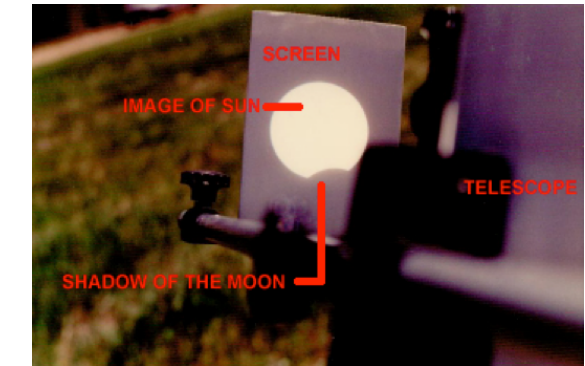
The last transit was in May of 2016, three and a half years ago. The next transit won't be for another 13 years, on November 13th, 2032. That transit and the one after it in 2039 won't be visible from here though. The next transit of Mercury that we will be able to see from here is the one on May 7th, 2049.

For us here in Eastern Massachusetts, the event on the 11th will start at 7:36 in the morning and end at 1:04 in the afternoon – about 5 1/2 hours in duration.

How can you view the transit? **VERY CAREFULLY!** You know that looking at the Sun with the unaided eye is a bad idea. Just as viewing a total eclipse of the Sun can harm your eyesight, so can this. Do you have a pair of solar eclipse viewing glasses left from the total eclipse of 2017? If they are not broken or scratched, they will work for the transit, too. Using a telescope is especially dangerous because a telescope focuses the sunlight into an intense beam on your eyes, can do real harm, possibly blinding you. I do not recommend using a telescope unless you are someone with a lot of experience using telescopes. There are only two **SAFE** ways to view the Sun with a telescope. One is to use a full-aperture solar filter. That is a filter that covers the entire end of the telescope tube. These filters block 99.999% of the Sun's light. That's right – they only allow one one-hundred-thousandths of the light through to your eye.

The other is called the projection method. In projection, a white screen is placed a short distance away from the telescope's eyepiece and the image of the Sun is projected onto it. The viewer looks only at the screen. In both methods, the finder scope of the telescope **MUST** be either covered or removed to prevent accidentally viewing the Sun through it. If you can't view the transit either of these two ways, **DON'T USE A TELESCOPE TO VIEW IT!**

In fact, the safest way to see the transit is on a television news program that evening!



The projection method for solar observing (photo taken during a solar eclipse in May 1994).

Will we see this transit, or have to wait 29 1/2 years? It's up to the weather! Only time will tell. If you do get to witness the transit, I'd love to hear about your experience. Write me about it or about anything astronomical, at astroblog@comcast.net.

Keep looking up!

Barry



A full-aperture filter for solar observing.