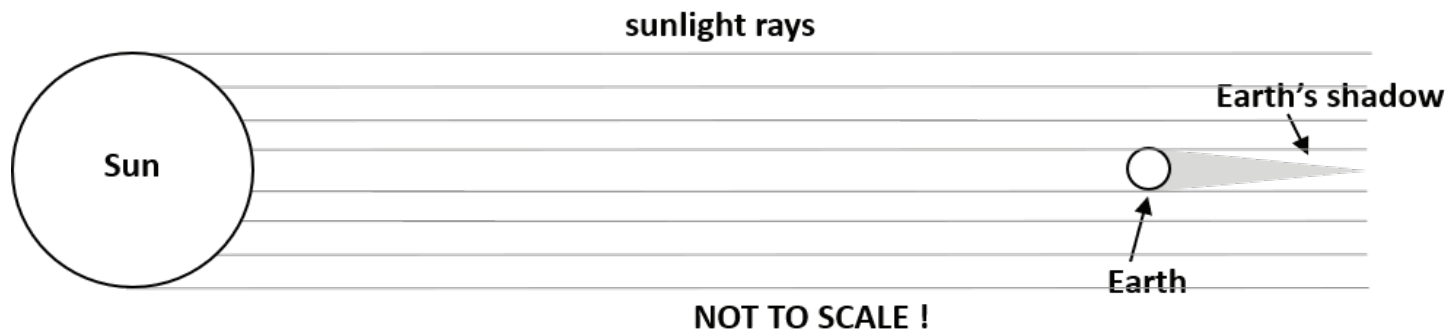
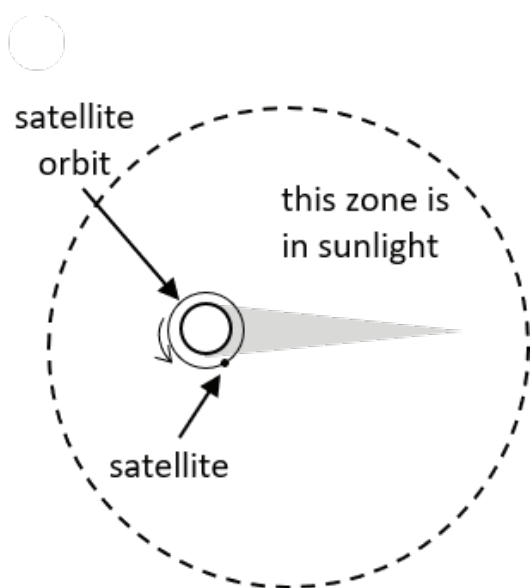


# WHAT'S UP?

“Where’d they go?” Hello. I was asked this question a couple of weeks ago and it’s a great question. A friend in town had seen two points of light moving across the night sky and suddenly, they disappeared. Have you ever seen such a thing happen? It happens all the time and in this installment of *What’s Up?* I’ll tell you why. This diagram shows the Sun, Earth, and the Earth’s shadow. When I note “NOT TO SCALE!”, I mean it! The Earth’s shadow is over 100 times the diameter of the Earth! It extends about 850,000 miles into space. That’s more than three times the distance to the Moon.



One thing to notice in this diagram is that there is still a zone of sunlight out in space in the area outside of the Earth’s shadow.



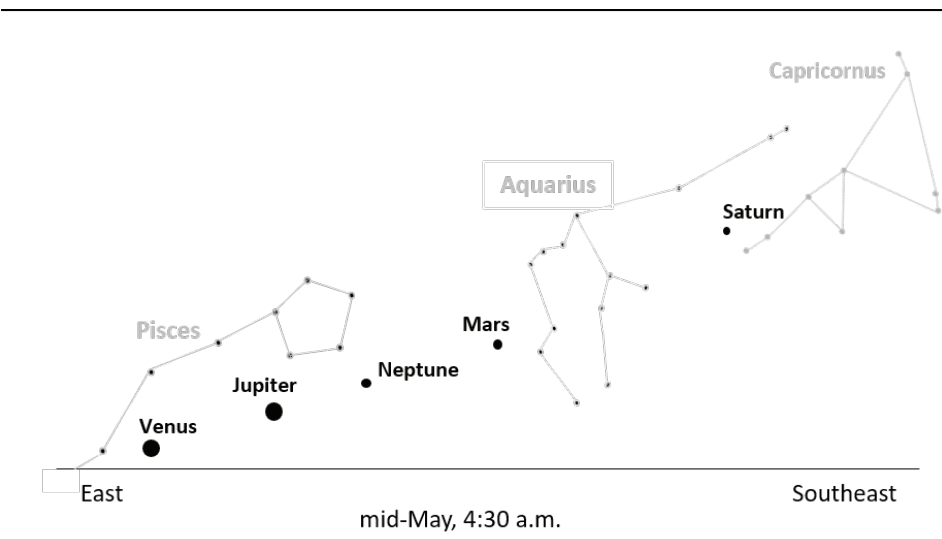
Now, let’s look at a close-up view of the situation. The close-up view shows the Earth, the Earth’s shadow, a satellite, and its orbit around the Earth. In the position the satellite is shown in the diagram, the satellite is still in sunlight even though, if you were on the surface of Earth below the satellite, you would be in darkness. On the Earth’s surface, we would be looking up into our night sky and see a bright point of light (the satellite) moving across the sky. Then, when the satellite enters the Earth’s shadow – poof! – it no longer is in sunlight and to us, it disappears. It’s that simple. A while back, I told you about a website that I use to find out what satellites can be seen in our skies and when (<https://www.heavens-above.com/main.aspx>). I’ve copied a portion of a table of the brighter satellites that could have been seen on the day that I was writing this article. Let’s look at the first satellite in this table, *Lacrosse 4 Rocket*. Going from left to right across the entry, we see that it is bright – 1<sup>st</sup> magnitude – that’s as bright as the North Star. It would first be seen at 9:40 p.m. (21:40:32 if using a 24-hour clock) low (10 degrees up) in the north-northwest.

It would move across the sky towards the east, getting as high as 67 degrees above the east-northeast horizon and then – poof! – it would disappear at 9:44 p.m. The next satellite also disappears while it’s still high in the sky. The third would be seen all the way from the south-southwest horizon to the northeast horizon. The differences in where each of the satellites rise and set are due to the particular altitude and tilt of their orbits. Another fun feature of this program is that you can click on a satellite’s name and find out what it is. For instance, the

Satellite	Brightness (mag)	Start			Highest point			End		
		Time	Altitude	Azimuth	Time	Altitude	Azimuth	Time	Altitude	Azimuth
Lacrosse 4 Rocket	1.3	21:40:32	10°	NNW	21:44:39	67°	ENE	21:44:50	66°	E
Cosmos 1340 Rocket	2.6	21:41:15	10°	N	21:45:16	85°	E	21:45:29	79°	SE
ATLAS 3B R/B	2.5	21:39:00	10°	SSW	21:45:27	68°	ESE	21:52:18	10°	NE

the United States on August 17<sup>th</sup>, 2000 and is in orbit about 350 miles above the Earth’s surface. While looking ahead to what can be seen on a given night can be fun, I use this app mostly to tell me what I saw, after I noted a particularly interesting satellite moving overhead. Maybe it was especially bright or appeared to change its brightness in some weird way while I was watching it. There is a lot of stuff up there going around and around the Earth!

Speaking of satellites moving through the Earth’s shadow, our natural satellite (the Moon) will be passing through the Earth’s shadow on the night of May 15<sup>th</sup>/16<sup>th</sup>. The main event starts at 10: 27 p.m. on Sunday, May 15<sup>th</sup> and the Moon will be completely in the shadow at 11:29 p.m. Totality ends at 12:53 a.m. on the 16<sup>th</sup> and the eclipse ends at 1:55 a.m.



### Planet Roundup:

All of the planets except Uranus (and Earth, of course) are still to be found only in our pre-dawn sky. By 4:30 a.m., Saturn, Mars, Neptune, Jupiter, and Venus mark the path of the ecliptic from southeast to east across the morning sky. They are seen against the stars of Capricornus, Aquarius, and Pisces as we sweep Saturn to Venus. The upcoming Moon phases are: 1Q on May 8<sup>th</sup>, Full Moon on May 16<sup>th</sup> (the night of the eclipse, of course), 3Q on May 22<sup>nd</sup>, and New Moon on May 30<sup>th</sup>.

As always, you can reach me at [astroblog@comcast.net](mailto:astroblog@comcast.net) with any question and comments. This is What’s Up? installment #59.

*Barry*