

WHAT'S UP?

Hello! After a couple of weeks of just looking at our night skies – seeing the Twins starting to set in the West in the evenings and the planets lining-up in the East in the mornings – I'd like to tell you about another motion of the planets that we see. This motion is not a real motion of the planets though, it is only an apparent motion. We see it in our skies through the interplay of the Earth's and the other planets' steady orbiting of the Sun. It's called *retrograde motion*. We know from Kepler's Third Law that the further away a planet is from the Sun, the longer it takes the planet to complete an orbit around the Sun. Mars, Jupiter, Saturn, Uranus, and Neptune are all further from the Sun than the Earth is. Mercury and Venus are closer than the Earth is. So, the phenomenon of retrograde motion breaks down into two cases. We'll start with the case of the retrograde motions of the planets further away from the Sun than the Earth. Let's look the movements of Earth and Jupiter over 6 months from a point of view above the plane of our Solar System. The dotted lines in Figure 1 are the lines of sight from Earth to Jupiter. If we extend the lines out to the stars, we can figure out where Jupiter will be seen against the background of stars. In Figure 1, notice that Jupiter doesn't actually change directions. It still orbits the Sun in the same direction. It is only because the Earth is on the inside track around the Sun and passes Jupiter as the Earth moves in its orbit, that Jupiter appears to move backwards for a few months. Trace the numbers 1 through 6 in the diagram with your finger to get a better feel for the changing directions of Jupiter's movement in our sky. At present, Jupiter is found among the stars of the constellation Sagittarius, just to the left of the Teapot asterism. Figure 2 shows the positions of Jupiter in relation to the stars of the Teapot from April 1 through October 1 of this year. With variations in time and extent of the apparent motions, Mars, Saturn, Uranus, and Neptune follow this same pattern.

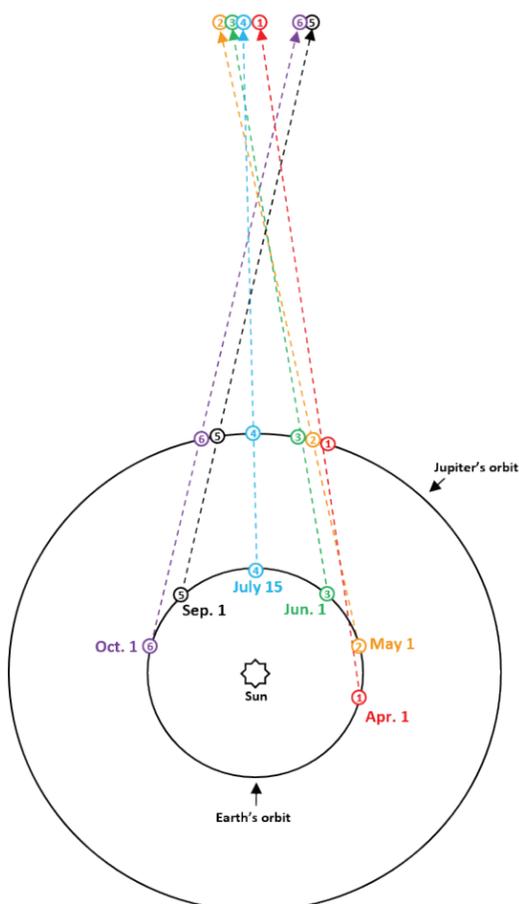
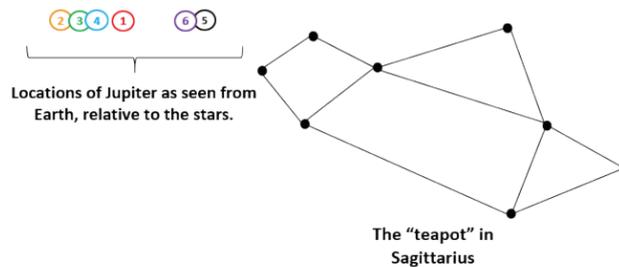


Figure 1



Horizon

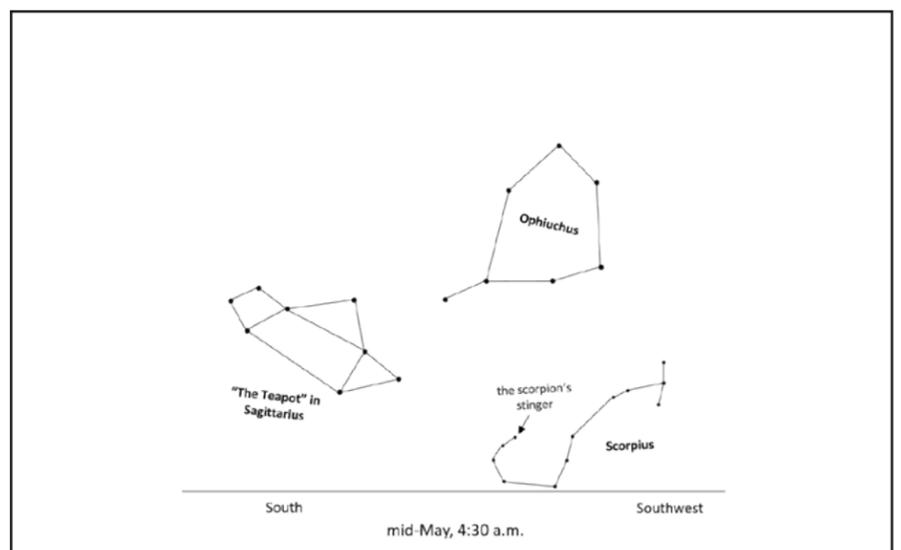
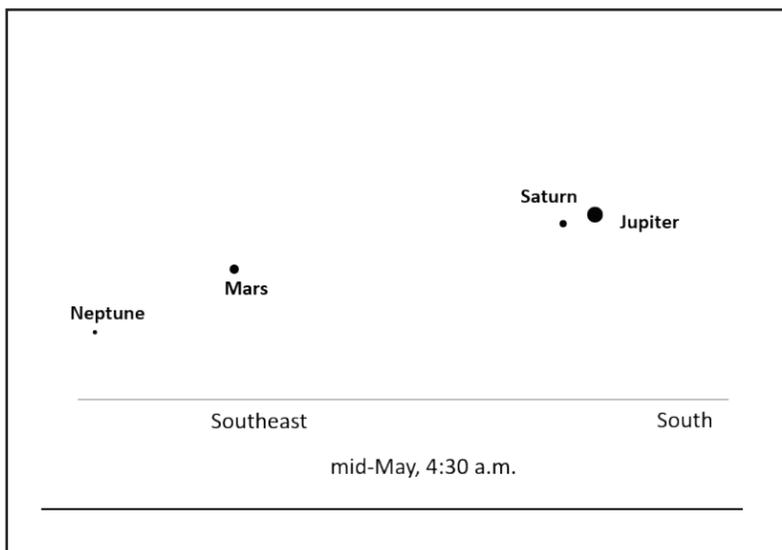
Figure 2

And, in the mornings...

The biggest changes since I last wrote about the morning skies, involve Mars and the Moon. In the past two weeks, Mars has moved steadily further away from Saturn and Jupiter from our point of view. On the 1st of May, Mars was about 20-degrees away from Saturn (two fist-widths apart) in the East. Now it is three fist-widths away – it keeps truckin' along on its inside path around the Sun. The morning grouping of planets has been joined by the waning crescent Moon. I won't say too much about that though, because in the next What's Up? I want to start telling you more about the features that we see on the Moon. In the South-southwest, Scorpius has crawled lower down towards the horizon. Can you still see the scorpion's stinger from where you are?

Here's what's up in the evenings...

Venus is still hanging in there in the west-northwest after sunset. Sun-set now occurs about 20 minutes later than it did two weeks ago. So, when you go out to see Venus, between Venus' own motion and the later hour, you'll find it only about half as high up in the sky as it was two weeks ago. In binoculars or a telescope, Venus is but an ever-so-thin crescent. We can see less than 10% of the day side of the planet as it works its way around the Sun, eventually passing between the Earth and the Sun on June 3rd. Afterwards, towards the end of June, we will begin seeing Venus in the morning lineup of planets. Did you take a look at the Beehive Cluster (M44)? If you did, I'd love to hear your impressions of it.



You can reach me at astroblog@comcast.net with any questions and comments you have. This is What's Up? Installment #20.

Keep looking up!

Barry