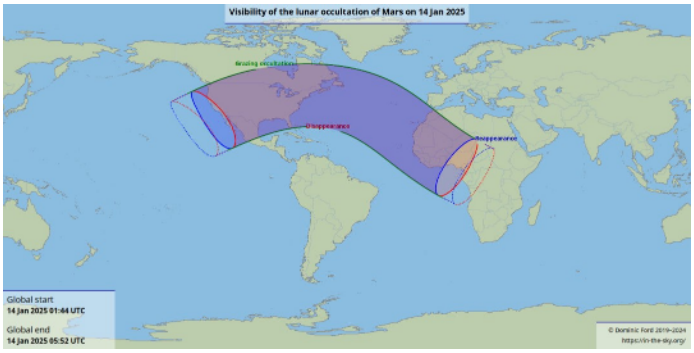
Moon Hides Mars, Venus Rides Pegasus

By Brad Young, Astronomy Club of Tulsa

Author's Note: I have nowhere near the talent to draw the Venus scene, you'll just have to imagine it.

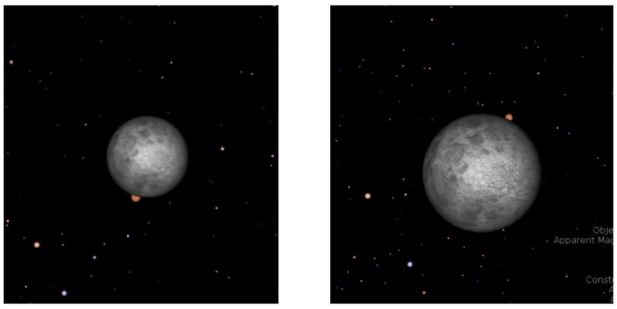
Another chemical engineer, this one from Boston not Tulsa, once stated "Don't Look Back". As much as I'd like to review 2024 more than I did last month, 2025 is upon us and it's time to look forward. As we all know, the first few months of the year can be a drag, as the weather is usually poor, or, if it is clear, it's way too cold to do much outdoors. So, events like the occultation of Mars by the Moon, and Venus' upcoming inferior conjunction give us events to look forward to, when we can't spend hours outdoors observing.



Note the occultation of Mars happens on Tulsa's Jan 13, evening

Adapted from: http://www.lunar-occultations.com/iota/planets/0114mars.htm

The occultation of Mars by the nearly Full Moon will be a wonderful, if slightly difficult thing to observe. In Tulsa, it will begin with the disappearance of Mars behind the Moon at 7:56 p.m. CST, 28 degrees up in the eastern sky. Its reappearance will be visible at 9:02 p.m. CST at an altitude of 41 degrees. The Moon will be nearly 100% lit, which means, although you may be able to watch to some degree the event with naked eyes, using binoculars or a small telescope will make it much easier.

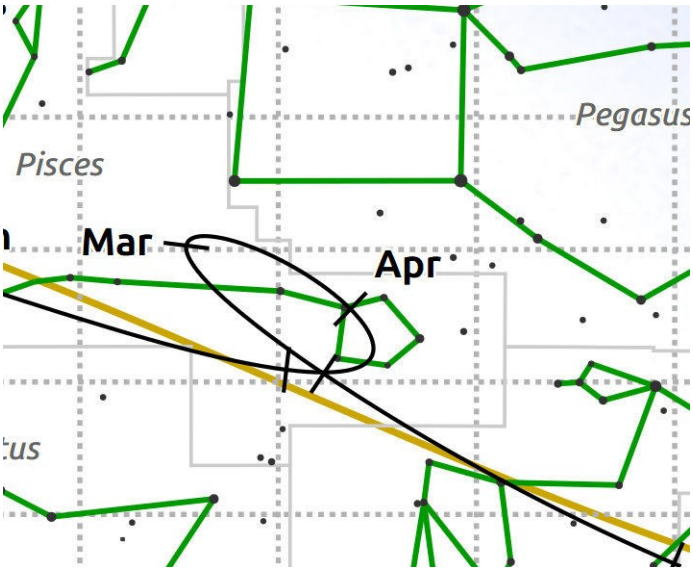


Mars disappearance and reappearance (adapted from Guide 8)

I've noticed a lot of buzz about this already, so you can expect the usual misinformation such as that "Mars will be as big as the Moon", "Mars will impact the Moon and throw off meteors that destroy the Earth" and all the usual claptrap. Please ignore all that and enjoy the show. If it is cloudy where you live, there will be several webcasts online and best of all, it occurs in mid evening, at a decent hour. Bundle up and see if you can catch both the disappearing and reappearing. You might even notice, it doesn't happen instantaneously like with a star; Mars has an appreciable if small disk, and it will take a finite amount of time for the Moon to obscure it completely.

Another particularly interesting sky sight early this year repeats about every eight years but is always worth trying. It usually occurs in mid-March, and you may recognize from the 8-year cycle that it has to do with the planet Venus.

Although Venus is not tipped a lot with respect to the ecliptic (3.4o), it is so close to us at inferior conjunction that it appears to be as much as eight degrees above or below the ecliptic. Its greatest elongation north occurs only a little west of the first point of Aries, therefore it is quite far north during March inferior conjunctions. In fact, in some years, including 2025, it strays so far north that it reaches for about a day into the constellation Pegasus.



Adapted from chart at https://in-the-sky.org/findercharts2.php

Its stay there is more an artifice of man than of the stars. When the official IAU constellation boundaries were drawn up, there was a small corner of Pegasus that reached down south just far enough to catch Venus on part of its path at these March inferior conjunctions. It isn't as if it will be seen in the great square of Pegasus, in fact during this time you probably won't see any other stars in the sky. So, there's a little bit of fanciful thinking going on here but bear with me.

One reason I bring this up now in January is that you may want to follow Venus's path up until that time as it moves from greatest eastern elongation (Jan. 10), dichotomy (varies), greatest brilliancy (Feb. 16), and then begins its retrograde motion March 1 as it approaches inferior conjunction (Mar. 22). This of course is also the best time to look at the planet. Although we were cursed with a very

near passing planet that has no surface features we can see, we can at least observe the phases on it and the fun part is around inferior conjunction. It passes through gibbous into a half-moon phase and then becomes a larger and larger size but thinner and thinner crescent as it approaches conjunction. And of course, on the other side of the Sun the reverse will occur. But Venus will be poorly placed for us in the northern hemisphere during that time. Perhaps some of you reading this in the southern hemisphere can watch those phase changes as they occur.

On a sidetrack, I did look to see if the same situation might be repeated in the southern hemisphere. It looks like Venus never quite makes it south enough to get into Hydra, which would be its best chance to escape the ecliptic. I didn't look very far in the future or past so if any of you that want to run a simulation can correct me feel free. And please limit it to less than 100 years, because by that point procession will take effect and we could find Venus in Orion by the time you get done.

Venus from Tulsa, about 15 minutes before sunrise, Mar 23, 2025. Note that locations further north will have a slight advantage as Venus will be a bit higher (and opposite for locations to the south).

If you want to try to at least see the planet when it's in Pegasus even if you can't see the stars, the placement of Venus as much as five to six degrees north of the Sun will allow us to see it in both the evening and morning sky from about March 20th to March 26th. The date it is within Pegasus is March 23rd, possibly also March 24th depending on the atlas and planetarium program I use. In this case, it will be slightly easier to see it in the morning sky 5° above the Sun, which means you'll want to look for it within 20 minutes of the Sun rising, very low and you'll need a perfectly flat Eastern horizon. The good thing is since this is very near the vernal equinox, if you look directly east, you'll be looking at the right spot. It will take quite a lot of luck to do this, including clear skies, which are not given in March.

I've done this before, but it's been three cycles ago and I'm itching to try it again. Luckily, now I live near a bridge which allows me to get a very flat Eastern look as I look right down the Eastern running Street from under the bridge. Now I just must hope for a perfectly clear morning sky in mid to late March. Be sure and let me know if you have any luck finding it, or indeed, have any luck seeing Venus around inferior conjunction at all. Seeing it during this time is special because very few people would even know how to look.

A lot of people also like to image or visually observe Venus at that time because it has an extremely thin crescent and is strangely pointed South instead of on the east or west side of the planet. I can't caution you enough to be very careful if you do this. One false move even with just your naked eye (which incidentally is hopeless for this kind of observation) and you could have your eyesight damaged or even become blind. **Do not ever look towards the sun with any optical aid or even without unless you have an approved filter or other fail-safe method of making sure your eye never sees the Sun.**

That's just one of the many great things coming up in 2025. Be sure and check your astronomical websites, calendars, etc. and look for many more. I don't know if 2025 can beat 2024, but here's hoping it does.

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