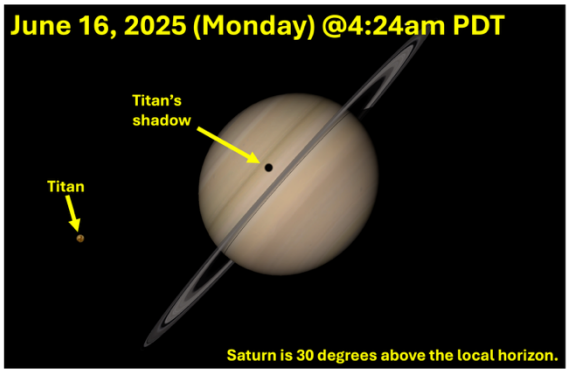
2025 Titan Shadow Transits

Experience a rare celestial event: a solar eclipse on Saturn!



About every fifteen years, the relative positions of the sun, Earth and Saturn are such that Saturn's rings appear to us nearly edge on. The orbital plane of Saturn's largest moon Titan is also nearly edge on to us. The result is that Titan's shadow "transits" (traverses) the surface of Saturn several times during a several-months' time period, but only viewable from one hemisphere of the earth. This year's phenomenon is viewable several times during the next few months for observers in the western hemisphere. That's us!

If you were a Saturnian floating at the top of the clouds of Saturn in just the right spot at just the right time, Titan's shadow passing over you would give the appearance of a solar eclipse. A solar eclipse on another planet!

Read this article to learn more about this rare celestial event. It will not be viewable again until 2038-39.

Below are the dates of upcoming Titan shadow transits in 2025. Dates shown are from the article referenced above, converted to local time (PDT).

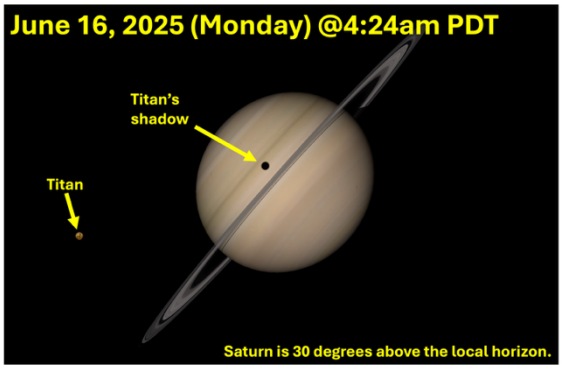
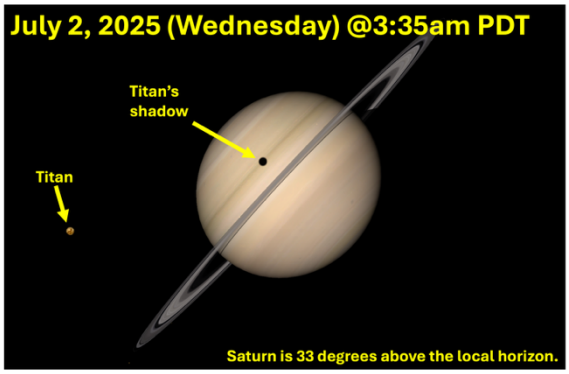
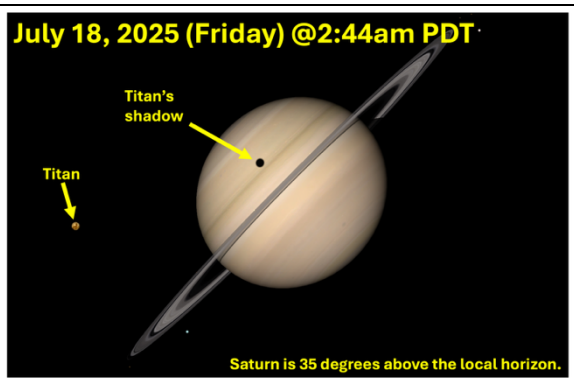
June 16
July 2
July 18
August 2-3
August 18-19
September 3-4
September 19-20
October 5

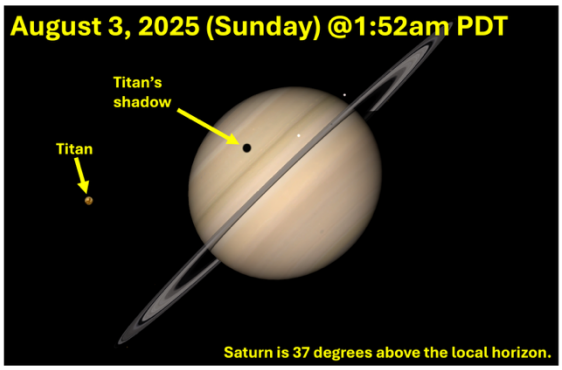
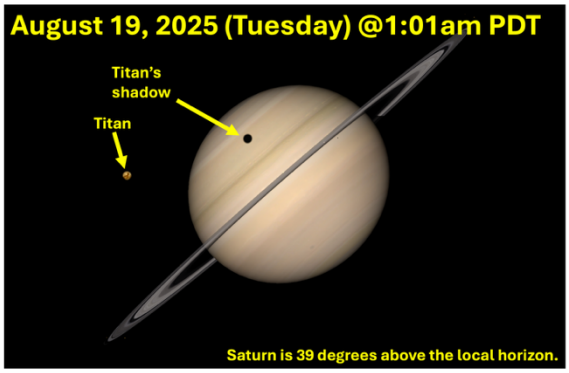
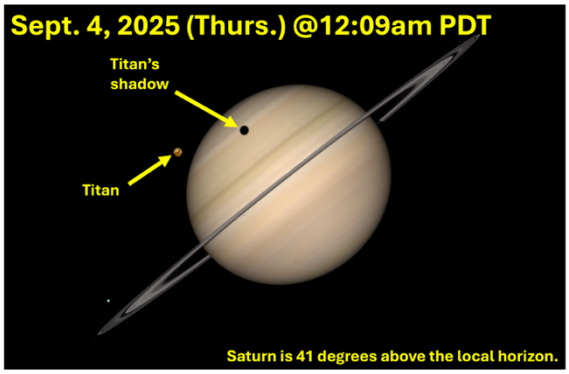
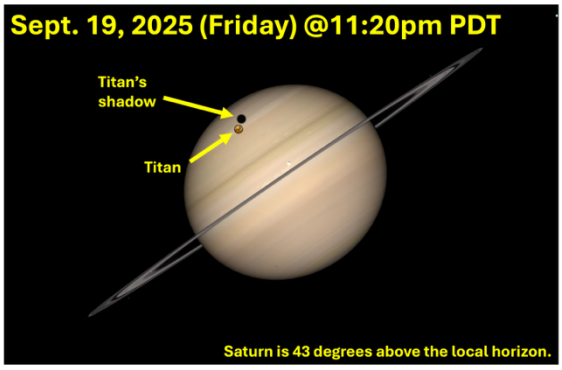
The club might schedule a formal club event to witness this rare phenomenon, perhaps on one of the dates in September (when Saturn is closer to us and mid-transit occurs earlier in the night). Alternatively, consider observing one of these occurrences on your own, from a favorable spot. Your chosen site ought to have an unobstructed view of the southeastern horizon.

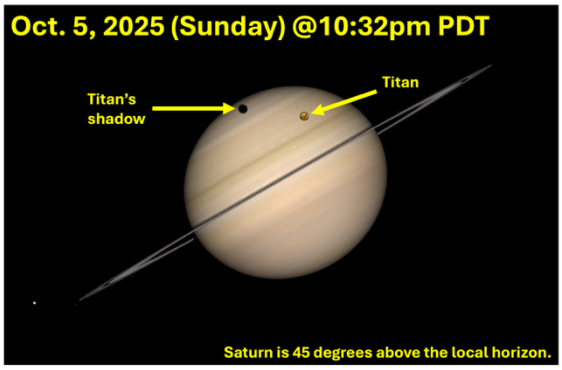
Full disclosure: viewing Titan's shadow may be a challenge. Use 200x magnification or greater and at least a 3" aperture refractor (or larger reflector). Larger aperture and longer focal length telescopes will increase image contrast, improving your chance of spotting the shadow. Friends of MIRA may borrow a loaner telescope from MIRA. Contact Jean Perkins for more information about MIRA loaner telescopes.

Astrophotographers: please take a photo of this event to share in a club future email or MIRA newsletter.

Below are more details on each of the upcoming occurrences. "Start" time is when Triton's shadow is first completely in front of Saturn's disk from our perspective. "End" time is when the shadow just starts to leave the front of Saturn's disk from our perspective. Disclaimer: before you plan on viewing any of these transits, please use your own planetarium software or on-line research to verify the dates and times shown below. (I am prone to making date and time conversion errors.)

	Start: 1:21am (below the horizon) Mid-transit: 4:24am (30 degrees above the horizon) End: 7:00am (after sunrise) Distance: 9.63 au (astronomical unit) Moon phase: waning gibbous
	Start: 12:40am (at the horizon) Mid-transit: 3:35am (33 degrees above the horizon) End: 6:03am (twilight) Distance: 9.36 au Moon phase: first quarter
	Start: 12:00am (5 degrees above the horizon) Mid-transit: 2:44am (35 degrees above the horizon) End: 5:05am (51 degrees above the horizon) Distance: 9.11 au Moon phase: third quarter

	Start: 11:25pm, August 2 (10 degrees above the horizon) Mid-transit: 1:52am (37 degrees above the horizon) End: 4:04am (51 degrees above the horizon) Distance: 8.88 au Moon phase: first quarter
	Start: 10:52pm, August 18 (16 degrees above the horizon) Mid-transit: 1:01am (39 degrees above the horizon) End: 3:00am (51 degrees above the horizon) Distance: 8.71 au Moon phase: third quarter
	Start: 10:25pm, September 3 (24 degrees above the horizon) Mid-transit: 12:09am (41 degrees above the horizon) End: 1:50am (50 degrees above the horizon) Distance: 8.59 au Moon phase: waxing gibbous
	Start: 10:09pm (32 degrees above the horizon) Mid-transit: 11:20pm (43 degrees above the horizon) End: 12:34am (September 20) (49 degrees above the horizon) Distance: 8.55 au Moon phase: waning crescent

	Mid-transit: 10:32pm (45 degrees above the horizon) (Titan's shadow is fully in front of Saturn only at mid-transit.) Distance: 8.58 au Moon phase: full