

Celestial Highlights, August 8-September 2, 2016

by Robert C. Victor. Evening sky scenes from Abrams Planetarium Sky Calendar.

August 2016 has rare gifts for skywatchers – until late in month, all five naked-eye planets can be seen during evening twilight, and they participate in beautiful pairings and groupings! From a site with an unobstructed view of western horizon, begin within half an hour after sunset, to catch **Venus** before it sinks too low. Use Robert Miller's *evening twilight chart* and diagrams selected from Abrams Planetarium *Sky Calendar* to guide you. To subscribe, visit abramsplanetarium.org/skycalendar/

Venus at mag. -3.8 will be visible with unaided eye. (It will get higher in coming months, setting in a dark sky starting in October, climbing highest in January 2017, and reaching spectacular brilliance at mag. -4.8 in February, before quickly departing from evening sky in late March.) Use binoculars, if necessary, to catch **Mercury** near mag. zero, some 9° upper left or left of Venus through Aug. 16, 2016, and fading to mag. $+0.5$ by Aug. 24 while 6° lower left of Venus.

Jupiter, at mag. -1.7 , is next in brightness after Venus and easy to find not long after you acquire Venus. For first half of month, you may even spot Jupiter *before* you notice Venus. For most of August, Jupiter appears to upper left of Venus, 1° closer daily until their spectacular close pairing on Sat. Aug. 27, described below.

As the sky darkens, **Mars** (mag. -0.8 to -0.3), **Saturn** ($+0.3$ to $+0.5$), and first-magnitude **Antares** 6° from Saturn all month become easy for unaided eye. The two planets and the red supergiant star will have a striking arrangement Aug. 23 and 24.

Watch for these events (data exact for Michigan sky watchers):

Aug. 8 and 9 at dusk: Mars 0.9° from Delta Scorpii, middle and brightest of three stars in head of the Scorpion, to the right of Antares. Moon passes First Quarter phase at 2:21 p.m. EDT on Aug. 10. **Tip for teachers and students – telescopic observation of Moon in daytime:** When Moon is within 2 days before or after half full – this month, on afternoons of Aug. 8-11, near First Quarter phase, and on mornings of Aug. 23-26, near Last Quarter phase, thread a *single* polarizing filter into a low-power eyepiece of your telescope. Next, while viewing the Moon, rotate the eyepiece until the blue sky surrounding the Moon appears darkest, increasing contrast of Moon against sky for wonderful daytime views of lunar craters and other features!

Thurs Aug. 11: As darkness falls, note the beautiful diamond-shaped arrangement of Moon-Mars-Antares-Saturn, about 6° - 7° on each side. Tonight's moonset occurs just over halfway from sunset tonight until sunrise on Friday. **Peak of the Perseid meteor shower occurs after moonset, in Friday's predawn darkness hours!** The dark, moonless sky should be wonderful for observing meteors.

Aug. 12: Moon 7° upper left of Saturn. The famous ringed planet marks the top vertex of an attractive triangle of three “stars”. Compare color and brightness of its two other members, Mars and Antares. Venus 15° lower right of Jupiter and 1° closer each day!

Aug. 16: Mercury at greatest elongation, 27° E of Sun. Since Mercury is more to left of setting Sun, rather than high above it, the planet sets well before darkness falls, and this is an unfavorable apparition for observers at mid-northern latitudes, despite Mercury’s unusually large angular distance from the Sun. Folks in southern Michigan and places farther south will have an easier time spotting it than folks at more northerly latitudes.

Wed Aug. 17, dusk: Venus 10° lower right of Jupiter. Ten days to go! Five planets span 84° . Also, Full Moon overnight, at 5:27 a.m. EDT on Thursday. Moon shines with enhanced brightness in that hour as it narrowly misses penumbra of Earth’s shadow and reflects sunlight toward us and source of illumination; look up *opposition effect*.

Aug 19: Mercury 3.8° lower left of Jupiter, their minimum distance apart in a *quasi-conjunction*.

Aug 22: Venus 5.0° lower right of Jupiter! **Aug 23:** Ve-Ju = 4.0° , Me-Ju = 4.3° , Me-Ve = 6.4° , in a nearly isosceles triangle.

Aug 23 and 24: In order from top to bottom, **Saturn, Mars, and Antares nearly line up, as Mars goes 4.4° S of Saturn and 1.8° N of Antares!**

Aug 25 predawn: Fat crescent Moon in the Hyades cluster, a pretty sight for binoculars and telescopes. Last Quarter phase occurred Aug 24, at 11:41 p.m. EDT. Follow waning Moon each morning through Aug. 31.

Aug 25: Ve-Ju 1.9° . **Aug 26:** Ve-Ju 0.9° .

Aug 27: This is first evening Jupiter appears to lower right of Venus. The planets are just 7 arcminutes apart, less than one-eighth of a degree, as seen from Michigan -- and even closer as seen from eastern U.S. – alert your friends!

Aug 28: Ve-Ju 1.1° apart. Their separation increases by about 1° daily. **Aug 31:** Ve-Ju 4.2° apart, Jupiter getting lower each evening. On what date will you last spot Jupiter?

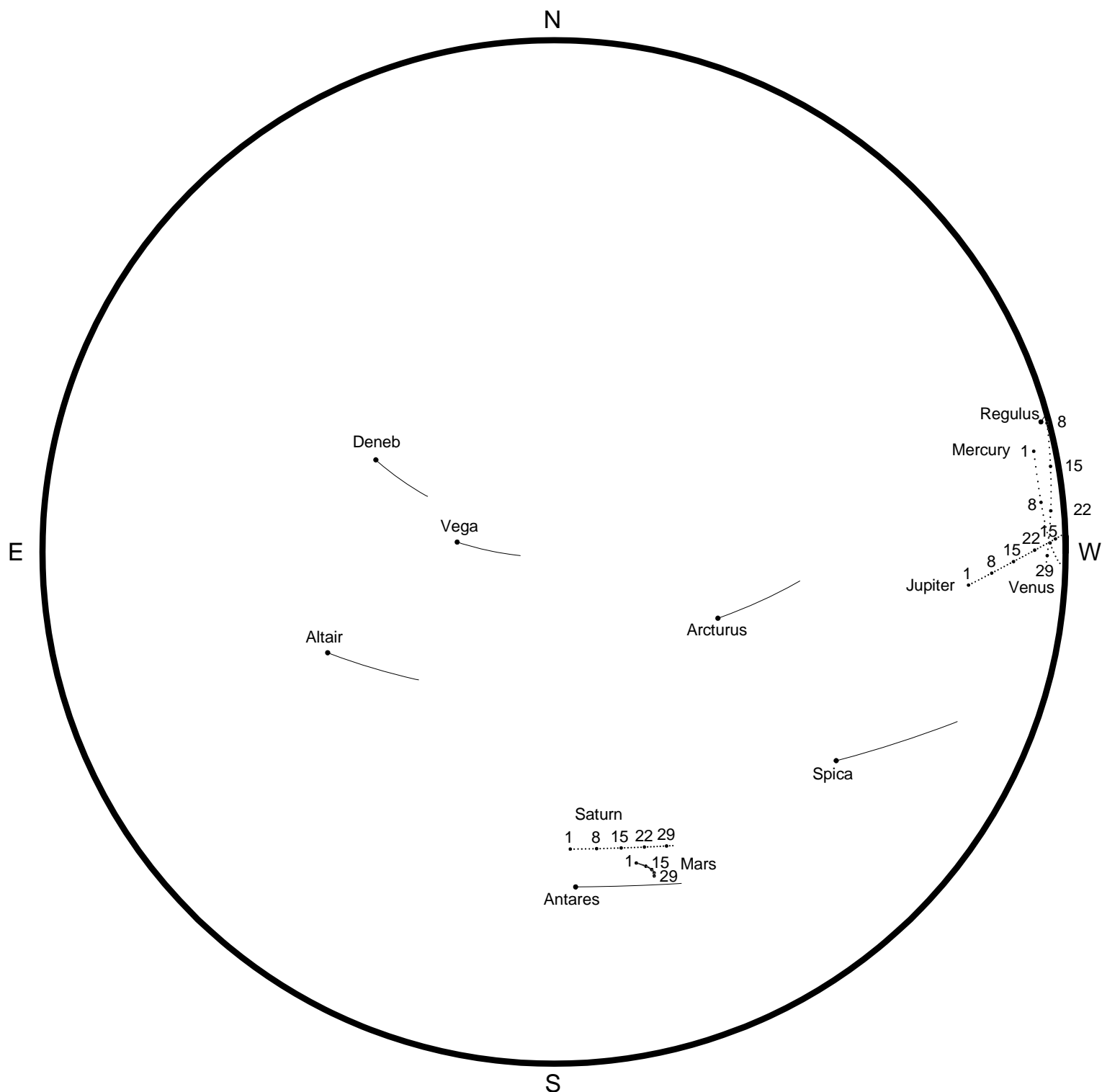
Sept. 1: New Moon, 5:03 a.m. EDT.

Sept. 2: Find 1.7-day-old thin crescent Moon very low in west, 5° lower right of Venus. Can you spot Jupiter within 1° to Moon’s right? Jupiter will sink into the solar glare within a few days.

Robert C. Victor was Staff Astronomer at Abrams Planetarium, Michigan State University. He is now retired and enjoys providing sky watching opportunities for public and school groups.

Planets and Bright Stars in Evening Mid-Twilight For August, 2016

This sky chart is drawn for latitude 40 degrees north,
but may be used in continental U.S. and southern Canada.



Evening mid-twilight occurs
when Sun is 9° below horizon.
Aug. 1: 48 minutes after sunset.
15: 46 " " "
31: 44 " " "

Stereographic Projection
Map by Robert D. Miller

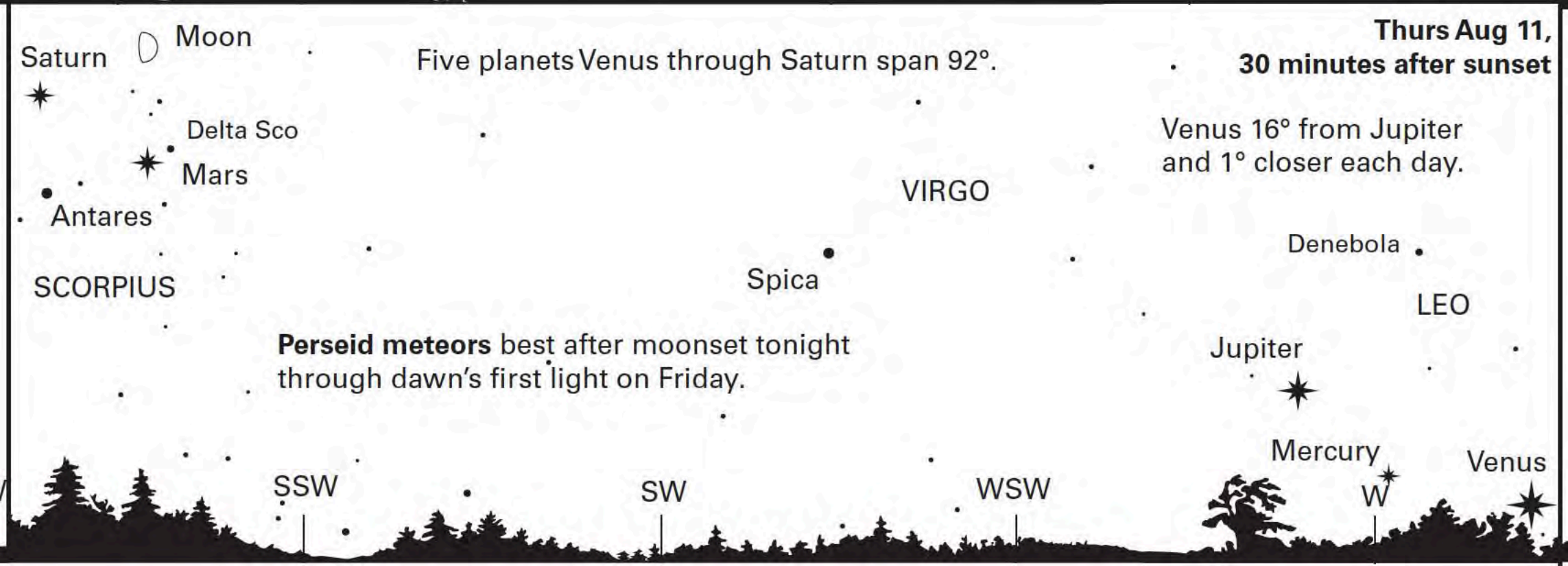
Thurs Aug 11,

30 minutes after sunset

Five planets Venus through Saturn span 92°.

Venus 16° from Jupiter
and 1° closer each day.

Perseid meteors best after moonset tonight
through dawn's first light on Friday.



Wednesday Aug 17,
30 minutes after sunset

Alpha Cap

SAGITTARIUS

Saturn

Mars

Antares

Alpha Lib

VIRGO

Spica

Denebola

LEO

Unusually bright Full Moon late tonight.
Look up *opposition effect*.

TEAPOT

SCORPIUS

Jupiter

Mercury

Venus

ESE

SE

SSE

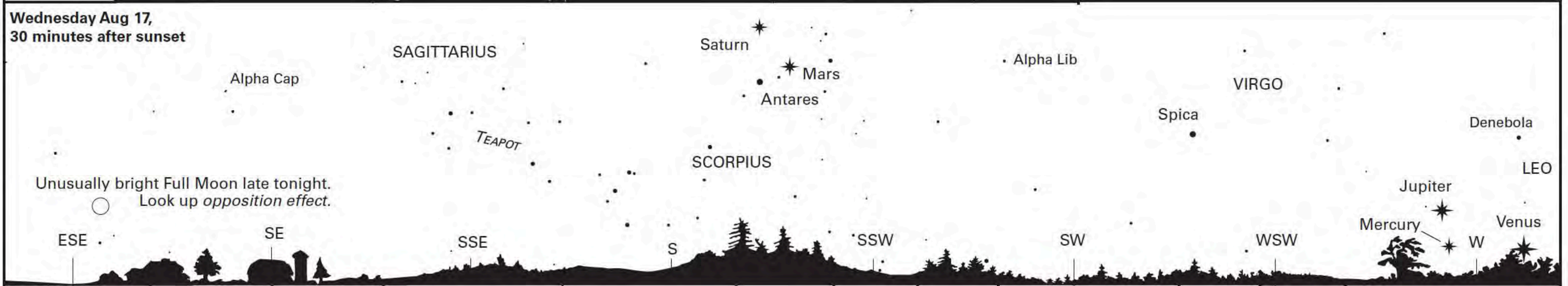
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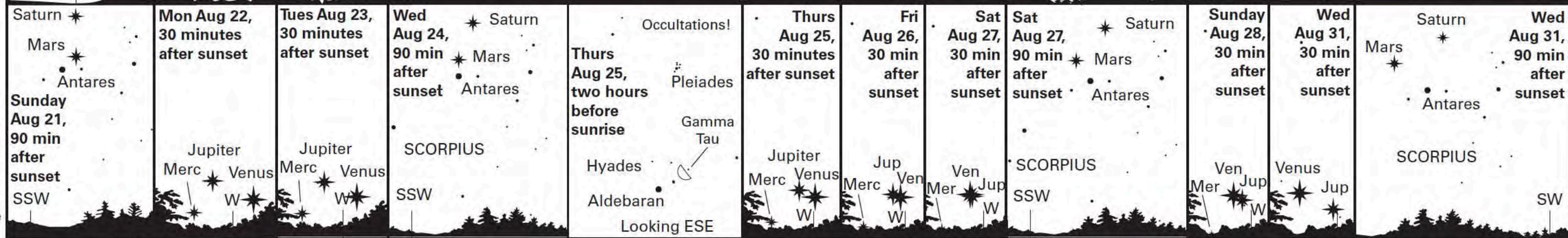
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SW

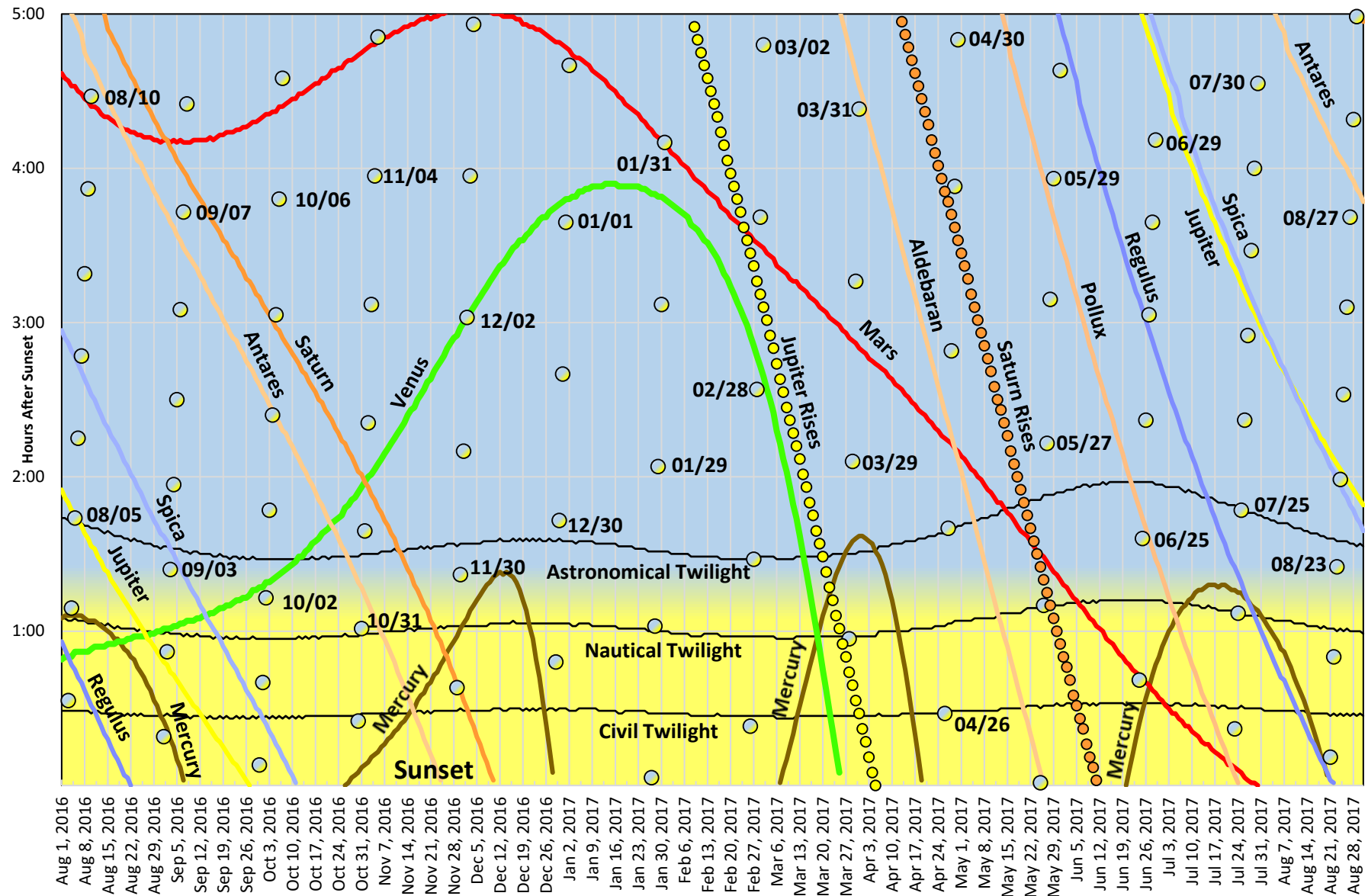
WSW

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Evening Sky, August 2016-August 2017 Sacramento, California



All moon dots, and the curves for planets and stars, indicate setting times in relation to sunset, except for the two planet curves labeled to indicate times of rising, also in relation to sunset.