SKY CALENDAR NOVEMBER 2017

An aid to enjoying the changing sky

Planetarium business office:
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Use this scale to measure angular distances between objects on diagrams below.

0° 10° 20°

November 2017 is a month of twilight treats, both morning and evening, so **binoculars are recommended** for enjoyable viewing. Note illustrations on calendar depicting **Venus and Jupiter low in the ESE morning twilight glow** 40 or 45 minutes before sunrise. In latter half of month, diagrams show **Saturn and Mercury low in the SW evening twilight glow** 40 or 45 minutes after sunset.

Of the morning planets, only dim, distant Mars rises in a dark sky throughout the month. Mars is of mag. +1.8 to +1.7, about as faint as it ever gets. At opposition and closest approach in July 2018, Mars will gleam at mag. −2.8, its brightest since 2003. Brilliant **Venus** of mag. −3.9 rises in ever brighter twilight, 1.4 hours before sunup on the 1st, and just 0.8 hour before sunup on the 30th. Watch for Venus' rising 16°-34° lower left of Mars. **Jupiter**, at mag. −1.7, is still lost in Sun's glare in the first week, but during **Nov. 8-18 may be found in the same binocular field as Venus**, as depicted on calendar. **Ve-Ju appear closest, just 0.3° apart, on Nov. 13.** (Their next pairings after this one will occur in 2019, on Jan. 22 in morning sky, and Nov. 24 in evening.) By end of Nov. 2017, Jupiter climbs 18° upper right of Venus, and rises in dark sky 2.3 hours before sunup.

Evening: Saturn (mag. +0.5), on Nov. 1 sets in dark sky 2.6 hours after sunset, and telescopes reveal its rings tipped as much as possible, 27° from edgewise. But in latter half of month, Saturn approaches brighter **Mercury** (mag. −0.4 to −0.1), mired very low in twilight. **For binoculars, after evening twilight ends: Uranus** in Pisces and **and Neptune** in Aquarius. Visit *web.pa.msu.edu/abrams/msta/skycalnov2017.html.* for more information

The long-period variable star Mira is expected to reach peak brightness in Jan. 2018. Note the "V" of Aldebaran and the Hyades cluster points in a straight line to Lambda Tauri, Alpha and Delta Ceti, and Mira. See boxes for Nov. 3-5 and Nov 21, and our monthly star chart for Dec. 2017. In Nov. 2017 Mira is too faint for most binocs, but as it brightens in Dec-Jan, compare it to Alpha Ceti at mag 2.5, Gamma at 3.6, and Delta at 4.1. Visit *aavso.org.*

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Wed Nov 1, 45 minutes after sunset: Saturn, 16°, SCORPIUS, SW, Antares, WSW	**Thurs Nov 2,** one hour before sunrise: Mars, Arcturus, VIRGO, 17°, Venus 3.5° N of Spica (min dist), E, Venus, ESE, Spica	**Fri Nov 3** ◯ Full Moon tonight, 10:23 p.m. PDT on Fri Nov 3, or 1:23 a.m. EDT on Sat Nov 4. In next box for Nov 3-5, Moon isn't plotted for Nov 5, because as seen from mid-U.S. it occults or covers Aldebaran at time illustrated. Occ'n of Aldebaran on Sunday Nov 5 best seen through telescope. Both disappearance behind Moon's leading bright edge (DB) and reappearance at trailing dark edge (RD) can be seen in evening after moonrise, E of a line through AL and ND. Farther west, Moon rises with occ'n already in progress, with RD observable as far west as LA TX OK KS CO WY and MT. East Lansing, MI: DB 8:04 p.m. EDT. RD 8:57 p.m. EDT.	**Nov 3-5,** 2.5 hours after sunset: Full Moon Fri 3, Gamma, Mira, Pleiades, Sat 4, Delta, Alpha, Hyades, LambdaTauri, CETUS, Moon occults Aldebaran Nov 5., Aldebaran, E, ESE
Nov 5-7, 1.5 hours before sunrise: Tues 7, Bull's horns, TAURUS, Mon 6 in WSW to W, Aldebaran, ORION, Pleiades, Sunday 5	**Nov 7-9,** 1.5 hours before sunrise: Castor, Pollux, Thurs 9, GEMINI, Wed 8 in SW, Procyon, Tues 7	**Wed Nov 8,** 45 minutes before sunrise: Mars, VIRGO, Ve-Ju 5°, Spica, Jupiter, Venus, ESE	**Nov 10-12,** 1.5 hours before sunrise: Daytime occ'n of Regulus Palm Springs 8:55-10:01 a.m. PST Nov 11., Fri 10, SICKLE, Last Qtr Nov 10 3:36 p.m. EST, Regulus, Sat 11 in SE, LEO, Denebola, Sunday 12	**Fri Nov 10,** 45 minutes before sunrise: Mars, VIRGO, 13°, Spica, Ve-Ju 3°, Jupiter, Venus, ESE	**Sat Nov 11,** 45 minutes before sunrise: Mars, VIRGO, Spica, Ve-Ju 1.9°, Jupiter, Venus, ESE
Sunday Nov 12, 45 minutes before sunrise: Mars, VIRGO, Spica, Ve-Ju 0.9°, Jupiter, Venus, ESE	**Mon Nov 13,** 45 minutes before sunrise: Mars, Min sep!, VIRGO, Spica, Ve 0.3° N (left) of Ju, Venus, Jupiter, ESE	**Tues Nov 14,** 45 minutes before sunrise: Mars, 10°, VIRGO, Spica, Ve-Ju 1.2°, Venus, Jupiter, ESE	**Wed Nov 15,** 45 minutes before sunrise: Mars, Moon, VIRGO, Spica, Ve-Ju 2.3°, Venus, Jupiter, ESE	**Thurs Nov 16,** 45 minutes before sunrise: Mars, 9°, VIRGO, Spica, Moon, Jupiter, Venus, ESE	**Fri Nov 17,** 45 minutes before sunrise: Mars, VIRGO, Spica, Ve-Ju 4.3°, Jupiter, Old Moon, Venus, ESE	**Fri Nov 17,** 40 minutes after sunset: Me-Sa 10°, Saturn, SW, Mercury	**Sat Nov 18,** 45 minutes before sunrise: Mars, 8°, Spica, VIRGO, Ve-Ju 5.4°, Jupiter, Venus, ESE	**Sat Nov 18,** ◯ New Moon 6:42 a.m. EST. Calculate Moon's age if you see it on Nov 17 or 19.
Sunday Nov 19, 40 minutes after sunset: Saturn, Me-Sa 8°, Young Moon, Mercury, SW, WSW	**Mon Nov 20,** 40 minutes after sunset: Me-Sa 7°, Saturn, Mercury, SW	SAGITTARIUS, **Tues Nov 21,** 40 minutes after sunset: Me-Sa 6.2°, Saturn, TEAPOT, SW, Mercury	Pleiades at opposition, **Tues Nov 21,** 75 minutes after sunset: Gamma, Mira, Delta, TAURUS, Alpha, Hyades, LambdaTauri, CETUS, ENE, Aldebaran, E, ESE	**Wed Nov 22,** 40 min after sunset: Me-Sa 5.4°, Mercury at greatest elongation, 22° on Nov 23., SAGITTARIUS, TEAPOT, Saturn, Mercury, SW	**Sat Nov 25,** 40 minutes before sunrise: Mars, Spica, Ve-Ju 13°, Ma-Sp 4.2°, Jupiter, Saturn, ESE, Venus, SE
Sunday Nov 26 ◑ Moon at First Quarter 12:03 p.m. EST. Follow Moon in afternoon and evening	**Mon Nov 27,** 40 minutes before sunrise: Jupiter, Ve-Ju 15°, Alpha, ESE, Venus	**Tues Nov 28,** 40 min after sunset: 3.0°, Saturn, SW, Mercury	**Wed Nov 29,** one hour before sunrise: Mars, 3.1° (min dist), Spica, Jupiter	**Wed Nov 29** Shortly after Venus rises, note Jupiter is midway between Venus and Mars, 17° from each.	**Thurs Nov 30,** one hour after sunset: ENE, Aldebaran at opposition Dec 1	

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November Evening Skies

This chart is drawn for latitude 40° north, but should be useful to stargazers throughout the continental United States. It represents the sky at the following local standard times:

Late October	10 p.m.
Early November	9 p.m.
Late November	8 p.m.
Early December	7 p.m.
Late December	6 p.m.

This map is applicable one hour either side of the above times.

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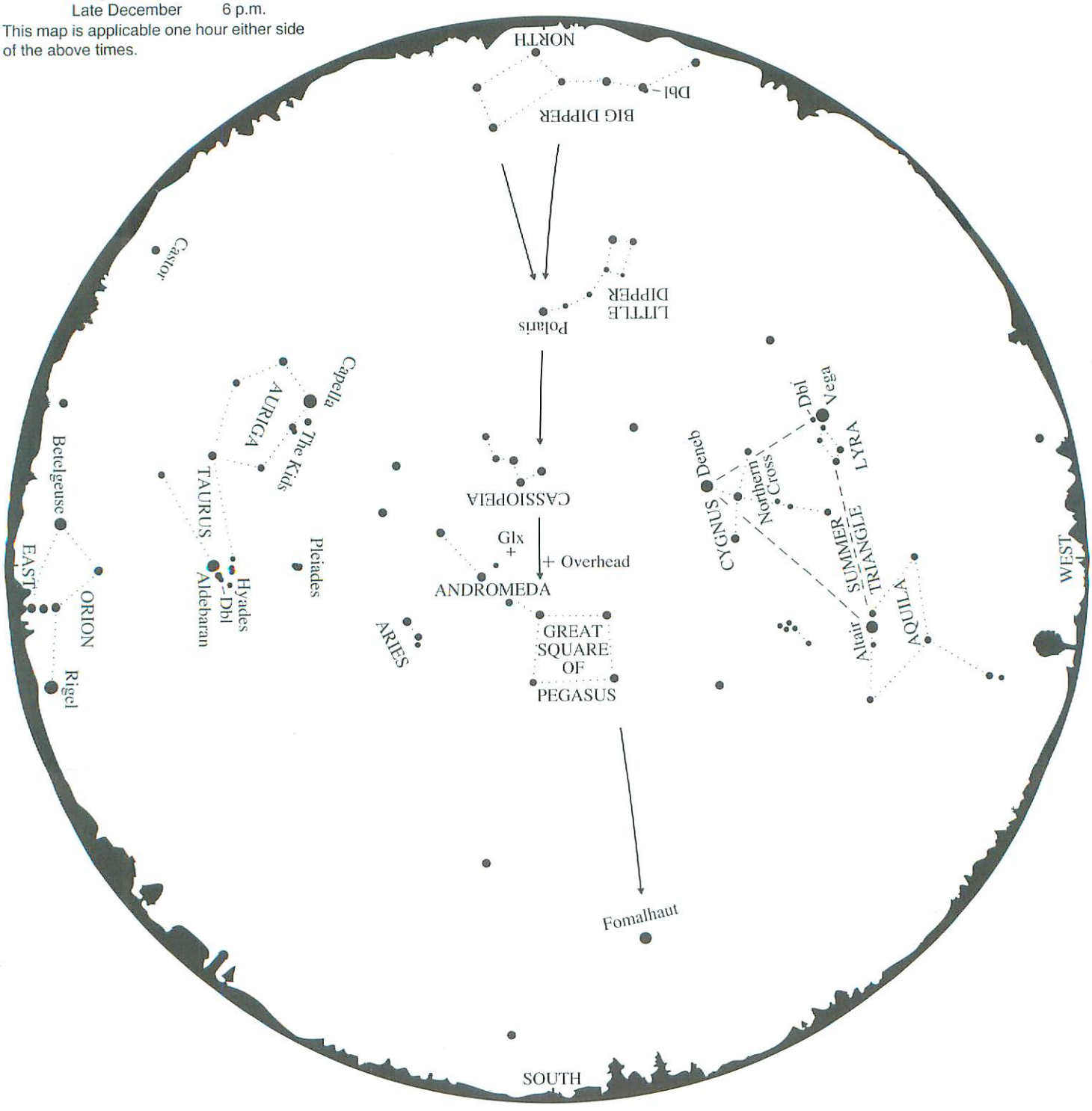

No planets are plotted for mid-November 2017. At chart time eight objects of first magnitude or brighter are visible. In order of brightness they are: Vega, Capella, Rigel, Betelgeuse, Altair, Aldebaran, Fomalhaut, and Deneb. In addition to stars, other objects that should be visible to the unaided eye are labeled on the map. The double star (Dbl) at the bend of the handle of the Big Dipper is detectable low in the north. Another is close to Aldebaran in the "face" of Taurus. More closely spaced is the double star near Vega in Lyra. The position of an external star system, called the Andromeda Galaxy after the constellation in which it appears, is also indicated (Glx). Try to observe these objects with unaided eye and binoculars.

—D. David Batch