

November Evening Skies

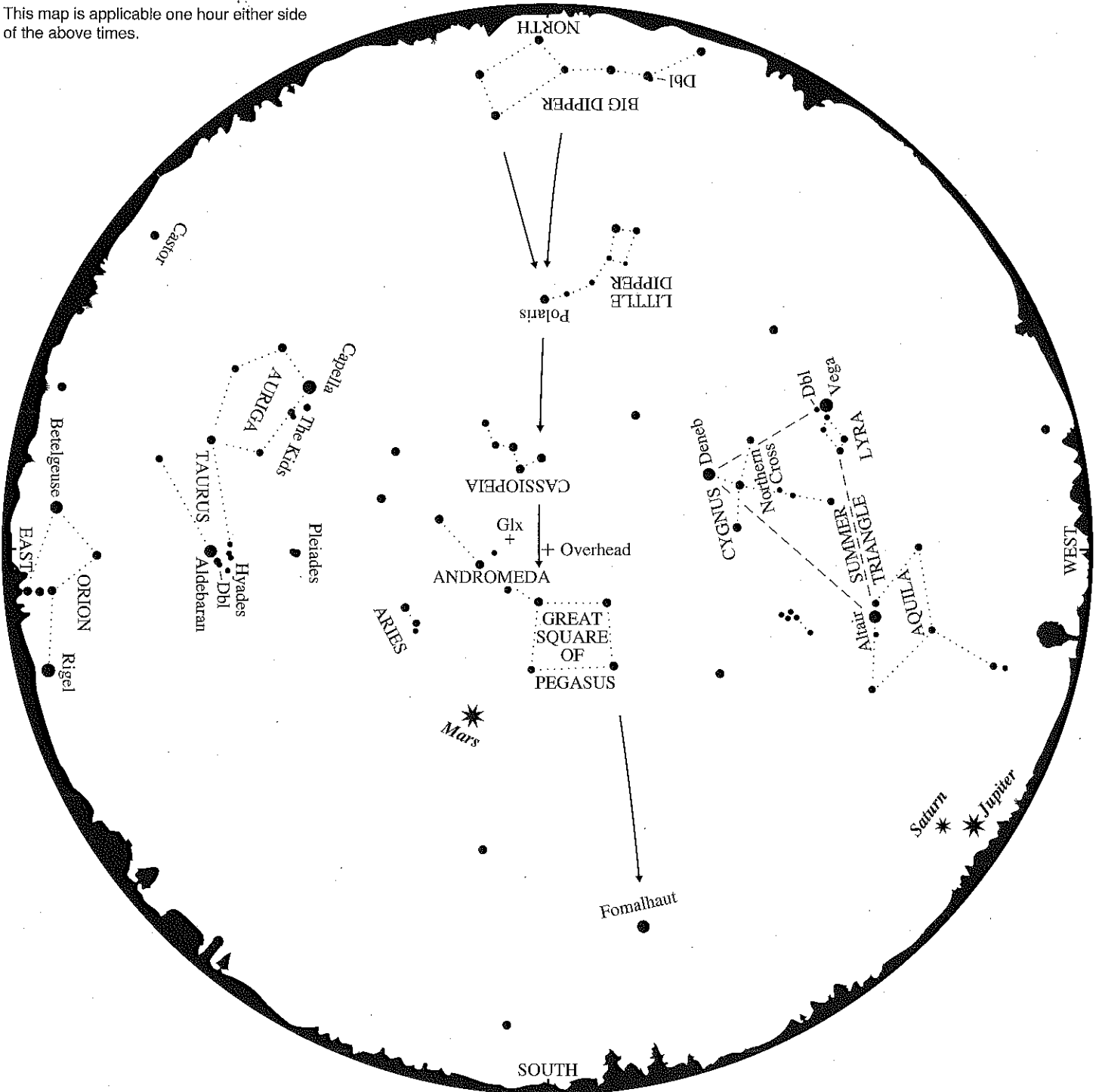
This chart is drawn for latitude 40° north, but should be useful to stargazers throughout the continental United States. It represents the sky at the following local standard times:

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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The planets Mars, Jupiter, and Saturn are plotted for mid-November 2020. At chart time eleven objects of first magnitude or brighter are visible. In order of brightness they are: Jupiter, Mars, Vega, Capella, Rigel, Saturn, 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 detect-

able 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.

ABRAMS PLANETARIUM SKY CALENDAR NOVEMBER 2020

An aid to enjoying the changing sky

Use this scale to measure angular distances between objects on diagrams below.

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Evenings: In mid-November, SpaceShip Earth is flying directly away from the 3rd-mag. star Delta Capricorni, or Deneb Agedi, tail of Capricornus; the Sea-goat, in south as twilight ends. During last four months, our fast-moving planet overtook all five outer planets: **Jupiter** and **Saturn** in July, **Neptune** in September, **Mars** and **Uranus** in October, each in turn appearing at *opposition* as we passed between Sun and planet. Now in November 2020, we are looking behind our planet at an impressive lineup of all the outer planets across the evening sky.

Let's consider the bright planets in order from west to east: In Sagittarius, east of the Teapot, **Jupiter**, at mag. -2.2 to -2.0, is now the brightest "star" in the evening sky. Look for it in SSW to SW an hour after sunset, lower as month progresses. Just 5.2° to 2.3° to its upper left is **Saturn**, at mag. -0.6 about one-tenth as bright. Illustrations for Nov. 2, 13, 23, Dec. 3, 12, 21 show Jupiter creeping about 1° closer to Saturn each ten days. A spectacular *close conjunction* will occur on **December 21**. These largest planets - Jupiter with cloud belts and four bright satellites, and Saturn with rings, are always pleasing for telescopic viewing.

Mars drops in brilliance from mag. -2.1 to -1.1 this month as we race away. An hour after sunset, the red planet climbs higher in ESE as month progresses, but remains near Delta and Epsilon in Pisces, a pair of matched 4th-mag stars 3.5° apart. Ending retrograde on the 13th, Mars doesn't wander far in Nov. Using binoculars and finder chart for Nov. 13, start at head of Centaurus star-tail, using fainter stars of Arias as stepping-stones to 5.7-mag. **Uranus**.

In morning sky, Regulus, heart of Leo, lies dead ahead of SpaceShip Earth on Nov. 21. This month, we're seeing the swift inner planets: **Mercury** and **Venus**, racing ahead of us. In a favorable apparition lasting nearly all month, **Mercury** stays 13° lower left of Venus Nov. 10-18. Mercury approaches within 4° E of Spica in a *quasi-conjunction* on Nov. 2. Venus passes 4° N of the same star on Nov. 18.

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>Sunday Nov 1, 2 hours 22 minutes before sunrise</p> <p>LEO Denebola</p> <p>Virgo E</p>	<p>Monday Nov 2, 1 1/2 hours before sunrise</p> <p>MILU - Uranus CETUS - Xi² Cet ARIES - Xi¹ Cet</p> <p>TAURUS Zeta Tauri</p> <p>PISCES Alpha Psc Mars W</p>	<p>Tuesday Nov 3, 45 minutes before sunrise</p> <p>TAURUS Zeta Tauri</p> <p>TAURUS Aldebaran Hyades Pleiades</p> <p>Virgo Mercury Venus</p>	<p>Wednesday Nov 4, 1 1/2 hours before sunrise</p> <p>TAURUS Zeta Tauri</p> <p>Virgo Mercury Venus</p>	<p>Thursday Nov 5, 2:45 minutes before sunrise</p> <p>Virgo Mercury Venus</p> <p>Sagittarius Spica ESE</p>	<p>Friday Nov 6, 1 1/2 hours after sunset</p> <p>Virgo Mercury Venus</p> <p>Sagittarius Spica ESE</p>	<p>Saturday Nov 7, 1 1/2 hours before sunrise</p> <p>POLLUX Castor Beehive Cluster FIC 6 THURS 5 GEMINI</p>
<p>Sunday Nov 8-10, 1 1/2 hours before sunrise</p> <p>Virgo E</p> <p>Virgo E</p>	<p>Monday Nov 9, 8:46 a.m. EST</p> <p>LEO Regulus</p> <p>Virgo ESE</p>	<p>Tuesday Nov 10, one hour before sunrise</p> <p>Virgo Venus</p> <p>Virgo Mercury Spica ESE</p>	<p>Wednesday Nov 11, one hour before sunrise</p> <p>Virgo Venus</p> <p>Virgo Mercury Spica ESE</p>	<p>Thursday Nov 12, one hour before sunrise</p> <p>Virgo Venus</p> <p>Virgo Mercury Spica ESE</p>	<p>Friday Nov 13, one hour before sunrise</p> <p>Virgo Venus</p> <p>Virgo Mercury Spica ESE</p>	<p>Saturday Nov 14, 30 minutes before sunrise</p> <p>Virgo Venus Spica</p>
<p>Sunday Nov 15, soon after sunset, thin crescent Moon</p> <p>Virgo Venus Spica ESE</p>	<p>Monday Nov 16, one hour before sunrise</p> <p>Virgo Venus Spica ESE</p>	<p>Tuesday Nov 17, one hour after sunset</p> <p>Virgo Venus Spica ESE</p>	<p>Wednesday Nov 18, one hour after sunset</p> <p>Virgo Venus Spica ESE</p>	<p>Thursday Nov 19, one hour after sunset</p> <p>Virgo Venus Spica ESE</p>	<p>Friday Nov 20, one hour after sunset</p> <p>Virgo Venus Spica ESE</p>	<p>Saturday Nov 21, First Quarter 11:45 p.m. EST</p> <p>Virgo Venus Spica ESE</p>
<p>Sunday Nov 22, Have you selected a site for observing the spectacular close pairing of Jupiter and Saturn on Monday, Dec. 21?</p> <p>Virgo Saturn Jupiter</p>	<p>Monday Nov 23, one hour after sunset</p> <p>Virgo Saturn Jupiter</p>	<p>Tuesday Nov 24, 45 minutes before sunrise</p> <p>Virgo Saturn Jupiter</p>	<p>Wednesday Nov 25, 1 1/4 hours before sunrise</p> <p>Virgo Saturn Jupiter</p>	<p>Thursday Nov 26, 40 minutes before sunrise</p> <p>Virgo Saturn Jupiter</p>	<p>Friday Nov 27, 1 1/4 hours after sunset</p> <p>Virgo Saturn Jupiter</p>	<p>Saturday Nov 28, 1 1/4 hours after sunset</p> <p>Virgo Saturn Jupiter</p>
<p>Sunday Nov 29, 4:43 a.m. EST</p> <p>Virgo Saturn Jupiter</p>	<p>Monday Nov 30, Full Moon 4:30 a.m. EST</p> <p>Virgo Saturn Jupiter</p>	<p>Tuesday Nov 31, 1 1/4 hours after sunset</p> <p>Virgo Saturn Jupiter</p>	<p>Wednesday Nov 32, 1 1/4 hours after sunset</p> <p>Virgo Saturn Jupiter</p>	<p>Thursday Nov 33, 1 1/4 hours after sunset</p> <p>Virgo Saturn Jupiter</p>	<p>Friday Nov 34, 1 1/4 hours after sunset</p> <p>Virgo Saturn Jupiter</p>	<p>Saturday Nov 35, 1 1/4 hours after sunset</p> <p>Virgo Saturn Jupiter</p>

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 ISSN 0733-6314
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December Evening Skies

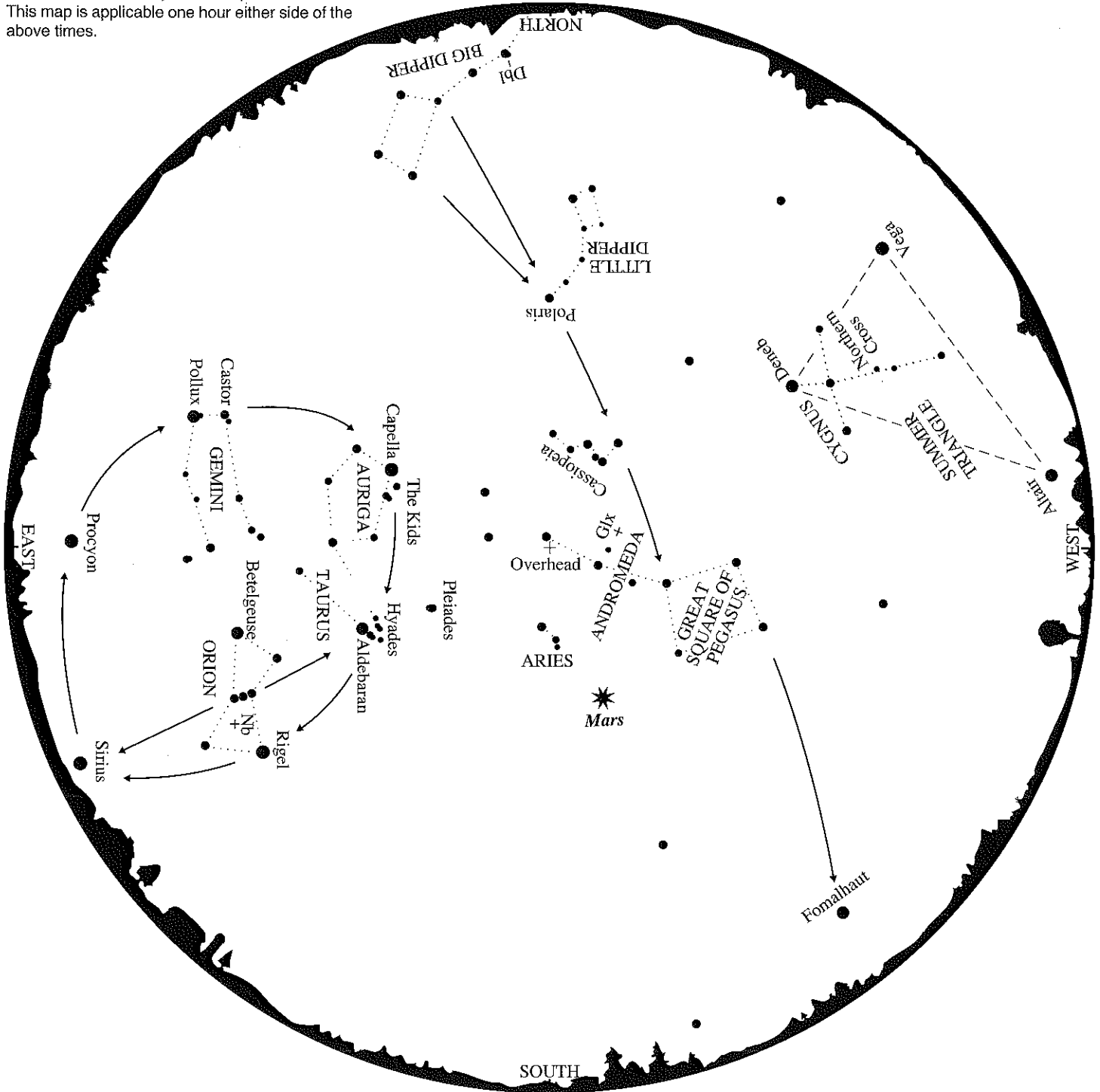
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Mars is plotted for mid-December 2020. At chart time 12 objects of first magnitude or brighter are visible. In order of brightness they are: Sirius, Mars, Vega, Capella, Rigel, Procyon, Betelgeuse, Altair, Aldebaran, Polliux, Fomalhaut, and Deneb. 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 should be detectable above the tree

tops in the north. The famous Orion Nebula, a cloud of gas and dust out of which stars are forming, is marked (Nb) in that constellation. 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

ABRAMS PLANETARIUM

SKY CALENDAR DECEMBER 2020

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Use this scale to measure angular distances between objects on diagrams below.

0° 10° 20°

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Evenings: Jupiter and Saturn form a striking, close pair in SW sky at dusk, within 2.2° apart on Dec. 1, closing to just over 6 arcminutes (0.1°) apart on Monday, Dec. 21, and reopening to nearly 1.2° apart on Dec. 31. During Dec. 12-29, the two giant planets appear within 1° easily fitting within a low-power telescope field. Evenings around Dec. 21, try higher magnifications for closer views of Jupiter's cloud belts; system of four Galilean satellites; and Saturn with rings 21° from edge-on, all within one field!

The pairing of Jupiter-Saturn in Capricornus on Dec. 21, 2020 is their closest since a conjunction in Cancer in 1623, and until another in Capricornus in 2080. Jupiter-Saturn pairings occur at intervals of about 20 years, just over two-thirds of the way eastward (or nearly one-third of the way westward) around the zodiac on each successive occasion. At their next two pairings, in Virgo on the morning of Oct. 31, 2040, and in Taurus within 5° S of the Pleiades on the evening of April 7, 2060, they'll appear 1.1° apart. This month, Jupiter at mag. -2.0 is the brightest evening "star," following Sun over WSW horizon by 3.3 hours on Dec. 1, by 2.3 hours on Dec. 21, and 1.7 hours on Dec. 31 (from lat. 40° N). Saturn at mag. +0.6 is about one-tenth as bright.

Mars is high in SW sky at dusk, fading from mag. -1.1 to -0.2 this month as Earth pulls away; the red planet ranks next in brightness after Jupiter among early evenings "stars," claims first place when Jupiter sets; and then drops back to second when Sirius appears in ESE. During Dec. 1-31, Mars goes 10° east against the faint constellation Pisces. Binoculars help you enjoy these passages; Mars 10° S of 4.3-mag. Epsilon Pisc on Dec. 4; within 6° N of globous Moon on Dec. 23; 4.5° S of 3.6-mag. Eta Pisc on Dec. 31; 2.5° N of 4.3-mag. Omicron Pisc on Jan. 1, 2021; and 16° N of 5.7-mag. Uranus on Jan. 20.

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Dec 6-8, one hour before sunrise Denebola	Mon Dec 7 Last Quarter Moon 7:37 p.m. EST	Tues Dec 8 Saturn after sunset Jupiter Sa-Ju 2.2°	Wed Dec 9 Pollux	Thurs Dec 10 Castor	Fri Dec 11 Virgo	Sat Dec 12 Alpha Cap, Beta Cap Saturn after sunset Jupiter Sa-Ju 1.7°
Sunday Dec 13, 40 minutes before sunrise Beta Lib	Monday Dec 14, total solar eclipse Chile and Argentina.	Tues Dec 15, 40 minutes before sunrise Alpha Cap, Beta Cap, Saturn Sa-Ju 0.6°	Wed Dec 16, 40 minutes before sunrise Alpha Cap, Beta Cap, Saturn Sa-Ju 0.5°	Thurs Dec 17, one hour after sunset Alpha Cap, Beta Cap, Saturn Sa-Ju 0.17°	Fri Dec 18, one hour after sunset Alpha Cap, Beta Cap, Saturn Sa-Ju 0.17°	Sat Dec 19, one hour after sunset Alpha Cap, Beta Cap, Saturn Sa-Ju 0.22°
Sunday Dec 20, one hour after sunset Alpha Cap, Beta Cap Sa-Ju 0.13°	Monday Dec 21, 5:02 a.m. EST. Winter begins in N hemisphere Alpha Cap, Beta Cap Sa-Ju 0.10°	Tues Dec 22, one hour after sunset Alpha Cap, Beta Cap, Saturn Sa-Ju 0.10°	Wed Dec 23, 40 min. before sunrise Alpha Cap, Beta Cap, Saturn Sa-Ju 0.17°	Thurs Dec 24, one hour after sunset Alpha Cap, Beta Cap, Saturn Sa-Ju 0.17°	Fri Dec 25, one hour after sunset Alpha Cap, Beta Cap, Saturn Sa-Ju 0.17°	Sat Dec 26, one hour after sunset Alpha Cap, Beta Cap, Saturn Sa-Ju 0.6°
Sunday Dec 27, one hour after sunset Hyades, Aldebaran	Monday Dec 28, 6:41 p.m. EST. First Quarter Moon Alpha Cap, Beta Cap Sa-Ju 0.10°	Tues Dec 29, 10:28 p.m. EST. Peak of Ursid meteors Alpha Cap, Beta Cap Sa-Ju 0.10°	Wed Dec 30, 40 minutes before sunrise Alpha Cap, Beta Cap, Saturn Sa-Ju 1.1°	Thurs Dec 31, one hour before sunrise Alpha Cap, Beta Cap, Saturn Sa-Ju 1.1°	Fri Dec 1 Pollux	Sat Dec 2 Castor
Sunday Dec 20, one hour after sunset (telescopic view) Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Monday Dec 21, one hour after sunset (telescopic view) Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Tuesday Dec 22, one hour after sunset (telescopic view) Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Wednesday Dec 23, one hour after sunset (telescopic view) Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Thursday Dec 24, one hour after sunset (telescopic view) Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Friday Dec 25, one hour after sunset (telescopic view) Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Saturday Dec 26, one hour after sunset (telescopic view) Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan
Sunday Dec 20, one hour after sunset Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Monday Dec 21, one hour after sunset Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Tuesday Dec 22, one hour after sunset Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Wednesday Dec 23, one hour after sunset Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Thursday Dec 24, one hour after sunset Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Friday Dec 25, one hour after sunset Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Saturday Dec 26, one hour after sunset Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan
Sunday Dec 20, one hour after sunset Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Monday Dec 21, one hour after sunset Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Tuesday Dec 22, one hour after sunset Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Wednesday Dec 23, one hour after sunset Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Thursday Dec 24, one hour after sunset Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Friday Dec 25, one hour after sunset Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Saturday Dec 26, one hour after sunset Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan
Sunday Dec 20, one hour after sunset Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Monday Dec 21, one hour after sunset Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Tuesday Dec 22, one hour after sunset Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Wednesday Dec 23, one hour after sunset Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Thursday Dec 24, one hour after sunset Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Friday Dec 25, one hour after sunset Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan	Saturday Dec 26, one hour after sunset Saturn, Callisto, Ganymede, Jupiter, Europa, Io, Titan

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 ISSN 0733-6314

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January Evening Skies

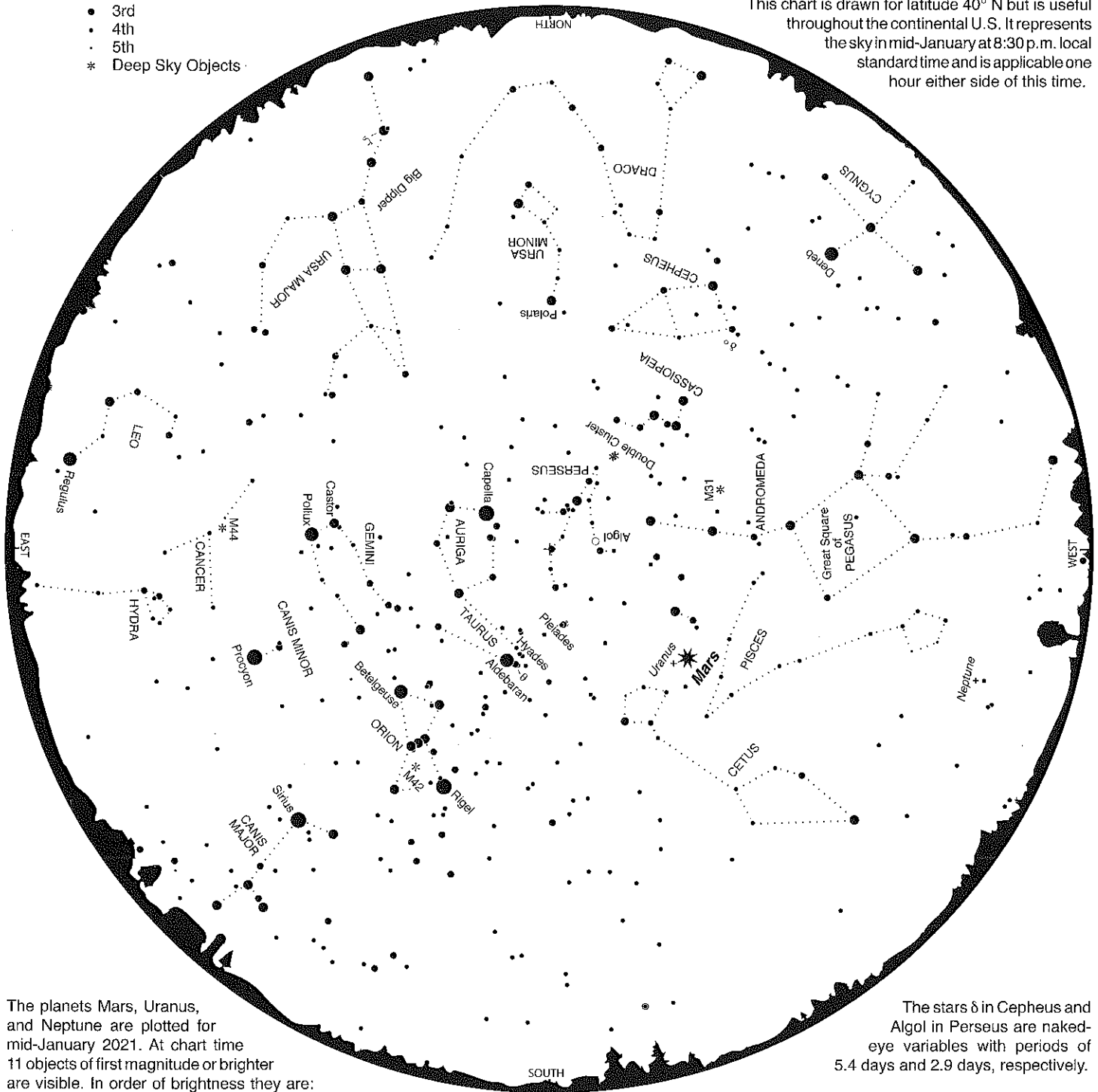
LEGEND Star Magnitudes

- Zero or brighter
- 1st
- 2nd
- 3rd
- 4th
- 5th
- * Deep Sky Objects

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This chart is drawn for latitude 40° N but is useful throughout the continental U.S. It represents the sky in mid-January at 8:30 p.m. local standard time and is applicable one hour either side of this time.



The planets Mars, Uranus, and Neptune are plotted for mid-January 2021. At chart time 11 objects of first magnitude or brighter are visible. In order of brightness they are: Sirius, Capella, Mars, Rigel, Procyon, Betelgeuse, Aldebaran, Pollux, Deneb, and Regulus.

Our usual monthly maps are designed for stargazers just beginning to find their way around the sky. This month's map is useful for serious stargazing from dark locations. It contains many more stars, inclusive to magnitude 4.5, and some fainter stars as needed to complete patterns or assist in locating special objects.

A selection of double stars (labeled with Greek letters) and "deep sky objects" is also plotted. All are visible with modest equipment; most are within the range of the unaided eye or binoculars. The double stars, in order of decreasing angular separation, are ζ in Ursa Major, and θ in Taurus.

The stars δ in Cepheus and Algor in Perseus are naked-eye variables with periods of 5.4 days and 2.9 days, respectively.

Four open or galactic star clusters are noted: the Pleiades or Seven Sisters, and the Hyades, both in Taurus; the Double Cluster in Perseus; and M44, the Beehive or Praesepe, in Cancer.

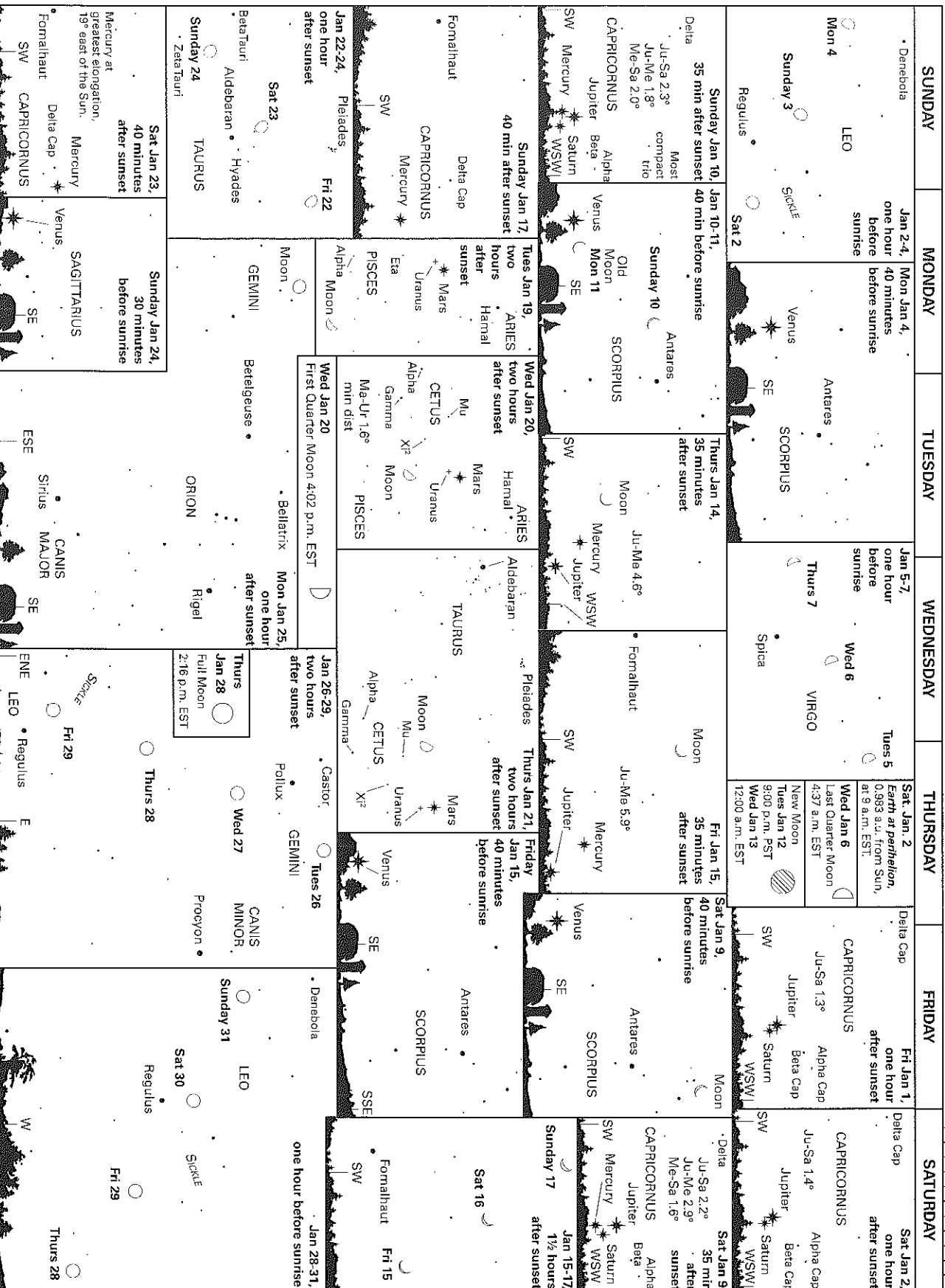
M42 is the famous Orion Nebula, a gas cloud out of which stars are forming. M31 is the Andromeda Galaxy, a collection of 300 billion stars located 2.5 million light years from Earth. Look for both with unaided eye and binoculars from a dark location.

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An aid to enjoying the changing sky

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Evening Planets:
Jupiter and Saturn start the month low in the southwest. **Mercury** overtakes them Jan 9 to 11. **Jupiter** is pulling away from Saturn after their historic conjunction last month. The next **Jupiter-Saturn** conjunction will be October 31, 2040. The gas giant pair drops from view by mid-month. **Saturn** and **Jupiter** will reemerge from the sun's glare in the morning sky next month.

Mercury forms a triangle with **Jupiter** and **Saturn** on January 10. Afterwards, **Mercury** climbs higher and away from **Jupiter** and **Saturn**. **Mercury** remains visible low in the southwest for the rest of the month. **January 23**, **Mercury** is at greatest elongation, 19° east of the Sun. **Mars** shines brightly high overhead all month.

Mars passes Uranus January 20 with the Moon close by. **Earth** is moving away from **Mars**. **Mars** is 84.3 million miles away from **Earth** on January 1 and 11 million miles away on January 31. **Uranus** is 1.798 billion miles from **Earth** January 1 and 1.844 billion miles away on January 31.

Morning Planet: Venus is still easy to spot low in southeast at start of the month. **Venus** is lost in Sun's glare late in the month. On what morning can you last spot **Venus**? **Venus** will be at superior conjunction with the Sun on March 26, 2021. **Venus** will reemerge into the evening sky in late April.

The **Quadrantid meteor shower** peaks **January 3, 2021**. Look for "shooting stars" in the predawn sky. This shower's radiant is north of the constellation **Boötes** the Herdsman.

Sunday Jan 10, 35 min after sunset
 Most compact trio
 Ju-Sa 2.3°
 Ju-Me 1.8°
 Me-Sa 2.0°
 CAPRICORNUS
 Jupiter Beta
 Alpha
 Venus
 Moon
 Mon 11
 SE

Monday Jan 11, 40 min before sunrise
 Old Moon
 SCORPIUS
 Antares
 Venus
 SE

Tuesday Jan 12, 35 minutes after sunset
 Moon
 Ju-Ma 4.6°
 Mercury WSW
 Jupiter
 SW

Wednesday Jan 13, 35 minutes after sunset
 Moon
 Ju-Ma 5.9°
 Mercury
 Jupiter
 SW

Thursday Jan 14, 40 minutes before sunrise
 Moon
 Delta Cap
 after sunset
 CAPRICORNUS
 Jupiter
 Beta Cap
 Saturn
 WSW

Friday Jan 15, 40 minutes before sunrise
 Moon
 Antares
 SCORPIUS
 Venus
 SE

Saturday Jan 16, 35 min after sunset
 Delta
 Ju-Sa 2.2°
 Ju-Me 2.9°
 Me-Sa 1.6°
 CAPRICORNUS
 Jupiter
 Beta
 Alpha
 Saturn
 WSW

Sunday Jan 17, 40 min after sunset
 Delta Cap
 CAPRICORNUS
 Mercury
 SW

Tuesday Jan 19, two hours after sunset
 ARIES
 Hamal
 Mars
 Uranus
 Eta
 PISCES
 Alpha
 Moon
 SE

Wednesday Jan 20, two hours after sunset
 ARIES
 Hamal
 Mars
 Uranus
 Mu
 CETUS
 Alpha
 Xp
 Gamma
 Moon
 PISCES
 Ma-Ur 1.6° min dist
 PISCES
 Alpha
 Gamma

Thursday Jan 21, two hours after sunset
 PISCES
 Hamal
 Taurus
 Pleiades
 Taurus
 Moon
 Mu
 CETUS
 Xp
 Gamma

Friday Jan 22, one hour after sunset
 Pleiades
 FII 22
 one hour after sunset

Saturday Jan 23, 40 minutes before sunrise
 Moon
 GEMINI
 Betelgeuse
 Orion
 Rigel

Sunday Jan 24, 30 minutes before sunrise
 SAGITTARIUS
 Venus
 SE

Monday Jan 25, one hour after sunset
 Castor
 Gemini
 Pollux
 WED 27
 CANIS MINOR
 Procyon

Tuesday Jan 26, two hours after sunset
 Castor
 Gemini
 Pollux
 WED 27
 CANIS MINOR
 Procyon

Wednesday Jan 27, two hours after sunset
 Castor
 Gemini
 Pollux
 WED 27
 CANIS MINOR
 Procyon

Thursday Jan 28, two hours after sunset
 Castor
 Gemini
 Pollux
 WED 27
 CANIS MINOR
 Procyon

Friday Jan 29, one hour before sunrise
 Delta Cap
 after sunset
 CAPRICORNUS
 Jupiter
 Beta Cap
 Saturn
 WSW

Saturday Jan 30, one hour before sunrise
 Delta Cap
 after sunset
 CAPRICORNUS
 Jupiter
 Beta Cap
 Saturn
 WSW

Sunday Jan 31, one hour before sunrise
 Delta Cap
 after sunset
 CAPRICORNUS
 Jupiter
 Beta Cap
 Saturn
 WSW

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Monday Jan 31, one hour before sunrise
 Delta Cap
 after sunset
 CAPRICORNUS
 Jupiter
 Beta Cap
 Saturn
 WSW

Tuesday Jan 31, one hour before sunrise
 Delta Cap
 after sunset
 CAPRICORNUS
 Jupiter
 Beta Cap
 Saturn
 WSW

Wednesday Jan 31, one hour before sunrise
 Delta Cap
 after sunset
 CAPRICORNUS
 Jupiter
 Beta Cap
 Saturn
 WSW

Thursday Jan 31, one hour before sunrise
 Delta Cap
 after sunset
 CAPRICORNUS
 Jupiter
 Beta Cap
 Saturn
 WSW

Friday Jan 31, one hour before sunrise
 Delta Cap
 after sunset
 CAPRICORNUS
 Jupiter
 Beta Cap
 Saturn
 WSW

Saturday Jan 31, one hour before sunrise
 Delta Cap
 after sunset
 CAPRICORNUS
 Jupiter
 Beta Cap
 Saturn
 WSW

Sunday Jan 31, one hour before sunrise
 Delta Cap
 after sunset
 CAPRICORNUS
 Jupiter
 Beta Cap
 Saturn
 WSW

Monday Jan 31, one hour before sunrise
 Delta Cap
 after sunset
 CAPRICORNUS
 Jupiter
 Beta Cap
 Saturn
 WSW

Tuesday Jan 31, one hour before sunrise
 Delta Cap
 after sunset
 CAPRICORNUS
 Jupiter
 Beta Cap
 Saturn
 WSW

Wednesday Jan 31, one hour before sunrise
 Delta Cap
 after sunset
 CAPRICORNUS
 Jupiter
 Beta Cap
 Saturn
 WSW

Thursday Jan 31, one hour before sunrise
 Delta Cap
 after sunset
 CAPRICORNUS
 Jupiter
 Beta Cap
 Saturn
 WSW

Friday Jan 31, one hour before sunrise
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 Beta Cap
 Saturn
 WSW

Thursday Jan 31, one hour before sunrise
 Delta Cap
 after sunset
 CAPRICORNUS
 Jupiter
 Beta Cap
 Saturn
 WSW

John S. French, Robert C. Victor
 ISSN 0733-6314

Subscription: 755 Science Rd, East Lansing, MI 48824 or online at abramsplanetarium.org/skycalendar/
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