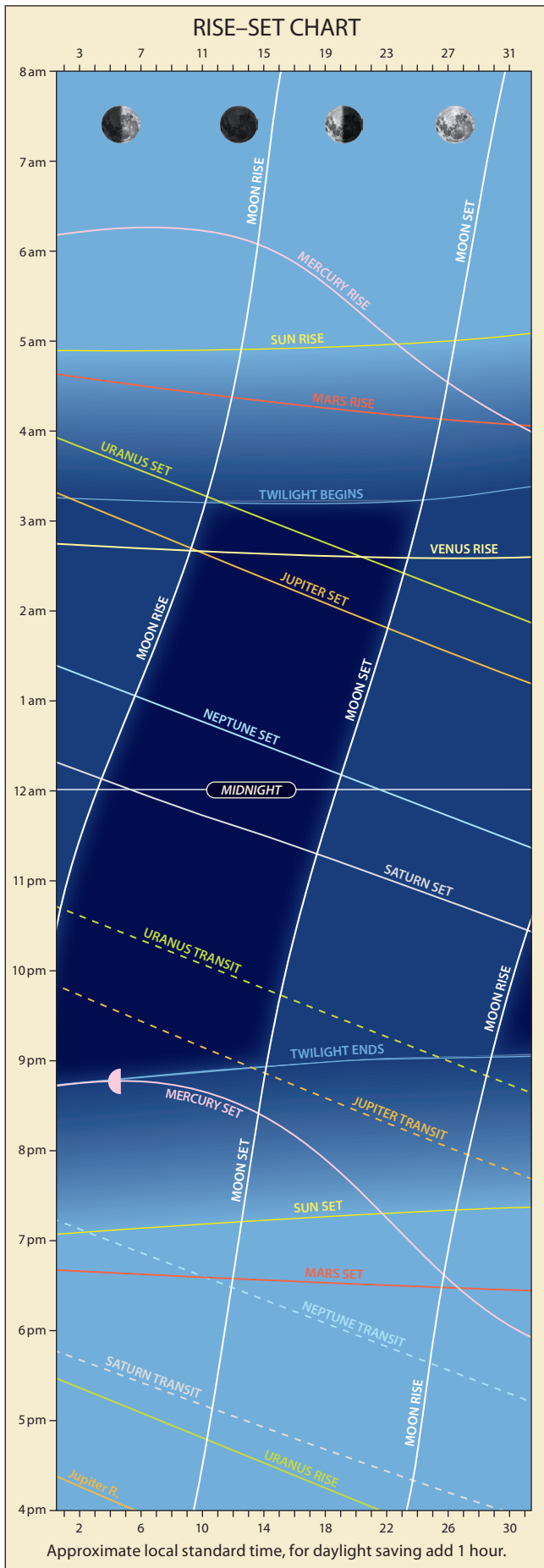


# DECEMBER 2023

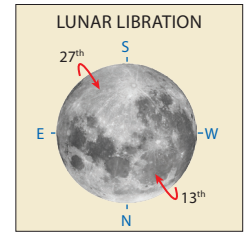


## HIGHLIGHT

○ The Geminids meteor shower.

## THE MOON

- 5<sup>th</sup> 5 am (3 am WST) Moon at apogee (furthest from Earth at 404,346 km).
- 5<sup>th</sup> 4 pm (2 pm WST) Last Quarter.
- 13<sup>th</sup> 10 am (8 am WST) New Moon.
- 13<sup>th</sup> Midnight (10 pm WST) Maximum Libration (7.4°), too close to New Moon to observe.
- 17<sup>th</sup> 5 am (3 am WST) Moon at perigee (closest to Earth at 367,901 km).
- 20<sup>th</sup> 5 am (3 am WST) First Quarter.
- 27<sup>th</sup> 11 am (9 am WST) Full Moon.
- 27<sup>th</sup> 8 pm (6 pm WST) Maximum Libration (7.8°), Full Moon.



## THE PLANETS

**Mercury** is visible in the western evening dusk sky. It reaches its greatest elongation of 21° east of the Sun on the 4<sup>th</sup>. The planet then loses altitude as it moves back toward the Sun and inferior conjunction (between Earth and the Sun) on the 23<sup>rd</sup>, returning to the morning dawn at month's end. On the 14<sup>th</sup>, the planet will be 5° below and north of the 2-day old slim waxing crescent Moon (see Sky View).

Visible in the early pre-dawn sky, **Venus** moves from Virgo to Libra this month. On the 10<sup>th</sup> the planet will be within 4° of the 26-day old waning crescent Moon (see Sky View). On the 17<sup>th</sup>

## APPEARANCE of the PLANETS

### MERCURY

4 Dec  
dia 6.6"  
mag -0.5  
Greatest elongation  
East (21.3°)



Mercury in inferior conjunction on the 23<sup>rd</sup>

13 Dec  
dia 8.3"  
mag 0.2



30 Dec  
dia 9.1"  
mag 1.1



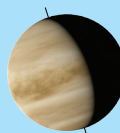
### MARS

15 Dec  
dia 3.8"  
mag 1.4



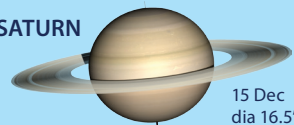
### VENUS

15 Dec  
dia 15.6"  
mag -4.1



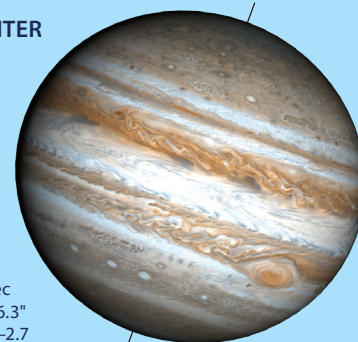
### SATURN

15 Dec  
dia 16.5"  
mag 0.9



### JUPITER

15 Dec  
dia 46.3"  
mag -2.7



### URANUS

15 Dec  
dia 3.8"  
mag 5.6



### NEPTUNE

15 Dec  
dia 2.3"  
mag 7.9



and 18<sup>th</sup>, Venus will be 2° from Alpha Librae, the second brightest star in Libra (despite its designation, the beta star of Libra is more brilliant than its alpha). Alpha<sup>1</sup> and Alpha<sup>2</sup> form a splendid wide double pair of 3<sup>rd</sup> and 5<sup>th</sup> magnitude stars at a wide 4 arcminutes, with a contrasting yellow and pale blue colour.

The **Earth** is at Solstice on the 22<sup>nd</sup> when the days are longest. On this day, the Sun is at its most southerly position with a declination of -23.5°.

**Mars** remains too close to the Sun for observation. However, it will reappear in the morning sky during late January in Sagittarius.

Now past opposition, **Jupiter**, in Aries, is visible in the early north-eastern evening sky. The prominent summer constellations

of Taurus and Orion are now extending back toward the east. The King of Planets is always fascinating to observe; besides the to-and-fro dance of the four Galilean moons, there are changes in the planet's atmosphere worth looking for. The most obvious and easiest to identify features on Jove are the dark north (NEB) and south equatorial (SEB) belts. At first glance, an inexperienced observer may see the two belts as straight bands across the disc. However, with steady seeing, short-term protuberances, gaps, and bright and dark spots are all visible within the bands. With Jupiter's rapid 10-hour rotation, things move quickly, and a feature noted in a belt will move perceptibly in half an hour. On the 22<sup>nd</sup>, the 10-day old waxing gibbous Moon appears near the planet (see Sky View).

**Saturn** is visible in Aquarius in the western sky at the end of dusk. Aside from the 1<sup>st</sup> magnitude star, Fomalhaut (Alpha Piscis Austrini), in neighbouring Piscis Austrinus, the planet is the brightest object in a region devoid of bright stars. Although not real close, the waxing crescent Moon enhances the western view with Saturn on the 17<sup>th</sup> and 18<sup>th</sup> (see Sky View).

**Uranus**, now past opposition, is in the northern evening sky at the end of astronomical twilight in Aries, transiting the meridian around 9:30 pm mid-month. Most amateur astronomers would have seen Mercury, Venus, Mars, Jupiter, and Saturn with the unaided eye or through a telescope. But to complete a planetary tour of the Solar System, one must observe the remaining two outer ice giants. They are not difficult to locate under a dark sky, and you can cross them off your bucket list.

**Neptune**, in Aquarius, comes to the end of five months in retrograde on the 7<sup>th</sup> and appears high in the early north-western evening sky at the end of astronomical dusk. The planet had a brief sojourn into Aquarius late last month, but its west to east motion brings it back into Pisces mid-month.

## DWARF PLANETS and SMALL SOLAR SYSTEM BODIES

On the evening of the 31<sup>st</sup>, minor planets 37 Fides and 704 Interamnia have a close encounter with 2<sup>nd</sup> magnitude Beta Tauri (Elnath), see Diary. Brightest minor planets at opposition this month include:

| Date   | Minor Planet   | Constellation | Mag  |
|--------|----------------|---------------|------|
| 11 Dec | 389 Industria  | Taurus        | 11.3 |
| 18 Dec | 704 Interamnia | Auriga        | 10.3 |
| 19 Dec | 37 Fides       | Auriga        | 9.8  |
| 22 Dec | 4 Vesta        | Orion         | 6.6  |
| 23 Dec | 9 Metis        | Gemini        | 8.5  |
| 26 Dec | 48 Doris       | Orion         | 11.3 |
| 28 Dec | 5 Astraea      | Orion         | 9.4  |

## COMETS

**Comet 62P/Tsuchinshan 1** (All Sky Map 5), approaching perihelion on Christmas Day, spends December in Leo, rising in the eastern sky around midnight this month, around 7<sup>th</sup> magnitude. The comet spends the first week of December crossing the Sickle asterism in Leo. It then goes onto an astrophotographer's dream, being within 1° of the M65/M66 group of galaxies in Leo on the 29<sup>th</sup>, see Diary.

| DIARY |                  |       |   |
|-------|------------------|-------|---|
| Fri   | 1 <sup>st</sup>  | pm    | m.p. 704 Interamnia 1.0° SE of M37 (OC) in Auriga                 |
| Sat   | 2 <sup>nd</sup>  | am    | Phoenicids meteor shower, Nov 28 to Dec 9, Moon affected.         |
| Tue   | 5 <sup>th</sup>  |       | Mercury at greatest elongation East (21.3°)                       |
| Tue   | 5 <sup>th</sup>  | 5 am  | (3 am WST) Moon at apogee (furthest from Earth at 404,346 km).    |
| Tue   | 5 <sup>th</sup>  | 4 pm  | (2 pm WST) Last Quarter Moon.                                     |
| Thu   | 7 <sup>th</sup>  |       | Mercury 0.3° S of M28 (GC) in Sagittarius                         |
| Thu   | 7 <sup>th</sup>  | am    | Comet 62P/Tsuchinshan 1 0.7° NW of star Eta Leonis                |
| Fri   | 8 <sup>th</sup>  | m.p.  | 15 Eunomia 0.1° NW of star Beta <sup>1</sup> Capricorni           |
| Fri   | 8 <sup>th</sup>  |       | Mercury 0.3° N of star Lambda Sagittarii                          |
| Fri   | 8 <sup>th</sup>  | am    | Puppis-Velids meteor shower, Dec 1-15.                            |
| Sat   | 9 <sup>th</sup>  | m.p.  | 3 Juno 1.1° SW of NGC 3521 (G) in Leo                             |
| Sun   | 10 <sup>th</sup> | am    | Comet C/2021 S3 (PANSTARRS) 0.6° S of star d Centauri             |
| Sun   | 10 <sup>th</sup> | 3 am  | (1 am WST) Venus 3° N of Moon                                     |
| Mon   | 11 <sup>th</sup> |       | Saturn 0.3° NE of star 42 Aquarii                                 |
| Tue   | 12 <sup>th</sup> | pm    | m.p. 5 Astraea 0.5° S of star Gamma Geminorum                     |
| Wed   | 13 <sup>th</sup> |       | Mercury 0.2° W of M22 (GC) in Sagittarius                         |
| Wed   | 13 <sup>th</sup> | 10 am | (8 am WST) New Moon.  |
| Wed   | 13 <sup>th</sup> | Midn  | (10 pm WST) Maximum Libration (7.4°), too close to New Moon.      |
| Thu   | 14 <sup>th</sup> | am    | Geminids meteor shower, Dec 4-17.                                 |
| Sun   | 17 <sup>th</sup> | 5 am  | (3 am WST) Moon at perigee (closest to Earth at 367,901 km).      |
| Sun   | 17 <sup>th</sup> | 10 pm | (8 pm WST) Saturn 8° NE of Moon                                   |
| Tue   | 19 <sup>th</sup> | 11 pm | (9 pm WST) Neptune 1° NE of Moon                                  |
| Wed   | 20 <sup>th</sup> | 5 am  | (3 am WST) First Quarter Moon.                                    |
| Fri   | 22 <sup>nd</sup> | am    | Comet 62P/Tsuchinshan 1 1.0° N of NGC 3489 (G) in Leo             |
| Fri   | 22 <sup>nd</sup> |       | Vesta at opposition   |
| Fri   | 22 <sup>nd</sup> |       | Solstice  |
| Fri   | 22 <sup>nd</sup> | 10 pm | (8 pm WST) Jupiter 3° SE of Moon                                  |
| Sat   | 23 <sup>rd</sup> |       | Mercury in inferior conjunction                                   |
| Sat   | 23 <sup>rd</sup> | Midn  | (10 pm WST) Uranus 3° S of Moon                                   |
| Sat   | 23 <sup>rd</sup> | pm    | m.p. 21 Lutetia 0.2° E of NGC 821 (G) in Aries                    |
| Sun   | 24 <sup>th</sup> | am    | Comet C/2021 S3 (PANSTARRS) 1.0° S of star Psi Centauri           |
| Tue   | 26 <sup>th</sup> | am    | Comet 62P/Tsuchinshan 1 1.3° S of star Theta Leonis               |
| Wed   | 27 <sup>th</sup> | 11 am | (9 am WST) Full Moon (391,769 km).                                |
| Wed   | 27 <sup>th</sup> | 8 pm  | (6 pm WST) Maximum Libration (7.8°), Full Moon.                   |
| Wed   | 27 <sup>th</sup> | pm    | m.p. 18 Melpomene 0.7° SE of NGC 1087 (G) in Cetus                |
| Fri   | 29 <sup>th</sup> | 3 am  | (1 am WST) Comet 62P/Tsuchinshan 1 0.3° NW of NGC 3628 (G) in Leo |
| Fri   | 29 <sup>th</sup> | 3 am  | (1 am WST) Comet 62P/Tsuchinshan 1 0.7° N of M65 (SG) in Leo      |
| Fri   | 29 <sup>th</sup> | 3 am  | (1 am WST) Comet 62P/Tsuchinshan 1 0.8° N of M66 (SG) in Leo      |
| Sun   | 31 <sup>st</sup> | pm    | m.p. 37 Fides 0.8° E of star Beta Tauri                           |
| Sun   | 31 <sup>st</sup> | pm    | m.p. 704 Interamnia 0.4° N of star Beta Tauri                     |

**Comet C/2021 S3 (PANSTARRS)** (All Sky Map 6) spends the month in Centaurus, rising in the south-eastern sky around midnight, brightening from magnitude 10.5 to 9.6.

**Comet 144P/Kushida** (All Sky Map 3) continues in Aries, brightening from mag 10 to 9.2. It rises in daylight, transiting the northern evening sky and setting in the western sky before dawn.

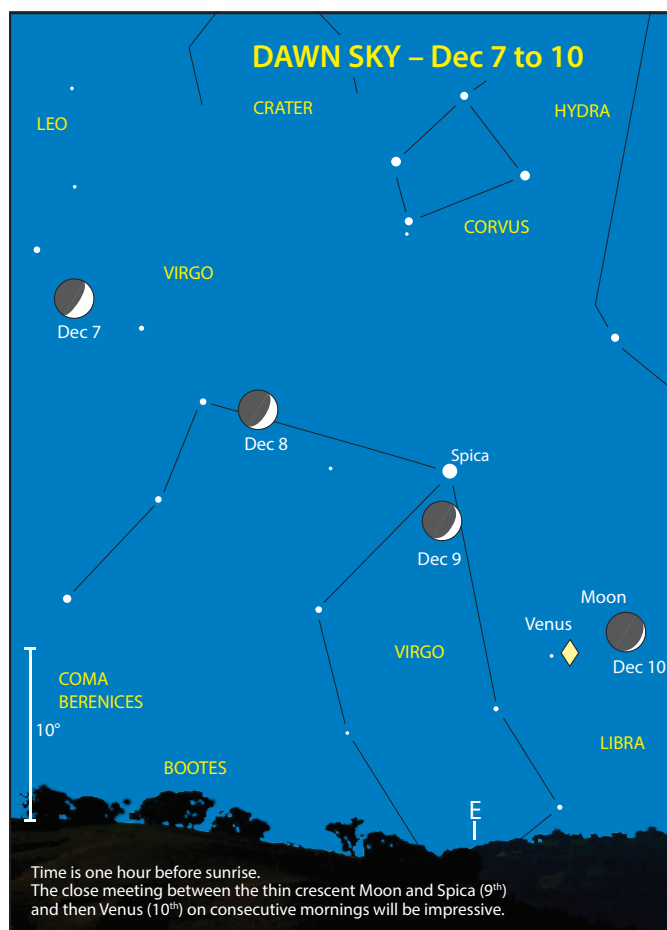
**Comet 2P/Encke** begins in Ophiuchus at magnitude 11, setting in the south-western sky around 90 minutes after sunset. It moves into Sagittarius on the 6<sup>th</sup> and ends the month at magnitude 13, setting about an hour after sunset.

## METEOR SHOWERS

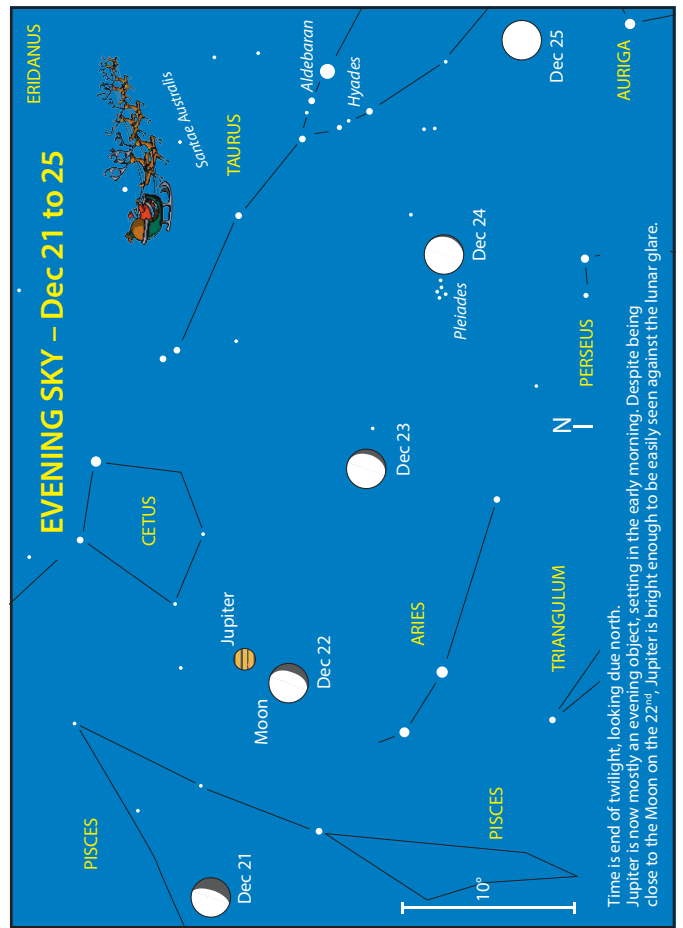
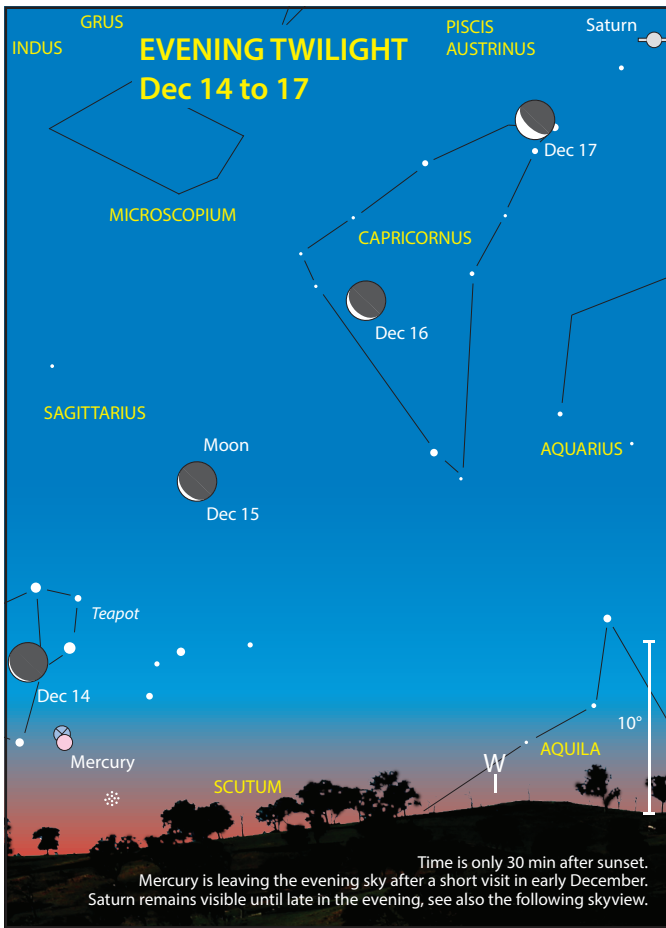
The **Phoenicids** is a southern shower discovered in 1956 during its only known major outburst when rates of around 100 plus were observed. Since then, there have been three minor bursts and some significant activity in 2014; therefore, they are a shower to keep an eye on, just in case. Their period of activity appears to be from November 28 to December 9, with maxima around the 2<sup>nd</sup>. The Phoenicids' radiant culminates at dusk, so early evening viewing should provide the best activity when the sky is Moon free.

The **Puppis-Velids** are a vastly complex system of showers active during November and December. Each radiant is so close that visual observation cannot easily separate them. Active from December 1–15, a ZHR of 10 around the evening of the 7<sup>th</sup> through to dawn on the 8<sup>th</sup> is possible. With New Moon on the 13<sup>th</sup>, there will be minimal lunar interference during the peak.

The **Geminids** are among the finest and most reliable of the major annual showers. Visible from the 5<sup>th</sup> to 16<sup>th</sup>, with maximum predicted late evening on the 14<sup>th</sup> and morning of the 15<sup>th</sup>. The Geminids often produce bright, medium-speed



meteors with zenith hourly rates of up to 120. Even though our northern counterparts will see the best of the Geminids, they can still provide a spectacular display for us south of the equator. The sky will be Moon free during the peak.



Approximate local standard time, for daylight saving add one hour.

