

## SKY CHARTS

EVENING SKY MARCH $7^{\text {th }}$ at 21 h 30 (NORTH DOWN)


EVENING SKY MARCH $7^{\text {th }}$ at 21 h 30 (SOUTH DOWN)


## THE SOLAR SYSTEM

PLEASE NOTE: all events are as predicted from HERMANUS, Western Cape, South Africa.
HIGHLIGHTS for MARCH FROM THE SKY GUIDE 2024

| Date | $\begin{gathered} \text { Time } \\ (S A S T) \end{gathered}$ | Item |
| :---: | :---: | :---: |
| 3 | 17h24 | Last quarter Moon |
|  |  | Asteroid (3) Juno (mag. +8.7) at opposition (1.69 au) |
| 5 |  | Moon (30\%) southernmost (-28.49 $)$, near $\boldsymbol{\tau} \mathbf{S g r}$ |
| 10 | 09h06 | Moon at perigee (356 895 km ) |
|  | 11h00 | New Moon, near Neptune |
| 12 | 03 h 18 | Moon (6\%) at ascending node |
| 14 | 21 h 15 | Jupiter sets $12.1^{\circ}$ south of Moon (20\%) with Pleiades $5.3^{\circ}$ to north-east |
| 17 | 06h11 | First quarter Moon |
|  | 16h45 | Moon northernmost ( $+28.54^{\text {º }}$ ) |
|  |  | Mercury at perihelion |
|  |  | Neptune at conjunction |
| 19 |  | Venus at aphelion |
| 20 | 05h07 | March EQUINOX * |
| 22 |  | Moon (92\%) near Regulus ( $\alpha$ Leo) |
|  |  | Venus near Saturn |
| 23 | 17 h 44 | Moon at apogee (406 292 km ) |
| 25 | 09h00 | Full Moon (29.48') |
|  |  | Mercury at eastern elongation (18.7 ${ }^{\circ}$ ) |
| 26 | 06h07 | Moon at descending node, near Spica |
| 30 | 21 h 35 | Moon (79\%) rises at 21h35 following Antares ( $\alpha$ Sco), separation 3.1 ${ }^{\circ}$ |

* weather permitting, this editor will be at GPAED to witness and photograph the sunrise at 06 h 51 and sunset at 18h50.
Anyone keen to join me? If so, please let me know on WhatsApp 0812129481 or petermh@hermanus.co.za .

\left.| SUGGESTED EVENING OBSERVATION WINDOW |  |
| :---: | :---: | :---: | :---: |
| (Lunar observations notwithstanding) |  |$\right]$

## SOLAR SYSTEM VISIBILITY

## 2024 MARCH 7

| Sun | Aquarius |  | 06 h 36 | Never look at the sun without SUITABLE EYE PROTECTION! |
| :---: | :---: | :---: | :---: | :---: |
| Length of day | 12 hours 55 minutes | Transit: Set: | 12h54 19 h 11 |  |
| Mercury | Pisces | Rise: <br> Transit: Set: | 07h10 <br> 13h23 <br> 19h34 | Early month too close to the Sun then later before sunrise |
| Magnitude | -1.5 |  |  |  |
| Phase | 96\% |  |  |  |
| Diameter | $5 "$ |  |  |  |
| Venus | Capricornus | Rise: | 04h45 | 'The Morning Star" |
| Magnitude | -3.9 | Transit: | 11h29 |  |
| Phase | 92\% | Set: | 18h12 |  |
| Diameter | 11" |  |  |  |
| Mars | Capricornus | Rise: | 04h14 | Low in the east before sunrise |
| Magnitude | +1.2 | Transit: | 11h03 |  |
| Phase | 97\% | Set: | 17h53 |  |
| Diameter | $4 "$ |  |  |  |
| Jupiter | Aries | Rise: | 11h00 | Evening |
| Magnitude | -2.1 | Transit: | 16h21 |  |
| Diameter | 36" | Set: | 21h42 |  |
| Saturn | Aquarius | Rise: | 06h05 | Too close to the Sun |
| Magnitude | +1.0 | Transit: | 12h32 |  |
| Diameter | $15 "$ | Set: | 18h59 |  |
| Uranus | Aries | Rises: | 11h37 | Evening |
| Magnitude | +5.8 | Transit: | 16h49 |  |
| Diameter | 3 " | Set: | 22h02 |  |
| Neptune | Pisces | Rise: | 07h23 | Low in the west after sunset |
| Magnitude | +8.0 | Transit: | 13h31 |  |
| Diameter | 2 " | Set: | 19h39 |  |
| Pluto <br> Magnitude | Capricornus$+14.5$ | Rise: | 02h50 | Morning |
|  |  | Transit: | 09h58 |  |
|  |  | Set: | 17h07 |  |

Phase: In a telescope, the inner planets (Mercury, Venus and Mars) appear to us in phases, depending on the angle of the Sun's illumination, as does the Moon. The observed angular diameter is given in arc seconds.

Transit: When an object crosses the local meridian it is said to 'transit'. The local meridian is an imaginary line from the horizon directly north passing overhead through the zenith to the horizon directly south.
Magnitude: we are accustomed to hearing stars described in terms of 'magnitude'. For example, the planet Jupiter at magnitude -1.8 is considerably brighter than the star Antares (in Scorpius) at +1.05 . The scale is 'inverse'; the brighter the object, the lower the value. A 'good' human eye on a clear night can see down to a magnitude of about +6 .

## THE MOON

## The Trio of Maginus, Tycho and Clavius

Maginus is an ancient lunar impact crater located in the southern highlands to the southeast of the prominent crater Tycho. It is a large formation almost three quarters the diameter of Clavius, which lies to the southwest.

The rim of Maginus is heavily eroded, with impact-formed incisions, and multiple overlapping craters across the eastern side. The wall is broken through in the southeast by Maginus C, a worn crater. Little remains of the
 original features that formed the rim of Maginus, and it no longer possesses an outer rampart. The floor is relatively flat, with a pair of low central peaks.

| Coordinates | $50.0^{\circ} \mathrm{S} 6.2^{\circ} \mathrm{W}$ |
| :--- | :--- |
| Diameter | 194 km |
| Depth | 4.3 km |
| Colongitude * | $7^{\circ}$ at sunrise |
| Eponym | Giovanni A. Magini |

Tycho is a prominent lunar impact crater located in the southern lunar highlands named after the Danish astronomer Tycho Brahe (1546-1601). It is estimated to be 108 million years old. The surface around Tycho is replete with craters of various sizes, many overlapping still older craters. Some of the smaller craters are secondary craters formed from larger chunks of ejecta from Tycho. It is one of the Moon's brightest craters, with a diameter of 85 km and a depth of $4,800 \mathrm{~m}$.

| Coordinates | $43.31^{\circ} \mathrm{S} 11.36^{\circ} \mathrm{W}$ |
| :--- | :--- |
| Diameter | 86 km |
| Depth | 4.8 km |
| Colongitude * | $12^{\circ}$ at sunrise |
| Eponym | Tycho Brahe $^{\text {E }}$ |

Clavius is one of the largest crater formations on the Moon and the second largest crater on the visible near side (very close in size to Deslandres). It is located in the rugged southern highlands of the Moon, to the south of the ray crater Tycho. It is named for the Jesuit priest Christopher Clavius. Clavius' location toward the southern limb of the Moon causes it to appear oblong due to foreshortening. Its great size makes it visible to the unaided eye as a prominent notch in the terminator about one to two days after the Moon reaches first quarter.

Coordinates
$58.4^{\circ} \mathrm{S} 14.4^{\circ} \mathrm{W}$
Diameter $\quad 231 \mathrm{Km}$
Depth
Colongitude * $\quad 15^{\circ}$ at sunrise
Eponym Christof Klau

[^0]
## The Selenographic Coordinate System

(from Wikipedia)
Selenographic coordinates are used to refer to locations on the surface of Earth's moon.
Any position on the lunar surface can be referenced by specifying two numerical values, which are comparable to the latitude and longitude on Earth. The latitude gives a position north or south of the lunar equator while longitude indicates a position east or west of the Moon's prime meridian, the line passing from the lunar north pole through the point on the lunar surface directly facing Earth to the lunar south pole. This can be thought of as the midpoint of the visible Moon as seen from the Earth. Both of these coordinates are given in degrees.

Astronomers defined the fundamental location in the selenographic coordinate system by the small, bowl-shaped satellite crater 'Mösting A'. The coordinates of this crater are defined as:

South $3^{\circ}$ 12' $^{\prime}$ 43.2"
West $5^{\circ} 12$ 39.6"
The coordinate system has become
 precisely defined by the Lunar Laser Ranging Experiment.
Anything past $90^{\circ} \mathrm{E}$ or $90^{\circ} \mathrm{W}$ would not be seen from Earth but for libration, which makes $59 \%$ of the Moon visible.

No eclipses, lunar or solar, will be visible from southern Africa in March 2024

## METEOR ACTIVITY

| From SGAS | Maximum <br> Date/Time | Moon on max <br> Date/Time | Duration | Radiant | ZHR* | Velocity <br> Km/sec |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\gamma$ Normids | Mar 14 | sets 21 h 34 | Feb 25 to | $1^{\circ}$ north-east of |  |  |
|  | 00 h 00 to 04 h 30 |  | Mar 28 | $\zeta$ Sco | 5 | 56 |

* A word of caution regarding predicted Zenithal Hourly Rates:

ZHR is an ideal value. It is by definition the number of meteors a single observer could possibly see during a shower's peak with the radiant directly overhead on a clear, dark night. Most observers, however, will not see as many meteors as the ZHR suggests. Also, the presence of a bright moon ot the shower's proximity to the horizon can seriously diminish the observation of meteor activity.

For more meteor watching details, please see SGSA 2023, pages 86-87.

## 47 TUCANAE NGC 104, C 106

## Description

Constellation
Distance
Magnitude
Apparent size
Actual size J2000 Dec/RA
Alt/Az

Globular cluster
Tucana
$13.4 \mathrm{kly}, 4.1 \mathrm{kpc}$
4.1
$30^{\prime}$
120 ly
-72 ${ }^{\circ} 04^{\prime} 53^{\prime \prime} / 0 h 24 m 05 s$
$+26^{\circ} 20^{\prime} 43^{\prime \prime} / 198^{\circ} 46^{\prime} 36^{\prime \prime}$

Visibility on March $7^{\text {th }} 2024$

| Rises | Transits | Sets |
| :---: | :---: | :---: |
| Does not rise | 14 h 06 | Does not set |

Naked Eye
Binoculars
Telescopes

Does not set
Yes
Yes
Yes

## DISCOVERY AND HISTORY

A conspicuous naked-eye object, 47 Tuc lies very far south at declination $-72^{\circ}\left(18^{\circ}\right.$ from the South Celestial Pole). It was not discovered by European observers until 1751 when Nicholas de Lacaille catalogued it in his list of southern nebulous objects. He initially suspected it was the nucleus of a bright comet. Next to observe and catalog it were James Dunlop in 1826 and John Herschel in 1834.

## DESCRIPTION

47 Tucanae, a Flamstead designation, is the second brightest and largest globular cluster in the sky after Omega Centauri. It is included in the Caldwell catalogue as C 106. The cluster is
 about 13400 light years away and is approaching us at roughly $19 \mathrm{~km} / \mathrm{sec}$. Spread over a diameter of nearly 120 light years, it is home to a number of exotic xray binary star systems. The cluster may contain an intermediate-mass black hole. A search for Jupiter-sized planets in 47 Tuc, carried out by a team of astronomers using the Hubble Space Telescope, came up emptyhanded. The work involved checking 34000 stars in the cluster for signs of large transiting planets. The absence of any positive results strengthens the argument that planets are rare or nonexistent in globular clusters because of their very low concentration of heavy elements. Though it appears adjacent to the Small Magellanic Cloud, the latter is some 60 kpc (200 000 ly ) distant, being over fifteen times further than 47 Tuc.


## AMATEUR OBSERVATION

At magnitude 4.1, this cluster looks like a misty star to the unaided eye. Under ideal conditions, the cluster appears 30' across in the sky - roughly the size of the full Moon. Binoculars clearly show an increase in brightness toward the centre. A telescope of at least 100 mm aperture resolves some of its roughly one million member stars with a very bright and dense core.
For more details, please see https://en.wikipedia.org/wiki/47_Tucanae .

## Please keep in touch...

Have a look at our excellent website, edited by Derek Duckitt. http://www.hermanusastronomy.co.za/

Contact ASSA - Get in touch with officers of the Society - we're real people with a passion for astronomy, so contact us and let's talk!

## With Grateful thanks to the following:

Sky Guide Southern Africa 2024
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Wikipedia


[^0]:    * Colongitude - the longitude of the morning terminator (division between illuminated and dark regions) as measured in degrees west of the prime meridian.

