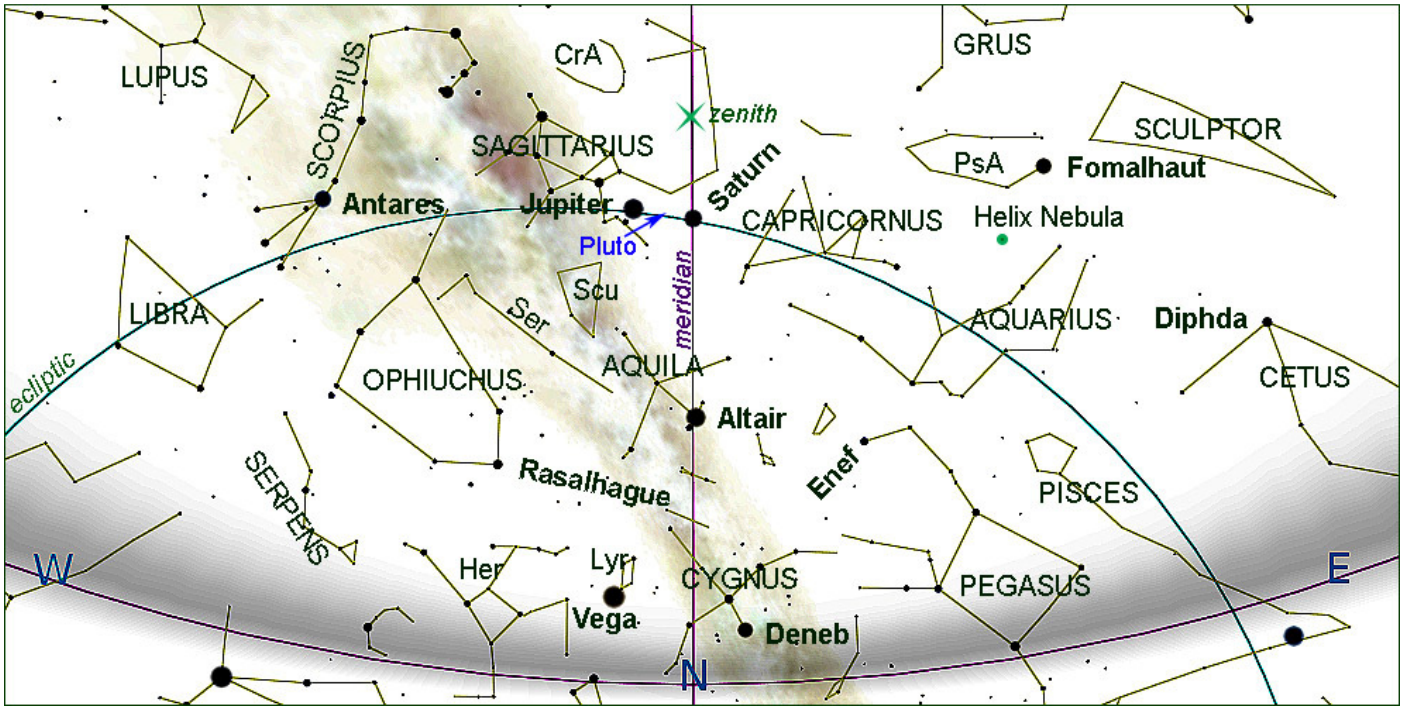
SKYNOTES from Hermanus

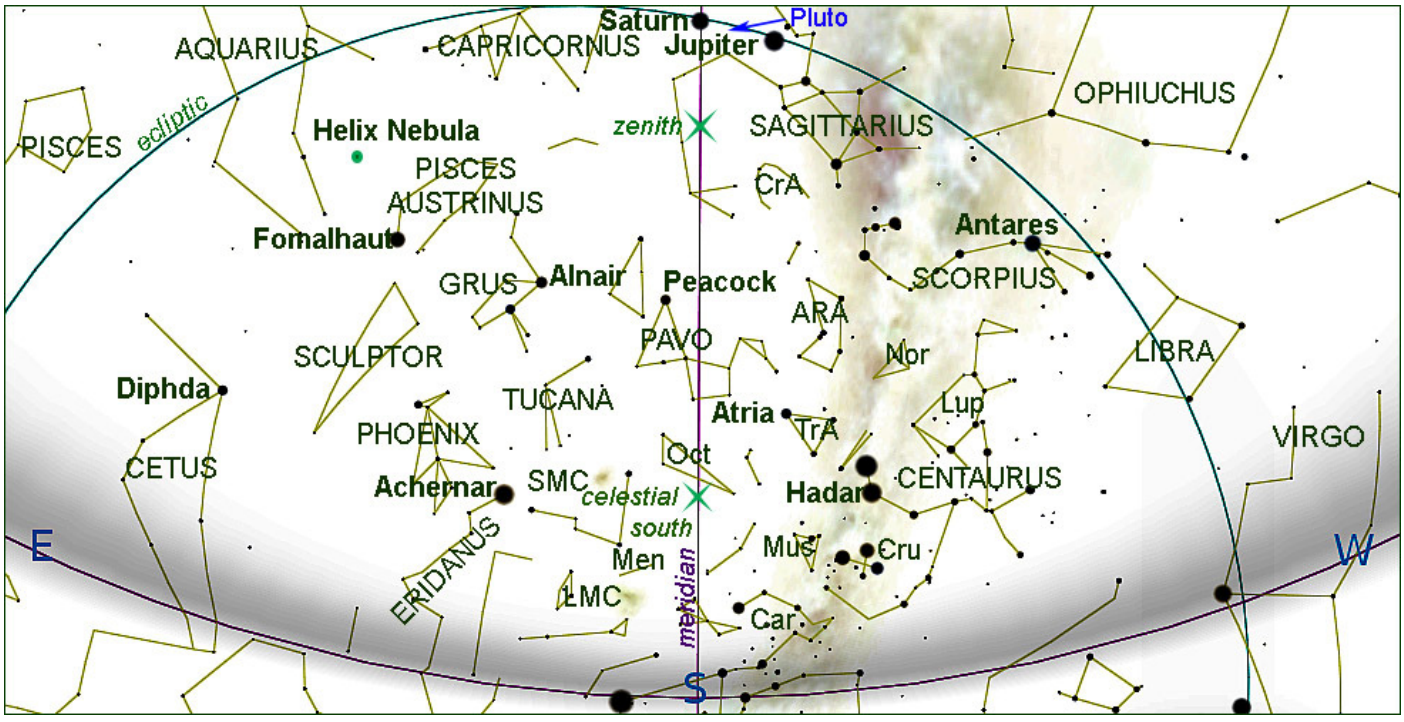
SEPTEMBER 2020

1. SKY CHARTS

EVENING SKY 13th SEPTEMBER at 21h00 (NORTH DOWN)



EVENING SKY 13th SEPTEMBER at 21h00 (SOUTH DOWN)

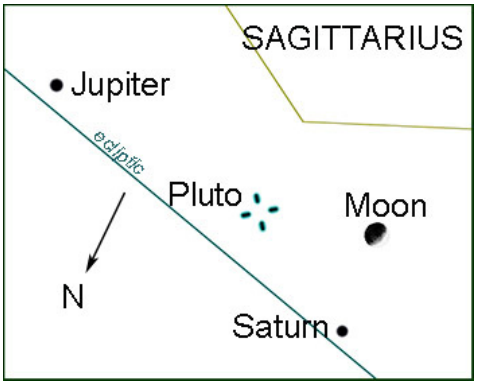


HIGHLIGHTS FROM THE SKY GUIDE

PLEASE NOTE: All events predicted are as observed from **Hermanus, Western Cape, South Africa. Times are South African Standard Time (UTC +2).** *Also please note*: with the exception of **Pluto** (magnitude +14.4), all events predicted are visible with the naked eye.

2. THE SOLAR SYSTEM

Date	*Time*	*Item*
2	07h22	**Full Moon**
		Pallas stationary
3		**Moon** near **Neptune**
6		**Moon** near **Mars**
	08h31	**Moon** at apogee (405 600 Km)
7		**Moon** near **Uranus**
9	19h09	**Moon** 4.3º north of **Aldebaran**
		Mars stationary
10	11h26	**Last quarter Moon**
11	21h15	**Neptune** at opposition
12	04h06	**Moon** occults 3.1 magnitude **Mebsuta** (ε Gem) (bright limb event)
	07h25	**Moon** furthest north (+24.4º)
13	05h24	**Moon** occults **κ Geminorum** (bright limb event)
	04h53	**Moon** 3.6º south-east of **Pollux** (β Gem)
14	05h38	**Venus** 2.6º north-east of **Beehive** cluster (M44)
		Jupiter stationary
		Titan at least 3' from **Saturn**
		Moon near **Venus**
15		**Moon** passes 4.3º north of **Regulus**
17	13h00	**New Moon**
18	15h44	**Moon** at perigee (359 100 Km)
19		**Mercury** at aphelion and near **Moon**
22	15h31	*EQUINOX*
		Moon near **Antares**
		Mercury near **Spica**
24	03h55	**First quarter Moon**
	21h11	**Moon** furthest south (-24.5º)
25	22h00	**Moon** near **Jupiter, Saturn, Pluto** [1]
26		*INTERNATIONAL OBSERVE THE MOON NIGHT*
29		**Saturn** stationary
30		**Moon** near **Neptune**



[1] On 25th September, the **Moon**, **Jupiter**, **Saturn** and **Pluto** are grouped within 7.7º. The three will make a fine visual spectacle but, of course, Pluto will not be seen without a telescope of 10" (250 mm) or more. *Please see the* **Deep Sky** *section below.*

SEPTEMBER 2020			*1st September*	*1st October*	*Visibility*
Sun Length of day	Leo to Virgo 11h24 to 12h27	Rises: Transit: Sets:	07h01 12h43 18h25	06h19 12h33 18h46	***Never look at the sun without SUITABLE EYE PROTECTION!***
Mercury Magnitude Phase Diameter	Leo to Virgo -0.6 to +0.1 92% to 61% 5" to 7"	Rises: Transit: Sets:	07h41 13h34 19h27	07h18 14h05 20h53	**Too close to Sun then low in west after sunset**
Venus Magnitude Phase Diameter	Gemini to Leo -4.2 to -4.1 60% to 72% 19" to 16"	Rises: Transit: Sets:	04h37 09h44 14h52	04h35 10h03 15h32	**Morning to low in the west after sunset**
Mars Magnitude Phase Diameter	Pisces -1.8 to -2.5 92% to 99% 19" to 22"	Rises: Transit: Sets:	22h02 03h49 09h33	19h51 01h41 07h25	**All night**
Jupiter Magnitude Diameter	Sagittarius -2.5 to -2.4 44" to 40"	Rises: Transit: Sets:	14h06 21h14 04h27	12h09 19h18 02h30	**Evening**
Saturn Magnitude Diameter	Sagittarius +0.3 to +0.5 17" to 18"	Rises: Transit: Sets:	14h46 21h49 04h57	12h45 19h49 02h57	**Evening**
Uranus Magnitude Diameter	Aries +5.7 4"	Rises: Transit: Sets:	23h08 04h336 09h54	21h07 02h33 07h54	**All night**
Neptune Magnitude Diameter	Aquarius +7.8 2"	Rises: Transit: Sets:	19h05 01h25 07h41	17h04 23h20 05h41	**All night**
Pluto Magnitude	Sagittarius +14.3	Rises: Transit: Sets:	14h28 21h36 04h48	12h29 19h37 02h50	**Evening**

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 **angular diameter** is given in arc seconds ("). This is the apparent size of the object as we see it from Earth.

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 number. A 'good' human eye on a clear night can see down to a magnitude of about +6.

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 *zenith,* see charts on page 1) to the horizon directly south.

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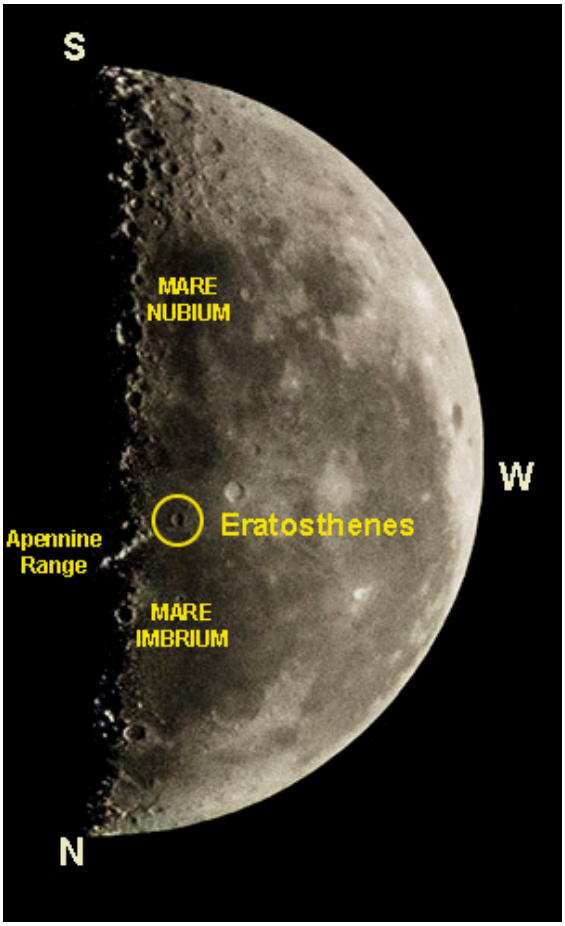
THE MOON

ERATOSTHENES CRATER

(from the 2020 Sky Guide)



Location : in the south-eastern plains of Mare Imbrium.

Best seen : one day after first quarter and at last quarter.

Description : A relatively deep lunar impact crater that lies on the boundary between the **Mare Imbrium** and **Sinus Aestuum** mare regions. It forms the western terminus of the **Montes Apenninus** mountain range.

The crater has a well-defined circular rim, terraced inner wall, central mountain peaks, an irregular floor, and an outer rampart of ejecta. It lacks a ray system of its own but is overlain by rays from the prominent crater Copernicus to the south-west.

The crater is believed to have been formed about 3.2 billion years ago. In 1910–1920, William H. Pickering noted dark patches in the crater that varied in a regular manner over each lunar day. He put forward the speculative idea that these patches appeared to migrate across the surface, suggestive of herds of small life forms. The idea received a degree of attention primarily due to Pickering's reputation.

Diameter : 59 Km

Depth : 3600 metres.

Name : after ancient Greek astronomer *Eratosthenes of Cyrene*, who estimated the circumference of the Earth and the distance from the Earth to the Sun.

Lunar and Solar eclipses: None predicted for this month

No meteor showers are predicted for September 2020.

For more details regarding meteor watching, please see

the Sky Guide Africa South (SGAS), pages 86- 87

3. LOOKING UP ...

SUGGESTED OBSERVATION SCHEDULE for **SEPTEMBER** *(Lunar observations notwithstanding)*

Date	*dusk end*	*moonrise*	*moonset*
7th	19h52	23h20 (77%)	
19th	20h02		21h05 (6%)

STARGAZING . With regret, we have had to suspend all our stargazing functions owing to the current situation.
Consult our website for updates:
http://www.hermanusastronomy.co.za.

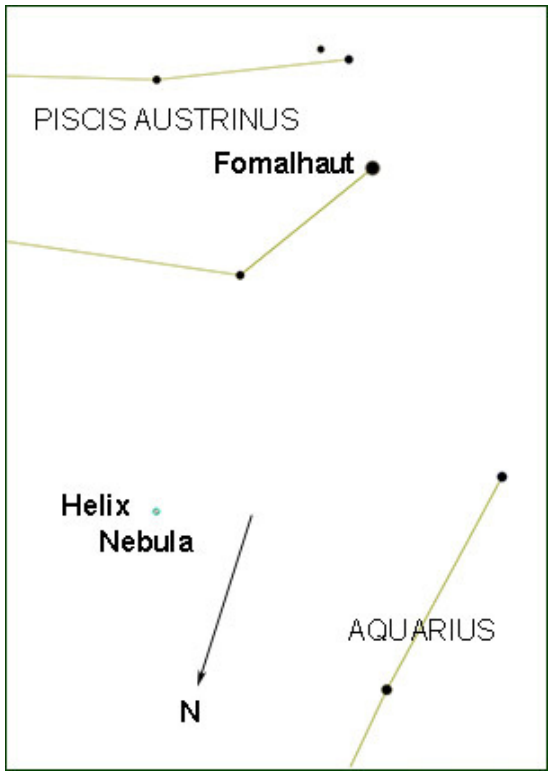
SUGGESTION:

Most of us may never have seen Pluto in a telescope (this writer has not). Please see the **Deep Sky** section below for more on Pluto's observation. Possibly we may share our experiences?

DEEP SKY HIGHLIGHTS

HELIX NEBULA
NGC 7293, C63

Description	Planetary nebula in Aquarius
Distance	790 Ly, 240 pc
Visual magnitude	+7.6
Apparent size	14.7 x 12.0 arcmin
Actual size	3.4 Ly, 1.0 pc
Alt/Azimuth	+52º 05' 23" / +79º 29' 31"
J2000 lat/long	-20º 48' 0" / 22h 29m 36sec
Location	10º 49' north of **Fomalhaut** (α PsA)



Visibility on **13 September**

Rise:	Transit:	Set:
17h32	23h39	05h46

Naked eye: No
Binoculars: Technically yes but challenging
Telescopes : Yes but still challenging

The Helix Nebula is the nearest planetary nebula to our Solar System. Since about 2003, this object has been referred to on the internet as “The Eye of God”.

Discovery and History

Overlooked by previous astronomers, notably Frederick William Herschel (no less!), this nebula was discovered by Karl Ludwig Harding some time before 1824.

Observing

Covering an area of about half that of the Full Moon (which averages 31 arcminutes), its halo extends even further to 28 arcmins. Although quite bright at magnitude +7.3, its light is spread over this large area so it has extremely low surface brightness, perhaps explaining the failure of the Herschels to observe it. Its ring structure, so conspicuous in photos, is not easy to detect visually.

In binoculars and rich field telescopes, the nebula is a large ghostly disc, vaguely circular with a much fainter centre. A very low power eyepiece is recommended. An O-III or UHC filter and averted vision can help quite substantially. Three 10th magnitude stars are involved in the disc.

Physical Properties

The nebula is thought to be 10 600 years old based on a measured expansion rate of 31 Km/sec. Shaped like a prolate spheroid (rugby ball?) with strong density concentrations along its equatorial plane. The outermost ring is flattened on one side owing to its collision with the interstellar medium. The Helix was the first planetary nebula discovered to contain knots. These knots are radially symmetric and are described as “cometary”, containing bright cusps and tails. There are estimated to be more than 20 000 cometary knots in the Helix. Excluding their tails, they are approximately the size of the Solar System.

PLUTO

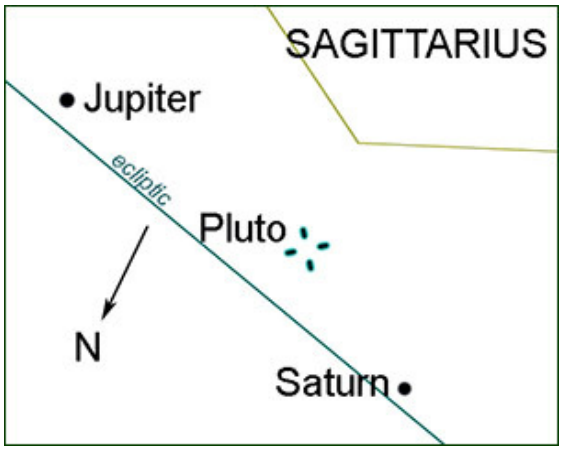
Minor planet designation 134340 Pluto

Although solar system objects are not considered “Deep Sky”, I am including a special on Pluto as its position between closely grouped Jupiter and Saturn this month could be useful in finding it in a telescope.

Pluto is an icy dwarf planet in the Kuiper belt, a ring of bodies beyond the orbit of Neptune. It was the first and the largest Kuiper belt object to be discovered.

Classification

Pluto was discovered by Clyde Tombaugh in 1930 and declared to be the ninth planet from the Sun. After 1992, its status as a planet was questioned following the discovery of several objects of similar size in the Kuiper belt. In 2005, Eris, a dwarf planet in the scattered disc which is 27% more massive than Pluto, was discovered. This led the International Astronomical Union (IAU) to define the term "planet" formally in 2006, during their 26th General Assembly. That definition excluded Pluto and reclassified it as a dwarf planet.



Observation

The chart to left may be of use to those with telescopes of 10” (250 mm) diameter or greater, many of which are Dobsonians without “goto” computers. I recommend scheduling your viewing between 7th and 19th September to avoid the Moon.

Physical Properties

It is the ninth-largest and tenth-most-massive known object directly orbiting the Sun. It is the largest known trans-Neptunian object by volume but is less massive than Eris. Like other Kuiper belt objects, Pluto is primarily made of ice and rock and is relatively small—one-sixth the mass of the Moon and one-third its volume. It has a moderately eccentric and inclined orbit during which it ranges from 30 to 49 astronomical units or AU (4.4–7.4 billion km) from the Sun. This means that Pluto periodically comes closer to the Sun than Neptune, but a stable orbital resonance with Neptune prevents them from colliding. Light from the Sun takes 5.5 hours to reach Pluto at its average distance (39.5 AU).

Pluto has five known moons: Charon (the largest, with a diameter just over half that of Pluto), Styx, Nix, Kerberos, and Hydra. Pluto and Charon are sometimes considered a binary system because the barycenter of their orbits does not lie within either body.

The *New Horizons* spacecraft performed a flyby of Pluto on July 14, 2015, becoming the first ever, and to date only, spacecraft to do so. During its brief flyby, *New Horizons* made detailed measurements and observations of Pluto and its moons. In September 2016, astronomers announced that the reddish-brown cap of the north pole of Charon is composed of tholins, organic macromolecules that may be ingredients for the emergence of life, and produced from methane, nitrogen and other gases released from the atmosphere of Pluto and transferred 19 000 km to the orbiting moon.

keep in touch...

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

Also...

ASSA website http://assa.saao.ac.za
ASSA Deep-Sky Section
Whatsappchat group: [074 100 7237]
MNASSAhttp://assa.saao.ac.za/about/publications/mnassa/
Nightfall https://assa.saao.ac.za/?s=Nightfall
Official Big 5 of the African Sky web page
Official Big 5 Facebook group
ASSA Deep-Sky Section mailing list

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