



NEWSLETTER NOVEMBER 2017

NEXT MEETING

Venue: The auditorium behind the main building at Christian Brothers College (CBC), Mount Edmund, Pretoria Road, Silverton, Pretoria.

Date and time: Wednesday 22 November at 19h15.

Programme:

- **Beginner’s Corner:** “Lunar geology” by Danie Barnardo.
- **What’s Up?** by Percy Jacobs.

----- **10-minute break — library will be open.** -----

- **Main talk:** “How to do planetary imaging” by Clyde Foster.
- **Socializing over tea/coffee and biscuits.**

The chairperson at the meeting will be Johan Smit.

NEXT OBSERVING EVENING

Friday November from sunset onwards at the Pretoria Centre Observatory, which is also situated at CBC. Turn left immediately after entering the main gate and follow the road.

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Observing evening report for October 20th 2017 – by Michael Poll

Michael, Fred, Rudolph and George came on a not very promising evening – we had thunder, some rain and lightning, not to mention that it was totally cloudy except for a few gaps in the west that were not heading our way. We are obliged to show a presence, as some members of the public may turn up and it would not be good for our image if there was no-one there, whatever the weather.

We got there just before dark, and around 7.00 pm we were inclined to call it a day. Michael stayed on a while but just as he was about to leave, at about 7.15 pm some friends of Bosman's came -Melt and Jo -"Are you Michael?" – well yes I was. They were hoping to see some sky, but I said that there was not much hope (we had not even got our telescopes out), but I said I could give them a run down on how to get started in looking at the sky. I had some copies of the ever useful Skymaps.com map and I explained the daily movement of the sky (due to the Earth's rotation on its axis) and the annual change of the constellations which is an effect of the Earth's travel around the Sun. I showed how to use the map and identify the bright stars first.

We did some fun calculations such as how fast one is going when standing on the equator (= 40 000 km in 24 hours) and the distance that the Earth travels in a year ($\pi \times 300\,000\,000$ km). We did not calculate the final figure but noted that the Earth had to travel at 29 km/second to get around in time for the next New Year.

Well, after this discussion and a few other topics we looked skywards and there was a star visible (Altair). We scooted on to the playing field and there were Saturn and Antares. Well, the guests had to be shown Saturn, and I got my telescope out, and we enjoyed a good view. Not much hope of any deep sky objects, but we had a look at Antares as an example of a red star, (a red giant) and Achernar as an example of a hot blue-white star. Then followed a discussion as to why the stars showed different colours. We discussed some more for a while, and left at 8.30 pm.

The next observing evening is on **November 17th 2017**. Weather and sky permitting, it is our best month for observing the Andromeda Galaxy. Ω

Astronomy- related articles on the Internet

1. **Pluto's 'skyscrapers': what's responsible for dwarf planet's giant ice blades?** Jagged spikes of methane ice, the height of skyscrapers, soar into Pluto's sky. https://www.space.com/38281-pluto-giant-ice-blades-explained.html?utm_source=sd-newsletter&utm_medium=email&utm_campaign=20170927-sdc
2. **Scientists reveal secrets of lost continent Zealandia.** Hitherto unknown continent on Earth discovered. http://earthsky.org/earth/lost-continent-zealandia-drilling-expedition-2017?mc_cid=f23d2bcddf&mc_eid=febfe10e42
3. **New Horizons' discoveries keep coming.** http://earthsky.org/space/new-horizons-pluto-mu69-sciencecast-video?mc_cid=f23d2bcddf&mc_eid=febfe10e42
4. **Lockheed Martin unveils sleek, reusable lander for crewed Mars missions.** This concept is like something from the pages of science fiction literature. <https://www.space.com/38306-lockheed-martin-reusable-mars-lander-unveiled.htm>
5. **Seven theories on the origin of life.** <https://www.livescience.com/13363-7-theories-origin-life.html>
6. **5 new pairs of merging super-massive black holes.** Scientists announced 5 newly discovered such pairs in the centres of distant galaxies. http://earthsky.org/space/scientists-find-5-merging-black-hole-pairs?mc_cid=9a68dbf4f7&mc_eid=febfe10e42
7. **Strong solar storm sparked planet-wide aurora on Mars.** https://www.space.com/38416-solar-storm-mars-auroras-nasa-maven.html?utm_source=sd-newsletter&utm_medium=email&utm_campaign=20171011-sdc
8. **Ion thruster prototype breaks records in tests, could send humans to Mars.** The time when space travellers on a spaceship will shout: "Mars Ahoy!" is creeping closer. https://www.space.com/38444-mars-thruster-design-breaks-records.html?utm_source=sd-newsletter&utm_medium=email&utm_campaign=20171013-sdc
9. **Far, far away! Glowing object's measurement sets Milky Way distance record.** The distance to a star-forming region that shines brightly in the microwave region and that is located on the other side of the Galaxy, was determined by the parallax method. Its distance of 66 500 light-years using this method beats the previous record of 36 000 light-years. <https://www.space.com/38440-glowing-object-measurement-milky-way-record.html>
10. **City-size lunar lava tube could house future astronaut residents.** <https://www.livescience.com/60733-moon-lava-tube-could-shelter-astronauts.html>
11. **NASA map of wildfire damage helps California recovery effort.** Another application of Earth-orbiting artificial satellites. <https://www.space.com/38514-nasa-map-helps-wildfire-effort.html>
12. **The puzzle of 'Tabby's Star': 9 NASA explanations for star's odd dimming.** https://www.space.com/38536-tabbys-star-mystery-9-nasa-theories.html?utm_source=notification
13. **Sunscreen 'snow' falls on scorching hot alien planet.** The weirdness of exoplanets continues to amaze. https://www.space.com/38581-alien-planet-sunscreen-snow-hubble-telescope.html?utm_source=notification

Astronomy-related images and video clips on the Internet

- **How did Saturn get its rings?** See a video clip.
http://video.nationalgeographic.com/video/101-videos/saturn-101?utm_source=NatGeocom&utm_medium=Email&utm_content=video_20170929&utm_campaign=Content&utm_rd=1654931348
- **After Cassini: 14 epic planetary science missions to get excited about.**
https://www.space.com/38298-solar-system-exploration-beyond-cassini.html?utm_source=sd-newsletter&utm_medium=email&utm_campaign=20171002-sdc
- **Tarantula Nebula unfurls like a cosmic spider in stunning HST image.**
https://www.space.com/38421-tarantula-honeycomb-nebulas-stunning-hubble-image.html?utm_source=sd-newsletter&utm_medium=email&utm_campaign=20171011-sdc
- **First glimpse of colliding neutron stars yields stunning pictures.**
https://www.space.com/38481-colliding-neutron-stars-stunning-pictures.html?utm_source=sd-newsletter&utm_medium=email&utm_campaign=20171017-sdc
- **Bird photobombs the ISS and Sun.** A bird crossed the face of the Sun at the same time as the ISS (International Space Station). https://www.livescience.com/60627-bird-photobombs-space-station-sun-photo.html?utm_source=lst-newsletter&utm_medium=email&utm_campaign=20171009-lst
- **Amazing aurora borealis: 33 breathtaking images.** <https://www.msn.com/en-za/weather/photos/amazing-aurora-borealis-33-breathtaking-images-of-northern-lights/ss-AAjlyWD?ocid=spartandhp>
- **Jupiter's colourful clouds swirl in stunning new image.** https://www.space.com/38747-jupiters-colorful-southern-hemisphere-images.html?utm_source=notification

Chairman's report for the meeting on 25 October 2017

- by Michael Moller

The meeting started on time at 19:15.

'What's up?' was presented by Michael Poll. He started by giving the lunar events for the month. He followed with the positions of the planets and highlighted some constellations to watch out for.

"Beginner's Corner" was also presented by Michael Poll this month, which he continued directly from 'What's up?' In this segment he described the details of the annual solar motion as affected by the earth's tilt and slightly eccentric elliptical orbit and their effects on the sun's rise and set times, and how these influence the solar analemma.

This was followed by a break at 20:10.

At 20:30 Johan Smit introduced the main speaker for the evening: Dr Sheldon Herbst. His presentation was titled 'Demystifying Relativity: A mostly gentle crash course'. While not going all the way into the mathematics, he did highlight interesting aspects of the equations and some of the innovations that Albert Einstein brought to them. He showed how the equations fit together and how to interpret their meaning.

The meeting was adjourned at 21:45, after which coffee and biscuits were provided. **Ω**

Observing: A cat’s footprint in Scorpius- by Magda Streicher

Gas nebulae in space indicate the beginning and end of the lives of stars, but also form the substance that transports our solar system through the universe. Such nebulae can be composed of many different elements. The Scorpius constellation houses the nebula NGC 6334, which can be seen in its totality in a size of almost 40'. The nebula lives up to its nick name of the Cat’s Paw or Bear Claw Nebula, a name which is really realistic for its shape. It was discovered by John Herschel on 7 June 1837 while he was staying in the Cape of Good Hope. This wonderful nebula, which is divided up by dark lanes to form four separate pieces of nebulosity, is around 5500 light years away.

NGC 6334 is a complex emission nebula which, in combination with ultraviolet radiation, delivers energy to the atoms and make them glow. The nebula hosts young stars that could be nearly ten times the mass of our sun. Pictures taken with large telescopes show this huge nebula glowing with a red colour due to an abundance of ionised hydrogen. It is located very near the galactic equator in the Carina/Sagittarius spiral arm, and scarily near the sting of Scorpius.

The nebula is not such a difficult object to observe – just be patient. I found dark skies to be the ultimate must to bring this wonderful object to the fore. NGC 6334 situated around 1.5 degrees north-east of the planetary nebula NGC 6302. The whole area is filled with partly dark and bright transparent clouds and haze. With the help of my ever reliable filters I could easily observe the three paws footprint look-a-like of a real-life big cats, if you wish.

The western piece, which represents the front "toe", is also the largest and most outstanding, with the other two situated to the north and south. The softer, more hazy piece situated towards the west indicates the rest of the larger footprint. Faint stars can be seen embedded in the nebulae. With the use of a nebular filter and careful observation a little piece of haze can be seen towards the middle. With my imagination it could be a thorn attached to the foot of this poor cat ... shall we call it leopard?

Beware of the cats in the dark of night, but try and spot his footprint against the stars of the Scorpius constellation.

OBJECT	TYPE	RA	DEC	MAG	SIZE
NGC 6334	Emission Nebula	17h 20.4m	-35° 57' 47"	5 - 7	35' x 20'

See an image of the Cat’s Paw Nebula on the next page.



NGC 6334, aka the Cat's Paw Nebula.

NOTICE BOARD

- ◆ **Karoo Star Party 2018 – diarize:** This event will take place from Thursday 9 to Sunday 12 August 2018 at Kambro Padstal, about 20 km north of Britstown in the Karoo, next to the N12 National Road. (Thursday 9 August is an official holiday.) See <http://www.kambroaccom.co.za>. **All the chalets at Kambro Padstal have already been booked for this period.** If you want accommodation in a chalet there for this period, phone Wilma Strauss regularly at 083 305 6668 to enquire whether there has been a cancellation. There is still accommodation available at the camp site there for this period. There is also accommodation available in Britstown at the Karoo Country Inn. Go to <http://karoocountryinn.co.za/kci.htm> for details.
- ◆ **Old newsletters:** All old newsletters from January 2004 onward are on our website. They contain a record of our Centre's activities as well as astronomical information.
- ◆ **Database:** Members are reminded that a database of the books in our library is to be found on our website.

Feature of the month:

First detection of gravitational waves from a neutron star crash

Optical flash also detected.

https://www.livescience.com/60689-gravitational-waves-from-neutron-stars-discovery-ligo.html?utm_source=lst-newsletter&utm_medium=email&utm_campaign=20171016-lst

GRB (Gamma-Ray Burst) also detected.

https://www.livescience.com/60695-why-gravitational-wave-discovery-matters.html?utm_source=ls-newsletter&utm_medium=email&utm_campaign=20171016-ls

What remains after the crash?

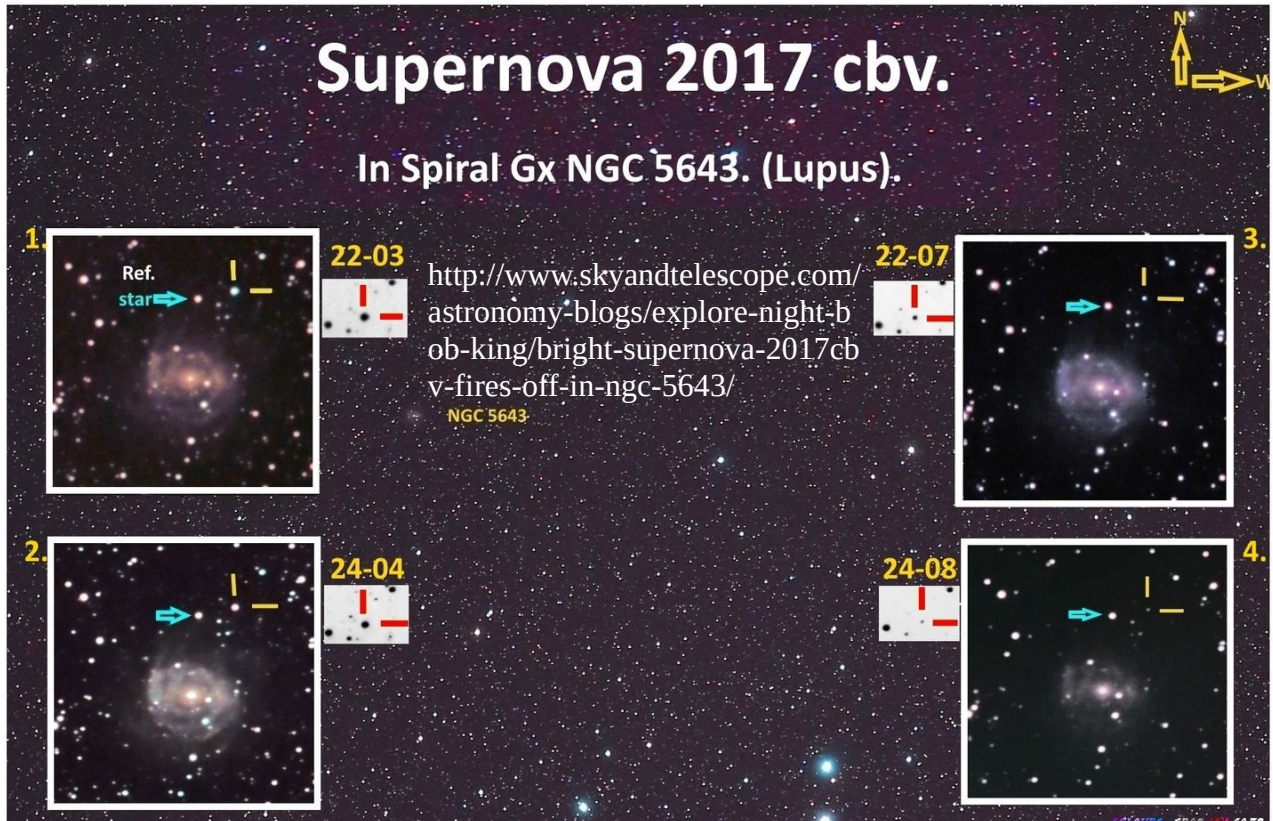
https://www.space.com/38478-did-neutron-stars-collision-create-black-hole.html?utm_source=notification

Explanation of the physics of the event.

https://www.space.com/38471-gravitational-waves-neutron-star-crashes-discovery-explained.html?utm_source=sd-newsletter&utm_medium=email&utm_campaign=20171016-sdc

Astronomy basics: the precession of Earth's axis

<https://www.youtube.com/watch?v=8z97i3FBhSs>



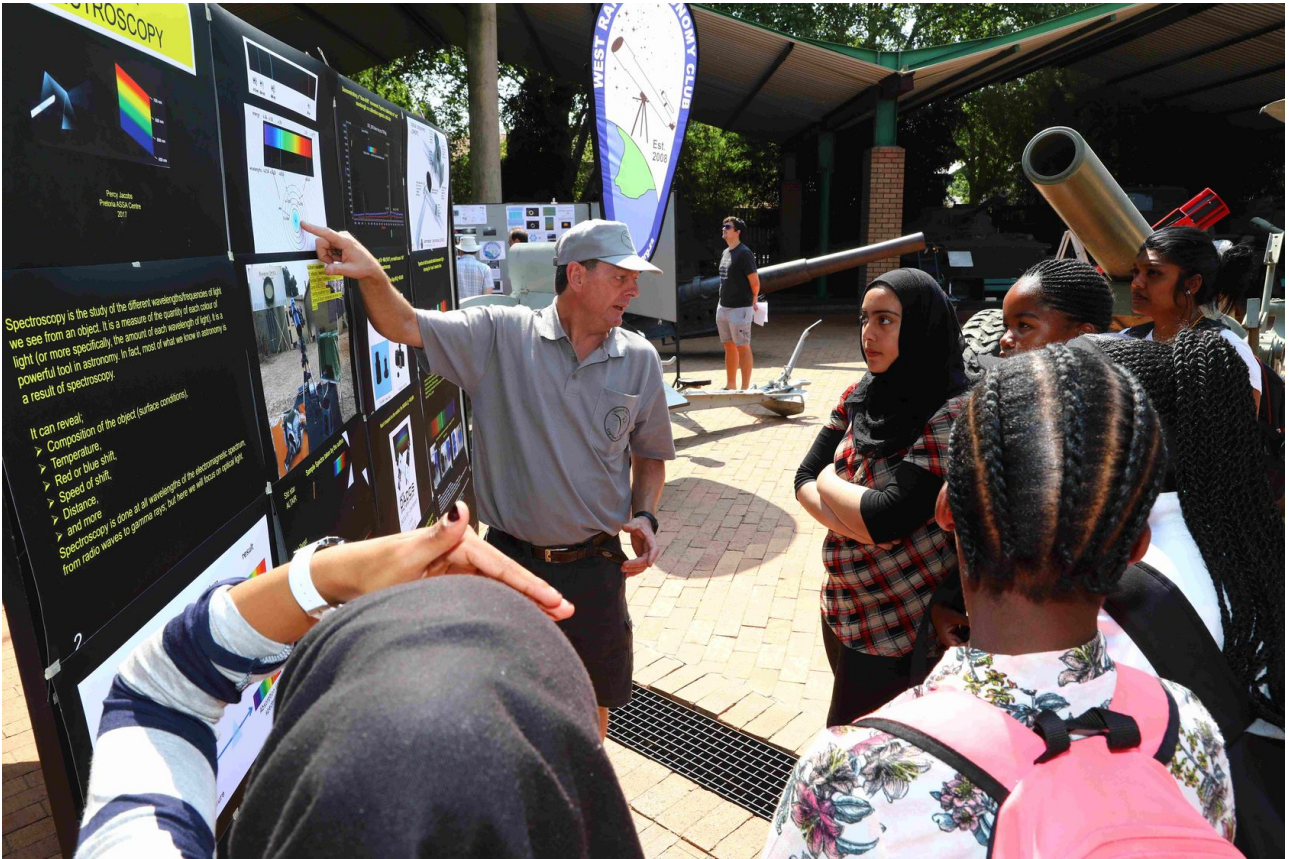
Top: SN 2017 cbv.

Bottom: Combo of the lunar eclipse of 7 August 2017.

Photographs by Johan Moolman.



The photographs on this and the next two pages were taken by Johan Moolman at the ScopeX 2017 event.
Top: The poster on astronomical spectroscopy of Percy Jacobs.
Bottom left: Johan Smit with his home made telescope.
Bottom right: Bosman Olivier with his home made telescope.



Top: Percy Jacobs enthusiastically talking to a small audience about astronomical spectroscopy.
Bottom: Neville Young talking to a small audience about the solar system.



Barbara Cunow at the ScopeX 2017 event.

Summary of “What's Up?” for Dec 2017 & Jan 2018 to be presented on 22 November - by Percy Jacobs

Phases of the Moon

Dec 17

Dark Sky – Sunday 10th to Thursday 21st – 12 days

Full Moon – Sunday 3rd

New Moon – Monday 18th

Summer Solstice – Thursday 21st

Occurs when a planet's **rotational axis**, or **geographical pole**, is the most inclined toward the Sun. The Sun reaches its **highest altitude** of the year on the summer **solstice**.

Jan 18

Dark Sky – Tuesday 9th to Saturday 20th – 12 days

Full Moon – Tuesday 2nd & Wednesday 31st

New Moon – Wednesday 17th

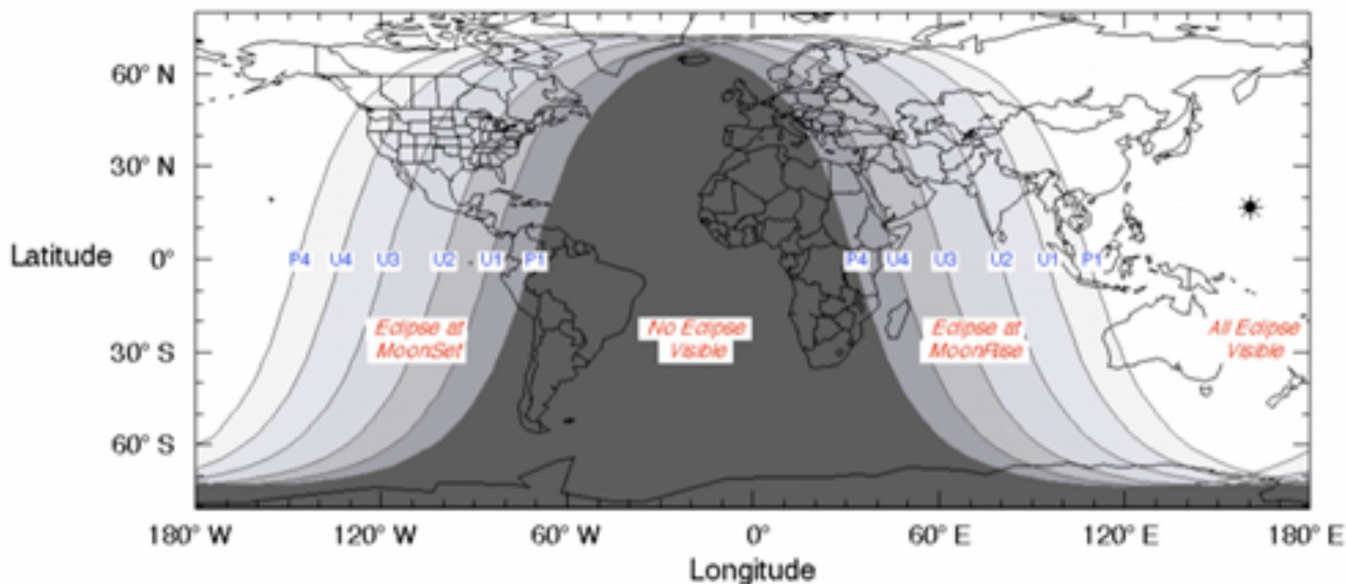
“**Blue Moon**” - 2 full moons in the month

the term "blue moon" is **used to mean a rare event**, as in the phrase "once in a blue moon"

Total Lunar Eclipse – Wednesday 31st

Not visible in South Africa

Start	Peak	End	Duration
14:52	15:30	16:08	01h16



Planets – Visibility

Dec

	@Sunset	@Midnight	@Sunrise
Mercury	yes	no	yes
Venus	no	no	no
Mars	no	no	yes
Jupiter	no	no	yes
Saturn	yes	no	no
Uranus	yes	yes	no
Neptune	yes	no	no

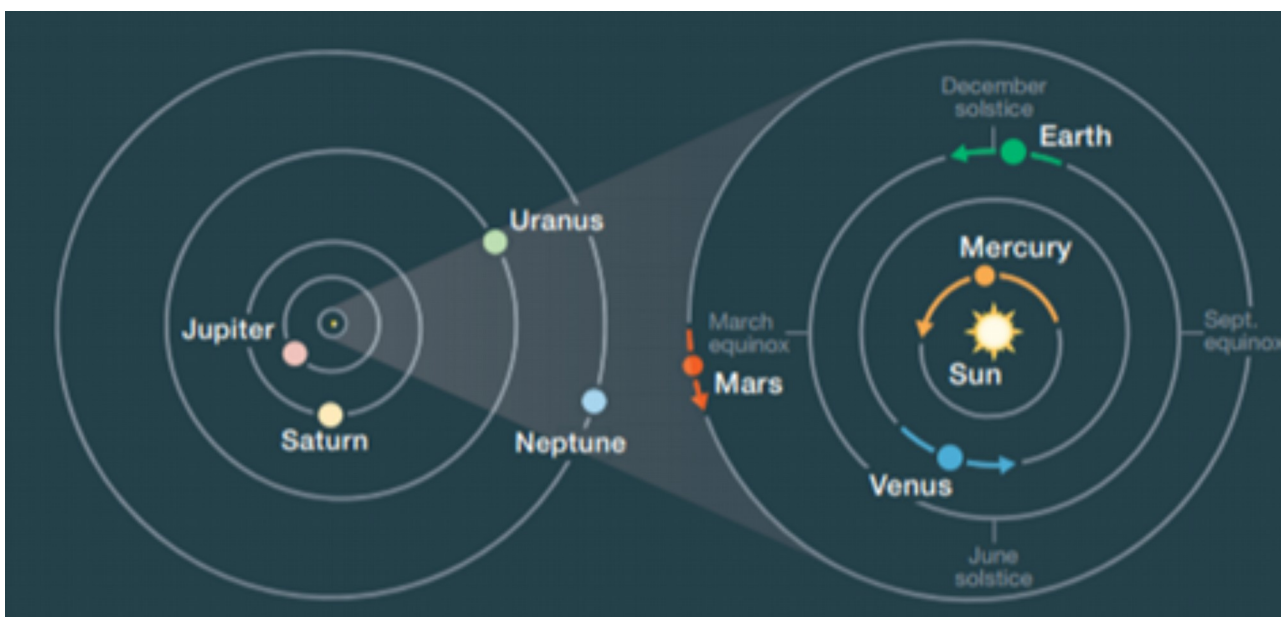
In the first week of Dec, Mercury & Saturn can be seen low on the horizon at sunset, in the west, close together.

Jan

	@Sunset	@Midnight	@Sunrise
Mercury	no	no	yes
Venus	no	no	no
Mars	no	no	yes
Jupiter	no	no	yes
Saturn	no	no	yes
Uranus	yes	no	no
Neptune	yes	no	no

In Jan, Mercury & Saturn can be seen just before sunrise in the east, low on the horizon

Planet Locations in month of July (compliments of Sky & Telescope) – Dec 17



Events – seen in the southern hemisphere

∅ Meteor Showers

- o 14th Dec – 23:00 to 03:00
- o Geminids
- o Rate/hr - ~50

∅ Other meteor showers, the Puppis-Velids & α Crucids, are not favourable

Comets – between mag 10 & mag 15

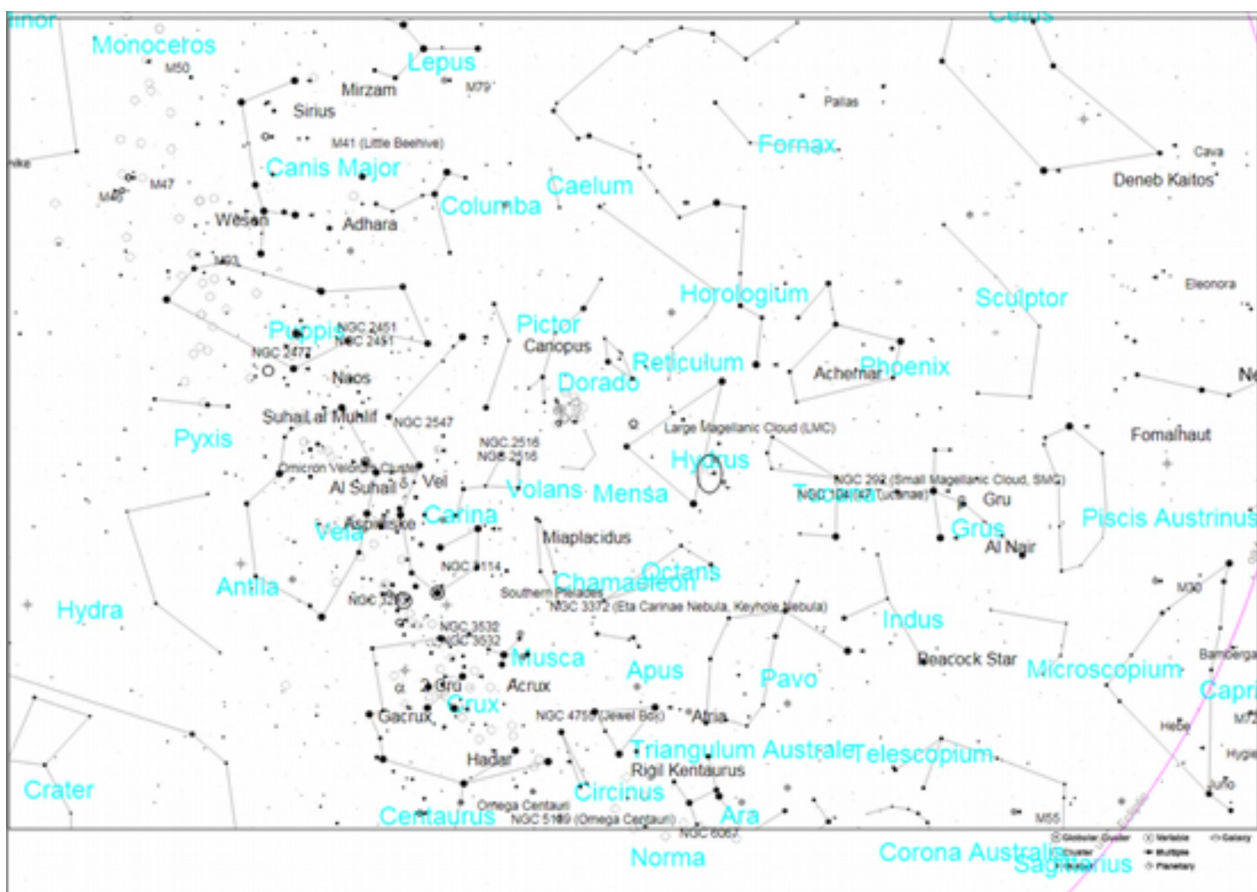
45P/Honda-Mrkos-Paidusakova – Capricornus

Johanson (C/2015 V2) – Indus

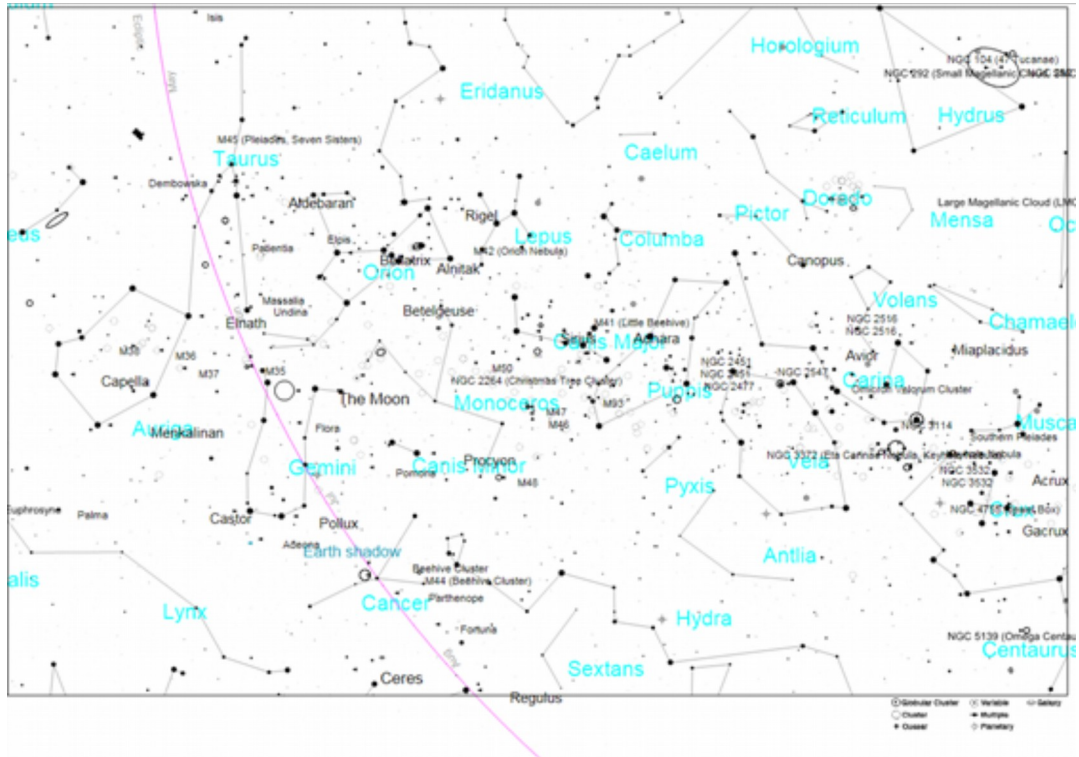
Panstarrs (C/2016 R2)

Constellations in Dec & Jan

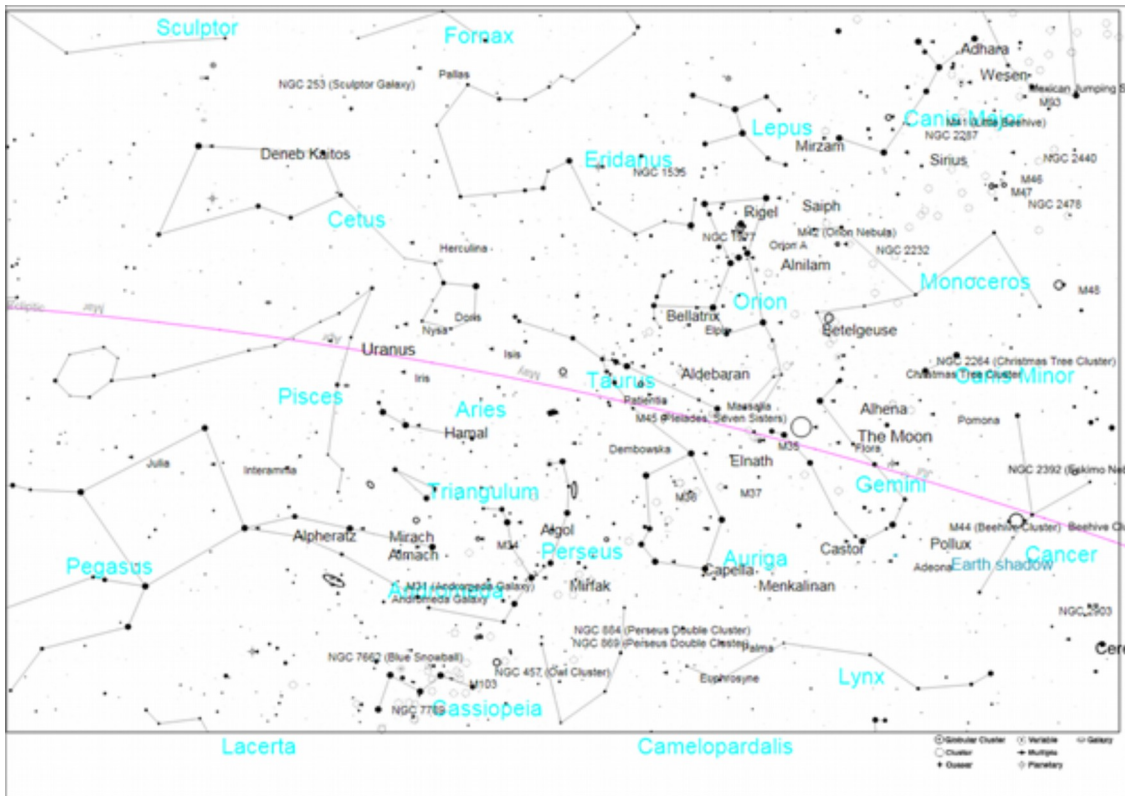
South



East



North



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