The PRETORIA CENTRE

of the

Astronomical Society of Southern Africa

www.pretoria-astronomy.co.za

NEWSLETTER OCTOBER 2012

Next meeting

Venue: The auditorium behind the main building at Christian Brothers College (CBC), Mount Edmund, Pretoria Road, Silverton, Pretoria.
Date and time: Wednesday 24 October at 19h15.
Programme:

- **Beginner's Corner:** "There's Blue Moons and There are Blue Moons" by Michael Poll*
- **What's Up?** by Johan Smit
- 10 minute break — library will be open
- **Main talk: A surprise from NASA / JPL**
- Socializing over tea/coffee and biscuits.

The chairperson at the meeting will be Percy Jacobs
* See page 12 of this newsletter.

Next observing evening

Friday 19 October at the Pretoria Centre Observatory, which is also situated at CBC. Turn left immediately after entering the main gate and follow the road. Arrive from sunset onwards.

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Report of observing evening on 21 September 2012 - by Michael Poll & Percy Jacobs

A layer of thin cloud, which got thicker, determined the outcome of this evenings viewing. We were six telescopes and 10 would be observers. One of the telescopes was Wessel Nel's recently completed and beautifully crafted instrument, which we stood and admired for some time.

On arrival, with the naked eye we could just make out Antares, Altair and Alpha Centauri. We could also see the five day old moon, and it was the Moon that provided the most entertainment before the thickening cloud diminished that view as well. We took the opportunity to do some lunar geography, or more correctly, selenography. We looked principally at the region around Mare Nectaris.

There is a group of three craters on the edge of Mare Nectaris, namely Theophilus, Cyrillus and Catharina. We noted that Theophilus overlaps into Cyrillus and there seemed to be a "channel" linking Cyrillus and Catharina. A note in Sky and Telescope (October 2012 Page 54) states that the side of Theophilius that overlaps Cyrillus is one kilometer higher than the opposite rim.

Around the "shore" of Mare Nectaris, we saw Fracastorius which is like a bay in Nectaris. It looks as though the wall of Fracastorius has been breached, allowing lava to flood in from Nectaris. Also on the Nectaris shore we noted the crater Beaumont.

In the entrance to the Mare Nectaris itself is the crater Madler, and on the on promontory on the other side from Theophlius we noted Isidorus and Capella. There is a cleft cutting into Capella which was reminiscent of the Alpine Valley. Post observing, this feature was identified as Vallis Capella. (Theophilus and Isidorus are like the Knysna Heads guarding the entrance to Nectaris, with Madler a "hazard" in the channel!)

Further to the south of Nectaris we noted the prominent crater Piccolomini, and running northwards from this crater we saw what appeared to be a prominent long wavy escarpment. This scarp was not identified at the time, as it was not labelled on the charts to hand, but from the reference below, its name was found to be Rupes Altai.

The following information about these craters is taken from "Atlas of the Moon" by Antonin Rükl (Hamlyn 1990). The numbers in square brackets refer to the crater numbers on the image on the next page, which was taken from Sky and Telescope, June 2012 pp 41- 42. On this image, north is up, and *lunar* west is to the left.

[134] Theophilus is a ring mountain, 100 km in diameter and 4400 metres deep. The rim of the wall rises 1200 metres above the surrounding terrain, and the central peak is 1400 metres high. St Theophilus was the Bishop of Alexandria from 385 AD, and died in 412 AD.

[150] Cyrillus is 98 km in diameter, and has a disintegrated wall. Cyrillus succeeded Theophilus as Bishop of Alexandria and died in 444 AD.

[166] Catharina was the St Catharina of Alexandria, who died in AD 307. She is the patron saint of Christian Philosophers. The crater is 100 km across and 3130 metres deep, and is described as "considerably damaged"

[168] Fracastorius is a walled plain, 124 km across, whose wall to the north is missing. It is named after Girolamo Fracastoro, (1483-1553) who was an Italian physician, astronomer and poet.

[167] Beaumont is named after Leonce Elie de Beaumont, (1798-1874), a French geologist who demonstrated a method for determining the ages of individual rock layers. This is a crater with an "interrupted wall" and is 53 km in diameter

[135] Madler is a simple crater (i.e no central peak), and is 28 km in diameter. Johan Madler (1794 – 1874) was a German selenographer.

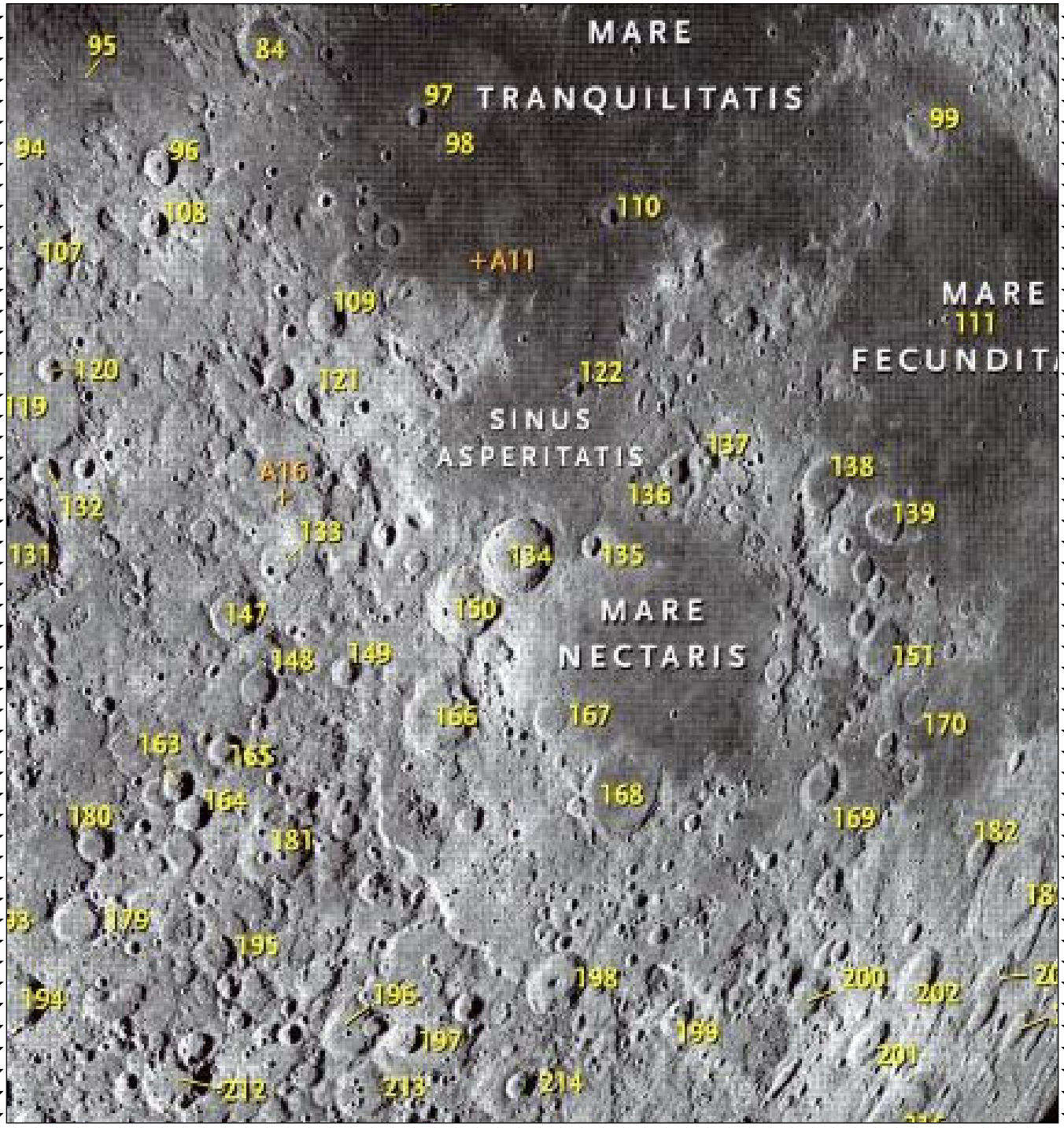
[136] Isidorus is named after St Isidore who was the Bishop of Seville. He lived from about 560 – 636 AD. He was interested in astronomy, and believed the earth to be a sphere.

[137] Capella is a crater 49 km in diameter and is named after Martianus Capella, a 5th Century AD Carthaginian lawyer, who theorised that Mercury and Venus orbit the sun, and that the sun and the rest of the planets orbit the earth.

[198] Piccolomini is named after Alessandro Piccolomini (1508 – 1578) an Italian archbishop and astronomer. Piccolomini made star maps, and was the first to label the stars by letters of the Latin alphabet. (Bayer's system using Greek letters came later). The crater is 88 km in diameter, and has a central peak.

Rupes Altai or the Altai Scarp, is about 480 km long and was named by Madler. The feature resembles a fault, sloping down to the Nectaris basin. It can be seen on the image running from [198] Piccolomini up to [149] Tacitus

Vallis Capella cuts through the crater Capella, and is about 110 km long. **Ω**



Report of monthly meeting on 26 September 2012 - by Fred Oosthuizen

A good turn out of about 70 members and friends attended the meeting.
Fred opened the meeting by welcoming all present with a special welcome extended to the Six first time visitors.

Announcements: Bosman requires volunteers with scopes to assist at the Vootrekker Monument function over the weekend 5 and 6 October. Please contact him via 'e' mail. Barbara and Neville will be attending the NASA symposium in Cape Town 12 - 14 October. Wessel was congratulated on the fine quality achieved in the construction of his 150mm telescope.

Beginners corner : Johan Smit entertained us in his explanation of Celestial co ordinate systems. Stating that lines of both right ascension and declination stay fixed with respect to the stars therefore they can be permanently printed on star maps. Directly out from the Earths equator is the *Celestial equator, =* 0° declination. If you stand on the Earths equator, the celestial equator passes overhead. Stand on the South pole - latitude 90 degrees S and overhead will be the *South celestial pole*, declination -90 degrees .The same thing applies to the North pole except that the declination will be +90 degrees .
The Earth is at the center of the *celestial sphere,* an imaginary surface on which the planets, stars and nebulae seem to be printed.
On the celestial sphere, lines of *right ascension and declination* are similar to longitude and latitude lines on Earth. When a telescope's *right - ascension* axis is lined up with the earths axis,the telescope can turn on it, to follow the rotating sky.
Johan demonstrated various methods of establishing and lining-up a telescope to the celestial pole.

"What's Up?" was presented by Percy Jacobs in his usual efficient manner.

The main talk: "LIVE FROM CERN" was presented by CLAIRE LEE from the control room of the **Large Hadron Collider** at **CERN** utilizing the "On Line Video Conferencing Technology, "WEB-X." This method proved to be very successful. Claire brought us up to date with the research achieved so far in the hunt for the "Higgs Bosson", "extra dimensions" and particles that can make up dark matter.Claire also eluded to Quarks, Gluons, Muons and the "Higgs Snow Analogy".

Summary of "What's Up?" to be presented on 24 October 2012 by Johan Smit

Deep time:

The best time for deep sky viewing is the first half of the month November.
Full Moon will be on 29 October, last quarter on 7 November and new Moon on the 14th. Plan your deep sky viewing for this time.
Watch how the typical winter constellations get replaced by the summer constellations.

Planets:

The end of October and beginning of November is a good time to locate Mercury. It will be in Scorpio just after sunset, and will be close to Antares on 6 November. Mars has passed Antares and this is the last chance to compare the red planet and its rival Antares for a while.
Jupiter watching season is upon us. It rises at 21:00 on 1 November and will rise at sunset at month-end.
We may be lucky this November. Previously I have reported many occultations of Jupiter by the Moon which we could not see or was clouded (rained) out. This month we will be treated to two opportunities. The first one happens on 2 November and the second on 29 November. Both will happen early in the morning so plan on going to bed very late at least twice.
Hold thumbs. Full details will be supplied at the monthly meeting.

Feature of the month: the Tarantula Nebula, R136 and R136a1
by Pierre Lourens

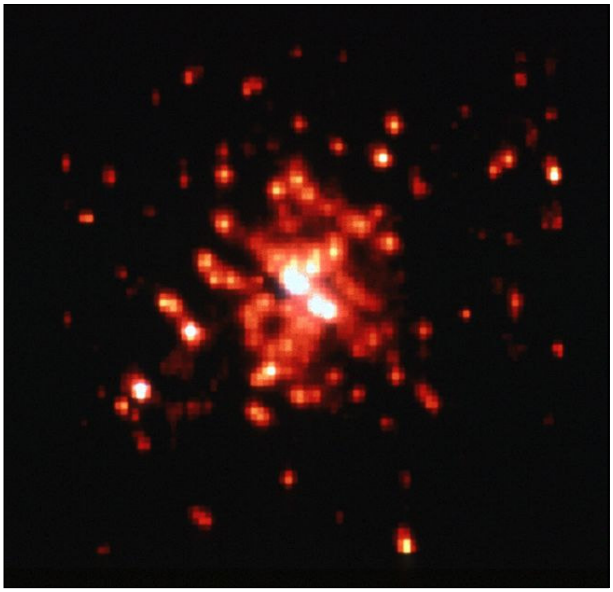
The Large Magellanic Cloud (LMC) lies about 160 000 light-years away. The Tarantula Nebula (NGC 2070) lies at the eastern end of the LMC. It was first catalogued as a star named 30 Doradus, then discovered to be a nebula by Nicolas Lacaille in 1751 - 52. It is the largest known emission nebula in the local group of galaxies. It is 700 light-years in diameter. By comparison, the Orion Nebula (M42) is 30 light-years in diameter and 1500 light-years away. If the Tarantula Nebula were at the same distance than the Orion nebula, it would occupy one third of Earth's sky and its light would be intense enough to cast shadows in the night.

Near its centre lies the extremely luminous and compact cluster R136, only 35 light-years in diameter. It has a mass of 450 000M_O *. It is the most massive known young cluster. In sheer bulk, it resembles our galaxy's globular clusters - except ours are all fashioned from ancient stars while the stars in R136 are only between 1 and 2 million years old. They are very massive, luminous giants and super giants of spectral type O. They light up the Tarantula Nebula.

The HST and other major telescopes have also found in R136 what was thought to be a super massive star with mass 1500M_O and radius 60R_O. It was named R136a. Subsequent research has shown that it is actually a cluster of twelve massive, luminous, newborn stars, situated very close together. They have masses between 35M_O and 57M_O, with the exception of one, named R136a1. R136a1 is a Wolf-Rayet star and is the most massive star known, with mass an estimated 265M_O. It is also the most luminous star known, with luminosity 8 700 000L_O. Its surface temperature is over 50 000 K. Astronomers suspect that such an enormous star will perish as a hypernova, a stellar explosion with an energy of over 100 supernovae.

So here is the largest, brightest nebula with the most massive young cluster, and with the most luminous, most massive star inside the cluster. And to add an additional exclamation mark: SN 1987A, the first naked-eye supernova since 1604, exploded in the outskirts of the Tarantula Nebula in January 1987.

* M_O : Mass of the Sun.
  R_O : Radius of the Sun.
  L_O : Luminosity of the Sun.



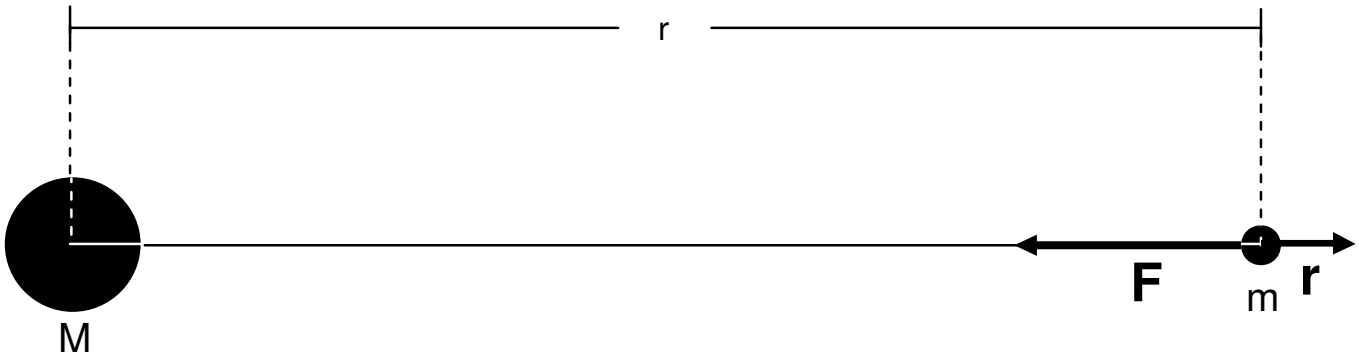
The image at top left shows the Tarantula Nebula and at top right the compact cluster R136. The artist's illustration below right shows a red dwarf, the Sun, a blue dwarf, and R136a1. (R136a1 is not the star with the largest known radius. This distinction belongs to the star NML Cygni.) **Ω**

Basics: Tidal force - by Pierre Lourens

This not a mysterious force, but just the difference in the force of gravity between two points on a body. To be more exact, consider the following. The gravitational force of a spherical body with mass M on another spherical body with mass m is given by Newton's law of gravity:

$$\mathbf{F} = [- G M m / r^2] \mathbf{r}$$

F is the force of gravity that the mass M exerts on the mass m. The negative sign on the right of the formula means that it is a vector pointing in the opposite direction than **r**, as shown below.
G is the Cavendish constant.
M is the mass of the attracting body.
m is the mass of the body that is being attracted.
r is the distance between M and m.
r is a unit vector in the direction as shown in the figure.

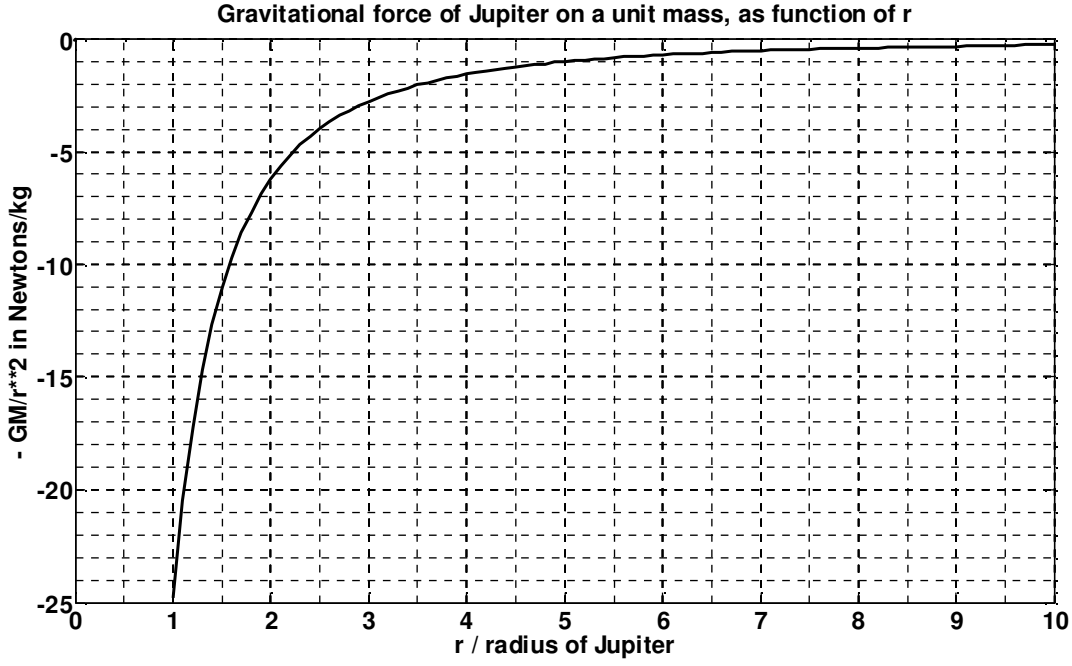


The mass m also exerts an equal but oppositely directed force on M.

The force of gravity that the mass M exerts on a unit mass is given by the vector **f**:

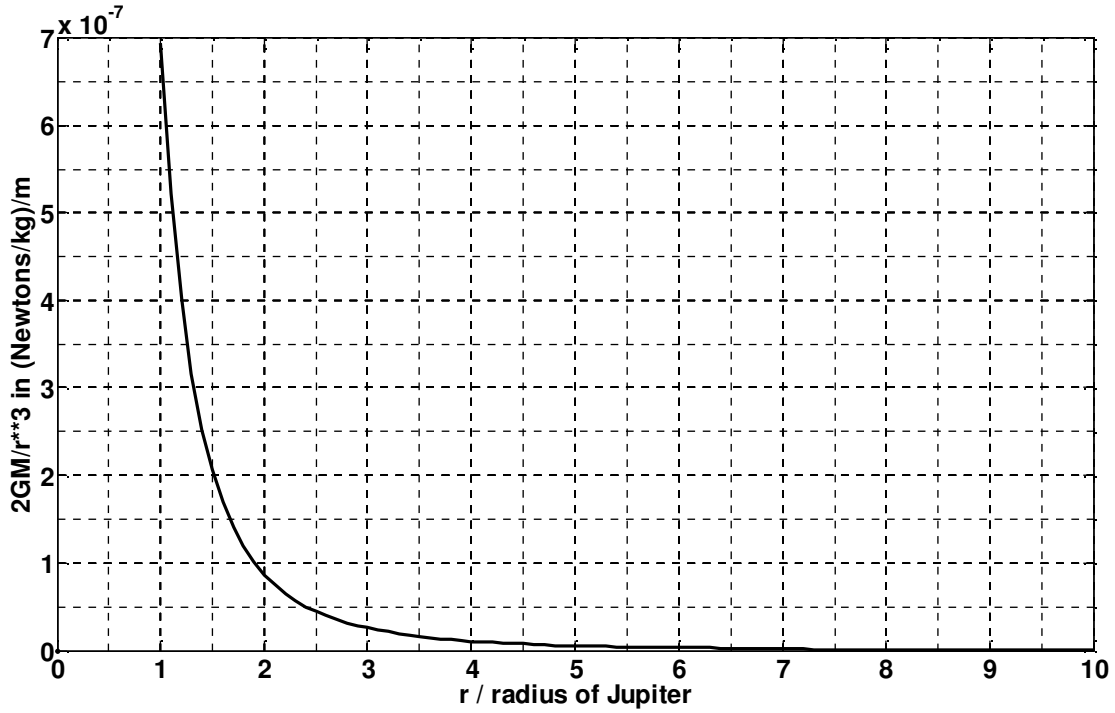
$$\mathbf{f} = [- G M / r^2] \mathbf{r}$$

For illustration, the graph in the figure below was drawn with M = mass of Jupiter. Note that the slope of the graph increases as r decreases. This has the following meaning.

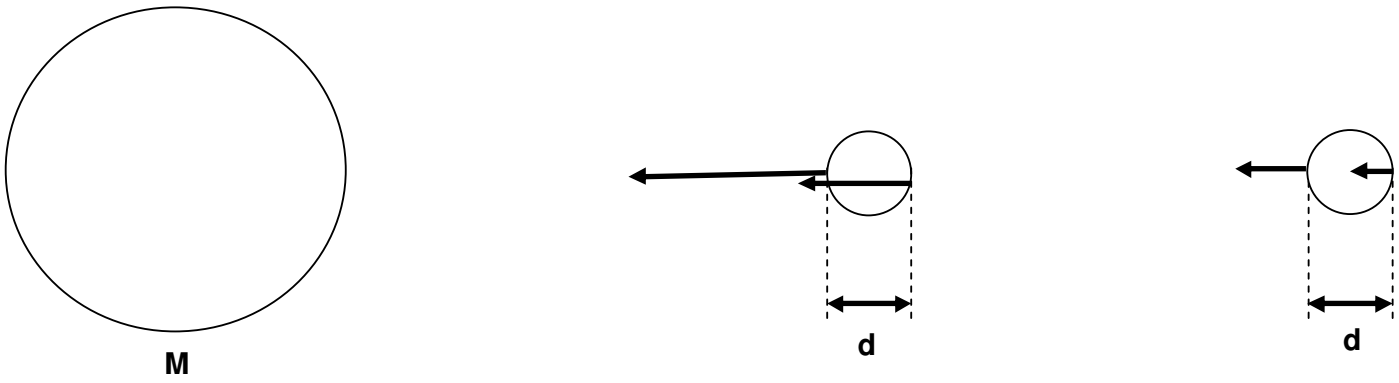


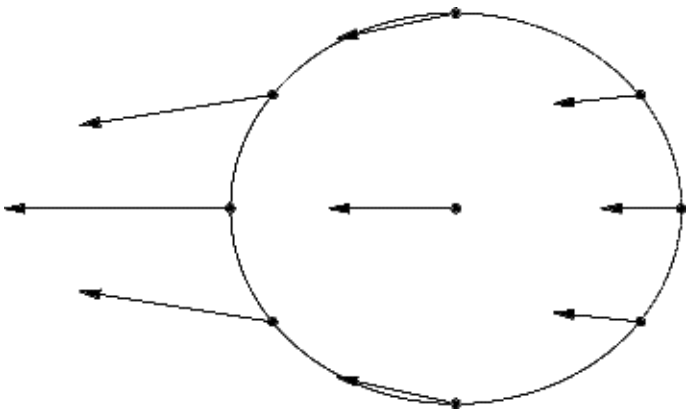
A body with diameter d experiences a difference in the attractive force per unit mass on the near and far sides of it. This difference tends to stretch the body towards the mass M. The

magnitude of the difference is $[2GM/r^3]d$. From this it can be seen that the magnitude of the difference is greater the smaller r is and the larger M is. $2GM/r^3$ is the slope of the plot on the previous page. Its plot as function of r is shown in the figure below. For this plot, M = mass of Jupiter.



The figure below illustrates how the forces per unit mass on the near and far sides of the body change when the body is moved closer to M. The difference increases as r decreases.



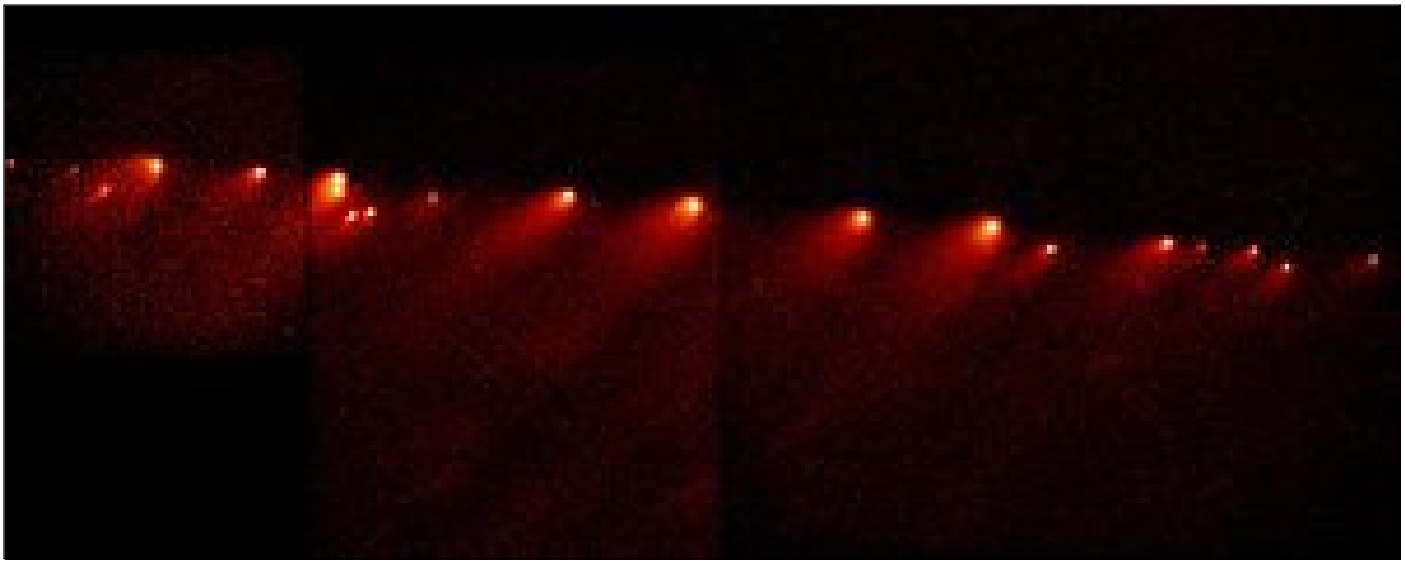


The force of gravity from M acts on every part of m. The arrows in the figure on the left represent the force of gravity per unit mass at more points in m. It is clear that there is a net stretching effect on m towards the left (towards M).

The gravitational field of Earth's moon produces a tidal force across the diameter of Earth, which raises tides of several meters in the solid Earth, and larger tides in the oceans. It also raises tides in Earth's atmosphere. And of course a similar tide is raised in the solid moon by the tidal effect of Earth on it.

If the tidal force is stronger than a body's cohesiveness, the body will be disrupted. The minimum distance that a body comes to a planet or the Sun before it is shattered this way is called its Roche Distance.

A comet nucleus consists of a mixture of rock rubble and dust only held together by frozen gases and the weak mutual gravity. Comet Shoemaker-Levy 9 broke up under the influence of Jupiter's tidal forces during a pass in 1992 when it approached closer than its Roche Distance to Jupiter. The figure below shows fragments of the original comet nucleus. These fell into Jupiter's atmosphere in June 1994.



Synchronous rotation of a moon around a planet means that that moon has an orbital period around the planet that is the same as the spin period around its spin axis. It therefore keeps the same face toward the planet. (It is also called tidal locking.) This is the case for all large moons in our solar system, including Earth's moon. This is because the tidal effect causes a slight bulge on the moon, on the side closest to the planet. As the moon spins on its axis and orbits around the planet, there is friction in the interior of the moon as the bulge shifts. These frictional forces eventually change the spin period until it is the same as the orbital period.

But the orbit of a moon around a planet is generally an ellipse, and not the special case of a circle. The spin angular speed of a moon remains constant, but the orbital angular speed varies. It is greatest at perihelion, and least at aphelion. (See the article on page 6 of the September 2012 newsletter about the two-body problem in celestial mechanics.) As a result of this, the side of the moon facing the planet shifts somewhat to and fro as the moon orbits the planet. (The libration in longitude of Earth's moon is an example of this.) It means that some residual friction always remains. And frictional forces at work always generate heat, like in a wire that is twisted to and fro. In the case of Jupiter's moon Io, this residual friction perpetually generates heat that drives Io's volcanoes of liquid sulphur. http://astronomycentral.co.uk/io-a-tormented-world-of-fire-and-brimstone/

Consider a human near a black hole, falling head first into it. The difference in the gravitational force per unit mass between the head and feet of a person with length ℓ will be $[2GM/r^3]\ell$ It will be very large, as a result of the large value of M and the small value of r. It will be so large that the person would literally be pulled apart in a long, thin stream! Some physicists with a distorted sense of humour have given this (fortunately imaginary) process the gory name of "spaghettification".

"Galactic cannibalism" has been known for some time. When a dwarf galaxy ventures too near a large galaxy, the former is drawn in by the gravitational force of the latter and the tidal forces of the latter pull a long stream of stars from the unfortunate dwarf galaxy. Such streams are also pulled from globular clusters. http://en.wikipedia.org/wiki/List_of_stellar_streams **Ω**

MNASSA

The August 2012 issue of MNASSA is now online and can be downloaded from the usual website at http://www.mnassa.org.za/

An Amateur Astronomer's Astro Ailments and Addictions: An African Assessment (AAAAAaA:AAA) - by Johan Moolman

Astronomy has been kind to me – affording hours upon hours of exploring creation and enjoying its glory. As a pathologist (microbiologist) the view through an eyepiece is part of my daily life, but honestly, I prefer the eyepiece to be on my telescope, rather than on a microscope! Numerous "challenges" cross our paths as amateur astronomers… taxing our "addiction avoidance" capabilities, but alas, many are the afflictions, ailments and addictions bestowed onto us!

"**Bino benevolence**". Starting off, a pair of 10 x 50 binoculars were THE tool... initially, but it wasn't long before the BIG binos (25 x 100) were on board, accompanied by their unfortunate "alignment attitude". Currently the 15 x 50 image stabilizers are doing duty… still faithful in helping me find my way around our galaxy (and beyond).

Aperture fever (or rather, **Mirror Madness**). Now THIS condition is NO stranger to many of us. My first love, an 8" Orion (Newtonian), unfortunately just HAD to go! But thankfully I am being thoroughly consoled by an 18" Obsession (Dobs of course). NO contest here. Gone are the days of the **Newtonian dance** and its accompanying back spasms! The views lead to an uncontrollable retinal riot, with rods and cones alike joining in to keep the old occipital lobes occupied! The addition of a "floater banisher", aka a binoviewer, was the last straw – my **"Big Dobs Dependence"** is complete! (PS. The 8" DID find a caring, appreciative AND faithful owner.)

Red light dyslexia – as if my childhood challenge to correctly orientate my "p's" vs. "9's", or my "d's" vs. "b's" etc. wasn't enough, the little LED headlamps just HAVE to have a dual switch – Left "red" and right "white", or is it…? Anyway! Needless to report that accidental dark adapted vision destruction still occasionally afflicts me…

Refractitis: Now what can I say. Popping a Lunt solar filter onto a 127mm refractor yielded a respectable solar scope. However, the psychedelic colours around solar system targets in this bottom of the line specimen just weren't "acceptable"! A remedy was urgently called for to rid me of these "symptoms"… and now I am awaiting the 85mm Televue TV-85… APO off course! Will just have to wait and see how THIS condition develops. Spontaneous resolution is hopefully on the charts, including some "**Solar Scope Solace**".

Pixel palpitations, fortunately this seems to be just a transient ailment... Up to now I have managed to withstand the lure of astrophotography, but obviously can't guarantee lasting immunity against this complex syndrome, and my resistance may well be duly challenged in future!

"To Go" or not "To Go". That is the question! Adding digital setting circles (Argo Navis) and go to drive system (ServoCAT) to the Dobs was probably one of my wiser decisions in life! Although my trusted star charts are always at hand, I enjoy spending time looking "at", rather than "for" targets. My mental stability however, had to endure / is enduring numerous "insults"- but all in good spirits though! Some of my "purist" colleagues - those by me highly revered and respected non-technically challenged, mirror grinding, tube assembling, "non-laser collimating" star hoppers - just can't resist humorous slurs aimed at the "Go-To Tracker"! Fortunately, at over 50, I am pretty secure in who I am and why I'm here – and sanity prevails!

Star Chart Indecision. What a quest this has been – trying to find charts that suit MY needs! Many versions, but none really making the cut! Targeted therapy was called for, and the final product: customized, laminated and duct taped … at last THIS itch has been scratched. Now I can check on the Go To's performance!

Laser pointer lunacy: Oh**,** what a blessing, for public and educational events, that is. No longer the need for frustrating, often ineffective verbal directions to elusive targets! The "lunacy" is on the part of those unscrupulous individuals who sell uncontrolled, "weaponized" versions of this tool to the uniformed public! No need to elaborate on this scourge. We can just hope and pray that authorities won't misdiagnose the condition and force a knee jerk blanket ban as a therapeutic intervention! This would really be a blow those of us law-, rule abiding astronomers with our registered lasers, proudly sporting DoH stickers…

"Monetary Muteness". This may quite possibly be an advantageous anamnestic affliction. To quote a cyclist's prayer: "…please don't let my wife sell my gear for the price I said I paid for it…" No comment … let's move on…!

Eyepiece Addiction: SO many choices, SO little time! Be sure not to suffer from vertigo or double vision when trying to negotiate this maze! Panoptic…? Ethos…? Delos…? Nagler…? Plössl…? "Space-Walk" experience or "tunnel" vision – you decide! A challenging but rewarding trial with few tribulations. But alas no remedy in sight yet!

Filter Flirtations. These relationships have been somewhat of a let-down and rather short-lived, admittedly due to ignorance and non-commitment on my side. The oxygen III version did however proofed useful as a glorified light pollution filter – complimenting the views of planetaries from my artificial light challenged skies.

Ladder leisure. Now, with my "Big Dobs Dependence" an established, chronic condition, attaining a relaxed ambiance at the eyepiece became a priority. Eventually, assaulting a bar chair with an angle grinder, and combining with a sturdy, wide stepped ladder, proofed to be just what the doctor ordered! Sorted – no more musculoskeletal straining.

Finally, may the photon screens (aka clouds) at your location be up for short intervals, may stray and artificial light sources be scarce and may your astronomy afflictions and addictions be conducive to your general health, and to our Non-African colleagues: Greetings and blessings from the south-eastern quadrant of Sol's third rock. Ω

Noteworthy items

- **Interstellar travel is hard, why bother?** http://news.discovery.com/space/interstellar-travel-is-hard-dont-bother-120913.html#mkcpgn=emnws1
- **Mars rover Curiosity takes photograph of Sun eclipsed by Phobos.** http://news.discovery.com/space/astronomer-curiosity-snaps-martian-eclipse-120918.html#mkcpgn=emnws1
- **H.E.S.S. II telescope.** On 26 July 2012, this telescope started operation in Namibia. It is dedicated to observing the most violent and extreme phenomena of the Universe in very high energy gamma-rays. http://phys.org/news/2012-07-largest-cherenkov-telescope.html
- **First planets found around Sun-like stars in a cluster.** Planets orbiting Sun-like stars in a crowded cluster of stars have been found for the first time. The findings offer the best evidence yet that planets can form in dense stellar environments. The newfound planets are not habitable, and their skies would be very star-studded. http://www.nasa.gov/home/hqnews/2012/sep/HQ_12-322_First_Planets_Around_Clusters.html
- **Dyson spheres: the ultimate energy shell game.** Give your imagination free rein. http://news.discovery.com/space/the-dyson-sphere-the-ultimate-shell-game-120923.html#mkcpgn=emnws1
- **Did a killer asteroid drive the planet into an ice age?** When a mountain-sized asteroid struck the deep ocean off the coast of Antarctica 2.5 million years ago, it set off an apocalyptic chain of events. Read and see a simulation and a video clip about it. http://www.universetoday.com/97455/did-a-killer-asteroid-drive-the-planet-into-an-ice-age/
- **NASA Mars rover Opportunity reveals geological mystery.** Spherical objects concentrated at an outcrop differ in several ways from iron-rich spherules nicknamed "blueberries" the rover had found at its landing site and at many other locations. http://www.nasa.gov/home/hqnews/2012/sep/HQ_12-324_Mars_Opportunity_Mystery.html
- **NASA's WISE survey uncovers millions of black hole candidates.** NASA's WISE mission has led to a bonanza of newfound candidate super massive black holes and extreme galaxies called hot DOGs, or dust-obscured galaxies.

http://www.nasa.gov/home/hqnews/2012/aug/HQ_12-295_WISE_Black_Holes.html

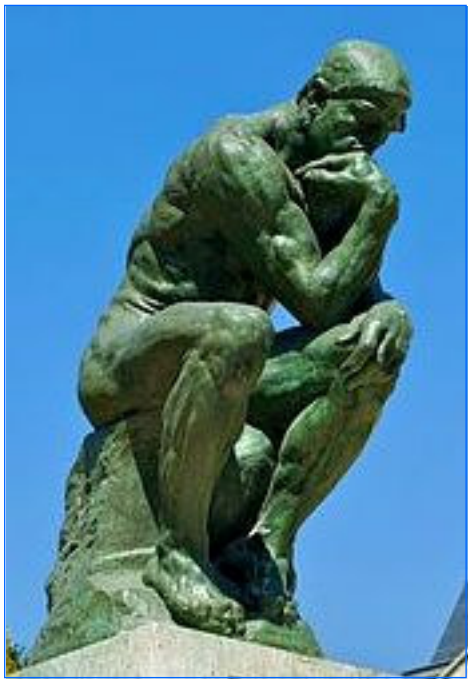
- **Ancient Buddhist statue of extraterrestrial origin.** http://news.discovery.com/history/meteorite-buddha-120926.html#mkcpgn=emnws1
- **NASA Orbiter observations point to 'dry ice' snowfall on Mars.** Mars Reconnaissance Orbiter data have given scientists the clearest evidence yet of carbon dioxide snowfalls on Mars from clouds around the south pole of Mars in winter. http://www.nasa.gov/home/hqnews/2012/sep/HQ_12-315_MRO_Snowfall.html
- **Hubble portrays a dusty spiral galaxy.** The HST has provided us with another outstanding image of a nearby galaxy. http://www.esa.int/esaSC/SEM1I5GYD7H_index_0.html
- **Mars streambed.** More evidence of liquid water on Mars in the past. http://www.nasa.gov/multimedia/podcasting/curiosity20120928.html
- **Nearby exoplanet could be covered with diamond.** Diamonds are forever, so this planet should stick around for a very long time - it appears to be literally made of the stuff. http://www.universetoday.com/97912/nearby-exoplanet-could-be-covered-with-diamond/51/
- **Lost asteroid rediscovered with a little help from ESA.** A potentially hazardous asteroid, once found but then lost, has been rediscovered and its orbit confirmed by a determined amateur astronomer. http://www.esa.int/esaCP/SEM3KS2S18H_index_0.html

Comets

- **Comet C/2011 L4 (Pan-STARSS) in southern sky.** The comet could be brightest between March 8-12 2013, with a magnitude near -0.5. http://cometography.com/lcomets/2011l4.html http://smithsonianscience.org/2011/06/astronomers-discover-new-comet-using-pan-starrs-1-telescope-in-maui/

  Pan-STARSS Home Page. Pan-STARRS is a wide-field imaging dream-machine. http://pan-starrs.ifa.hawaii.edu/public/home.html
- **Comet C/2012 S1 (ISON) discovered. It is predicted that its appearance will be very exceptional**. http://astronomynow.com/news/n1209/25comet/

  International Scientific Optical Observation Network (ISON). This system is intended for near-Earth space surveillance. http://lfvn.astronomer.ru/report/0000029/index.htm **Ω**



For members with a philosophical bent: New Scientist Special Issue - What is reality?

Plato lets Socrates describe a group of people who have lived chained to the wall of a cave all of their lives, facing a blank wall. The people watch shadows projected on the wall by things passing in front of a fire behind them, and begin to ascribe forms to these shadows. According to Plato's Socrates, the shadows are as close as the prisoners get to viewing reality. He then explains how the philosopher is like a prisoner who is freed from the cave and comes to understand that the shadows on the wall do not make up reality at all, as he can perceive the true form of reality rather than the mere shadows seen by the prisoners.

Read about the elusive nature of reality in this special issue. http://www.newscientist.com/special/reality

Also for sale at the CNA @ R69.95.

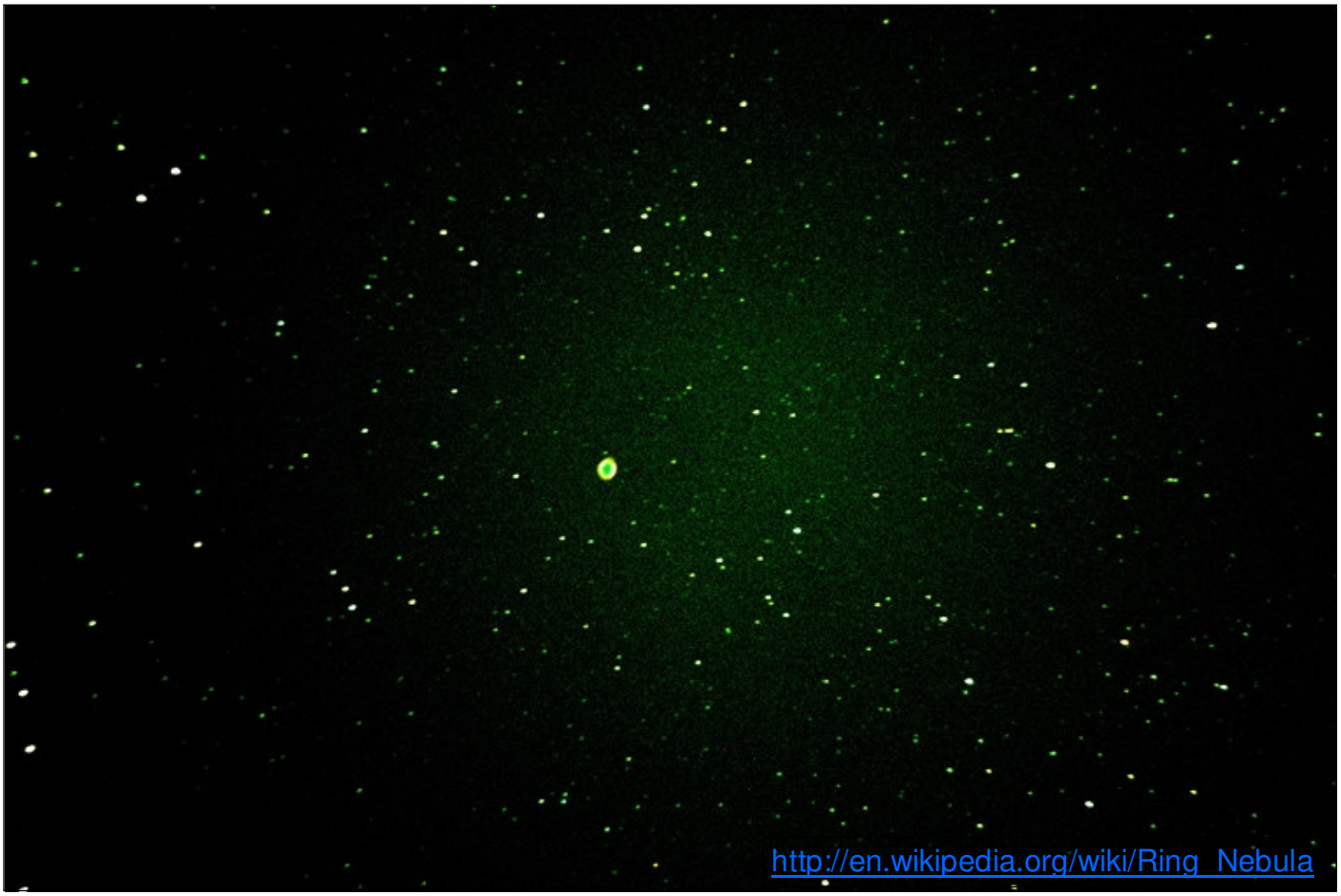
Left: “The Thinker”, the famous statue by Auguste Rodin.

M31 visible

M31, the Andromeda Galaxy, is visible in the evening during October. It is one of only 3 extra-galactic objects visible with the naked eye. The other two are the SMC (Small Magellanic Cloud) and the LMC (Large Magellanic Cloud). http://en.wikipedia.org/wiki/Andromeda_Galaxy

"Beginner's Corner" on this month's programme

The talk is about the several meanings of the expression "Blue Moon" and includes a discussion about the origin of the currently popular meaning that a "Blue Moon" is when there are two full moons in a month.



http://en.wikipedia.org/wiki/Ring_Nebula

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Photo of M57 (aka NGC6720 or the Ring Nebula) taken by Louis Kloke, a member of the Pretoria Centre of the ASSA and an ASSA 100 Observer. 8" Newtonian reflector Skywatcher on EQ5 mount (Synscan goto). Orion short 80mm Guide scope with Orion Starshoot autoguider. Orion Starshoot ProII Deep Space Colour CCD imager. Orion 2" Skyglow Astrophotography Imaging filter. Maxim DL Essentials software for main CCD image capture. PHD auto guider software for guiding.Ω