



The **PRETORIA CENTRE**

of the
Astronomical Society of Southern Africa

www.pretoria-astronomy.co.za

NEWSLETTER APRIL 2014

Next meeting

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

Date and time: Wednesday 23 April at 19h15.

Programme:

- **Beginner's Corner:** "The element fluorine's exotic origins" by Fred Oosthuizen.
- **What's Up?** by Percy Jacobs.
- 10 minute break — library will be open.
- **Main talk: "Space junk" by prof Pat Zeitzer.**
- Socializing over tea/coffee and biscuits.

The chairperson at the meeting will be Pat Kühn.

Next observing evening

Friday 18 April 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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Chairman's Report for the monthly meeting of 26 March 2014 by Pierre Lourens

In **Beginner's Corner**, Johan Smit talked about reporting meteor sightings: how to observe, report and whom to report to. Standard reporting should be:

1. Exactly where you were.

- Stay calm and observe.
- Make notes to use later.
- It is valid to search for your location on Google maps.
- Record your location so that your position can be found on a map.

2. The date and timing of the event.

- Date and time. State whether it is Universal Time or local clock time.
- Event timing: how long did the event last?

3. A short description.

- Start and end position in the sky. Report start and end azimuth and altitude.
- What compass direction? Start and end directions.
- If using a compass: magnetic declination?
- At worst state N, SW, ESE, etc.
- Remember what you saw. You can always estimate the compass directions later.
- At night, make a note of the stars close to the start and end. Note landmarks in the day.
- Apparent speed. 0 = stationary, 5 = very fast.
- Trails. Fast, brighter ones, may leave a glowing **ionization trail** after they have disappeared. How long to fade?
- Sounds. What sounds? How long after the event?
- Fragmentation. Breakup? How many pieces? Sparkles along the path?
- Colours. Use only pure hues, red, orange, yellow, green, blue, violet, white.
- Magnitude. Difficult. Brighter than? As bright as?

He presented some statistics about meteors and illustrated it with the example of Hunter's Meteor, 1 October 1949, 14:32 PST, Central Oregon, USA.

In **What's Up?** Bosman Olivier followed with a short presentation about what is to be seen in April.

Finally, in **Main talk**, in Michael Poll and Neville Young gave us a presentation titled **Jack Bennett - An Appreciation**. Some highlights of his life were:

- He organised the "Moonwatch" in 1957.
- He discovered a supernova in M83 in Hydra on 16 July 1968.
- In 1969 he became President of the ASSA.
- He discovered his first comet on 28 December 1969 in Tucana. It was named comet Bennett.
- He received the Merlin medal in 1971.
- In November 1974 he discovered another comet.
- Discovery of Nova Cygni in 1975.
- Jack started a Nova Search Section of the ASSA and was director of it from 1975 to 1987.
- On April 22, 1986, Jack received an honorary master's degree.
- An asteroid was named after him: asteroid 4093 Bennett.
- In 1989 he became an honorary member of ASSA.

The meeting was then adjourned, after which discussions continued over a mug of tea/coffee and biscuits. Ω

Report of Observing Evening on Friday 21 March 2014 - by Michael Poll

Well, better than last month! Clear though moisturized sky gave a variety of objects for viewing. Nine telescopes and about 20 people had an entertaining time. There were some visitors, including Peter and Lucy who said that they had enjoyed the evening.

First out and first to look at was Jupiter, riding high in the north in Gemini, almost at its furthest north of the celestial equator. All four of the Galilean satellites were on view, with Europa to the (celestial) west of Jupiter and Io, Ganymede and Callisto, in that order outwards, to the east.

Apart from Jupiter in Gemini, we also looked at Castor A and B which are now quite easily split. They have opened up in the past couple of years, having been too close to separate for some decades. We also noted Castor C, which is fairly widely separated from the A-B pair. Castor C showed a distinct orangey colour which contrasts with the white colour of both A and B. Also in Gemini we looked at the open cluster Messier 35, which showed a scattering of fairly bright stars. Needless to say a less light polluted sky would enhance the view. The same comment also applies to the Beehive Cluster (M44) the open cluster in Cancer, which we also checked out. It was a bit of a job to locate it with the naked eye, there are no bright stars near, but it can be found on a line joining Pollux and Regulus, which are two bright stars in Gemini and Leo respectively. M44 is also known as the Praesepe which means "The Manger", and the stars Gamma and Delta Cancrri which "guard" the Manger are known as Asellus Borealis and Asellus Australis respectively – i.e they are the Northern Donkey and the Southern Donkey.

Later on we returned to the northern sky to look at Gamma Leonis, which is a fine double star, with components of not-quite-equal brightness. Both components look orangey red. There is a similarly bright field star, 40 Leonis, close to Gamma Leonis,

Orion is will leave the evening sky in a month or two, but was still well placed. We showed M42, the Orion Nebula, and explained to the visitors that it was a site of star birth. The Trapezium was noted, as was the row of three stars near to it. Also in Orion we looked at Sigma Orionis, a multiple star system. Seven stars in the group were noted, the seventh star forms a fairly close companion to one of the components. We also found Rigel B, Rigel's companion. This star is not always easy to find because of the glare of Rigel itself, but once it had been located with a high magnification (186x) it could be seen with lower powers. Canis Major was high up, south of Orion, and we showed M41, the open cluster just south of Sirius.

Further south, we had a fine view of Alpha Crucis, a notable triple. The third component is widely separated from the close pairing of Alpha Crucis A and B. Also in the south we looked at IC 2602, the Southern Pleiades. The brightest component of this group is the naked eye star Theta Carinae, which is at one end of the Diamond Cross asterism. Omega Centauri was noted, but was not well shown, being low down in the light pollution.

Amongst the things discussed with the visitors were telescopes and mountings and the various telescope configurations. We also did a bit of naked eye work, showing the zodiacal constellations from Taurus in the north west, (we could still see Aldebaran) and stretching to Virgo, south of east. Virgo rose later in the evening. At present Mars is in Virgo. It is at opposition on April 8th, so it was just about at the brightest it will be until 2016. We thought we could see some surface markings, but it was low down. It will be better placed for the April observing evening. Mars was not far from Spica in the sky, and the contrast in colour between bluish Spica and reddish Mars is very noticeable.

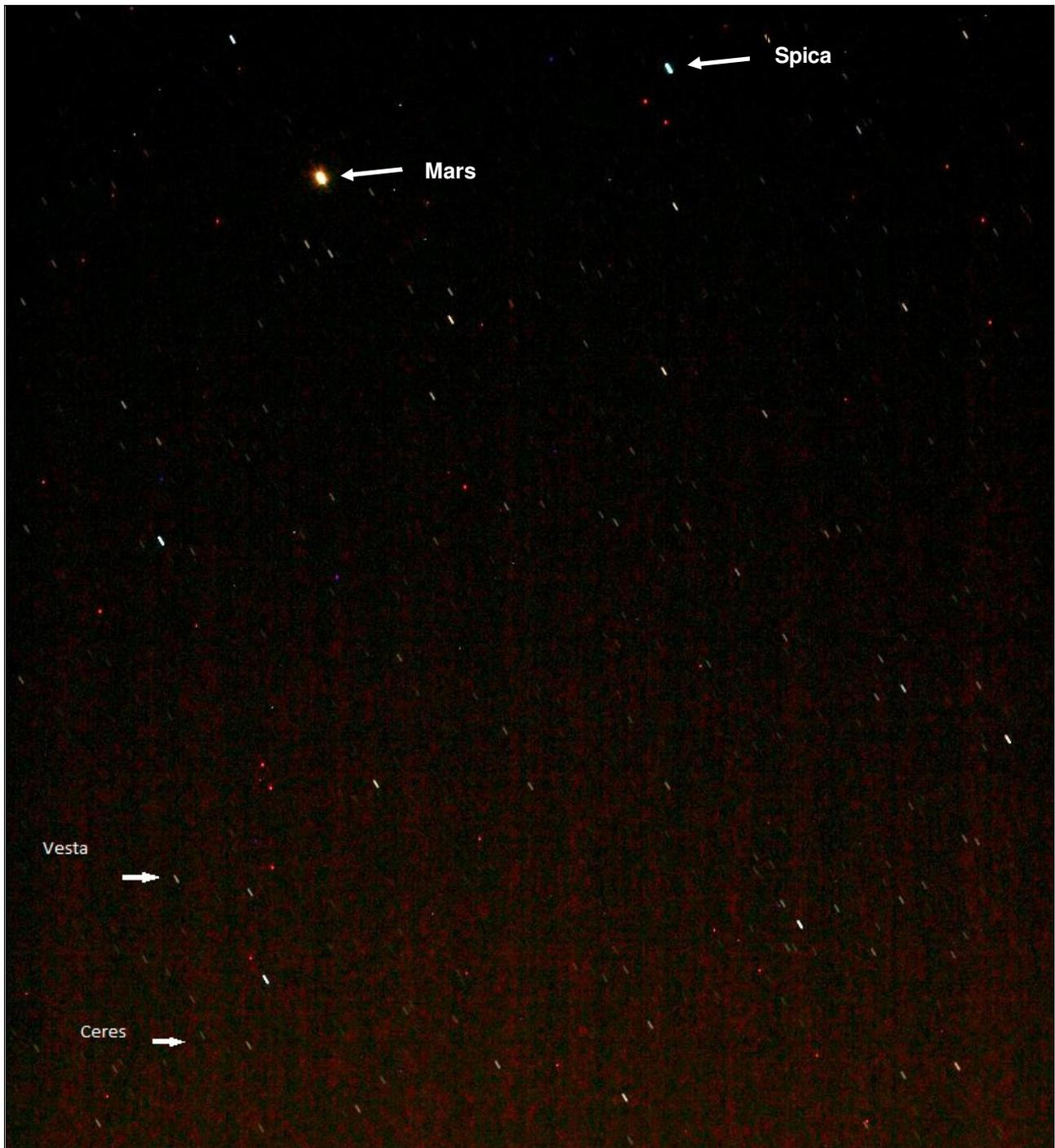
During the naked eye discussions it was suggested that people should note the movement of the planets against the star background. It was seen on this evening that Rigel, Beteguese and Jupiter were in a straight line, but that the line would break up as Jupiter moved away. Similarly the gap between Mars and Spica would change.

The next observing evening is on Friday April 18th (Good Friday), when both Mars and Saturn will be well placed for observing. Ω

This was in the February newsletter, but is repeated here: **Ceres and Vesta in 2014**. The two brightest asteroids are very close to each other in the sky in 2014, fitting in a single field of view through binoculars and some telescopes. Get a printable map of Ceres and Vesta's paths through Virgo in 2014. <http://www.skyandtelescope.com/observing/objects/asteroids/Ceres-and-Vesta-in-2014-243533241.html>

Tony Viljoen, a committee member, wrote in an e-mail message: "Quite impressed how clear last night (the night of 3 April 2014) was and, after seeing a picture on Spaceweather of Ceres and Vesta earlier (which are near one another and Mars), decided to look with binoculars. After printing out a map from Skymap, both were quite easy to find. Then took a 30 sec slightly trailed picture which is attached. Don't know how the weather is going to be, but will welcome any other observations or pictures. The pic was with 50mm lens at F/5,6 and 30 sec exposure at ISO 200 on Canon 400D. Bright object at top is Mars and slightly dimmer object to the right is Spica."

The picture is shown below. Ω



**Summary of "What's Up?" to be presented on 23 April 2014
by Percy Jacobs**

What's up in May 2014

Phases of the Moon

Dark Sky: 1st week & last week of May

Viewing evening – Friday 30th May – moon rises at 07:57 & sets at 19:03
(crescent moon in the west)

New Moon – 29th April

First Quarter – 7th May – rises 12:51 & sets at 00:15

Full Moon – 14th May – rises 17:25 & sets at 06:02

Last Quarter – 21st May – rises at 00:35 & sets at 12:24

New Moon – 28th May

Planets

Mercury - ~15 min to ½ hr after sunset

Venus – seen in the morning a few hrs before sun rise in the East

Mars – seen in the NE (after sunset)

Jupiter – setting in the NW (after sunset)

Saturn – rises in E (after sunset)

Uranus & Neptune – seen in the E (before sun rise)

Events

Annular Solar Eclipse – 29th April 14 – we will not see this – predominately over
Antarctica & Australia

Meteor Showers - "eta" Aquariids – May 5th peak – start April 21st and ends
around May 12th. Can expect about 60/hr from 04:00 to 05:30

Galaxy month – many galaxy's can be seen in the north

Constellations – shall be discussed in more detail at meeting

South

Centaurus - The Centaur - "half horse half man"

Musca - "The Fly"

Carina - "Keel of the Ship"

Crux - "Southern Cross"

Pavo - "peacock"

East

Libra - "The Scales" (Saturn is located on Libra)

Lupus - "The Wolf"

Scorpius - "The Scorpion"

Ophiuchus - "The Serpent Bearer"

North

Bootes - "The Herdsman"

Basics: The Gregorian telescope - by Pierre Lourens

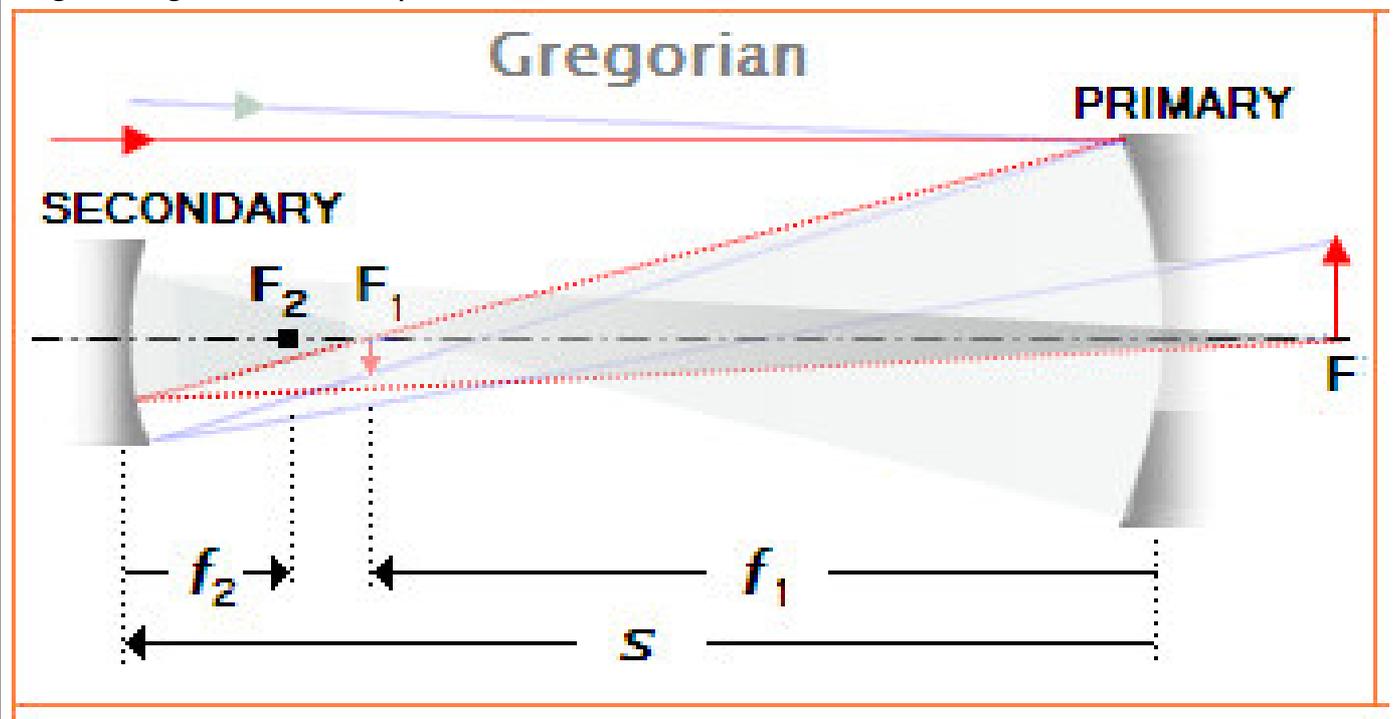
The **Gregorian telescope** is a type of reflecting telescope. It is named after James Gregory, whose design appeared in his publication *Optica Promota* (The Advance of Optics), published in 1663. It was not until ten years later, aided by the interest of experimental scientist Robert Hooke, that a working instrument was created.

The Gregorian telescope design predates the first practical reflecting telescope, the Newtonian telescope, built by Isaac Newton in 1668, but was not successfully built until 1673, five years after Newton's first Newtonian telescope had been built.

The Gregorian telescope consists of two concave mirrors; the primary mirror (a concave paraboloid) collects the light and brings it to a focus in front of the secondary mirror (a concave ellipsoid) where it is reflected back through a hole in the centre of the primary, and thence out the bottom end of the instrument where it can be viewed with the aid of the eyepiece.

The Gregorian design solved the problem of viewing the image in a reflector by allowing the observer to stand behind the primary mirror. This design of telescope renders an upright image, making it useful for terrestrial observations.

The design was largely superseded by the Cassegrain telescope. The design is still used for some spotting scopes because it creates an erect image without the need for prisms. The Steward Observatory Mirror Lab has been making mirrors for large Gregorian telescopes at least since 1985.



NASA to provide live coverage and commentary of April 15 lunar eclipse.

<http://www.nasa.gov/press/2014/april/nasa-to-provide-live-coverage-and-commentary-of-april-15-lunar-eclipse/>

From the archives: a quarter of a century ago

THE PRETORIA NEWS Thursday March 2 1989

Reach for the stars with Assa

TANIA STAPELBERG
Staff Reporter

MEMBERS of the Pretoria Centre of the Astronomical Society of Southern Africa (Assa) recently brought the stars to a shopping centre.

As part of a competition the society is running, telescopes and other astronomical delights went on display at the Arcadia Centre this week as members explained some of the mysteries of the galaxy.

Posters of the solar system and the galaxy were on display along with an original poster of Halley's comet.

ANIMATION

Computer animation and an audio-visual slide show were used to show what this universe of ours is about.

And after learning about space the emphasis changed to humour: the Pretoria Centre is now running a competition concerning "your favourite astronomy-related cartoon or comic strip".

First prize is a R50 book prize donated by CNA, and the runner-up will get R40. The winners will also be invited to attend a meeting of the centre when its chairman, Professor WJ Wargau, will talk about the link between astronomy and its portrayal in cartoons.

Those wishing to enter must send a copy of their favourite cartoon to Astro Cartoons, c/o Mike Haslam, P O Box 875, Halfway House, 1685 by March 31.

The reason for the exhibi-



Picture: RICHARD NEZAR

Birds of a feather: Professor Walter Wargau and fellow members of the Astronomical Society Michael Poll, Mike Haslam, Frikkie le Roux and Neville Young view a model of the stars.

tion was not only to educate and humour but also to inform the public about the Assa, an organisation of professional and amateur astronomers in Southern Africa.

The Pretoria Centre has about 50 members who meet on the fourth Wednesday of every month.

Prof Wargau, professor of astronomy at Unisa, is chairman of the centre. Apart from one other member, the rest are all amateurs with wide-ranging interests and levels of active observation.

The programmes at meetings vary from lectures to audio-visual presentations and

observation evenings. The level of complexity also varies at each meeting from basic elementary topics to more involved discussions.

Anyone wishing to know more can contact the secretary, Neville Young, at ☎ 83 3765 or Prof Wargau at ☎ 341 5147.

The tadpole. A bright blue tadpole appears to swim through the inky blackness of space. Known as IRAS 20324+4057. It was dubbed "the Tadpole". This clump of gas and dust has given birth to a bright protostar, one of the earliest steps in building a star.

[http://www.esa.int/spaceinimages/Images/2014/04/The Tadpole and the Wiggler](http://www.esa.int/spaceinimages/Images/2014/04/The_Tadpole_and_the_Wiggler)

NOTICE BOARD**Freemarket**

A new service for the benefit of astronomers is available via a page on the website of the Pretoria Centre of the ASSA. (<http://www.pretoria-astronomy.co.za>) This service is described below. This page is maintained for the benefit of private individuals to place for sale, to swap, or wanted notices regarding astronomy related equipment or services.

- This service is free and ASSA Pretoria will not accept any responsibility or guarantee, or comment regarding anything that is advertised there.
- The Centre does not take any responsibility for the sale of the item placed, neither for the quality of the item advertised.
- Advertisers and prospective buyers must deal directly with each other.
- Notices older than 3 months will be removed from the site, unless ASSA Pretoria is otherwise notified.
- Notices that are suspected to be disguised commercial adverts will be removed without warning.

How to use.

- Send a notice to the following address to place an advert: freemarket@pretoria-astronomy.co.za
- A notice must contain a description of the goods, price and contact details of the advertiser.
- A maximum of 2 photos and 50 words will be allowed per notice.

Editor's note: This was the brainchild of Danie Barnardo, and Johan Smit made some good suggestions about it. Eventually Danie followed up on the suggestions and created the page on our website.

Invitation - by Fred Oosthuizen

Members are invited to visit my private observatory which houses a self-made 8" – f18 unobstructed, off-axis 4-mirror system "STEVICK-PAUL" telescope.

DATE: FRIDAY 25 APRIL 2014

ADDRESS: Fred Oosthuizen. Unit 65, Oostvallei Retirement Village, c/r Serene and Coley Streets, Garsfontein East, Pretoria. Tel: 072 373 2865 / 012 755 4065. E-mail address: fredo@oostvallei.co.za

EDITOR'S NOTE. Those who want to attend, must book with Fred. He can accommodate only 10 people. There are still places left. First come, first served.

Feature of the month: A very weird kind of star by Pierre Lourens



In 1975, astrophysicists Kip Thorne and Anna Żytkow published a theoretical paper in the *Astrophysical Journal* describing a rare, dying star with a surprise in its core. According to Thorne and Żytkow, it is possible for a red supergiant star to collide with a superdense neutron star, the remnant of a supernova, swallowing it.

A red supergiant can merge with a binary partner neutron star, or that both occupied a dense globular cluster.

Once the neutron star is eaten, it settles in the core of the supergiant, interrupting normal fusion processes inside the star's guts. This, according to the theorists, should create a very specific chemical signature in the "host" star's chemical makeup. What's more, there should be a few dozen Thorne-Żytkow objects in our galaxy.

Now, astronomer Emily Levesque of the University of Colorado has reported the discovery of another Thorne-Żytkow object candidate in the Small Magellanic Cloud, the strongest candidate to date. She says: "What we found is the most compelling observational evidence for this model of stellar interior."

<http://news.discovery.com/space/astronomy/has-the-weirdest-star-in-the-universe-been-discovered-140107.htm>

Winners

The winners of the March 2014 Monthly Observation Challenge were George Dehlen and Nigel Rotherham. Each one received a R100 Voucher for purchasing goods at Eridanus Optics.



George Dehlen



Nigel Rotherham

Noteworthy items on the Internet

Solar system

- **NASA eyes ambitious mission to Jupiter's icy moon Europa by 2025.** The space agency has set aside \$15 million in its 2015 budget proposal to start planning a daring robotic mission to Jupiter's watery moon Europa.
<http://www.space.com/24926-nasa-europa-mission-2015-budget.html>
- **Asteroid with ring system discovered.**
<http://www.planetary.org/blogs/guest-blogs/2014/0326-a-centaurs-shadow-reveals.html>
- **Solar system has a new most distant member.** New work reports the discovery of a distant dwarf planet, called 2012 VP113, which was found beyond the known edge of the solar system. http://www.sciencedaily.com/releases/2014/03/140326153725.htm?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+sciencedaily%2Fspace_time%2FAstronomy+%28Astronomy+News+--+ScienceDaily%29
- **NASA space assets detect ocean inside Saturn moon.** NASA's Cassini spacecraft and Deep Space Network have uncovered evidence that Saturn's moon Enceladus harbours a large underground ocean of liquid water.
<http://www.nasa.gov/press/2014/april/nasa-space-assets-detect-ocean-inside-saturn-moon/>
- **HST spots Mars-bound comet sprout multiple jets.** See an image of comet C/2013 A1 that, on October 19, will pass within 135 000 kilometers of Mars - less than half the distance between Earth and the moon. <http://www.nasa.gov/press/2014/march/nasas-hubble-space-telescope-spots-mars-bound-comet-sprout-multiple-jets/>
- **Fierce magnetic storm just missed us.** On July 23, 2012, two nearly simultaneous coronal mass ejections on the Sun plowed through Earth's orbit. Luckily, Earth was on the other side of the Sun at the time.
http://www.sciencedaily.com/releases/2014/03/140318154940.htm?utm_source=feedburner&utm_medium=email&utm_campaign=Feed%3A+sciencedaily%2Fspace_time%2FAstronomy+%28Astronomy+News+--+ScienceDaily%29
- **HST witnesses asteroid's mysterious disintegration.** <http://www.nasa.gov/press/2014/march/nasas-hubble-telescope-witnesses-asteroids-mysterious-disintegration-1/>
- **Ancient asteroid impact.** A massive asteroid, measuring between 37 and 58 kilometers across, hit the Earth about 3.26 billion years ago.
<http://io9.com/insane-details-are-emerging-about-ancient-asteroid-stri-1561730259>
- **Weird asteroid Itokawa has a dual personality.** 25143 Itokawa is a relatively small near-Earth asteroid that was visited by the Japanese Hayabusa spacecraft in 2005. The asteroid appears to be composed of two different types of material that have been "mashed" together to form one peanut-shaped body. <http://news.discovery.com/space/asteroids-meteors-meteorites/weird-asteroid-itokawa-has-a-dual-personality-140205.htm>

Our Galaxy

- **HST extends stellar tape measure 10 times farther into space.** Astronomers have developed a technique which dramatically improves the HST's accuracy for measuring the tiny parallaxes of stars. They now can now precisely measure the parallaxes of stars up to 10 000 light-years away - 10 times farther than previously possible.
<http://www.nasa.gov/press/2014/april/nasas-hubble-extends-stellar-tape-measure-10-times-farther-into-space/>

For an explanation of the parallax of a star and how it is used to determine the distance to a star, see the newsletter for February 2011, page 11.

Extragalactic astronomy

- **HST team finds monster "El Gordo" galaxy cluster bigger than thought.** By measuring how much the cluster's gravity warps images of galaxies in the distant background, a team of astronomers has calculated the cluster's mass to be as much as 3 million billion (3×10^{15}) times the mass of our Sun. <http://www.nasa.gov/press/2014/april/nasa-hubble-team-finds-monster-el-gordo-galaxy-cluster-bigger-than-thought/>

Exoplanets

- **Incredible technology: giant "starshade" could help find an alien Earth.** A flower-shaped "starshade" may help scientists see Earth-like alien worlds like never before. Watch the excellent video clip. <http://www.space.com/25172-starshade-alien-earth-exoplanets-incredible-tech.html>
- **Rare exoplanet found in cluster, orbits Sun's 'twin'.** Three new exoplanets have been discovered inside a star cluster, which is a rare find as only a handful of such exoplanets are known to exist. However, one of the three new finds is even more remarkable - it orbits a star that appears to be "an almost perfect solar twin." Also watch the video clip. <http://news.discovery.com/space/alien-life-exoplanets/rare-exoplanet-found-in-star-cluster-orbits-suns-twin-140115.htm>
- **Earth-size planets come in two flavors: rocky or gassy.** <http://news.nationalgeographic.com/news/earth-size-planets-come-in-two-flavors--rocky-or-gassy/>

Meet a member of the Pretoria Centre of the ASSA



Prof Fanie van Vuuren

NASA releases first Interactive mosaic of lunar north pole.

<http://www.nasa.gov/press/2014/march/nasa-releases-first-interactive-mosaic-of-lunar-north-pole/>

Coming soon in cinemas. Europa Report is a science fiction film about a manned mission to Europa, one of Jupiter's moons. Its purpose is to search for life underneath Europa's thick water ice crust.

NASA's Spitzer telescope brings 360-degree view of galaxy to our fingertips. Touring the Milky Way now is as easy as clicking a button with NASA's new zoomable, 360-degree mosaic. <http://www.nasa.gov/press/2014/march/nasas-spitzer-telescope-brings-360-degree-view-of-galaxy-to-our-fingertips/>

Ride into space. Cameras on the Soyuz rocket that launched the first Sentinel satellite into space give us a unique front-row seat from liftoff to separation. http://www.esa.int/spaceinvideos/Videos/2014/04/Sentinel-1A_rides_into_space_on_a_Soyuz

A photograph of the planet Jupiter, taken by Johan Moolman.



Pretoria Centre committee

Chairman	Bosman Olivier	082 883 1869
Vice Chairman	Pat Kühn	082 895 5686
Secretary	Michelle Ferreira	073 173 0168
Newsletter Editor	Pierre Lourens	072 207 1403
Treasurer and Membership Secretary	Rynhardt van Rooyen	082 325 8745
Assistant Treasurer	Michelle Ferreira	073 173 0168
Librarian	Danie Barnardo	084 588 6668
Assistant Librarian	Pat Kühn	082 895 5686
Curator of Instruments	Johan Smit	072 806 2939
Public Relations Officer	Fred Oosthuizen	072 373 2865
Observing Coordinator	Percy Jacobs	082 498 4680
Webmaster	Danie Barnardo	084 588 6668
Member	Michael Poll	074 473 4785
Member	Tony Viljoen	072 247 6648

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. The database was created by Danie Barnardo, one of our committee members.