



The PRETORIA CENTRE

of the

Astronomical Society of Southern Africa

www.pretoria-astronomy.co.za

NEWSLETTER JANUARY 2010

Next meeting

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

Date and time: Wednesday 27 January 2010 at 19h15.

Programme:

Beginner's Corner: "ASSA Pretoria Centre Library" - by Danie Barnardo

What's Up in the Sky: by Percy Jacobs

10 minute break — library will be open

Main talk: "Shrouds of the night" by Prof D L Block

Tea/coffee and biscuits.

The chairperson at the meeting will be Percy Jacobs.

The next observing evening will be held on Friday 22 January 2010 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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The November 2009 meeting - by Percy Jacobs

Well everyone, I must start off by saying welcome back after the holidays and we wish everyone all the best for 2010. I am sure it shall be a good year for all and Pretoria ASSA shall certainly have activities planned to keep us all busy. Details to follow during the year.

As with any long good holiday, the mind gets forgetful and the mind takes some time to "start-up", which is exactly the case with me, so please excuse the short Chairman's Report.

At the Nov 09 meeting, we were pleased to have 5 visitors and 27 members attending.

What's-up for Dec / Jan was presented by Andrie van der Linde. We were shown & informed about many interesting things to look out for in our holidays. Wonder who the lucky ones were that were able to convince wives & kids that the scope must be packed as well?

Johan Smit once again entertained us with a presentation on African Star Lore which was very informative. In basic summary, general observations guided the lifestyle of people. If you so wish to read up more on this subject, information is available on the ASSA web site.

Michael Poll presented a talk on our solar system with many interesting facts highlighted. Each aspect and component of our solar system was explained. The activity of our sun was especially interesting. Makes one think about global warming or even global cooling.

The November 2009 Observing Evening - by Michael Poll

More cloud and rain for this observing evening, but without the thunder and pyrotechnic lightning that we had at the October Observing Evening. Rudolph and Michael were the only attendees. As well as discussing the world in general, we had a look at what was going on behind the hessian fence that has been put up in the area in front of the dome. CBC are building another pavilion there, it looks as though it might be finished soon. The new one seems to be a twin of the old one, with a stairway in between, which leads from our viewing area up to the playing fields. If we want to move telescopes up to the playing fields at any time, it will now be much easier than negotiating those steep iron steps!

Ou nuusbriewe

Danie Barnardo het ou nuusbriewe van ons Sentrum van die ASSA op ons webwerf geplaas. Alle ou nuusbriewe vanaf Januarie 2004 is daar te lese.

Hulle bevat:

- 'n Rekord van ons Sentrum se aktiwiteite.
- Sterrekundige inligting.

Summary of "What's Up in the Sky" to be presented on 27 January 2010 by Percy Jacobs

Phases of the Moon

- Full Moon – 28th Feb 10 (rise 18:23, sets 05:30)
- Last Quarter – 5th Feb 10 (rises 23:07, sets 12:07)
- New Moon – 14th Feb 10 (rises 06:00, sets 18:56)
- First Quarter – 22nd Feb 10 (rises 13:21, sets 23:56)
- Dark Sky – from about 14th Feb to 22nd Feb

Planets

- Mercury** - (mag. -0.1) early morning sky – rises at about 04:30 – in the east
- Venus** - (mag. -3.9) visible ½ hr after sunset – in the west
- Mars** - (mag. -1.3) can be seen from sunset in the east
- Jupiter** - (mag. -2.0) visible ½ hr after sunset – in the west
- Saturn** - (mag. 0.7) visible from about 21:30 in east
- Uranus** - (mag. 5.9) visible for about 2hrs after sunset – in the west
- Neptune** - (mag. 78.0) sets along with sun in the west – cannot be seen

Events

Meteor Showers

Alpha Centaurids – listed as good – 5 per hr – 22:00 to 03:30

Asteroids

2008 CI20 - passes at about 0.0603 AU (9,000,000 km's)

2008 CQ116 - passes at about 0.0537 AU (8,000,000 km's)

Constellations – shall be discussed in more detail at meeting

- Orion – "ID" stars - Rigel & Betelgeuse
- Canis Major - "ID" stars - Sirius
- Gemini - "ID" stars - Castor & Pollux
- Tauris - "ID" stars - Aldebaran
- Carina - "ID" stars - Canopus
- Southern Cross coming up
- Vela – above Southern Cross
- Aries - - "ID" star - Hamal

Saturn's Moon Enceladus, Part 1 - by Michael Poll

Enceladus is one of Saturn's mid-sized moons. Others of the mid-sized moons (in order outwards) are Mimas, Enceladus, Tethys, Dione, Rhea, Hyperion, Iapetus and Phoebe. The largest moon, Titan (5150km) orbits between Rhea and Hyperion. The mid size moons range in size from Rhea (1530 km in diameter, the second largest moon of Saturn) to Phoebe (about 220 km diameter).

Enceladus was discovered, during a ring plane crossing, by Sir William Herschel in August 1789. A naming procedure for Saturn's moons was proposed by William's son Sir John in 1847. The moons are named after the offspring of Ouranos ("Sky") and Gaia ("Earth"). Ouranos and Gaia produced several sets of siblings. The first set of siblings were the twelve Titans, some of which were male and some of which were female. The Titans included Cronus, the youngest, and leader of them, but these siblings also included Hyperion, Iapetus, Rhea, Phoebe and Tethys and Dione. Cronus is the equivalent of Saturn in Roman mythology, and Ouranos is the equivalent of Uranus. Another set of siblings, the Gigantes, included Enceladus and Mimas. The last of the "classical" moons to be discovered was Phoebe, in 1898. No others were discovered until 1966. Phoebe was the last to be named in accordance with the procedure proposed by Sir John Herschel.

Features on Enceladus are named after places and characters in the Arabian Nights. Impact craters http://en.wikipedia.org/wiki/Impact_crater are named after characters, while other feature types, such as fossae [http://en.wikipedia.org/wiki/Fossa_\(geology\)](http://en.wikipedia.org/wiki/Fossa_(geology)) (long, narrow depressions), dorsa (ridges) <http://en.wikipedia.org/wiki/Dorsum>, planitia <http://en.wikipedia.org/wiki/Planitia> (plains <http://en.wikipedia.org/wiki/Plain>), and sulci (long parallel grooves) <http://en.wikipedia.org/wiki/Sulcus>, are named after places.

Enceladus is the sixth largest moon of Saturn, and the 13th in order of distance outwards. (Figure 1 – note that many of the smaller, inner moons are not depicted in this diagram). Enceladus is about 500 km in diameter and the surface area is about 800,000 km², which is about the same as that of Mozambique <http://en.wikipedia.org/wiki/Mozambique>. It orbits Saturn in approximately 33 hours at a distance of about 238 000 km, centre to centre of the two bodies, and about 180 000 km from the surface of Saturn. It has the most reflective surface of any body in the solar system, reflecting nearly 100% of the light that falls upon it. Because Enceladus reflects so much sunlight, the mean surface temperature at noontime only reaches minus 198 degrees Celsius, which is colder than other Saturnian satellites.

Enceladus is about magnitude 11.7 as viewed from Earth, and with its proximity to the much brighter Saturn and its rings, it is difficult to observe. A telescope with a mirror of 15–30 cm in diameter is required to see it.

The first spacecraft to visit Enceladus was Voyager 1, which flew by in November 1980. The resolution of the photographs was poor due to the distance of the flyby – 202 000 km. Voyager 2 passed Enceladus at a distance of 87 000 km in August 1981, and was able to obtain detailed photographs. Voyager 2 images (Figure 2) showed Enceladus to be covered in ice, and that the northern part is cratered. The images also showed that the southern part of the surface had been wiped free of craters, presumably by internal geological activity - the lack of impact craters on any body implies a geologically very young surface, and given the lack of craters, the surface in this region is probably less than a few hundred million years old. Accordingly, at the time it was concluded that Enceladus must have recently been, or still was, active with "water volcanism" or other processes that renew the surface. The fresh clean ice that dominates the surface gives Enceladus its high reflectivity.

Enceladus orbits within the densest part of Saturn's E Ring, which, (until 2009) was the outermost known ring of Saturn, and is about 300 000 km wide. The E ring is very diffuse, and so faint that it was not discovered until 1966. Calculations showed that the ring is unstable, and would only have a lifespan of between 10,000 and 1,000,000 years if the particles composing it were

not being constantly replenished. It was noted that Enceladus travels through the E ring while orbiting the planet, and that the E ring was at its brightest just where Enceladus happened to be. (Figure 3) Enceladus was therefore identified as the most likely source of this replenishment, somehow supplying the ring material, which is now known to consist of particles of water ice. This was a novel idea at the time, but the Cassini flybys have proved the hypothesis.

To be concluded.

Figure 2

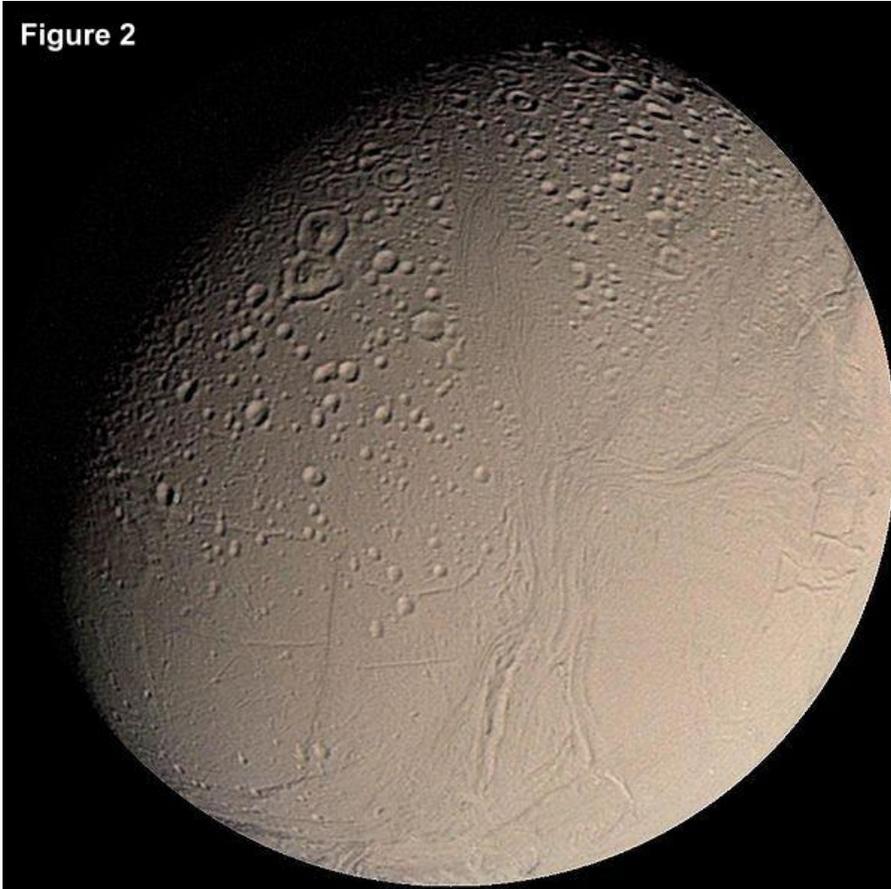


Figure 1 (next page): Saturn's Rings & moons.

Figure 2: Enceladus from Voyager 2.

Figure 3: Enceladus in E ring.

Figure 3



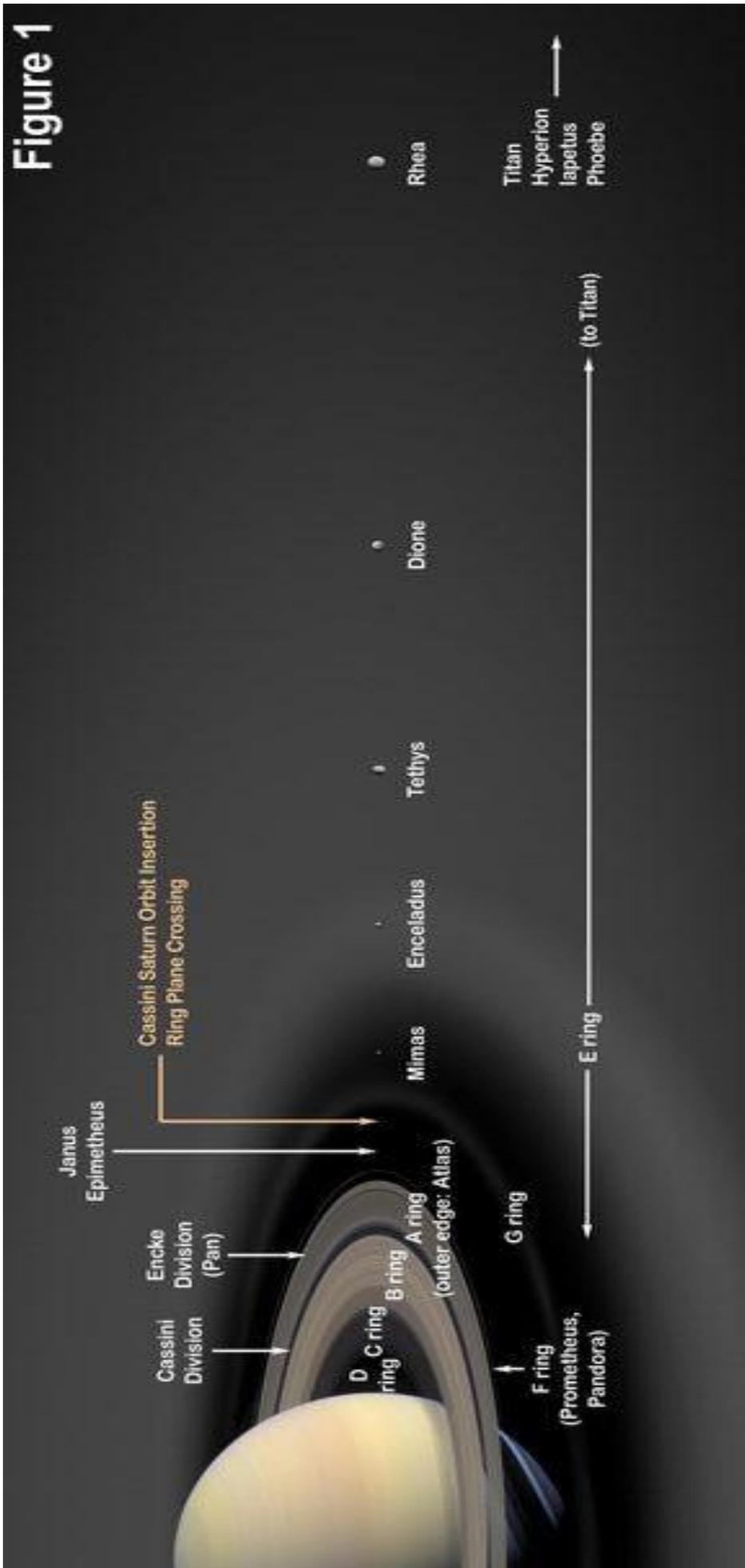
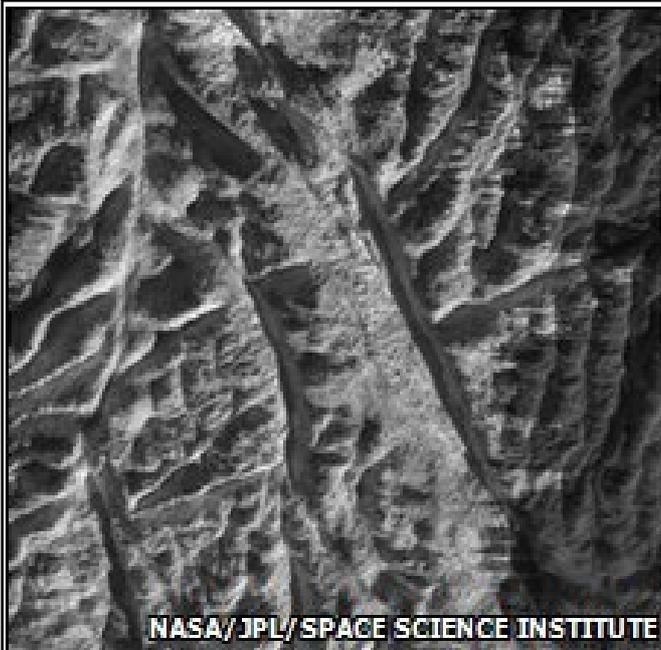


Figure 1

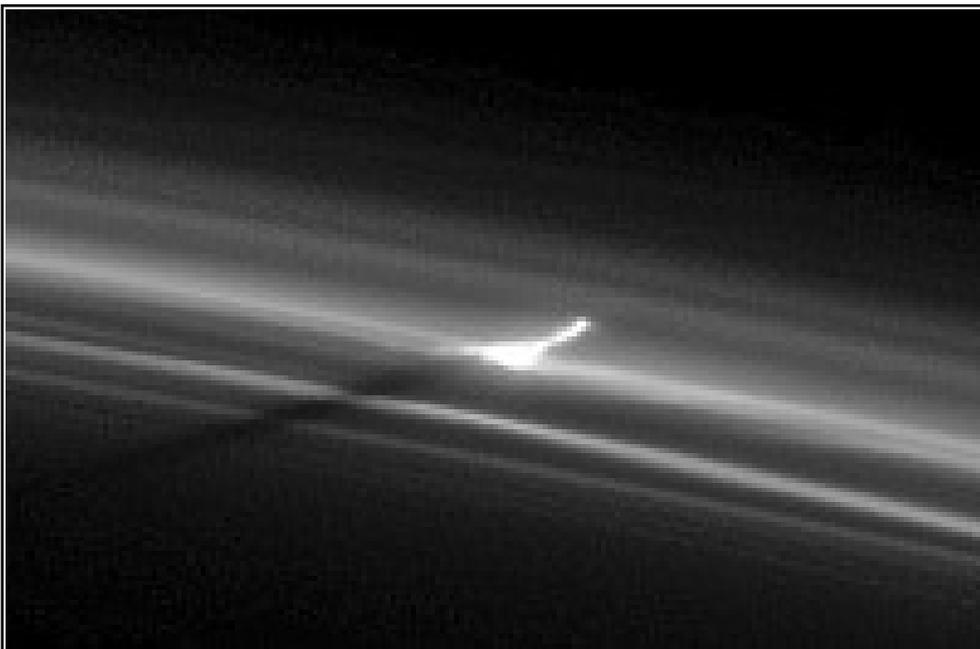


More about Enceladus

Nasa has released the latest raw images of Saturn's moon Enceladus, from the Cassini spacecraft's extended mission to the planet and its satellites. The images show the moon's rippling terrain in remarkable clarity.

Cassini started transmitting uncalibrated temperature data and images during a flyby on 21 November 2009. The data will help scientists create a highly detailed mosaic image of the southern part of the moon's Saturn-facing hemisphere, and a thermal map. This thermal map will help researchers to study the long fractures in the south polar region of the moon's surface, which have been dubbed "tiger stripes" and are warmer than the rest of the surface. The image is one of the latest photographs of the surface.

- See the newsletter for May 2006, page 3, about the geysers of Enceladus.
- <http://news.bbc.co.uk/2/hi/science/nature/8374194.stm>
- <http://www.newscientist.com/search?doSearch=true&query=Enceladus>



Mystery object pierces ring of Saturn

A mystery object that punched through one of Saturn's thin outer rings created a glittering spray of ice crystals and pulled some material along in its wake, as seen in this rare image recently released by NASA's Cassini orbiter. The puncture, which Cassini snapped on 11 June 2009, is among the many marvels that have been revealed in the weeks leading up to Saturn's equinox,

which happened on 11 August 2009.

<http://news.nationalgeographic.com/news/2009/08/090811-saturn-equinox-rings-picture.html>

Sterrekundeboeke

- Protea Boekhuis, Burnettstraat, Hatfield Galleries, Pretoria: Stap vanaf die hoofingang 12 tot 15 treë reguit in (dit hang af hoe lank jou treë is). Aan jou regterkant sal jy rakke vol sterrekundeboeke, wat te koop is, sien.(Wenk: plaas 'n besoek hieraan laaste op jou program vir daardie dag, anders gaan die ander dinge op jou program nie tyd kry nie!) Let op dat Burnettstraat nou 'n eenrigtingstraat van oos na wes is.
- Die tydskrif "National Geographic" se uitgawe vir Desember 2009 bevat 'n populêre artikel oor die soektog na aardagtige planete.



Doomsday prophecy

The world is going to end on December 21st, 2012. Yes, you read correctly. In some way, shape or form, the Earth (or at least a large portion of humans on the planet) will cease to exist. Stop planning your careers, don't bother buying a house, and be sure to spend the last years of your life doing something you always wanted to do but never had the time for. Now you have the time, less than three years of time, to enjoy yourselves before....the end.

Whence all this nonsensical talk? We've all heard similar doomsday predictions which eventually did not realize, and we are still here and the planet is still here.

The Mayan Doomsday Prophecy is wholly based on the belief that something terrible is going to happen when the ancient Mayan calendar ends. And that

calendar will end on December 21st, 2012.

The only reason to take note of this is that the Mayan Doomsday Prophecy is gaining strength and appears to be worrying people in all areas of society. The doomsday event is predicted to be huge and many wholeheartedly believe something horrible is really going to happen.

<http://www.universetoday.com/2008/05/19/no-doomsday-in-2012/>

Maansverduistering op Oujaarsaand 2009

Hieronder is 'n foto van Oujaarsaand se maansverduistering by maksimum verduistering, geneem ongeveer 20h30 deur Danie Barnardo.



New "impossible" planet may be on a death spiral

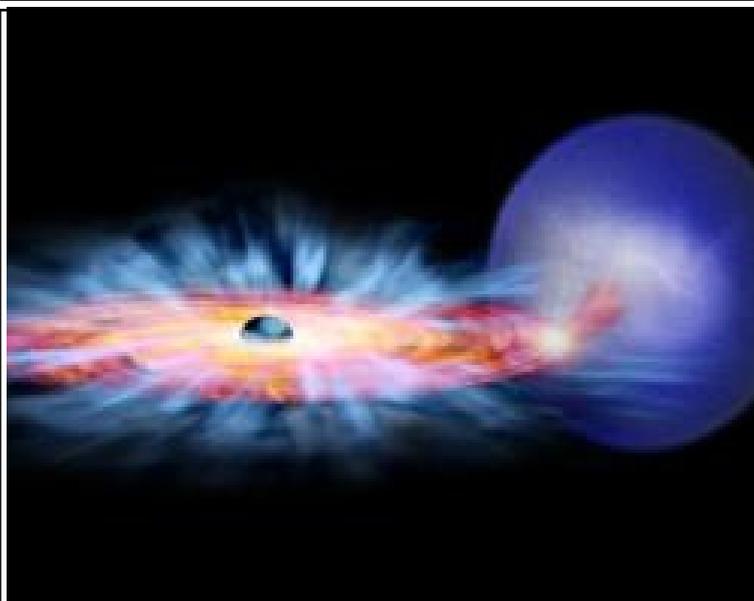
A newfound planet orbiting a star about 325 light-years away has astronomers believing in the impossible. Dubbed WASP-18b, the planet is ten times more massive than Jupiter but is so close to its star that it only takes one Earth day to make a full orbit, according to a new study.

Current theories say that such a massive planet so close to its star should be pulling on the host star, creating a tidal effect similar to the moon's pull on Earth. At that range the planet's pull would be so strong that it would drain energy from its orbit, causing the planet to rapidly fall into the star.

What's more, the researchers calculate that a doomed planet as massive as WASP-18b would plunge into its star in less than a million years. That's a very short timeframe on a billion-year timescale of stellar evolution. That's why what they are seeing is so unlikely.

If it is indeed at the very end of its life, astronomers should be able to see the telltale decay of WASP-18b's orbit in a decade or less.

http://news.nationalgeographic.com/news/2009/08/090826-impossible-planet-wasp-shouldnt-exist_2.html



Nearby black hole caught burping gamma rays

A black hole has been spotted belching out a burst of gamma rays after gulping down part of a nearby star, something never seen before. Such violent burps may actually be the most common type of explosive GRB (gamma-ray burst) in the Universe.

The event was named GRB 070610 after the date of its discovery by NASA's Swift satellite on 10 June 2007. At first it looked like another ordinary long GRB in a distant galaxy. These outbursts are thought to be the death cries of massive stars collapsing to form black holes.

But this GRB seems to have a different provenance altogether. Astronomers traced the burst to a star system in our own galaxy, where a black hole and a star are orbiting each other.

The image is an artist's illustration of a black hole sucking matter from a companion star. The matter swirls around in an accretion disk around the black hole before being swallowed by it.

<http://www.newscientist.com/article/dn12440>

HAGAR THE HORRIBLE

Dik Browne





Second Karoo Star Party

The ASSA Pretoria Centre wants to hold its second National Karoo Star Party during the long weekend of 6 to 9 August 2010 about 20 km north of Britstown in the Karoo, right next to the N12 at the Kambro Padstal. The reason for this locality, apart from the fabulous Karoo skies, is that it is almost exactly halfway between Gauteng and the Cape Town area, so we can all drive the same distance to the site. The first event of this type was held during April 2009 and proved to be a big success. The Karoo lived up to its reputation and provided magnificent views to those lucky enough to be present.

More information from:

- Johan Smit, cellphone: 072 806 2939, e-mail: JohanS@firsttech.co.za
- Danie Barnardo, cellphone: 084 588 6668, e-mail: daniebar@telkomsa.net

To book, please contact Wilma Strauss, the Manager of Kambro directly at 083 305 6668 or at e-mail: kambro@worldonline.co.za. You can also view their website (with a report on the star party that took place last year) at: <http://www.kambroacom.co.za/>

Significant amount of water found on the moon

There's water ice on the moon, and lots of it. When melted, the water could potentially be used to drink, to extract hydrogen for rocket fuel or to extract oxygen. NASA's LCROSS probe discovered beds of water ice at the lunar south pole when it impacted the moon in October last year. The findings confirm suspicions announced previously, and in a big way.

"Indeed, yes, we found water. And we didn't find just a little bit, we found a significant amount. I'm pretty impressed by the amount of water we saw in our little 20-meter crater," said the LCROSS principal investigator. "What's really exciting is that we've only hit one spot. It's kind of like when you're drilling for oil. Once you find it in one place, there's a greater chance you'll find more nearby."

<http://www.space.com/scienceastronomy/091113-lcross-moon-crash-water-discovery.html>

But how do you get the water out? You just use a big microwave oven. "*No magic--*" says Ed Ethridge of NASA's Marshall Space Flight Center "*-- just microwaves. We're showing how microwaves can extract water from moondust by heating it from the inside out.*"

http://science.nasa.gov/headlines/y2009/07oct_microwave.htm?list50005

New technique could reveal exoplanets with water

When it comes to life as we know it, nothing is more important than liquid water. Now scientists have devised a way to spot water on distant planets that can only barely be seen now, which in turn could reveal whether they might be able to support life.

Astronomers have detected 399 planets orbiting alien stars. Although most of these exoplanets are gas giants similar to Jupiter, powerful space telescopes such as the one aboard NASA's recently launched Kepler Mission will make it easier to detect smaller rocky exoplanets similar to Earth.

Seen from dozens of light years away, an Earth-like exoplanet will appear in telescopes as little more than a pale dot. Now a team of astronomers and astrobiologists has come up with a method to tell whether such a planet harbours liquid water, using NASA's Deep Impact spacecraft.

<http://www.space.com/scienceastronomy/090601-mm-exoplanet-water.html>

Geminid fireball

Early on the morning of 14 December 2009, Bjørnar G. Hansen photographed a Geminid fireball streaking through the Northern Lights over Kvaløya, Norway. (Photo below.) "I took the picture using a Nikon D3," says Hansen. "It is a 30 second exposure." (Info sent by Tony Viljoen.)

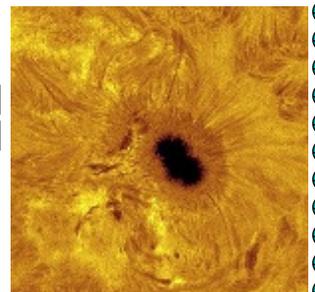


Video clip of a meteor

See a video clip of a meteor spotted in the skies of Gauteng, South Africa on the 21st of November 2009. http://www.liveleak.com/view?i=09f_1259107748 (Info sent by Tony Viljoen.)

Pretoria Centre committee

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Vice Chairman	Danie Barnardo	084 588 6668 [Mobile]	
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