

CANOPUS

Monthly Newsletter of the Johannesburg Center of ASSA



Symposium: A Resounding Success

luna, loony, lunatic

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Dear Canopus Reader,

We are on the brink of the Festive Season. Some call it the Silly Season, and I tend to agree! But before we go off on a tangent and rant about Christmas Shopping and queues at Pick&Pay, let me rather stick to matters astronomical.

A question that has been buggin me for a while, is: Why do we call the Moon 'Moon' and why are other satellites around neighbouring planets also called 'moon'? They are moons, but they are not the Moon, right? If anyone of you have a decent explanation, let us hear it, please!

Then, in October the local big bang took place. No, I'm not talking about the bulls winning the Curry Cup for the third time... I'm referring to the Symposium that was so efficiently and elegantly arranged and planned by our own.

A huge congratulations to all who were involved in fetching speakers from airports, pouring cups and cups of coffee, serving lunches and dinners, swinging huge scopes into view of marvellous clusters and nebulae, sitting through all the talks, talking about the talks afterwards and enjoying every talk thoroughly. Kudo's for a job well done!

The Yearend party will take place on the 11th of December, at 17h00. Brian Fraser has kindly offered his house as the venue and all are invited to join. Dress is casual and the event will be a bring and braai.

And since it looks like El Nino is hitting us hard at the moment, I simply cannot resist by leaving you with:

'May your clear skies turn into rainy skies soon!'

Mariëtte



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Symposium Feedback

Dr Ian Glass wrote a piece for MNASSA on the Symposium that was held in October. He was very complimentary of the entire proceedings and the entire article will be made available once it has been published in MNASSA.

Herewith a sneak peek:

"The local arrangements, including teas and lunches, proceeded flawlessly and those who attended agreed that the Johannesburg Centre under the leadership of Brian Fraser had done a magnificent job. Members of the Centre went out of their way to ensure that the visitors were well looked after."

"Attendees had the unusual opportunity during the breaks to stroll around displays of military hardware from the time of the South African War to the latest G5 cannons of the SA Army, not to mention many interesting pieces of equipment captured during the Angolan campaign."

A host of interesting, and at times controversial, topics were covered by professional and amateur astronomers alike over a period of three days. A planetarium show, a star party and a 'bosveld' braai also formed part of the proceedings.

Everyone involved did a great job and all the symposium goers enjoyed a funfilled time jam-packed with up to date information, interesting facts and astronomical eats.



Scope for Sale

Celestron NexStar 130GT for sale. Asking price is R 6800.00 (R8200 new). The telescope is now 6 months old, complete with all the standard accessories. Anyone interested in it can look at it (in Pretoria, close to the Pretoria Centre meeting place) before they purchase it, but the sale is "as is" (voetstoets). The owner has not had any problems with it and the only reason for selling is that he wants a larger scope...

For additional information please contact Bruce Zangel on zangelbd@state.gov or 083 423 9653.

Attention!

All Radio Astronomers!

Members that would be interested in starting an amateur radio astronomy group can send an e-mail to Bjorn Magnussen:

magnussen@telkomsa.net

He is appealing to members with radio astronomy experience to share their knowledge and contribute in setting up amateur radio telescopes.

Filters for sale

Meade #911 Oxygen III Nebular Filter (2 inch thread) - R750-00

Meade #911 Narrowband Filter (2 inch thread) - R450-00

If you are interested in any of the above, please contact Dave Gordon on 011-702-1219 or 083-746-2200



Through my looking Glass

by Ed Finlay

I stepped out into my backyard the other night to take a look at the constellation of Pegasus, the flying horse, which usually dominates the north east sky at this time of the year; alas it was not to be seen. Pollution over Johannesburg is so bad that even the bright stars of the great square of Pegasus (the steed's body, magnitudes between 2 and 3) were invisible to the naked eye.

Strangely, this northern hemisphere constellation is the only one that is the right way up as seen from the southern hemisphere! It is seen rearing up on its hind legs with its forelegs pawing at the sky.

The nose of the horse is marked by a golden super giant Epsilon Pegasi, mag. 2.31. 4 degrees to the north west is the compact globular cluster M15, mag. 6.5, one of the brightest in the northern skies. My 4" refractor showed a moderately bright diffuse blob of light; it needed the 8" SCT to begin resolving individual stars around the edge of the cluster.

The north east (bottom right) corner star of the square, Delta Pegasi has been given to the constellation of Andromeda and is now Alpha Andromedae. Use the stars Beta and Mu Andromedae, halfway down the hind legs of Pegasus, as a pointer to find M31 - the great galaxy in Andromeda, which is slightly to the north west.

This galaxy is a naked eye object from a dark sky site. The German astronomer Simon Marius first observed it with a telescope in 1612 and described it as resembling "the diluted light from the flame of a candle as seen through horn". Messier noted it as a nebula and toward the end of the 19th century it was still noted as a cloud-like nebula.

There was controversy about its true nature even during the early 20th century, when the 100" Hooker reflector at Mount Wilson Observatory managed to resolve some of the stars in the arms of M31. Only in 1923, when Edwin Hubble found Cepheid variable stars in the arms, was it realised that M31 was an extra-galactic star system like the Milky Way.

10x50 binoculars show an elongated haze about 1.5 degrees across with the two satellite elliptical galaxies M32 and NGC205 in the field of view. NGC205 is fairly diffuse so can be more difficult to see.

Even through my 4" refractor, M31 is a disappointment, just a featureless haze; you can't see the spiral arms, as the the most luminous super giants are around magnitudes 16 and 17. If you think you can, you are probably looking at part of the central region of old giant stars that circle the nucleus of the galaxy. I'm told that with an 8" telescope you can see NGC206, one of the star clouds in the arms of the galaxy. I've tried - but have never been able to see it!

Just to the north east of Andromeda is the constellation of Triangulum, which consists of a long right-angled triangle

of 3rd and 4th magnitude stars. A short distance to the north west of Alpha Triangulum, lies M33 - a face-on galaxy known as the pinwheel galaxy as it resembles a spinning Catherine wheel. With a diameter of just over 1 degree and a magnitude of 5.7 it is rather faint, but easily seen through my 4" with a low-power eyepiece. If you step up the magnification too much you will miss it, because you will be looking right through it.

Turning to the southern sky, Tucana the Toucan sits on its egg - the Smaller Magellanic Cloud (SMC) about 51 degrees above the horizon and slightly west of the meridian. The SMC is some 200,000 light years away and sprawls across 6 degrees of sky. It is actually two galaxies, one behind the other, the far galaxy being about 30,000 light years beyond the SMC.

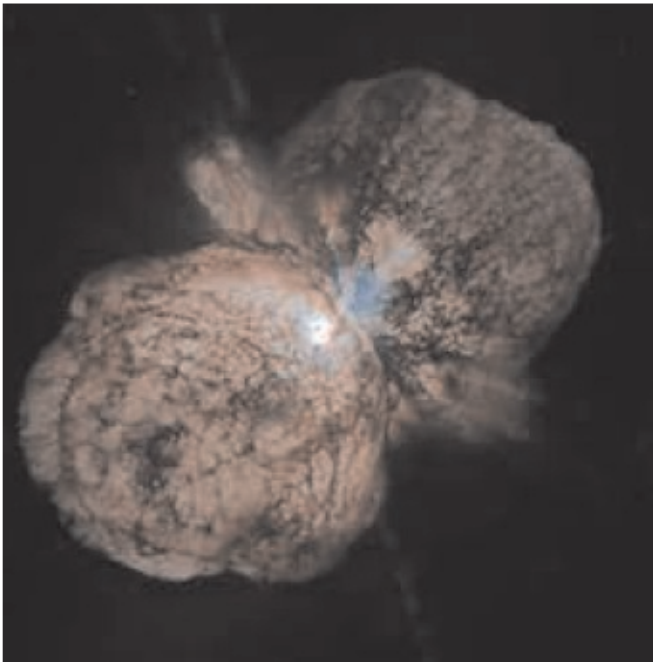
Astronomers believe that there was a collision between the Larger Magellanic Cloud and the SMC in the distant past, resulting in the SMC being torn into two parts.

Find 47 Tucana, then move south east - about 3 degrees into the SMC - to find NGC346, an open cluster embedded in nebulosity; at 10th mag. easy to see with my 4" scope. Another cluster, NGC330, is also visible in the same field if a low-powered eye-piece is used. 1 degree north is NGC 362, a conspicuous globular cluster; my 8" SCT resolves stars at its edge.

Finally, position your scope with a medium power eyepiece to one edge of the SMC and allow it to drift across your field of view. Most rewarding!!

More next month,

Ed



A huge, billowing pair of gas and dust clouds is captured in this stunning Hubble telescope picture of the super-massive star Eta Carinae.

Even though Eta Carinae is more than 8,000 light-years away, features 10 billion miles across (about the diameter of our solar system) can be distinguished. Eta Carinae suffered giant outburst about 150 years ago, when it became one of the brightest stars in the southern sky. Though the star released as much visible light as a supernova explosion, it survived the outburst. Somehow, the explosion produced two lobes and a large, thin equatorial disk, all moving outward at about 1.5 million miles per hour. Estimated to be 100 times heavier than our Sun, Eta Carinae may be one of the most massive stars in our galaxy.

Credit: Jon Morse (University of Colorado) and NASA

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... Join an ASSA list today!

It's really simple - see the howto on the next page.

Subscribing to a list ensures that you are kept up to date with events and information, as well as in constant contact with fellow amateur astronomers.

Don't delay - join a list today!

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Attachments limited to 50kB per person per day.

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offensive or aggressive language or make personal attacks on other members.

If you misbehave you will be evicted from the list.

ASSA Johannesburg cannot accept any responsibility or liability for mail content or attachments propagated via these list services.

Keep the subject line relevant to the topic and change the subject line when the focus of the thread changes. Rather send separate mails, each focused on a separate topic, than jam a whole lot of different topics into one mail.

All of this information is also available on the website at www.assajhb.co.za

Wikid!

Evan has created a stub for ASSA on Wikipedia. If anyone would like to expand the entry, please do so directly by visiting <http://en.wikipedia.org/wiki/ASSA>, or forward your addition or amendment to him on Demskey@tut.ac.za

Take Isaac Asimov's Super Quiz to a Ph.D.!

Score 1 point for each correct answer on the Undergrad Level, 2 point each on the Hons. Level and 3 points each on the Ph.D. level.

Each answer consists of a six-letter word that begins with the letters 'co'. Alternate answers may be possible...

Answers on page 11.

Undergrad:

1. A member of the cat family.

2. A metal.

3. A nonalcoholic beverage.

Hons.:

4. A relative.

5. A fabric.

6. An alcoholic beverage.

Ph.D.:

7. A famous explorer.

8. A bird of prey.

9. A garment part.

Alien Thunder

based reports by ESA, the Heralds, the Times and the Tucson Citizen

The sound of alien thunder, the patter of methane rain and the crunch (or splash) of a landing, all might be heard as Huygens descends to the surface of Titan on 14 January 2005.

What's more, they will be recorded by a microphone on the probe and relayed back so that everyone on Earth can hear the sounds of Titan. Although the Russians took a microphone to Venus in the 1970s, few scientific results came out of that endeavour. A similar microphone for Mars was destroyed when NASA's Mars Polar Lander crashed a few years ago.

The new microphone is part of the Huygens Atmospheric Structure Instrument (HASI), one of six multi-functional experiments carried on the Huygens probe. It is designed to help track down lightning by listening for the clap of thunder usually associated with such an event.

Although there is only a small chance that the spacecraft will pass near a thunderstorm, it is an extremely important investigation to carry out. It may help us to understand if thunderstorms are an important energy source for organic chemistry on Titan.

This may hold clues about how life began on Earth. Titan's atmosphere is laced with chemicals and many scientists think these are the same as those that formed the building

blocks of life on Earth, 4000 million years ago. But how did they join together on Earth to ultimately become DNA?

One possibility is that sudden discharges of energy, as occur in lightning, could have forced the simple chemicals together, making more complicated ones. So Huygens will listen for thunder and 'sniff' for chemicals that might have been produced in lightning strikes.

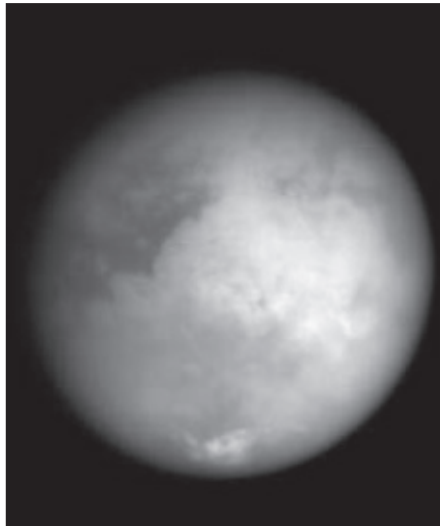
In fact, a second microphone experiment can also be found on Huygens. It is part of the Surface Science Package (SSP) and contributes to an experiment to measure the speed of sound in Titan's atmosphere.

These results present an exciting possibility because if the HASI microphone does hear thunder, electrodes on the same instrument will register the lightning's electrical discharge and scientists will be able to calculate how close Huygens passed to the storm.

If Huygens actually passes through a storm, the microphone will detect the splash of the rain onto the spacecraft casing.

Unlike on Earth, this rain will not be water but probably liquid methane.

Marcello Fulchignoni, of the Université Denis Diderot, Paris, is the principal investigator of HASI. He says, "Combined with the camera images, temperature and pressure profiles, and altitude data, the 'soundtrack' will provide a fascinating look at the details of the mission's descent. We will be working hard to bring the voice of Huygens to the public as soon as we can after the descent."



Titan during flyby showing distinct bright/dark regions. Image Credit: NASA/ESA

Piercing the Fog

The Cassini space probe has already pierced the haze around Titan, Saturn's biggest moon, revealing details that have shattered theories about its composition.

The probe, launched nearly seven years ago by an international team, became the first craft to orbit Saturn and its rings and moons after a flawless 3.5 billion kilometre trek across our solar system.

On its first trip past Titan on Thursday, the robot probe snapped infrared images that left scientists puzzled. "This is the best view of the surface yet and we don't know what to make of it," scientist Elizabeth Turtle said at the Jet Propulsion Laboratory in Pasadena, California.

The first photos taken at 340,000km above Titan show a murky landscape with fuzzy linear structures, which could be mountains, rivers or faults. Better shots were taken of Titan in October, when Cassini descended to 1200km to snap close-ups of the moon. It has atmosphere and soil similar to primordial Earth and may contain the building blocks of life.

Surprise, Surprise!

Scientists expected a few rough spots when their space drone snapped close-range images of Titan, Saturn's largest moon. Instead, the planetlike moon appears to have a "bizarre," mysteriously smooth surface, and the latest images have left them in a state of wonder.

"The surface looks like it has been resurfaced," said University of Arizona professor Robert H. Brown.

The Cassini spacecraft, launched in 1997, came within 750 miles of Titan.

"The overriding theme of what we found is that we are not sure how to interpret what we are seeing," said Brown, the leader of the Cassini Visual and Infrared Mapping Spectrometer Science team.

The Cassini-Huygens mission is a cooperative project of NASA, the European Space Agency

and the Italian Space Agency. The program calls for 43 more close flybys of Titan. Cassini's Huygens probe will be sent down Dec. 25 for arrival on Titan in January. Meanwhile, scientists are trying to figure out what that surface is.

"It's so bizarre," Brown said. "We knew that we were going to see the surface in detail, and we knew it was going to be quite good."

But they were not ready for what they found - or didn't find.

"There are no obvious geologic features like impact craters or tectonic features," Brown said. "The surface is ... giving even the best geologists a real run for their money."

According to radar reports, there are no hills or valleys more than 50 meters high or deep. "For a body the size of Titan, that's pretty smooth," he said. "Most of us are going around here scratching our heads trying to put this into context."

"There also is a surprising lack of thick clouds on Titan," he said. The main obstruction is haze, made up of particles the size of those found in cigarette smoke.

Jonathan Lunine, UA professor of theoretical planetary science and physics and a scientist on the Cassini mission, says Titan has many qualities of planets orbiting the sun. It's larger than Mercury, and it has a dense atmosphere of nitrogen and methane, Lunine has said.

Earth and Venus have dense atmospheres. Mars may have once had a dense atmosphere, but it's cold and thin now, he said. "If we want to explore a planet in the solar system which is somewhat like the Earth, (Titan is) the place to go."

Cassini will pass by Titan 43 more times over four years. By allowing itself to be briefly caught by Titan's gravity, Cassini will pick up velocity from Titan's motion around Saturn, then blast back out. That will save fuel, and power Cassini into varying orbits that will allow closer looks at Saturn's other moons.

Stealing from the Gods

from NewScientist.com news service

In Greek mythology, Prometheus stole fire from the Gods. Now, Saturn's tiny moon Prometheus is showing similar tendencies, repeatedly stealing material from planetary rings, according to new images taken by the Cassini probe.

The image was taken on 29 October 2004 from a distance of 791,000 kilometres. It shows a sliver of light about 300 km inside Saturn's F ring, which lies beyond its main ring system and contains at least three bright strands of ice and dust.

That sliver is the partially illuminated, potato-shaped moon Prometheus, which is about 150 km in length. Prometheus and another moon - Pandora, which orbits just outside the ring - bookend the ring and have been called "shepherd" moons because they appear to keep the ring in line.

But this image confirms that sometimes the moon also strips material from its neighbouring ring, as a stream of material appears to be drawn from the innermost bright strand toward the moon.

This type of feature - called a streamer - was first seen around Saturn by the joint US-European Cassini spacecraft earlier in 2004. It is thought to occur when Prometheus - which travels in an elliptical orbit around the planet every 14 hours or so - reaches its closest point to the F ring. It is currently unclear to astronomers whether the wobbles in the bright central strand near Prometheus are associated

with the moon.

The image also shows evidence of previous close approaches. A dark horizontal band in the upper right section of the image is thought to be the hole left behind from a previous pass in which Prometheus siphoned off ring material. These dark lanes - called striations - were also first seen by Cassini earlier in 2004. But streamers and dark lanes have never been seen together in the same image.

"When we saw this we were blown away," says Mike Evans, an astronomer at Queen Mary, University of London, UK. "Before, we postulated streamers and dark lanes were

connected and were effectively the same feature. But now you've got an image of Prometheus yanking material out and then these dark lanes in the same image."

"It's amazing to see something that looks just like what was seen in numerical simulations," agrees Luke Dones, a Cassini imaging team member at the Southwest Research Institute in Boulder, Colorado, US.

Earlier observations from NASA's Voyager spacecraft in 1980 and 1981 had hinted that the F ring might be divided into bright strands, but the ring looked different when it was observed at different times.

Then, observations from Earth when a star passed behind the ring in 1989 showed "a perfectly well-behaved narrow ring", Dones told New Scientist. He says the new Cassini data suggests "it's a complicated system" and not just one ring.



The crescent moon Prometheus syphoning off material from the planet Saturn. (Image: NASA)

Scoring:

18 points - Congratulations, Doctor!

15 to 17 points - Master's degree

10 to 14 points - You're plenty smart, but no cigar...

4 to 9 points - you really should hit the books harder.

1 to 3 points - enroll in remedial courses immediately!

0 points - who read the questions to you?

Answers to the Asimov Quick Quiz:

1. Cougar.
2. Copper or Cobalt
3. Coffee.
4. Cousin.
5. Cotton.
6. Cognac.
7. Cortez.
8. Condor.
9. Collar.

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November Skies

dd hh		14 16 Moon at apogee
2 18 Moon at apogee	14 16 Moon at apogee	
3 20 Saturn 5.4 S of Moon	16 08 Venus 4.2 N of Spica	
4 20 Venus 0.6 N of Jupiter	18 03 Neptune 5.3 N of Moon	
5 06 LAST QUARTER	19 06 FIRST QUARTER	
8 10 Saturn stationary	19 14 Uranus 4.0 N of Moon	
9 16 Jupiter 1.0 S of Moon Occn.	20 14 Mercury greatest elong. E(22)	
10 02 Venus 0.2 N of Moon Occn.	21 21 Mercury 10.8 S of Pluto	
11 05 Mars 0.4 N of Moon Occn.	25 20 Mercury greatest brilliancy	
11 11 Mercury 2.2 N of Antares	26 20 FULL MOON	
11 23 Uranus stationary	30 08 Mercury stationary	
12 15 NEW MOON	30 12 Moon at apogee	
14 04 Mercury 0.7 N of Moon Occn.		

December Skies

dd hh	15 12 Neptune 4.9 N of Moon
1 03 Saturn 5.3 S of Moon	16 21 Uranus 3.9 N of Moon
5 01 LAST QUARTER	18 17 FIRST QUARTER
5 07 Venus 1.3 N of Mars	20 14 Mercury stationary
7 10 Mercury 7.6 S of Pluto	21 13 Solstice
7 11 Jupiter 0.3 S of Moon Occn.	23 21 Venus 5.8 N of Antares
10 00 Mars 2.2 N of Moon	24 15 Mercury greatest brilliancy
10 05 Venus 3.5 N of Moon	26 15 FULL MOON
10 09 Mercury in inf. conj.	27 20 Moon at apogee
11 20 Mercury 5.6 N of Moon	28 06 Saturn 5.0 S of Moon
12 02 NEW MOON	29 22 Mercury 1.2 N of Venus
12 23 Moon at perigee	29 23 Mercury greatest elong. W(22)
13 17 Pluto in conj. with Sun	

Local Times of Rise and Set for the Major Planets November & December 2004

Site Location: Long +28 deg. Lat -26 deg. Local Time UT +2 h

Date	Sun		Mercury		Venus		Mars		Jupiter		Saturn	
	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
Nov 06	5.17	18.26	6.14	19.53	3.37	15.51	4.24	17.07	3.32	15.47	23.43	10.24
Nov 16	5.12	18.33	6.26	20.17	3.34	16.06	4.04	16.57	2.58	15.16	23.03	9.44
Nov 26	5.09	18.41	6.29	20.22	3.32	16.22	3.46	16.49	2.24	14.44	22.23	9.04
Dec 06	5.09	18.48	5.51	19.32	3.33	16.39	3.29	16.40	1.50	14.12	21.42	8.22
Dec 16	5.12	18.55	4.29	17.54	3.36	16.57	3.12	16.32	1.15	13.39	21.00	7.40
Dec 26	5.17	19.00	3.52	17.18	3.43	17.16	2.57	16.25	0.39	13.05	20.18	6.58

PARDON MY PLANET

BY VIC LEE

