



The PRETORIA CENTRE

of the

Astronomical Society of Southern Africa

www.pretoria-astronomy.co.za

NEWSLETTER MAY 2008

The next meeting of the Pretoria Centre will take place at Christian Brothers College, Pretoria Road, Silverton, Pretoria

Date and time Wednesday 28 May at 19h15
Chairperson Hein Stoltsz
Beginner's Corner "Dark Sky Measurement" by Johan Smit
What's Up in the Sky Danie Barnardo

+++++ **LEG BREAK - Library open** +++++
MAIN TALK

"From the outside, looking in" *

by

Dr Cecil L Churms

The meeting will be followed by tea/coffee and biscuits as usual.

The next observing evening will be held on Friday 23 May at the Pretoria Centre Observatory, which is also situated at CBC. Arrive anytime from 18h30 onwards.

*See page 8

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Last month's meeting — Johan Smit

I acted as chairperson in the place of Percy Jacobs who was unable to attend due to work commitments. This was a totally new experience for me, because I have not performed this duty before. Anyway, about 40 people including 6 visitors attended on a rather cool evening. Either the cold or the European soccer on TV kept the attendance low. I hoped it was the soccer, because our main speaker did rush home afterwards to watch the game.

Everything that could go wrong on the evening did go wrong. I suspect that it was done deliberately to test the first-time chairperson, but it could also have been just Murphy's Law at work. The normal welcome speech was done and notices read. Upcoming events were :

2 to 3 May – Dark sky weekend at Bela-Bela.
14 May – Observing evening at Menlo Park primary school - members were invited to bring their telescopes along. 24 May – Scope-X, at the Military Museum in Johannesburg.

For Beginner's Corner, Danie Barnardo introduced us to a new library control database that he is busy developing. The system looks promising and once completed will enable us to list our library contents on our web site. The first of many bugs reared its ugly head during Danie's demonstration of the search facility of the system. Some things did not work properly, but I am sure that the final product will exceed our wildest dreams. Danie handled to mishaps very professionally and once this system is complete we will be the first centre to have its library controlled electronically.

In the meantime I was getting worried about the next speaker who had not yet arrived, but at the last moment Andrie van der Linde came, and after a quick computer change Andrie presented his usual elegant "What's Up?" talk. He informed us about things that could be observed at the dark sky weekend in Bela-Bela. One special occasion to look forward to happens on the morning of 22nd May - all Jupiter's moons will be either occulted or eclipsed for about 20 minutes. It is indeed rare to see Jupiter without any moons, so be sure to get up early to follow this spectacle. Better still, stay up all night and enjoy the splendid winter skies.

It was during Andrie's talk that I noticed the non-presence of our main speaker. Needless to say,

it worried me greatly and I mentally prepared myself for doing an impromptu main talk. Fortunately I had just such a talk prepared for emergencies, but during the short leg break Berto Monard arrived. To say that I was relieved is an understatement. Then another test of my chairperson skills happened. When setting up his presentation I discovered that my version of software was incompatible with his presentation. After using my computer at our meetings for many years this was quite a shock. I have since then upgraded my software, so repeats of this will not happen. Fortunately Berto fetched his laptop and after a short delay we were entertained by him.

Berto can only be described as a professional amateur astronomer. He introduced us to his observing programmes at the Bronberg Observatory:

- Cataclysmic variables (CVs):
- Long term monitoring of faint CVs
- Time series Photometry (CBA, VSNET)
- Supernova searching
- Symbiotic stars
- Microlensing events (uFUN)
- Exoplanets

And, if this not enough, any other targets of opportunity – he has discovered 62 supernovae since 2002, and he still wishes to resume observing gamma ray bursts when he gets the time.

Berto does his observations in conjunction with the Centre of Backyard Astrophysics (CBA) with its HQ at the Astronomical Department of the Columbia University, and in collaboration with the Variable Star network (VSNET) and the microlensing follow up network (uFUN), with its HQ at the Astronomical Department of the Ohio State University. Observations done at his observatory are documented in annual reports which are published in MNASSA.

Berto showed pictures of his observatory and equipment. He is indeed a hands-on type of person. He showed us images of light curves that were derived from his work, including some new results that are still to be published.

Because of the wet and cloudy summer weather on the Highveld, Berto has decided

to move to the Karoo and set up an observatory that can do observations all year round. It is amazing what he has done in our unfavorable climate – the sky will truly not be the limit for him in a more favorable climate. We wish him all the best for the future. We were indeed lucky to hear him, because our event will probably be his last public speaking event in Gauteng. It was an honor to “see” his work and every-one could sense his enthusiasm and commitment. I trust it will inspire the next generation of observers.

Just after 22:00 a very nervous and tired chairperson closed the meeting and everyone was invited to enjoy some tea or coffee. At least we did not experience any technical difficulties with the refreshments.

Last month's observing evening - Johan Smit

Some 12 people arrived and guess what – it was cloudy again! There were some first time visitors and Johan took them on a tour of the facilities. The operation of the 12 inch telescope and dome was explained. In the mean time Pat set up his telescope and the visitors had a look at the nearly full moon as it appeared and disappeared between the clouds. Just as we considered closing for the evening someone spotted some stars. Miraculously the clouds opened up and we got down to some serious viewing.

All the favourites were visited for the benefit of the visitors. Saturn, the Orion Nebula (M42), the Jewel Box and Omega Centauri were looked at. Eventually we had one 6 inch, one 8 inch, one 10 inch, the Bennett telescope and Johan Moolman's giant 20 x 100 binoculars in operation. The visitors were treated to various views of the objects through the whole range of instruments. Because of the bright moon our viewing was limited to bright objects and included the favourite double stars, Castor, Alpha Centauri and Alpha Crucis. Pat pointed out a coloured pair in Canis Major. This one resembles another favourite, Albireo in Cygnus. Now we have a showpiece coloured double for the summer months when Albireo is not visible.

I did some research on this pair and found it to be identified as h3945 or ADS 5951. The h-number means that it is included in the continuation of John Herschel's 1833 catalogue. These are referred to as h 2308 -- h 4021. The ADS- number means that it is listed in the Aitken Double Star catalogue of R.G. Aitken, in 1918 (revised in 1935). At Space.com I found the following statement about double stars: “There is an interesting rule about the colours of telescopic double stars. If the stars of the pair are equally bright, they have the same colour. If they are unequal in brightness, they have different colours. If the brighter star is the redder of the two, as in the case of Albireo, it must be a giant star; if it is the bluer, then it is what astronomers call a main sequence star, like our Sun”.

We did have a look at another newly found favourite, NGC 2547 in Vela. It is an open cluster that forms a heart shaped asterism. Even though it was a bit washed out by the bright moon, the heart shape could still be seen. This was much appreciated by the only lady present. This romantic symbol was not so impressive to our predominantly male group and one totally unromantic soul could not even identify the asterism as heart shaped. I will save it until there are more ladies present - at least they appreciate the pretty things in life!

Just before 22:00 the clouds returned, but by that time we were happy to close up and go home. We had a good viewing session and learnt a lot on a night that looked like a total loss at the start. Moral : do not stay at home when the weather looks unfavourable, you never know how the evening will turn out.

A Dark Sky Weekend : May 2 & 3 2008 - Michael Poll

The Centre Dark Sky weekend was officially on May 2nd and 3rd, but as the 2nd was declared a public holiday, some took the opportunity of going earlier.

I arrived on Friday 2nd May. When I awoke at home that morning I was greeted by an appallingly grey day with light rain. Oh dear! The story of astronomy observing, 2008 style. The clouds

broke up a bit during the morning, but on arrival, observing prospects looked bleak. Some people already there had done some observing the night before. As it got dark we braaied and ate, and surprise, surprise the sky started clearing up. Happily it stayed clear for most of the evening, with some hazy cloud now and then. The sky was not crystal clear, there was a lot of moisture that made haloes around the stars, but we were still able to see things. There were four telescopes up on the night. Operated by :Tony, Gareth, Michael and Pat. We were up until midnight, when the cloud closed in rather more.

I had no serious plans for an observing programme, but I decided to look at some objects in Puppis, a constellation I have not really examined properly - one usually gets into the area around Carina and Crux, forgetting about the bit of Milky Way between the False Cross and Canis Major. Before I got on to Puppis, Pat showed me a colourful double (an Albireo lookalike) in Canis Major that I learned had been looked at during our last observing evening, which I had not been able to attend. Johan has identified it as h3945. I also looked at M44, the Beehive cluster in Cancer, which has not had much attention at our observing evenings. (It will probably get some attention at our next observing evening when Mars will be in the cluster!)

In Puppis, I looked at M46 and M47, which are on a line extended from Beta CMa through Sirius. M47 is a collection of bright stars, but M46, which is more than three times further away than M47, has stars that look like fine dust. Another cluster pair in Puppis is NGC2451 and NGC2477. I noted that these two are a very similar pair to M46 and M47, with 2451 having the bright stars and 2477 having the fine dust.

I looked at a couple of things I had read about, but had never looked at before. First was the double star Alpha Circini (it is near Alpha Centauri). This 3rd magnitude star has a speck of a companion. Next was the globular cluster NGC4833 in Musca. This constellation lies just to the south of Crux, and this globular gets frequent mentions. NGC 4833 lies near delta Muscae.

I revisited some things I have seen before, but not often :- NCG2070, the Tarantula Nebula in the Large Magellanic Cloud; NGC 6441, a globular cluster surprisingly close to the star G Scorpii, in the sting of the Scorpion; M104, the Sombrero Galaxy, which I found for the first time by myself on last April 24th. (The 24th was a clear night, I found the galaxy from my home location); and the Stargate asterism, which is very close to the Sombrero, which I was shown for the first time at our observing evening on June 22nd 2007. This small asterism consists one equilateral triangle of stars within another equilateral triangle.

The next day, Saturday, we spend chatting, except the battery in my car had failed, necessitating a trip to Bela-Bela to get a new one. Everyone left at various times during the day, the weather got gloomier and gloomier. Pat and Erica were last to leave, still hoping it would clear up, but reality crept in. It rained from 2.00 pm until 8.00 pm, and was cloudy before and afterwards. With only me left, I caught up with news with Mike Haslam during the evening, and went to bed early. I enjoyed sleeping in a tent, the first time I have done it for years. Soothing sounds of the wind in the trees. I got up at about 1.30 am and the sky was wonderfully clear, and there were all the stars! I re-discovered a distinctive arc of five naked eye stars that I had noticed when we were at the same site in June last year, but had never noticed since, and had, in fact, forgotten about. The stars are beta, gamma and chi Herculis, and gamma and beta Serpentis. While I was looking I saw mist coming up, and it must have closed over quickly after that, because there was some more rain - soothing sounds of raindrops on canvas.

The next morning was still cloudy, but it was time to pack up and leave. Although Mike and Joy are probably going to discontinue their operation at Ezulweni, (the property is for sale) the site will still be available for some time, and until further notice, so if anyone wants a dark sky weekend, or just a quiet weekend, Joy says any one is welcome to go at any time. Camping is R40-00 per person per night, rooms and / or meals are available by arrangement.

The Riddle of the Nebulae : Part 2 - Michael Poll

The discovery of spiral structure

In the 1840's Lord Rosse (the third Earl, 1800 – 1867) in Ireland, with what was then the largest telescope in the world, a 72 inch reflector, showed that some of the white nebulae had a spiral structure. The first one of the sort found was M51, the Whirlpool in Canes Venatici.

Photography had come into use at the end of the 1800s, and early celestial photographs showed more of the white nebulae with a spiral form. In 1887 Isaac Roberts showed that the Andromeda Nebula was a spiral, and in 1899, James E Keeler (1857 – 1900) showed that, in fact, that most of the white nebulae had a spiral form. This led to the belief that the spiral shape was typical for the white nebulae, and then to the idea that **all** white nebulae were spirals. Originally it had been thought that M51 was an isolated example.

Contemporary thinking about spiral nebulae at turn of the 19th –20th century

In the 1850's (before Huggins discovered the gaseous nature of the green nebulae) it was still thought that all nebulae would be resolved into stars given a sufficiently powerful telescope. In 1850 Alexander von Humboldt called them "Island Universes", but the problem with the spirals was that it was not known if they were part of the Milky Way or not.

In a book published in 1909, Garret P Serviss examined a number of theories that tried to explain what was going on. LaPlace's (Pierre Simon LaPlace 1749 – 1827) Theory of the formation of the solar system (1796) suggested the solar system had formed from a nebula that first gave rise to the sun, and as the nebula contracted it ejected rings of diffuse matter which condensed into planets. A planetary nebula was the evidence for this - the star had already formed in the centre. It was also stated that there *appeared* to be elliptical rings surrounding the central condensation of the Andromeda Nebula. However, after Keeler had found spiral structure to be common, it was concluded that a spiral shape was inconsistent with a disc or sphere of gas condensing around a star and throwing off rings of material. LaPlace's theory was discarded in some quarters, and replaced by one that suggested that the solar system originated from a spiral nebula, and not from a planetary nebula.

Serviss then considered other contemporary theories. Using M51 as an example, the condensations [in the arms] of spirals might be suns, "albeit small ones", and that there could be enough material in a spiral "to make a hundred other solar systems". These ideas still assumed that spirals were part of the Milky Way, and therefore must be physically quite small. At this time the spiral in Triangulum (M33) was, for practical purposes, resolved into stars, but if it was still part of the Milky Way, then the stars would have to be small. The Andromeda Nebula was perceived as being less advanced towards transformation into stellar bodies than M33. The "nebulous rings" of the Andromeda nebula are described as having "one or two huge masses [of material which could transform] into stellar bodies of unusual magnitude". Note that in this theory, the spiral arms of Andromeda Nebula are still called "rings". Those wishing to demolish Laplace's theory, called them "spiral rings", but Serviss wrote "...they are not obviously spiral when compared with M51 ... they look like circles seen at an angle", so even at this stage it was still not altogether admitted that Andromeda was a spiral.

Serviss says that if these rings were truly circular then they accord well with LaPlace "... if the Andromeda Nebula is to become a solar system it will surpass ours in grandeur beyond all comparison", but he further wrote "One problem about the spiral nebulae makes their origin even more puzzling - they show a continuous spectrum, ie the light must be coming from a solid, a liquid or a gas under heavy pressure [i.e a star or stars] and he adds that the spectrum of the Andromeda Nebula was indicative of "... not a luminous gas, but a flock of stars so distant that they are separately indistinguishable.... just as the component stars of the Milky Way are indistinguishable to the naked eye" [Kant's words of 1755!]. So here it is suggested that Andromeda is an outer universe (Humboldt's "Island Universe") but the theory was unacceptable to some, because **all** the spirals had the same spectrum and, "no one would be disposed to regard them

all as outer universes”.

The continuous spectrum of starlight was seen as a support for a substitute for LaPlace's theory of solar system formation. This theory suggested that spirals could be a result of the close approach of two stars and then one or both exploded. - the tidal forces would make them elliptical at first, then the two wings are twisted into spirals by their rotation, and planets are formed from the condensed matter in the wings. The evidence for this was that spirals are elliptical, the central masses are oval from a left over tidal effect, their spectra are continuous (ie they are stars not gas), and some are visually double (M51, M31). “But questions remain ...[M33]... suggests a swarm of stars being formed... and there are no tidal nodes”.

LaPlace's theory could be used to account for planetary nebulae, - and for Andromeda if it was *not* a spiral, but it did not account for spirals or the gaseous nebula. However, Serviss points out that the 1796 theory was intended only to explain the formation of the solar system, but was now being used to account for things that it was never intended to account for - Laplace had not seen, and did not even know of the existence of, spiral nebulae, nor did he know the gaseous nebulae for what they were.

In his 1909 book, Serviss concluded *“The spiral nebulae remain among the greatest riddles of the universe, while the gaseous nebulae are no less mysterious, although it seems impossible to doubt that both forms give birth to stars... but the scale of the phenomena is different and the forces in operation may be equally different”*

To be continued

The age of the Universe

NASA's Wilkinson Microwave Anisotropy Probe (WMAP) has taken the best measurement of the age of the Universe to date. According to highly precise observations of microwave radiation observed all over the cosmos, WMAP scientists now have the best estimate yet on the age of the Universe: 13.73 billion years, plus or minus 120 million years (that's an error margin of only 0.87%). The image below is an artist's rendering of WMAP at the second Lagrange point (L₂).

See website

<http://www.universetoday.com/2008/03/28/1373-billion-years-the-most-accurate-measurement-of-the-age-of-the-universe-yet/>



Preparations for Phoenix Mars Lander

Three Mars orbiters are adjusting their orbits to be over the right place at the right time to capture data from NASA's Phoenix Mars Lander as it enters the Martian atmosphere on 25 May 2008. Phoenix will hit the Martian atmosphere at 5.7 km/s and will slow down over a period of 7 minutes to 2.4 m/s before landing.

The orbiters are:

- JPL's Mars Odyssey.
- NASA's Mars Reconnaissance Orbiter.
- ESA's Mars Express.

All three will do data capturing to try and ensure that no data will be lost during the descent.

See our Centre's newsletter for October 2007 (on our website), page 7 and web links there.

REMINDER

YOUR MEMBERSHIP MUST BE RENEWED BEFORE 30 JUNE 2008.

Sien die heelal met die klik van 'n muis - deur André Buys

Enige aanhanger van Star trek of Star wars sal weet dat dit nie maklik is om die heelal en die buitenste ruimte te verken nie. Microsoft poog egter met 'n nuwe toepassingsprogram om so 'n verkenningstog so maklik te maak soos om jou rekenaar aan te skakel. Die wêreld se grootste sagtewarevervaardiger het op Maandag 12 Mei dié gratis program, genaamd WorldWide Telescope, bekend gestel.

WorldWide Telescope (WWT), wat gratis by www.worldwidetelescope.org afgelaai kan word, stel enigiemand – van kinders en amateurs tot professors in sterrekunde – in staat om die heelal se sonnestelsels, sterrestelsels en verafgeleë planete gerieflik te verken.

Die WWT werk deur 12 teragrepe se beelde en data – gelykstaande aan 2,6 miljard bladsye teks – van bronne soos die Hubble-ruimteteleskoop, die Chandra X-Ray Observatory Center en die Spitzer-ruimteteleskoop saam te voeg. Die uitvloeisel is 'n ondervinding soortgelyk aan 'n rekenaarspeletjie wat gebruikers toelaat om in en uit verafgeleë sterrestelsels te beweeg en selfs seldsame ruimtestofonele in “ongelooflike helderheid” te aanskou.

Microsoft het gesê dié program word gratis aan die publiek beskikbaar gestel as 'n huldeblyk aan mnr. Jim Gray, 'n navorser van Microsoft wat verlede jaar aan die kus van Kalifornië op 'n seilboot vermis geraak het. Gray het saam met sterrekundiges aan projekte gewerk om die enorme hoeveelhede beelde en inligting te organiseer wat deur satelliete ingesamel word.

Microsoft het gesê die doelwit van die WWT-inisiatief is om kinders en jongmense se belangstelling in die ruimte, ruimte-reise en sterrekunde aan te wakker. “My idee van sukses sal wees as die WWT die manier kan verander waarop mense die heelal sien – en dat kinders oor 'n vlak van kennis oor die ruimte sal kan beskik wat tot nog toe ongekend was,” het mnr. Curtis Wong, bestuurder van Microsoft se Next Media Research Group, gesê. “Ek glo dit sal mense help om die buitenste ruimte te kontekstualiseer.”

Telescope for sale

10" LX5 Meade telescope for sale. The optics are good, but the electronics need some attention. Contact Mike Haslam at

Cell: 082 921 5973

e-mail: paradise4joy@gmail.com.

Dark Sky weekend 6 - 8 June 2008

Eridanus Optics CC is arranging a Dark Sky weekend in the Vredefort dome from 6 June to 8 June 2008. New moon is on 3 June. The event includes a talk on the dome by Prof Frans Waanders of the North West University and a guided trip through the dome. Prof Okkie de Jager will also present an astronomy related talk. The cost is R380 per person and includes accommodation and all meals. You bring your own bedding and drinks. For more detail go to website www.eridanusoptics.com/store and click on 'Events'.

Event at Rietvlei dam lapa - by Danie Barnardo

The South African Hunting Association had a meeting at Rietvlei dam lapa on the evening of 17 April 2008. They requested the Pretoria Centre to give a short talk on astronomy and to show the hunters at the meeting some of the heavenly delights.

Several members responded to the call and the following persons were present with their telescopes: Johan Smit, who brought the Bennett telescope, Fred Oosthuizen with his 8" Dobsonian, Clive Callaway with his 12" Dob, Pat Kühn with his 6" Dob, and Danie Barnardo with his 6" Dob. Danie gave a short talk on the size of the Universe (compliments to Johan, the compiler of the talk), which was very well received by the hunters. After the meeting a steady stream of hunters visited the telescopes and, as usual, the Moon and Saturn drew the most admiring comments, but we were also able to show the other "regulars", such as the Jewel Box, Orion Nebula and Alpha Centauri. Johan "discovered" a new wonder, the Open Cluster NGC2547 in Vela. It displays a distinct heart-shaped asterism and was promptly dubbed "Johan's Heart". It proved to be a particular favourite with the ladies.

All in all, it was a very enjoyable evening, with excellent skies (the best for many nights) and many compliments were received from the hunters.

Introduction to Astronomy

Course presented at the Johannesburg Planetarium. They will be repeating their basic "Introduction to Astronomy" series on Wednesdays in July, starting July 9th 2008. More info at www.planetarium.co.za.

Scopex 2008

Sat 24th May at the Military History Museum, Johannesburg. Scopex is the annual astronomy and telescope fair of the Johannesburg branch of the ASSA. A day of astronomy talks, workshops, stalls & astrophotography competition and an evening star party. For details, see website www.assajhb.co.za

Note: The Johannesburg Planetarium will be closed on 24th May - they'll be at Scopex.

This month's main talk

His talk covers some personal insights into the life of his uncle, Joe Churms, Assistant Director of SAAO, and how modern technology was used to discover how an ancient astronomical computer worked.

ASSA Symposium 2008

ASSA Symposium: Durban Country Club, Thursday 7th August to Saturday 9th August, 2008. Professor George Ellis of the University of Cape Town has accepted the invitation as keynote speaker. The Symposium theme is "**Interaction between Astronomy and Cosmology.**"

See website www.astronomydurban.co.za

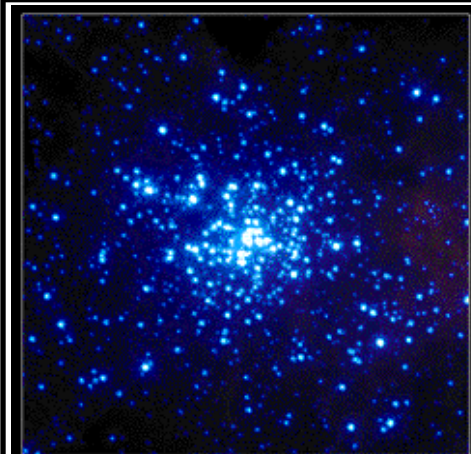


The Tarantula Nebula

The **Tarantula Nebula** (image on left) in the Large Magellanic Cloud (LMC) is also known as NGC 2070, 30 Doradus and the Looped Nebula. It is an emission nebula and resides on the leading edge of the LMC. It is 168 000 light-years away and has a radius of 500 light-years. It is the most active starburst region known in the Local Group of galaxies. At the center of it is the spectacular **R136** cluster, whose massive stars shine brightly in the far ultraviolet, ionizing the surrounding gas to produce the visible **Tarantula Nebula**. The **R136** cluster, at a tender young age of 2-3 million years, still has all of its massive stars intact. The nebula is luminous in X-rays as well, indicating the existence of gas shock-heated to millions degrees Kelvin by supernova remnants (in which there are shock waves moving outward from the supernova explosions). Supernova explosions in the older cluster **Hodge 301**, near **R136**, are responsible for the shock waves that caused the shock heating. (SN 1987A was a supernova that exploded elsewhere, in the outskirts of the **Tarantula Nebula**.)

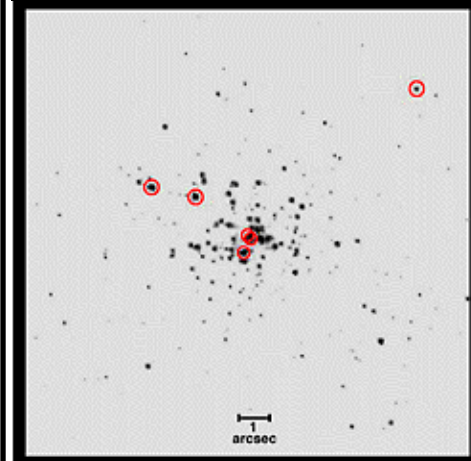
See website <http://heritage.stsci.edu/1999/12/supplemental.html>

See website <http://www.seds.org/messier/xtra/ngc/n2070.html> for web links to this topic.



The star clusters R136 and Hodge 301 in the Tarantula Nebula

The image on the upper left shows **R136**. It contains the most massive stars yet discovered. The stars marked with circles in the image on the lower left are estimated to be more than 100 times the mass of the Sun. The line drawn near the bottom of the image shows one arc second on the sky, which is a typical resolution limit for ground-based telescopes. The HST can resolve individual stars within one tenth of an arc second of sky, allowing detailed analysis of dense star clusters like **R136**.



Star cluster **Hodge 301** is shown on the immediate left. The cluster was formed early on in the current wave of star formation. Since the cluster formed, it is estimated that at least 40 stars within it have exploded as supernovae, giving rise to violent gas motions within the surrounding nebula and emission of X-rays.

**“Strangers in the night
exchanging glances
wandering in the night.....”**
(From a song that was sung
by the late Frank Sinatra.)

Magellanic Clouds just passing through

Our closest galactic “companions” are not companions at all — just strangers passing us in the night. New measurements of the velocities of the Magellanic Clouds show that the cloudy apparitions of Southern skies may be zooming past the Milky Way and are not its little siblings after all. New 3-D measurements of both the Large Magellanic Cloud and the Small Magellanic Cloud put their velocities at close to that needed to escape from the Milky Way. That suggests they're rather new arrivals and may not even stick around.

The velocities of the lesser galaxies were worked out by first establishing the precise positions of very distant and powerful quasars in the deep background sky behind the vastly closer Magellanic Clouds. With the quasars providing an unmoving frame of reference, observations with the Hubble Space Telescope allowed astronomers to directly measure changes in positions of stars in the Magellanic Clouds.

The images below show the Large (left) and Small (right) Magellanic Clouds.

Website: http://dsc.discovery.com/news/2007/09/20/magellanicclouds_spa.html?category=earth&guid=20070920103000

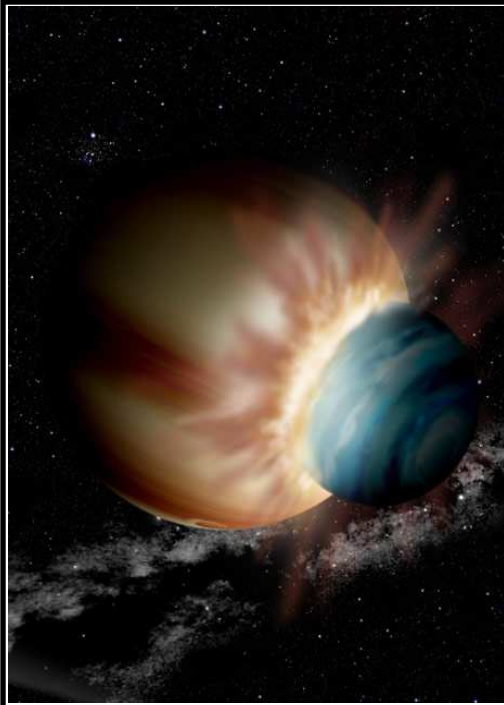


© Anglo-Australian Observatory/Royal Observatory, Edinburgh.



Telescope for sale

12" Meade LightBridge with lots of accessories.
12mm Celestron Eyepiece (1.25"), 26mm and 9mm Meade eyepieces.
Various colour filters, Moon filter, OIII Filter and UV/IR cut filter.
2 x Meade Barlow. 2 x CCD Webcam Imagers ready to use in telescope, 1/2" CMOS Imager.
Functional tool case for all these parts.
Dell D500 laptop with all required software for imaging.
Excellent condition!! See image at left. Price: R12,000.00 ono.
Phone Karl Crous at 082 888 1199.



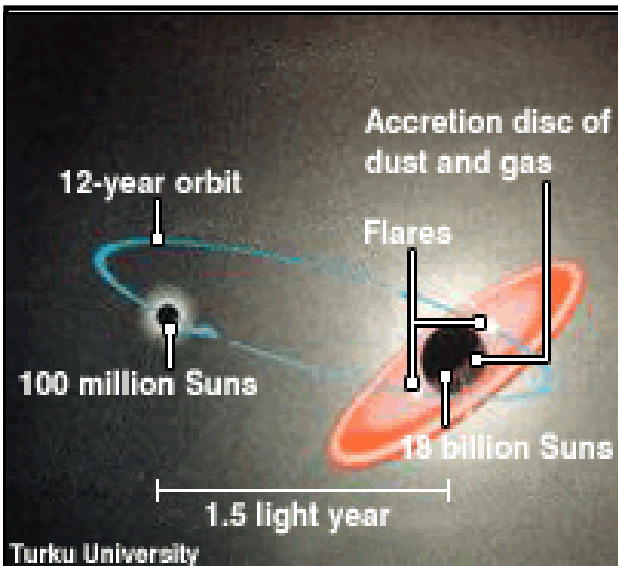
Evidence of Huge Planetary Collision Found

Astronomers may have discovered the aftermath of a collision between a Saturn-size planet and a smaller world, perhaps the size of Uranus, some 170 light-years away. Scientists made the find while studying the larger planet, which orbits a small, dim star in the constellation Centaurus.

The planet had puzzled experts, because its brightness and temperature didn't match what is known about how such objects evolve. The planet's star system is only eight million years old, an age at which planets are still being formed. So the world may be glowing with the leftover heat from a mammoth collision with another protoplanet, Eric Mamajek of the Harvard-Smithsonian Center for Astrophysics proposed. Such a collision would leave the planet unusually hot for many years, he explained. "We're not seeing the actual collision right now," Mamajek said. "We're seeing this long drawn-out period after the collision, of roughly a hundred thousand years, where this thing would be very hot."

Mamajek discussed his findings at a meeting of the American Astronomical Society in Austin, Texas. The discovery is exciting, because when our own solar system was young, at least three planets—Uranus, Venus, and Earth—are believed to have been smacked by large protoplanets. "This could be the first evidence of this happening to another object in another solar system," Mamajek said. The theory can't be confirmed, however, until the astronomers can make detailed observations of the distant planet's atmosphere. "It's really faint," Mamajek said. "So even the biggest telescopes we have now really struggle to gather enough light."

An artist's conception depicts the collision of two protoplanets in the distant star system.



Most massive known black hole in the Universe

The monster celestial object is **18 billion** times as massive as the Sun - six times more massive than the previous record. The object, called OJ287, is orbited by a smaller black hole, which allowed its mass to be measured very accurately.

The finding also enabled the researchers to test Einstein's theory of gravity for the first time in a strong gravitational field. The team managed to show that Einstein's theory could give the correct orbital behaviour of the binary orbit. They measured this at a 10% level of accuracy, though the researchers said this could be improved with future observations.

The binary black hole system powers a quasar - a compact halo of matter which radiates enormous amounts of energy. It is relatively close for a quasar - about 3.5 billion light-years away from us in the constellation of Cancer - making it one of the most studied objects of its type. It emits a pulsing light signal, with two major pulses every 12 years. From this, astronomers were able to construct models to predict the arrival of the pulses.

Websites: <http://news.bbc.co.uk/2/hi/science/nature/7181877.stm>

<http://space.newscientist.com/article/dn13166-biggest-black-hole-in-the-cosmos-discovered.html>

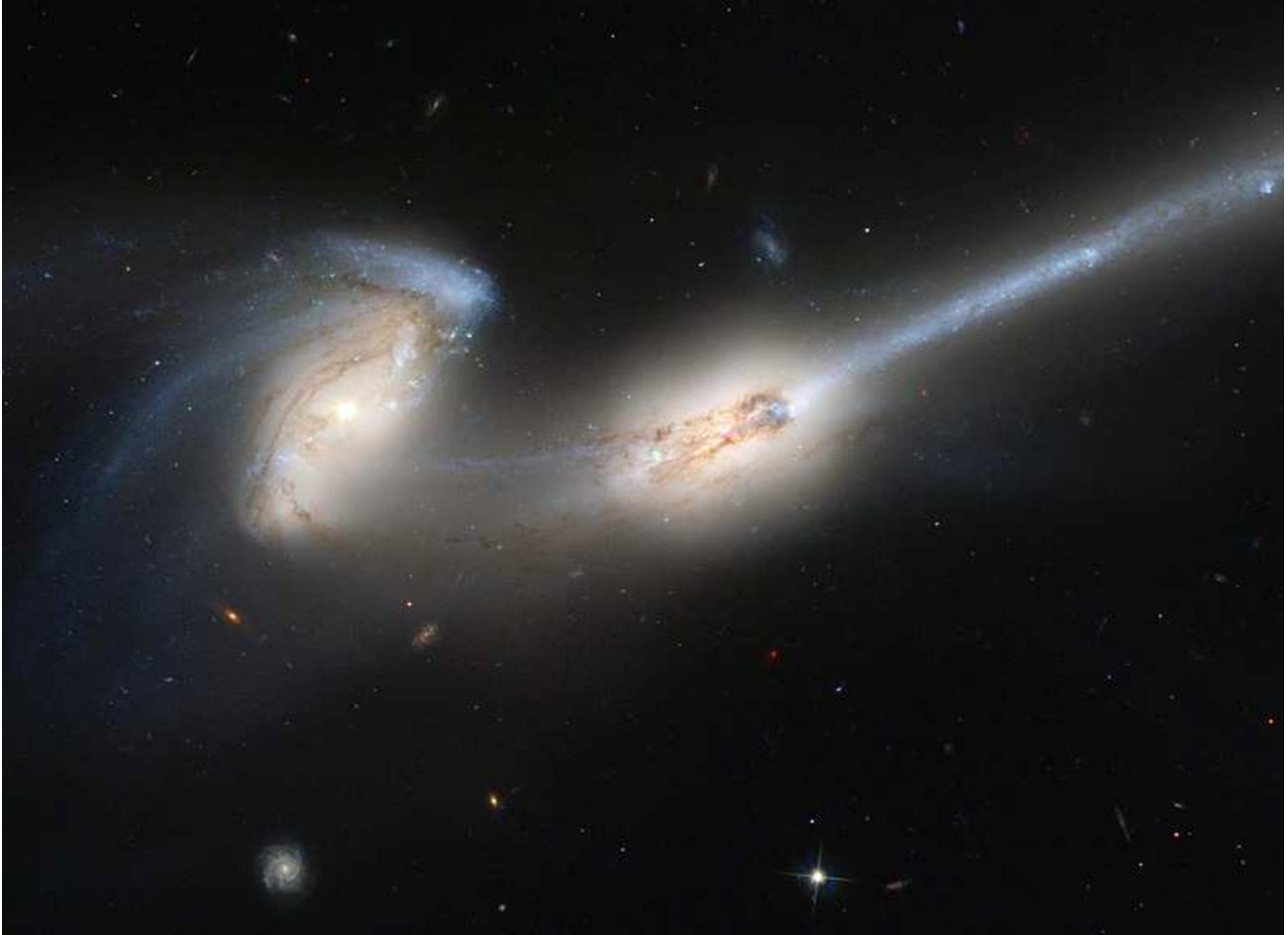
The Mice

This pair of galaxies (NGC 4676A & NGC 4676B) are known as “The Mice” because of their tails of stars and gas. They have collided and will eventually merge into a single galaxy. Streams of material have been tugged out of the galaxies by the force of gravity, triggering new star birth.

Websites:

http://www.ifa.hawaii.edu/~barnes/research/interaction_models/mice/index.html

http://en.wikipedia.org/wiki/NGC_4676 and web links there.



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