november 2005

canopus

monthly newsletter of the johannesburg centre of assa

Old Republic Observatory, 18a Gill Street, Observatory, Johannesburg
PO Box 412 323, Craighall, 2024

The Southern African Large Telescope photographed under the canopy of the stars. © 2005 Stephen B. Potter

contents

notice of next meeting – assa johannesburg

The next monthly meeting of the Johannesburg Centre of the Astronomical Society of Southern Africa will be held at the old Republic Observatory, 18a Gill Street, Observatory, Johannesburg on Wednesday 9 November 2005 at 20h00. Guest speaker:

Professor Okkie de Jager

"The High Energy Stereoscopic System Telescope (HESS)"

year-end star party – Henley on Klip

The year-end star party will once again be held at Brian Fraser's dark sky viewing site at Henley on Kilp on Saturday, 10 December 2005. Further details will be posted in the December edition of Canopus.

Urgent Item – Late Entry – BOOK AUCTION!!

The auction of donated books from the late Graham Tremeer's estate will take place at the November monthly meeting. For information on the bidding process see page 17. Email bids to **fraserb@intekom.co.za** are accepted until 28 **October** 2005.

assa johannesburg committee members & volunteers for 2005/2006

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ATM: Amateur Telescope Making classes held on the premises of Parktown Boys High School on most Saturday afternoons.

ASSA Johannesburg Centre's mailing-list subscriptions:

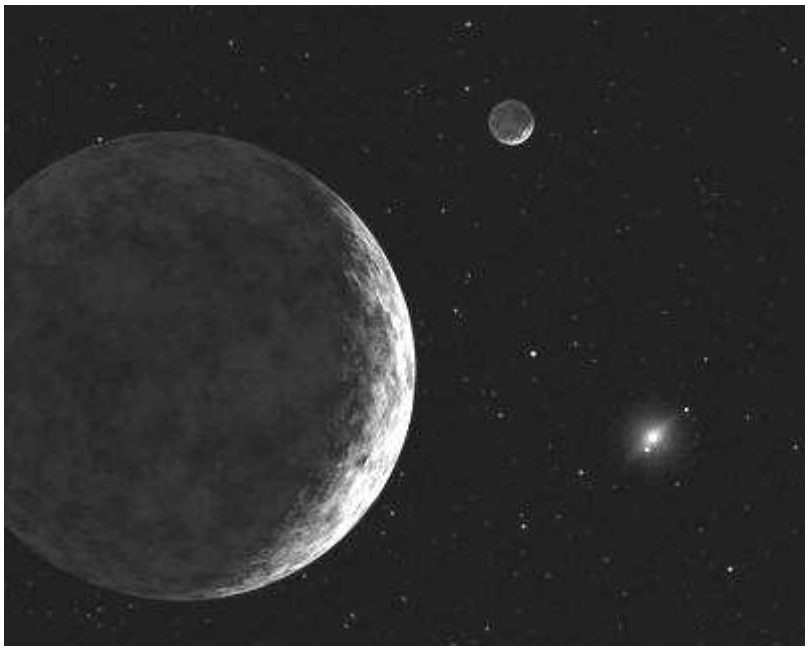
Announcements and discussion, send a blank email to: **assajhb-subscribe@yahoogroups.com**

ATM class' mailing list, send a blank email to: **assaatm-subscribe@yahoogroups.com**

10th planet has a moon

edited article from a Caltech News Release

The newly discovered 10th planet, 2003 UB313, is looking more and more like one of the solar system's major players. It has the heft of a real planet (latest estimates put it at about 20 percent larger than Pluto), a catchy code name "Xena" (after the TV warrior princess), and a Guinness Book-ish record of its own (at about 97 astronomical units, it is the solar system's farthest detected object). And now, astronomers from the California Institute of Technology and their colleagues have discovered, it has a moon.



The moon, 100 times fainter than "Xena" and orbiting the planet once every couple of weeks, was spotted on September 10, 2005, with the 10-meter Keck II telescope by Michael E. Brown, professor of planetary astronomy, and his colleagues at Caltech.

Brown estimates that the moon, nicknamed "Gabrielle", after the fictional Xena's sidekick, is at least one-tenth of the size of the Kuiper Belt object – around 250 km across.

Further observations of the moon with NASA's Hubble Space Telescope, planned for November and December, will allow Brown and his colleagues to pin down Gabrielle's exact orbit around Xena. With that data, they will be able to calculate Xena's mass.

"A combination of the distance of the moon from the planet and the speed it goes around the planet tells you very precisely what the mass of the planet is," explains Brown. "If the planet is very massive, the moon will go around very fast; if it is less massive, the moon will travel more slowly. It is the only way we could ever measure the mass of Xena – because it has a moon."

"Pluto once seemed a unique oddball at the fringe of the solar system," Brown says. "But we now see that Xena, Pluto, and the others are part of a diverse family of large objects with similar characteristics, histories, and even moons, which together will teach us much more about the solar system than any single oddball ever would."

editorial

Robert Groess

This edition of Canopus is positively bursting at the seams. In the end, I realized I'm fighting a loosing battle – the battle to keep Canopus to 16 pages. I sat with articles strewn across my desktop, trying to decide which deserves more merit above the other. And then it struck me one morning, the idea to bump this edition up to 20 pages. The pieces of the puzzle fell seamlessly together, and here you are, holding the result of that epiphany in your hands! So what's the big deal you may ask – the real concern is that Canopus could become too thick to be classified as standard postage, especially since it needs to be folded to fit into a DL size envelope. I checked, and rechecked – and it looks like a 20 page edition would fit, with some room to spare as a safety margin!

Over the past few weeks I have come across some amazing astrophotos, taken by Encarni's husband, Dr. Stephen Potter at the SAAO. I asked him if I could kindly reproduce some of those stunning images in Canopus, and I have the honour to announce that you do indeed have the good fortune of being able to see some of them. With the official opening of SALT on November 10th, I thought this menagerie of SALT images was particularly appropriate for this edition! More details are listed in our new section, Canopus Gallery (page 18).

And then… there has been overwhelming support for the idea of providing Canopus in electronic format. The following section distils the proposed phasing in of just such a publication. With more than enough to read in this November edition, I will sign off by thanking all of you who have contributed to making Canopus the embellished edition you have in front of you. The Editor.

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chairman's chat

Brian Fraser

I can't remember ever having such fowl weather in Jo'burg. Or such foul weather. It really is for the birds.

How is one supposed to do astronomy with all the cloud and haze around? I guess if we asked the Europeans that question they would have many suggestions as to what to do when the weatherman is not on your side. Read astronomy books. Tweak your telescope or clean it or make that little widget that you have been meaning to do for so long. Maybe surf the net and see what others have been doing.

In recent times I see that John Dobson is now 90 years old. He has been one of the most successful popularizers of simple telescope designs and also a campaigner in the 'San Francisco Sidewalk Astronomers' of taking astronomy, literally, to the man in the street. I was surprised to see, in the discussions around his 90th birthday, that he has attracted a lot of criticism for his views on the formation of the universe which, apparently, he punts at many astronomical gatherings. He supports a "fundamental" view rather than the "big bang" model. This aside, he has made a great contribution to the ATM business and if you want to see how his ideas are put to use then go along to our telescope making class any Saturday and you will see that most of the telescopes made there are of the Dobsonian design.

You will by now have seen that SALT is up and running and producing some stunning images. This bodes well, for when it has all the little refinements and is tuned properly it can only get better. The official opening is to be held on November 10th and the SAAO web site says that interested bodies could contact them for a possible ticket to the visitor's centre for the event.

Another news item that caught my eye was the announcement by Tim Cooper (Pretoria centre) of the discovery of a new double star. Tim was doing some casual observing of a comet field and happened to notice this double star, which was not listed in the catalogues. Just shows that if you stay alert while observing there is no knowing what you may discover. Personally I doubt that I would notice a supernova unless it had red and green flashing light on it. So well done Tim.

Now if we could only get the weatherman to dump these clouds in Polokwane…
Brian

PS: Did you hear that the Chinese are looking for an astronaut?
"But didn't they just launch an astronaut just recently?"
Yes, that's the one they are looking for!

encarni's reflections

Encarni Romero Colmenero – erc@saao.ac.za

Hi all,

I'd like to start off this column in what is now becoming the usual manner: with an update on this month's news from SALT. This issue's news concerns the Primary Focus Imaging Spectrograph (PFIS), which is the main instrument on SALT. PFIS, as its name already hints at, is a pretty complicated instrument that sits at SALT's prime focus, on top of the tracker, and it can do just about everything - imaging, spectroscopy, polarimetry, and any combination of the above (imaging spectroscopy, spectropolarimetry, imaging spectropolarimetry… you name it!). It weighs over 500 kg and it has been built by the University of Wisconsin-Madison (USA). It arrived in Cape Town in April this year, and it has been 'living' in our workshop getting re-assembled and tested thoroughly since its arrival, until the 28th of September, when it was finally packed up ready to go to SALT. It was actually supposed to leave Cape Town on the 29th at 8:30 in the morning, but it turned out that the crane we have in the Cape Town workshop was not tall enough to lift it onto the truck, so the transport had to be delayed until another crane could be located, rented, it arrived, lifted PFIS onto the lorry… and PFIS finally left Cape Town on the evening of the 29th! The truck driver, sensibly, decided not to drive through the night with such a precious cargo, so PFIS actually arrived on the 30th of September at SALT's door, safe and sound. It was then lifted into the spectrometer room, where it was again anxiously checked by the PFIS team and… (here comes the exciting bit) on the 13th of October it was finally put on its final location, on top of the tracker, at SALT's prime focus! Due to all of the delays in getting PFIS on site, the Performance Verification (PV) phase for both SALTICAM and PFIS has been extended until the end of March 2006, and that means that there will be another round of PV proposals soon. So if you missed the first round and have some interesting ideas for your own observations with SALT, have a look at the SALT webpages (**www.salt.ac.za**) or drop me an email for more information.

And onto the 'bragging' subject again, what do you think of the three images of SALT we're posting in this issue (sorry, could not resist)? They were taken by my husband, which means he is way ahead in our private competition to see who takes the best night-time photographs. And with my camera too! Grr. They are panoramas (i.e.: made up of several separate images which then get stitched together using software) taken with our digital camera. Each exposure is about 40 seconds long, since that is the maximum before you start getting star trails. He was lucky to catch the light on, on the CCAS tower (the tower which contains the mirror alignment system), which nicely illuminates the dome (but is a no-no in terms of night light-pollution!).

Bye for now,
Encarni

the "drie konings" and the "kaapse wolkies"

by Auke Slotegraaf – auke@psychohistorian.org

Perhaps *Canopus* readers can help solve a puzzle that's been exercising me for some time. How did the custom arise in South Africa of calling the three brilliant stars of Orion's Belt, the *Drie Konings*? And who was the first to use *Kaapse Wolkies* for the Large and Small Magellanic Clouds?

While involved in the redesign of ASSA's annual *SkyGuide*, I started searching for indigenous star lore to include in the handbook. While there's nothing wrong with the Greek legends behind the constellations, we are living in South Africa and have our own legends. A selection of material is available on African ethnoastronomy*, with good summaries published by professors Keith Snedegar** (Utah Valley State College, USA) and Brian Warner (University of Cape Town). But I drew a blank when I started searching for *boere-stories*, traditional Afrikaans tales.

Perhaps the most knowledgeable person on Afrikaans folk tales and cultural history is Prof. Pieter W. Grobbelaar, who used to be at the Department of Cultural History (University of Stellenbosch) before his retirement. His authoritative *Die Afrikaner en sy kultuur* records a vast number of fascinating tales but nothing to excite the ethnoastronomer in me. I recently visited him at his home in Wellington and asked him if he knew of any *boere ster-stories*. Surely, I said, the dark African night sky and brilliant southern constellations must have made quite an impression on our outdoors-oriented forebears. Did they tell any folktales that could be considered unique? His considered opinion was no, there weren't any such stories. He speculated that the strongly religious heritage of the Afrikaner led them to regard the heavens as God's domain, not to be meddled with by the telling flippant stories. He was familiar with the *Drie Konings* as a name for Orion's Belt, but did not know its origin. When I asked him about the *Kaapse Wolkies* he admitted he hadn't heard the phrase before.

A few weeks later, I asked readers of my astronomy column in *Die Burger* newspaper if anyone knew the origin of these terms. I received one reply, from Ed Foster, a paleobotanist at the University of Stellenbosch and a friend of mine. "It's in the [Afrikaans] Bible", Ed said. I was dumbstruck. I thought I was familiar with all the astronomical references in the Bible. I checked all the Afrikaans Bibles I had, looking up Job 9:9, Job 38:31 and Amos 5:8 in each. All mention Orion (originally, *kesil* in the Hebrew) and the Pleiades (*kimah* in the Hebrew). A Dutch *Bijbel* from 1929 also spoke of Orion. Then I came upon a Bible dated 1940, and in all three verses, "Drie Konings" is used instead!

Ed was right, but why only in this one Bible? The "Astronomy in the Bible" entry (written by the well-known astronomer Agnes M. Clerke) in the *Catholic Encyclopaedia*, for example, says it quite plainly: "We may then safely admit that *Kimah* and *Kesil* did actually designate the Pleiades and Orion."

Could the solution be that "Drie Konings" came into the Afrikaans language because of an eccentric Bible translation?

Next I went to speak to Prof. Hendrik Bosman, Old Testament scholar at the Theology Faculty, University of Stellenbosch, and explained my situation. He thought at first that the ancient Hebrew and Greek source-texts mentioned 'three kings', but to his surprise, found the obscure references to *kesil*. Intruiged, he investigated further, and came to the conclusion that most Biblical scholars have identified *kesil* with Orion. So why the reference to "three kings" in that one Bible, I asked?

The 1933 version of the Afrikaans Bible, he explained, was the first translation into Afrikaans, and was done from the original Hebrew and Greek texts. The translators for some reason decided to use "Drie Konings" instead of "Orion" for *kesil*. In 1953, the Bible translation was modified using less anachronistic Afrikaans. One of the many changes was to replace "Drie Konings" with "Orion" (and "Pleiades" in place of "Sewester"). All later Afrikaans Bibles have followed this convention. Prof. Bosman thinks that when the 1933 translation was undertaken, "Drie Konings" was in common use amongst Afrikaans speakers, and may have been more familiar to them than "Orion".

And here my trail ends. If "Drie Konings" was commonly used by Afrikaans-speaking people in 1933, where did it come from? No Englishman I've spoken with uses "Three Kings" for Orion's Belt. Willie Koorts of the SAAO has been in touch with several Dutch astronomers, none of whom in their mother tongue use that phrase for the Belt. Is this usage, in an astronomical context, limited to Afrikaans?

In mythology, the number three has many connotations. It symbolizes beginning-middle-end, birth-life-death, father-mother-child, body-soul-spirit, past-present-future, New-Full-Old Moon, and more. It is the Christian Trinity, the Hindu trimuri (Brahma, Shiva and Vishnu), the Taoist Great Triad (heaven, man and earth). Three Wise Men bring three gifts to Christ who is tempted thrice, denied thrice by Peter, and who rises from death on the third day, is witnessed by three Marys, then appears three times to his apostles. And so on. Orion, of course, is a conspicuous constellation.

Perhaps these Three Wise Men were transformed into the Three Kings? Of course, nowhere in the Bible are Three Wise Men mentioned – there were magi, and there were three gifts. The narrative doesn't mention the number of people, and there is no long-standing tradition in this matter. Early Christian art, the *Catholic Encyclopaedia* points out, "is no consistent witness"; some works show two, three, four or eight magi.

Whatever the number, I'm still at a loss for the currency of "Drie Konings" in Afrikaans, and its apparent absence from English or other languages when applied astronomically to Orion's Belt. Help!

As for the *Kaapse Wolkies*, things are not much clearer.

Perhaps the earliest astronomy book in Afrikaans, *Sterrekunde vir skole* by A W Long (1941) mentions neither "Drie Konings" nor "Kaapse Wolkies"; however, this work was translated from English and in the process these "indigenous" terms could have been overlooked. In preparation for the *Sterrekundewoordeboek* by the Suid-Afrikaanse Akademie vir Wetenskap en Kuns, a *Sterrekundewoordelys* (1960) was compiled by the late Prof. Gawie Cillié. His list has neither the "Cape clouds" nor "Magellanic clouds" but the subsequent *Sterrekundewoordeboek* (1966) does have an entry for "Kaapse wolke". In the same year, Roy Quarmby's *Ons Suiderhemel* (1966) was published following translation, and it mentions the "Kaapse Wolkies" a number of times. I have no paper-trail before 1966 – help, again!

* The term "ethnoastronomy", denoting folk astronomical knowledge, was suggested by Elizabeth C. Baity in 1973 ('Archaeoastronomy and Ethnoastronomy so far', Current Anthropology, vol 14, p. 389-449), and can be understood to be part of the wider discipline of cultural astronomy that researches relationships between people and the astronomical knowledge of their culture.

** Professor Snedegar is an invited speaker and a member of the scientific committee for the African Astronomical History Symposium, to be held 8 & 9 November at the South African Astronomical Observatory in Cape Town. Registration forms and a tentative programme may be downloaded from the website at: **http://www.saao.ac.za/assa/aahs**

polish customs seize smuggled meteorites

news release 09.09.2005 17:56 MSK (GMT +3)

Customs officers in Dorohusk, on Poland's border with Ukraine, have made an unusual seizure, confiscating nearly 530kg of meteorites they found hidden in a Russian-registered truck, the AFP reported on Friday citing local officials.

"In total, 529.5kg of meteorites were confiscated, including three very big ones, weighing 176 kilos, 150 kilos and 80 kilos", Poland's customs service said in a statement.

"They probably came from the same place in Siberia where a meteorite crashed in 1947", the statement said.

According to the truck's payload ledgers, its cargo was quartzite, a tough stone composed almost entirely of quartz grains, derived from sandstone. The truck was bound for the Czech Republic.

Kormendy's supermassive back holes (part 2 of 2)

by Robert Groess

Have you ever marvelled at a rainbow? We are truly fortunate to experience a change in the wavelength of visible light, as a different colour! So what's so special about the wavelength of light? Why is it such a big deal? The answer is tied up with one of the most profound and fundamental aspects of Nature. Light of a different colour implies light with a different amount of intrinsic energy. Red light has less energy than green light. And green light has less energy than blue light. In fact, the example of an iron poker in a hot furnace is very helpful to our intuition. At first, after just being placed in the furnace, it will start glowing red. The thermal excitations of its molecules and atoms cause it to give off light in the visible spectrum. It tries to rid itself of the excess energy supplied by the furnace. The hotter it gets, the more it changes colour… in fact all the colours of the rainbow and in that order. From red to orange… and so on until it gets to blue – at which point it will have molten! And in much the same way, cool stars are red and hot stars are blue. (Be careful when using hot and cold water taps at an observatory. Red and blue may have a different meaning!)

But homing in on the point. The colours are generated by electrons shifting energy levels inside their host atoms. While they do that, different atoms give off different colours of light. In fact, any particular atom can only give off discrete colours of light, when excited to do so. This is because electrons have very strict rules as to which "amounts" or packets of energy they are allowed to release, given the atom in which they are in. These rules can be applied in reverse too. Electrons may "absorb" energy into their host atom, by being constrained to precisely the same rules. And that is why, if you look at a rainbow of light from a star (or a group of stars – or a galaxy) – when you look at their spectra, you can immediately tell if certain "bands of light" are present or absent and thus determine what those stars are made of. All from the comfort of your favourite observatory!

We all know about the Doppler effect. We have encountered it many times. It is part of our intuition. But one not to be underestimated. It is an extremely powerful tool when looking at the fingerprints of galaxies – when looking at their spectra. Different atoms give off different discrete sets of colours. Now, if an object – if a star were moving relative to your telescope and spectrograph then its colour would be shifted. It will look more red if it's receding from you. Blue, if it's approaching. So now for the crunch…

While sitting at his computer console in Hawaii, John Kormendy knew exactly what he was looking for. Galaxies rotate. They harbour angular momentum, and exhibit gravitational torques. The key is that stars closer to the centres of galaxies orbit the centre faster than the outer-lying ones. How much faster? Well, that is determined by the amount of mass they orbit. The more mass at the centre, the faster they have to travel in their orbits to prevent themselves from "falling down" the gravitational "well" at the centre. In short, John Kormendy was looking for a Doppler shift near the centre of the Andromeda spiral galaxy

M31. The degree to which the shift is observed, determines the mass that has to be present at the centre. And indeed on that fateful night in 1987 at the Canada-France-Hawaii-Telescope, a little jump appeared on the spectrum. John Kormendy's heart jumped a whole lot more! In order to be orbiting the centre of Andromeda at the speed which the Doppler signatures suggest, there must be something truly massive present. At least 20 to 80 million times the mass of our Sun! The only problem is that the orbital period of the stars also suggests they are very close to the centre. No other known object could fit the bill of being the mass concentration at Andromeda's centre – other than a black hole. A region of space and time where gravity's grip takes us to the limits of known physics. And so, the idea that monstrous black holes are lurking in the centres of many galaxies has to be taken very seriously.

Black holes, you might say – that's all fine and nice. How did they get there? For this answer we look to the quasars. Beacons of light beaming through billions of years of space and time. How do they get their power – their energy? What known process could possibly generate the amount of energy required to see them as brightly as we do, despite some of them being further away than the furthest known galaxies? We could try and go "in for the kill". We could suppose nuclear energy was responsible for their energy source. This is a physics problem that can be tackled very well theoretically. If we were to take the amount of latent nuclear energy present in a billion Suns, will that be enough to sustain the energy output of these quasars for eons of time? And moreover, can it be contained in a space not much larger than our own solar system? This restraint comes from the fact that the light curves from quasars show changes in output intensity measured over a period of as little as a few hours. Since light has a finite speed – this means we can work out the upper bound to how large this inner region is allowed to be. After doing the calculations… requiring an object the size of our solar system to sustain an energy output 3 billion times that of our sun for at least many hundreds of millions of years… its becomes clear than nuclear energy cannot compete. It falls short by at least a factor of 10. The only way known to liberate the amount of energy we see from quasars, and being subject to their nucleus size constraint, is the energy due to friction in accretion disks around black holes. Only the intense rubbing of atoms against other atoms in their final death throes around a billion solar mass black hole would provide the acute energy outputs seen. And so it seems very plausible that the behemoths present at the centres of galaxies, are today the vestiges of the bygone era of quasars.

As of mid-September 2005, John Kormendy and colleague Ralf Bender, amongst others, have taken a closer look at the centre of M31 (one of our closest spiral galaxy neighbours) and have found a young population of blue stars. These stars are about 200 million years old (compared with our Sun's 4.6 billion) and are in a very close orbit about the central supermassive black hole. Their origin remains a puzzle to this day and is the subject of intense research.
For more information about supermassive black holes, visit John Kormendy's webpage: **http://chandra.as.utexas.edu/~kormendy/**

9 planets? 12? what's a planet, anyway?

edited article by Dennis Overbye

In my daughter's circle of friends, one 3-year-old named Jared can reel off the names of all the planets. He and his parents are pretty proud, justly in my estimation, of this achievement. Little does he know, however, that the lords of astronomy are working against him. For the last 18 months, a committee appointed by the International Astronomical Union has been pondering in frustrating exactitude whether the word "planet" means anything anymore.

Last month Nature reported that the committee was ready to propose dumping the bare term "planet" in favor of an expanded, more embellished set of terms like "terrestrial planets", "trans-Neptunian planets" and so forth. But that turned out to be a false alarm, according to the committee's chairman, Iwan Williams of Queen Mary College in London. He said in an e-mail message that although a majority favoured the redefinition many other ideas were blooming and contending so fractiously that he despaired of ever reaching general agreement. Dr. Williams said, "Up to this point I have been hoping for a consensus, but I guess we might need to go for a majority vote."

The solar system is much more complicated now, astronomers say, than in 1930 when Clyde Tombaugh added Pluto to the inventory of wandering lights circling the Sun. In addition to Earth, Mars, Venus, Jupiter, Saturn, Mercury, Neptune, Uranus and Pluto, schoolchildren now learn that there are also comets and asteroids bumping about in the night. But there is also the Oort cloud, a hypothesized halo of cometary bits hibernating in deep, deep space, and the Kuiper Belt, a ring of icy bodies beyond Neptune's orbit. Not to mention the dozens of moons circling the planets.

Pluto is the big problem. Is it a planet or not? Some astronomers have long argued that its small size, less than one-fifth the diameter of Earth, and a weird tilted orbit that takes it inside Neptune’s every couple hundred years make Pluto more like a Kuiper Belt body than a full-fledged planet. A furore arose five years ago when my colleague Kenneth Chang reported that the new Rose Center for Earth and Space at the American Museum of Natural History in New York had demoted Pluto, calling it a "Kuiper Belt object" rather than a planet.

The controversy became more desperate this summer when astronomers discovered a new object larger than Pluto orbiting in the Kuiper Belt at a distance of nine billion miles from the Sun. Michael E. Brown of the California Institute of Technology, its discoverer, has said it will be fine with him if Pluto is demoted to a minor planet, but, he argues, if Pluto is a planet, so is the new object, which he nicknamed Xena, making it the 10th planet. Last Friday Dr. Brown announced that Xena has a tiny moon, making it seem even more planetlike.

Brian Marsden, an astronomer at the Harvard-Smithsonian Center for Astrophysics, directs the Astronomical Union's Minor Planet Center, a clearinghouse for solar system discoveries, thinks that both Pluto and Dr. Brown's Xena should be called minor planets. He is one of those who support the idea of categorizing planets into groups. But according to Dr. Williams, other members of the panel have championed other ideas, for example, that planets should be larger than 2,000 kilometers (or about 1,250 miles) in diameter (Pluto is about 1,500 miles)

Dr. Neil DeGrasse Tyson, of the Rose Center, who is not a member of the Astronomical Union committee, said the proposed naming scheme sounded a lot like the museum's system. He said, however, that the need to assign adjectives to the word "planet" might mean it was time to retire the term altogether. Asked what he would replace it with, Dr. Tyson said he hoped the geologists could come up with something and offered up words like "terrestrials" for balls of dirt and rock like Earth; "Jovians" for giant gaseous planets like Jupiter and Saturn; comets; and so forth.

Not only did the panel members disagree on the definition of a planet, at the last report they could not even agree, it seemed, on whether they were making progress. Within the space of a few minutes the other week, I received one e-mail message from Dr. Marsden saying he was optimistic and another from Alan Boss of the Carnegie Institution of Washington complaining that his morning e-mail gave him no sense that they were close to bringing the issue to a close.

In another e-mail message, Dr. Boss described the process as "like trying to shovel frogs into a wheelbarrow - they keep jumping out again."

The new object, now known poetically as 2003 UB313, is destined to languish nameless until the Astronomical Union panel comes to a conclusion and thus decides which part of the astronomical bureaucracy is responsible for major planets or minor planets. "Every time it looks as though we might be approaching a consensus, a rather severe disagreement has a way of breaking out again," Dr. Marsden said. "It is all very unfortunate."

Even the idea that a majority of the committee was leaning anywhere was hotly disputed by Alan Stern of the Southwest Research Institute in Boulder, Colo., who is the principal investigator of a coming NASA mission to Pluto and the Kuiper Belt.

Dr. Stern has suggested that the criterion of planethood be roundness - a body big enough for gravity to have conquered geological and mechanical forces. That would include in the roll call of planets not only Pluto, but dozens of objects he thinks are yet to be discovered out in the Kuiper Belt.

It'll be obvious very shortly that dwarf planets surely outnumber the planets our fathers' generation thought of as mainstream. If it should turn out in the years to come that Earth is not actually a very good example of a planet, that would not be the first instance in which astronomers have painted themselves into a corner, linguistically. Being limited to looking in the practice of their science, astronomers tend to characterize and classify new phenomena by their appearances, their colors, for example. Objects that resemble one another then get lumped together under the name of their progenitor until enough differences accumulate to start a new category.

So it was that a starlike object known as BL Lacertae, the progenitor of a kind of exploding galaxy, was eventually said to not be a good example of a BL Lacertae object!

Astronomers are not alone in having a silly name problem, but they may be alone in agonizing so much about it. Physicists have shown little restraint in creating names like neutrinos, quarks, squarks, gluons, photinos, selectrons, strangeness and charm, not to mention strings and branes.

No commission regulates what physicists call things. "Basically physicists are too undisciplined to let anyone else tell us what to name something," said Gordon Kane of the University of Michigan. "It's mainly whatever name catches on."

Dr. Boss of the Carnegie Institution, who favors and hopes that the adjective-planet compromise will catch on in astronomy, said he thought the public would be "thrilled" to realize that astronomy had progressed so far as to require a re-sorting of the primary components of the solar system. "Science marches on," he said, "and this brouhaha is a sterling reminder of both the joy and the pain of this process."

I cannot argue with his logic and his desire for clarity. But at the risk of being a curmudgeon, and in the interest of 3-year-olds everywhere who are reaching for a basic comprehension of how the universe is put together and where they stand, I think the astronomers should take a page from the lawyers and jurists we're hearing so much from these days.

I think they should adopt "*stare decisis*," Latin for "stand by that decided." By precedent Pluto is a planet. If we agree on that, then we can look forward to many more planets.

There were smiles all around the office here when the putative 10th planet was announced last July. There is something ennobling and hopeful about living at a time when a 10th planet is added to the solar system, and maybe an 11th and 12th as planned surveys of the trans-Neptunian void are carried out. It is like being young again and finding out your family is larger than you thought.

It is like living in an expanding universe.

assa johannesburg centre library

by Alec Jamieson

The ASSA Johannesburg Centre has a library of over 500 books on astronomy and related subjects, situated in the building on top of the hill where normally we used to hold our meetings. The society also has four (no less!) new library volunteers. They are Atze Herder, Ilse von Willich, Sue Jamieson and myself, Alec Jamieson. The library has not been used recently, but that is about to change. If members are to use the library, it must open its doors regularly. In future, the library will open from 6 pm to 7:30 pm on the evenings when the society holds its monthly meeting. The next monthly meeting is scheduled for Wednesday 9th November at 8 pm.

Due to recent burglaries and theft of furniture, using the library will not be a Seattle Coffee Shop experience, but we can get by with the few pieces of furniture that the burglars left behind, until a final decision is made on the location for the library.

The library has quite a few books by famous authors who were close to the action in many developments in astronomy and related science. Below is a list of twenty books that I picked from the library catalogue, by authors that I think of as "big hitter" scientists.

In many cases, authors writing about their own contributions to science do a really good job of explaining their work to the reading public.

Title	Principal Author	Date
Evolution of Stars & Galaxies	Baade, W	1963
Elementary Nuclear Theory	Bethe, H	1947
Stellar Populations	Burbridge, G & M	1958
Expanding Universe, The	Eddington, Sir Arthur	1933
Sidelights on Relativity	Einstein, A	1955
Revue D'Astronomie Populaire	Flammarion, C	1885
Thirty Years that Shook Physics	Gamow, G	1985
Brief History of Time, A	Hawking, S	1988
Outlines of Astronomy	Herschel, Sir John	1850
Some Recent Researches in Solar Physics	Hoyle, F	1949
Black Cloud (fiction)	Hoyle, F	1964
Realm of the Nebulae	Hubble, E	1958
Stars in their Courses	Jeans, Sir James	1954
Principles of Relativity	Lorentz, H	1952
In the Centre of Immensities	Lovell, Sir Bernard	1978
Man into Space	Oberth, H	1957
Source Book in Astronomy, A	Shapley, H	1929
Intelligent Life in the Universe	Shklovskii, I	1966
Photographic Study of the Brighter Planets	Slipher, E	1964
Man on the Moon	Von Braun	1953

If you would like to know more about the books in the library, check the library section on the society website at **http://www.aqua.co.za/assa_jhb/new/library.htm** (Don't miss out the underscore lurking in the underlined *assa_jhb* part) You can't click this detailed address from Canopus and an easier way of typing your way to the web page is **http://www.assajhb.co.za** then choose old site and then choose the Library/Literature navigation button.

Even better, come and browse.

Alec Jamieson,
Librarian.

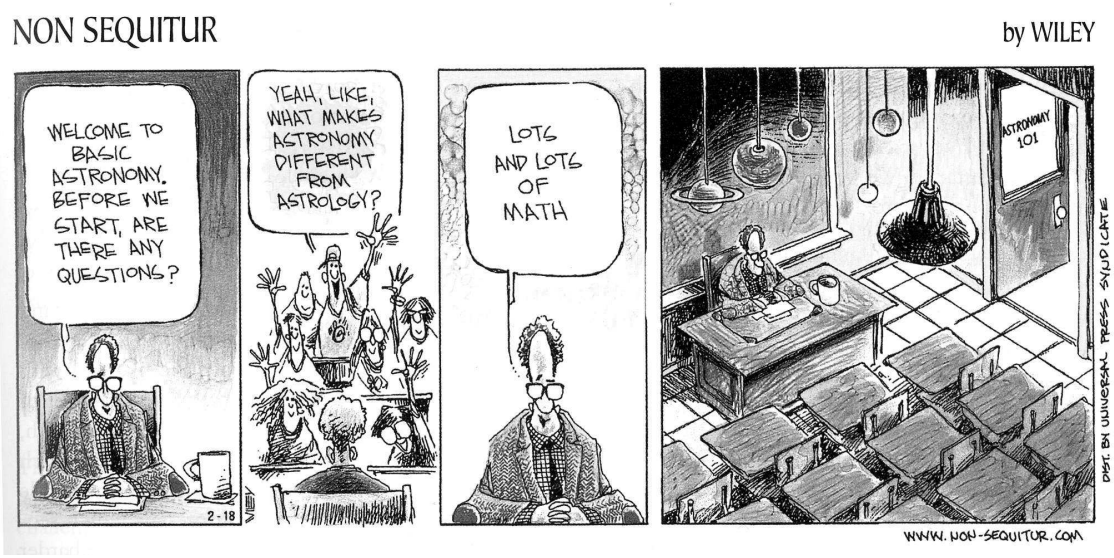
hard to believe

posted by Alec Jamieson

"The reaction between two protons to make a nucleus of deuterium is so slow that even the human body generates more heat, volume for volume, than the sun! The reason the sun is so hot, despite such a pathetically low rate of heat production, is simply that it is large. Like all large bodies its surface area is small compared to its volume. It means that solar heat, which can escape only through its surface, gets dammed up inside."

Reference:
Marcus Chown, "The Magic Furnace – The Search for the Origins of Atoms", p 122.

This book is a very interesting account of the scientific discoveries made since ancient times that have led to our present understanding of the origins of atoms and stars. When the truth finally sinks in, one is left with a better appreciation of just how HUGE is the number of cubic metres in the Sun, each one accounting for a tiny fraction of the total rate of heat production. – Alec Jamieson.



book auction

You are invited to bid for any of the books that we will be auctioning at the November monthly meeting. This is how we are going to work it:

If you will not be able to attend the meeting you may submit an email bid to Brian Fraser at:
fraserb@intekom.co.za
[All email bids are to be received by 28 **October** 2005.]

These bids will be kept secret and the highest bid for each book noted before the meeting.
At the meeting we will hold an auction and accept bids from the floor.
The highest bid from the floor will be compared to the highest email bid and the higher offer will be successful. There will be no opportunity for any other bids to be made from the floor once the auctioneer knocks the item down. If the email offer is higher it will go to the email bidder.

The following books are up for offer, with their reserve prices listed:

No	Book	Author	Reserve
1	Observing Variable Stars, A guide for the beginner	David Levy	R40
2	The Key to the Universe, A report on the new physics	Nigel Calder	R35
3	Exploration of the Moon	R A Smith & Arthur C Clarke	R20
4	The Astronomy of Southern Africa, 2 off	Patrick Moore & Pete Collins	R30
5	Practical Astronomy	W Schroeder,	R30
6	A Dictionary of Science	E B Uvarov & D R Chapman	R5
7	Collins Dictionary of Astronomy	Ed Valerie Illingworth	R40
8	Lets Look at the Sky – The Stars	Patrick Moore	R5
9	The Macmillan Dictionary of Astronomy	Ed Valerie Illingworth	R35
10	Practical Astronomy with your Calculator,	Peter Duffet-Smith,	R10
11	All about Space Exploration,	Peter Cattermole	R5
12	Astronomy with your Personal Computer	Peter Duffet-Smith	R40
13	Violent Universe, An eye-witness account of the Commotion in Astronomy 1968-69	Nigel Calder	R25
14	Einsteins Universe	Nigel Calder	R20
15	Teach yourself Astronomy	David Evans	R20
16	The Amateur Astronomer	Ed John Gribbin	R35
17	Burnhams Celestial Handbook, Vols 1,2,3	Robert Burnham	R120
18	Introduction to Astronomy	Cecilia Payne-Gaposchkin	R40
19	Make your own Telescope	Reg Spry	R5
20	The Messier Album	John Mallas & Evered Kreimer	R50
21	Small Astronomical Observatories	Patrick Moore	R50
22	Seeing the Deep Skys	Fred Schaaf	R40
23	Sundials, Their Theory and Construction	Albert E Waugh	R40
24	Stars and their Spectra	James B Kaler	R40
25	Star Watch	David Block	R20
26	Nortons Star Atlas		R25
27	1978 Yearbook of Astronomy	Patrick Moore	R5
28	1979 Yearbook of Astronomy	Patrick Moore	R5

canopus gallery

These two images (and the one on the front cover) were taken with a Canon EOS 20D digital camera.

Individual exposure times were 40 seconds. This is about the maximum exposure time before stars start to trail too much.

Right: Looking up towards the centre of our galaxy. A vertical panorama of 2 images stitched together.

Below: A panorama of 3 images stitched together. Both images © 2005 Stephen B. Potter.

through my looking glass

Ed Finlay

Paging through my observing log I see that I spent a few nights around February 1995 observing the red planet Mars which came to within 100,000,000 kilometres of Earth at that time. The planet was some 13 arcsec. in diameter and through my 4inch apochromat refractor was a beautiful orange colour with a white polar cap clearly visible. Although the seeing was not good enough to discern any surface features the disc had a mottled appearance which might have been some dark areas partly obscured by dust storms.

After its spectacular 2003 opposition, when it came closer to Earth than at any time in 60,000 years, Mars is back again. It will reach a maximum apparent size of 20.2 arcsec. which is 5 arcsec. less than in 2003 but certainly better than typical oppositions. On October 30th it will come within 69,000,000 kilometres of us and if the seeing is good (steady air) should reach magnitude –2.3; it will spend the rest of this year in the constellation of Aries which rises at sunset.

Just about any telescope will do for observing Mars this time around. Remember, however, that the image will be quite small and the surface details even smaller. With a 3inch refractor or 4.5inch reflector you should be able to see the south polar cap which faces us and maybe some dark markings on the surface like Syrtis Major or the bright impact basin Hellas. Don't expect to see much with your first look. You will need patience and a trained eye; the details will come!

You don't need filters to observe Mars although, if you have an inexpensive refractor that has some chromatic abberation, filters can reduce the colour fringing. Stepping up the magnification will allow you to see more but the seeing must be really good and some sort of telescope drive would be a help. Forget binoculars, you will only see what you see with your naked eyes, a bright, red point.

While you have your scope outside try searching for Uranus and Neptune. Uranus is in the constellation of Aquarius about 72 degrees above the northern horizon. At magnitude 5.8 and 4 arcsec. in diameter you should see a tiny, blue-green disc. The more distant Neptune, in the constellation of Capricorn, is a little to the east of Uranus some 67 degrees above the horizon and should also appear as a blue-green disc but tinier than that of Uranus.

the sky this month

site location: lat. **26.0 deg S** long. **28.0 deg E** local time – UT = **+2.0 hrs**.

november 2005

dd hh	dd hh
1 11 Jupiter 2.6N of Moon	15 05 Mars 2.5S of Moon
2 02 NEW MOON	16 01 FULL MOON
3 12 Mercury greatest elong E(23)	16 08 Uranus stationary
3 18 Venus greatest elong E(47)	17 15 Mercury 3.1N of Antares
3 23 Mercury 1.2N of Moon	20 17 Pollux 1.7N of Moon
4 08 Antares 0.3S of Moon Occn.	22 05 Saturn 4.0S of Moon
5 19 Venus 1.4N of Moon	22 18 Saturn stationary
7 09 Mars at opposition	23 07 Moon at apogee
8 23 Neptune 4.3N of Moon	23 19 Regulus 3.0S of Moon
9 02 FIRST QUARTER	23 23 LAST QUARTER
10 02 Moon at perigee	24 16 Mercury inferior conjunction
10 12 Uranus 2.2N of Moon	28 06 Spica 1.0S of Moon Occn.
10 17 Mercury 2.0N of Antares	29 07 Jupiter 3.2N of Moon
14 07 Mercury stationary	30 17 Mercury 5.8N of Moon

december 2005

dd hh	dd hh
1 16 Antares 0.3S of Moon Occn	18 01 Pollux 1.8N of Moon
1 16 NEW MOON	19 12 Saturn 3.7S of Moon
4 04 Mercury stationary	20 23 Mercury 5.8N of Antares
4 19 Venus 2.3N of Moon	21 03 Regulus 2.8S of Moon
5 05 Moon at perigee	21 04 Moon at apogee
6 06 Neptune 4.1N of Moon	21 19 Solstice
7 18 Uranus 2.1N of Moon	23 05 Venus stationary
8 10 FIRST QUARTER	23 20 LAST QUARTER
11 02 Mars stationary	25 15 Spica 0.8S of Moon Occn
12 05 Mars 1.2S of Moon Occn	27 02 Jupiter 3.9N of Moon
12 17 Mercury greatest elong W(21)	29 02 Antares 0.2S of Moon Occn
15 17 FULL MOON	30 00 Mercury 4.9N of Moon
16 05 Pluto at conjunction	31 04 NEW MOON

local times of rise and set for the major planets

Date	Sun	Mercury	Venus	Mars	Jupiter	Saturn
	Rise Set	Rise Set	Rise Set	Rise Set	Rise Set	Rise Set
Nov 7	5.15 18.31	6.30 20.21	8.09 22.14	18.26 5.29	4.40 17.33	0.31 11.25
Nov 17	5.10 18.38	6.05 19.52	8.13 22.16	17.32 4.36	4.08 17.03	23.52 10.46
Nov 27	5.08 18.46	4.53 18.17	8.14 22.09	16.42 3.47	3.35 16.33	23.13 10.07
Dec 7	5.08 18.53	4.03 17.18	8.08 21.53	15.57 3.03	3.02 16.03	22.33 9.27
Dec 17	5.11 19.00	3.55 17.22	7.51 21.26	15.19 2.23	2.28 15.32	21.52 8.45
Dec 27	5.16 19.04	4.05 17.47	7.18 20.43	14.46 1.47	1.55 15.01	21.11 8.03