



Pretoria Centre

Of the
Astronomical Society of Southern Africa

www.pretoria-astronomy.co.za

NEWSLETTER FOR FEBRUARY 2004



THE MICE, NGC 4676

MEETINGS FOR FEBRUARY

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

Date : **Wednesday 25 February at 19h15**
Chairperson : **Lorna Higgs**
Beginner's Corner : **"Long Period Variable Stars" by Michael Poll**
What's Up : **Neville Young**

+++++**BREAK (LIBRARY OPEN)**+++++

Main Topic : **"Visit to Mars" by Johan Smit**

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

The next social/practical evening will be held on Friday 20 February at the Centre Observatory, also at CBC. You can arrive anytime from 18h30 onwards.

REPORT OF MONTHLY MEETING : JANUARY 28TH 2004

The first meeting of 2004 was attended by 66 members and visitors. There were some apologies for absence.

Johann Swanepoel did "Beginners Corner", describing and showing the stages in construction of a machine he has made to grind a 20 inch mirror blank. He showed us various types of grinding machine, and showed how the one he made was a hybrid of these designs. Johann closed with some video clips of his machine in action.

Johan Smit did "What's Up", showing the planets and constellations visible during February, and some star maps showing aspects of the evening sky. Johan ended his talk with some details of indigenous African star lore.

The main speaker of the evening was Jorrie Jordaan, who spoke about the structure of the Cosmos. Starting with the inner solar system, Jorrie moved further out into space in a kind of cosmic zoom, showing that there are only a handful of bright stars within 12,5 light years of the sun, most of the stars within this distance are faint dwarfs. Most of the bright stars we see are within 250 light years of the sun, and well within 5 000 light years of the sun are all the stars we see with the naked eye. 50 000 light years gives us the radius of the Milky Way galaxy, and the satellite galaxies of the Milky Way (e.g the Magellanic Clouds and various dwarf galaxies) are within 500 000 light years. The Local Group of Galaxies, of which the Milky Way and the Andromeda Galaxy are the largest members, are within 5 000 000 light years, and the Local Group is on the edge of the Virgo supercluster,

which covers 100 000 000 light years. Neighbouring superclusters are encompassed within 1 billion light years, and after this superclusters form Great Walls of galaxies, and there are voids where there are no galaxies. The Universe itself is nearly 14 billion light years across.

Thank you Jorrie for an interesting talk. We were brought back to Earth via coffee and biscuits.....

Michael Poll

OBSERVING EVENING REPORT JANUARY 23RD 2004

After a cloudy, rainy week, there was not much hope of seeing anything, but in the event, the clouds cleared for an hour or so, and the five of us who came (Brian, Jean, Wayne Michael and Johan Smit) saw some fine sights.

Mars is still in the evening sky in the north west, perhaps almost forgotten after its showing last August, it could be mistaken for a star like Betelgeuse, (it nearly was!) but it is still in a part of the sky where there are not many other bright objects. It showed a small disc in Michael's 3 inch. We also looked at Sigma Orionis, which is a compact group of bright stars. It is the radiation from Sigma which powers the red band of gas (IC 434) upon which the Horse Head Nebula is silhouetted. Also seen through the 3 inch was M41, and open cluster near Sirius. This is the only Messier object in Canis Major, and was discovered by John Flamsteed (the first Astronomer Royal) in 1702.

Saturn was the prime object for the Centre 12 inch telescope. The rings can still be seen above and behind the planet, and the Cassini division in the rings was easily seen. A dark belt on the planet was visible. Also through the 12 inch the Orion nebula (M42) was as good as ever, and the greenish colour was clearly discernible. In photographs ionised hydrogen gives clouds of gas like this a red colour, because the photographic film and the eye are sensitive to different wavelengths The green colour is from the light of doubly ionised oxygen, and to the naked eye, it distinguishes gas clouds (like M 42) from clouds of stars (i.e. clusters and galaxies), which appear white.

Michael Poll

BOOKS ON THE MARKET

The 2004 edition (the 20th) of **Norton's Star Atlas** has been published. I saw it being offered for sale at Exclusive Books. Like the previous editions, it is both a star atlas and an astronomical reference handbook. If you are at all serious about astronomy, get a copy.

South African Weather and Atmospheric Phenomena by Dries van Zyl. There is also an Afrikaans version of the book. Available at CNA and Exclusive Books. Stargazers look up at the sky to see astronomical bodies. They cannot fail to also note weather and atmospheric phenomena. It is almost natural for them to have an interest in these as well.

Editor

ASTRONOMICAL WEBSITE ADDRESSES

NEO's: <http://neo.jpl.nasa.gov/>
<http://newton.dm.unipi.it/cgi-bin/neodys/neoibo>

Asteroids: www.minorplanetobserver.com/astlc/default.htm

Cassini-Huygens space mission: www.jpl.nasa.gov/cassini/
Space Art: www.space-art.co.uk

Editor

THE CONSTELLATION OF GEMINI

(See star chart below.)

Gemini is a conspicuous constellation and is the northernmost constellation of the zodiac. Because it contains a pair of similarly bright stars, Castor and Pollux, the constellation has been known as The Twins by many civilisations, be it twin men, twin gods or twin animals. Sumerian star names indicate that Castor and Pollux were identified as a pair of twins as early as 3000 BC. It is not known if the Mesopotamians had any particular duo in mind or whether the two stars were just two of a kind. They were known as the great twins in Babylonia around 700 BC. By the 3rd century BC, the Greeks had associated the constellation with the Dioscuri, which means "sons of Zeus". The sons were Kastor (the Horseman) and Polydeukes (the Pugilist). Castor and Pollux are the Latinised names.

In classical mythology Castor and Pollux are the sons of Jupiter and Leda. Leda was the queen of Sparta, wife of Tyndareos the king. Leda was seduced by Zeus who visited her in the form of a swan. She bore 2 eggs, one of which contained the Dioscuri and the other Helen of Troy and Clytemnestra . Details on the twins paternity differ, but Castor was born mortal and Pollux had the immortality that was reserved for the gods. Another tradition made Pollux the son of Jupiter, and Castor the son of Tyndareos himself, i.e they had different fathers, which might explain Castor's mortality. Castor and Pollux were inseparable companions, who, amongst other things, sailed with Jason and the Argonauts to find the golden fleece, and gave help when a storm threatened the ship. Because of this the constellation was thought to be a favourable sign for sailors. Castor was killed in a dispute, so Pollux appealed to Jupiter that Castor should share his immortality and so Jupiter placed them both the sky.

The constellation is roughly in the shape of a quadrilateral, one end being marked by Castor and Pollux. Castor is the northernmost, and is alpha, although it is the fainter of the two. It is suggested that Johann Bayer (1572 - 1625), who was the first to label the bright stars in a constellation with Greek letters, labelled the more northerly star first if two belonged to the same magnitude class, which seems to

be the case with Castor and Pollux. A line drawn through Castor through Pollux and curving up to the left meets the star Procyon, and line from Pollux through Castor curving down to the left meets the bright star Capella.

It was in this constellation that both Uranus and Pluto (near delta) were first found, by William Herschel in 1781 and Cyde Tombaugh in 1930 respectively. The summer solstice is in Gemini, and is shown as a black square on the chart, near the star eta Geminorum. This is the point of the sky where the sun is in June 21st.

Castor is a double star, (Castor A and Castor B) which may have been resolved by G D Cassini in 1678, but was rediscovered by James Bradley (Astronomer Royal) in 1718. Between 1718 and 1759 a change was noted in the relative positions (i.e. in the Position Angle) of the two stars, and in 1803 William Herschel announced that the two stars were gravitationally bound. The Rev John Michell may have suggested this possibility in 1767, but this was the first true physical binary to be recognised, and the first object beyond the solar system in which the force of gravity was shown to be operating. The period of revolution is about 400 years, with a mean separation of 90 astronomical units (AU). (For comparison Alpha Centauri A and B vary between 11 AU and 35 AU apart, and the mean distance of Pluto from the sun is 39.5 AU).

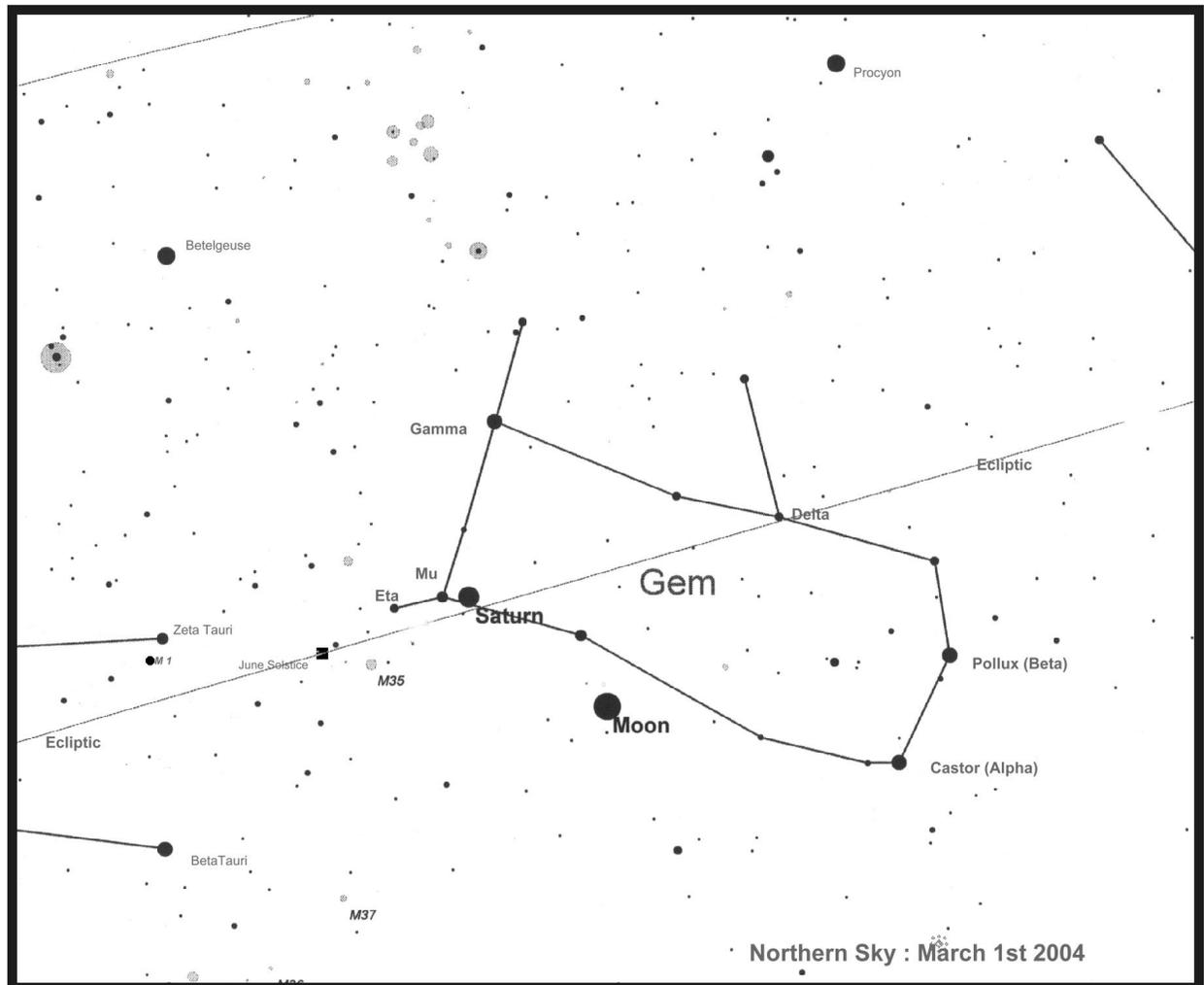
Castor A and B were at their widest in 1880, with an angular separation of 6.5", reducing to 3.9" in 1937, and slowly closing to a minimum of 1.8" in about 1965. At this time the physical separation was 55 AU. For the last few decades this fine double has not been available to most amateur telescopes. The 16th edition of Norton's star atlas (1973) states that the pair "... is not now very easy with small apertures". James Muirden in "Astronomy With a Small Telescope" (1989) states that, at a separation 2".5, they are "a good test for a 60mm telescope" and the Collins Gem "Stars" (1999) says that Castor will be "split by small telescopes with high magnification". However, they are now wide enough and can be separated in a small telescope. (This writer saw them double, for the first time ever, in my 3 inch refractor at 66 x magnification on January 26th this year, but maybe if I had looked sooner? - Maybe I was not looking hard (or often!) enough, or was using too low a magnification. When *did* they separate?)

Castor is at a distance is 52 light years, and is the 23rd brightest star in the sky. Its magnitude is 1.6, with A and B at magnitude 1.9 and 2.9 respectively. Castor is a white star, with both components of spectral type A (like Sirius). A third star, Castor C (mag 9.5) accompanies the main pair. Both A and B are spectroscopic binaries, as is Castor C, but Castor C is an eclipsing spectroscopic binary, so it also has the variable star designation YY Geminorum. Spectroscopic binaries cannot be seen separately because they are so close together. They are identified by the fact that on examination of their light with a spectroscope, there are two sets of absorption lines. Castor is therefore a system of 6 stars.

Pollux is the 17th brightest star and contrasts in colour with Castor, being yellowish-orange (spectral type K). Its magnitude is 1.2 and it is 34 light years away.

There is one Messier object in Gemini, namely M 35 (NGC 2168). The discovery of this object was originally attributed Philippe Loys de Cheseaux (1718-51) in a catalogue published in 1746, but it seems that John Bevis (d 1771) saw it first, because the object was plotted in his atlas prepared earlier. M 35 is near eta Geminorum. It is magnitude 5.5, and so is visible to the naked eye under favourable conditions. It is an open cluster consisting of about 100 stars.

Michael Poll



NEWSLETTERS BY E-MAIL

Some members have indicated on their membership application forms that they want to receive the monthly newsletter by e-mail. Such members receive it by e-mail. Other members who also want to receive it by e-mail, should contact the membership secretary of our Centre and give him their e-mail addresses. The advantages of receiving it by e-mail is that you receive it sooner than by snail mail, there is little chance of it not arriving, you get all colour pictures in the newsletter in colour, the Centre saves money, and the newsletter editor (who sends out the newsletters) saves work.

Editor

CHANGES IN POSTAL OR E-MAIL ADDRESSES

If members want changes to be made in their postal or e-mail addresses, they should contact the membership secretary rather than another committee member. It works best that way. The membership secretary updates the address list each month and sends it to the newsletter editor, who sends out the newsletters.

Editor

TELESCOPE BUILDING ACTIVITIES

Johann Swanepoel, een van ons komiteelede, skryf:

“Ek is tans besig om aan twee 20" F4.5 spieëls te werk. Die spieëls is 20" in deursnit en 1 en 7/8 duim (47 mm)dik. Dit is sogenaamde dun spieëls ("thin mirrors"). Die spieëls is van "fine annealed" Pyrex wat vanaf Newport Glassworks in California ingevoer is. Hulle weeg elk omtrent 20 kg. Die een se fynslyp is al voltooi met die tweede een nog so twee weke van klaar. Daarna gaan hulle poleer word, ook op die masjien. Die spieëls gaan in oop buis ("truss tube") Dobsonians gebruik word. Die masjien (die onderwerp van laas maand se aanbieding) het ek spesiaal gebou vir die slyp en poleer van hierdie spieëls. Dun spieëls moet op 'n spesiale wyse geslyp en poleer word as hulle nie astigmaties moet uitdraai nie.”

RECENT NOTEWORTHY ARTICLES IN “SKY AND TELESCOPE”

“A trip to the galactic center.” S&T, April 2003, p. 44.

“Eta Carinae’s year of glory.” S&T, July 2003, p. 30.

Editor

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