



# The PRETORIA CENTRE

of the

Astronomical Society of Southern Africa

[www.pretoria-astronomy.co.za](http://www.pretoria-astronomy.co.za)

## NEWSLETTER OCTOBER 2005

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

Date and time            Wednesday 26 October at 19h15  
Chairperson             Peet van der Walt  
Beginner's Corner     by Tony Viljoen—Beating the Seeing  
What's Up                by some willing volunteer!

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

Dr Fabio Frescura from the Centre for Theoretical Physics at University of the Witwatersrand will present a talk entitled

### **The Galaxy, the Universe, and Everything: an Hitchhikers Tour of the Cosmos**

The meeting will be followed by tea/coffee and biscuits as usual.  
The next social/practical evening will be held on Friday 21 October at the Pretoria Centre Observatory, which is also situated at CBC. Arrive anytime from 18h30 onwards.

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## Last month's meeting - by Lorna Higgs

Although it was school holidays, there were 50 attendees, 12 of whom were visitors.

In Beginner's Corner, Jan Plomp explained how he started making notes of his astronomical observations. He then shared with us some of his notes, star charts, drawings, photos, research and comments. It should have inspired everyone present to get out to do some observing and make notes for future reference and enjoyment. I hope to be able to see more of his fascinating records in the future.

Michael Poll told us about What's Up in October - some good planet viewing (even Mercury), a meteor shower (pity about the bright moon!) and a partial solar eclipse. (Note: The summer rains did not start on 3

October and the entire eclipse could be observed.)

The Main Topic was The Cosmic Rainbow by Pierre Lourens. He started with a tiny bit of Special Relativity (which was quite digestible) and then showed us what a viewer, surrounded by yellow stars, would see if he travelled at almost the speed of light. All the stars appeared to lie ahead of the viewer (aberration of starlight) and change colour (Doppler effect), resulting in a circular rainbow of stars. This got smaller and narrower as the speed of light was neared. The talk started a lively discussion of possible (and impossible!) scenarios when the speed of light was equaled (or exceeded!).

## Last month's observing evening— by Johan Smit & Michael Poll

Venus and Jupiter were seen in the early evening, Venus showing a gibbous phase, but Jupiter was quite low in the western sky, heading towards conjunction with the sun.

The sky was still extremely hazy, with even the brightest stars having a job to shine through. It was an evening for double stars – including Alpha Centauri, Beta Cygni (Albireo), Epsilon Lyrae, and the naked eye double, Alpha Capricornii. However we also looked at M7, M6 and NGC 6231 all in Scorpius, and M8, the Lagoon Nebula, in Sagittarius.

The “Summer Triangle” (Deneb, Altair and Vega) was up in the north. Beta Cygni is about half way between Altair and Vega, slightly east of the line. Uranus was found in Michael's telescope. Uranus can currently be found as the brightest object on a line between Sigma and Lambda Aquarii. As an aid to finding it, start with Gamma and Delta Capricornii. These two stars form an almost straight line with Iota, Sigma and Lambda Aquarii. The planet can be seen with binoculars.

The 12 inch started on Jupiter and Venus and once every one present had a good look, it was aimed at M6 and M7. These objects were also observed with the Bennett telescope, giving every one a chance to compare views of these objects at high and low magnification. The Bennett telescope also provided a stunning view of the Coat Hanger cluster. Because of this telescope's low magnification and wide field of view the whole cluster fits nicely into the field. Lastly with the 12 inch, we tried to split the double-double (Epsilon Lyrae), but due to the hazy sky conditions we could split only one of the pairs easily, the other one with a fainter companion proved difficult. Some observers did see the faint companion while others did not. We will try this star again in October.

An example of a perfect observing log/diary. This is an extract from the observing log of Jan Plomp, who introduced us to his history of observations in the September Beginner's Corner

FEB 99

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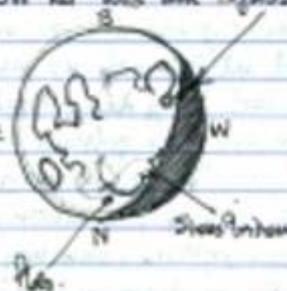
**Don. 25. 2. 99:** Vorigenad is helder, byna wollose lug met Jupiter nou so 2° SW van Venus bo die westelike horison (met in deursig van selen nog 15° of meer). Die Maan is ekkle 08:00 1235

08:30 Die see vol en gaar een teen mekaar 20h30 oor die meridiaan. Tot ok om 22h00 herkom is alles weer bedek met wolke.

08:30:00 Teen 00h30 kom ek in in dynamiese met die buxer in die NW v-Cameri, kry met Vesta baie naby. Ek is nie seker wie is wie nie maar sal moet sien wie beweging en die volgende paar dae.

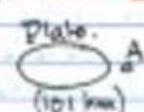
**Vry 26. 2. 99** Na sonsonder pale die wolke soos en bedek die maan wat el klein een oky. By 20h45 is die lug verhelder en ek gaan stel op. Dit is vier dae na volmaan. Die terminator loop in die N vanaf suidpunt die N-pool, net W vanby Suis Fridam, en in die SW net wes van Gessoudi. Ek stel op met die poolies in sprong en gebrink aanmerklik die 12.4 min. met die 45°R. Baie by Mare Parthium soos met 08:021, maar verduidelik die W en S deel.

08:30:00 026 12:00 E 10

13:00 

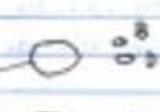
14:00 Chryseus is Plato ③ met Plato A aan sy wete kant. Verder S, naby 2 1/2 Plato breedtes sien ek Fontanelle en nog 1/2 suid Philolaus. Vanaf Fontanelle loop daar 'n vallei in die rigting van die N-pool en eindig by Fontanelle A. Teen Philolaus, S daarvan lê (op die terminator)

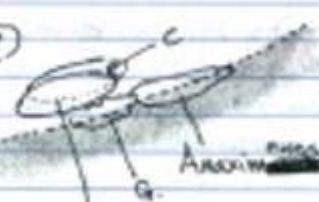
14:30 Aleximinos en Aleximinos G. Wes van Fontanelle is aantal klein kraters B en D.

15:00 

15:30

16:00

16:30 Fontanelle (38 km) 

17:00 Terminator 

17:30 Terminator Aleximinos (20 km) Philolaus (71 km)

18:00 \* Kant no. 3 in Rijkl

By Philolaus kry ek die indruk sy S. rand is met in tuis, maar dit lyk in Rijkl ③ asof daar 'n krater veel meer as Philolaus was en verduidelik net die S rand nog wys. Die afstand van die krater word nou (gla ek) Philolaus C genoem.

Rijkl bron ook in "foto" van Plato met een wete rand in A kom nup met in "landlike" 08:04 klein kraters (tussen 1.7 en 2.2 km) so hoër vir in teleskoop.

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## The Discovery of Neptune – Part Two by Michael Poll

History has given equal credit to Urbain J J Le Verrier and John Couch Adams for the discovery of Neptune. The planet was found on September 23<sup>rd</sup> 1846 at the Berlin Observatory using predictions prepared by Le Verrier. On November 13<sup>th</sup> 1846, nearly three weeks after the discovery, the Astronomer Royal, George Biddel Airy announced that he was in possession of documents prepared by Adams in November 1845, which predicted the position of Neptune to “within one degree” of the position in which it was found.

### The Neptune File

The full Neptune file of the Royal Greenwich Observatory (RGO) was kept secret until at least the 1950s. Historians who asked to consult it were told that the file was “unavailable@, and then it disappeared altogether.

A senior RGO archivist, Adam Perkins, stated in 1994 that the file had been missing since the 1960s. Suspicion fell on an eminent stellar astronomer, Olin J Eggen, who, on enquiry in 1996 denied that he had the file. Eggen was not further pressed about the matter in case he destroyed the evidence! Eggen, born in 1919, died at Sierra Tololo observatory in Chile in October 1998. In his flat were found 105 kg of archive material, stolen from the RGO, including the Neptune File. Eggen’s proponents claimed that he had only borrowed the material for researches on Airy. The documents have been returned to the RGO archives at Cambridge, and University of London astronomer Nick Kollerstrom is studying its contents. It includes Ahundreds@ of letters.

The file itself was retrieved from wartime storage in 1956 and taken to Herstmonceaux Castle in Sussex, where the RGO moved from Greenwich. Richard Woolley and Eggen arrived in that year, as Astronomer Royal and Chief Assistant respectively. Eggen stayed at the RGO until 1961 and returned to the same post from approximately 1963 – 1965, at the end of which period he was fired by Woolley. It is assumed that the thefts took place during

this period. A list of RGO documents drawn up by archivist Phil Laurie (about 1970) has a note next to the entry for the Neptune file stating “missing for along time, [since] about 1965”. After leaving the RGO, Eggen moved to Mount Stromlo Observatory in Australia, and later to Chile. Eggen had been given permission to use the Neptune file because he was doing biographies on Airy and Challis, but it is unlikely that he had permission to take it out of the country.

A re-evaluation of the story of the discovery of Neptune is now possible. The following analyses some of the statements of the “Official Version”

### “Adams sent his calculations to Challis”

On October 17<sup>th</sup> 1846, some weeks after Neptune’s discovery, the Reverend James Challis (Professor of Astronomy at Cambridge) claimed at the Athaeneum Club that: “In September, 1845, Mr. Adams communicated to me values which he had obtained for the [orbital parameters and mass] of an assumed exterior planet - deduced entirely from unaccounted-for perturbations of Uranus”. Challis repeated this at the November 13<sup>th</sup> 1846 meeting of the Royal Astronomical Society (RAS). He stated it again in his “Report to the Cambridge Observatory Syndicate” on December 12<sup>th</sup> 1846. On none of these occasions did he state any figures, nor did he show a document, and no-one seems to have asked what the “values” were! No document was published, nor did anyone record having seen one. Adams also made a speech at the November 13<sup>th</sup> meeting, stating “I communicated to Professor Challis, in September 1845, the final values which I had obtained for the mass . etc. of the assumed planet”

Adams had been working on the problem of Uranus since early in 1844. On September 22<sup>nd</sup> 1845, Challis wrote to Airy saying “My friend Mr Adams (who will probably deliver this note to you) has completed his calculations respecting the perturbation of

the orbit of Uranus by a supposed outer planet and has arrived at results, which he would be glad to communicate with you personally". This suggests that Challis does not have copy of the results.

And yet, when Challis heard about the discovery a year later, he wrote to the local newspaper, the *Cambridge Chronicle*, published on October 1<sup>st</sup> 1846, stating that Adams and Le Verrier had determined the result "four months ago".[ie June 1846]. This contradicts the remarks made in his letter to Airy in September 1845. The official story began to take shape with the October 17<sup>th</sup> statement at The Athenaeum

**"Adams called at Greenwich on Oct 21 1845"**

**"Adams left a note for the Astronomer Royal"**

**"Airy replied to Adams note"**

**"Airy realised he had seen a similar result the previous autumn"**

**"On November 13<sup>th</sup> 1846 Airy presented a document before the RAS"**

**"Airy had had the document for 13 months"**

No one can recall the actual date in October 1845 on which Adams tried to see the Astronomer Royal. There were stories of a butler who had failed to announce Adams, and that Airy had "snubbed" Adams, but Airy's wife, Richarda, in the only written testimony about the matter, states that Airy was out when Adams' card was brought to the room, and that she had no recollection of Adams' second call while they were having dinner. Mrs Airy also pointed out that Airy did reply to Adams.

Adams wrote to his parents on October 23<sup>rd</sup> 1846, saying that he that he left a note for the astronomer royal "containing a short statement

of the result at which I had arrived". Airy's reply on November 5<sup>th</sup> thanked Adams for the "paper showing the perturbations of Uranus".

Airy received a copy of Le Verrier's prediction in June 1846 and in a letter written on June 25<sup>th</sup>. 1846, Airy does not indicate that he still had a document given to him by Adams, he states that Adams' results "in manuscript reached me first". It does not mention his having received Adams' result the previous year

On November 13<sup>th</sup> 1846, Airy presented a document before the RAS, which he claimed was the "note" that Adams had left for him in October 1845. Airy said "The position assigned by Le Verrier ...differed by only one degree from that given by Adams, in the paper which [Adams] had left at the Royal observatory more than seven months before". [i.e seven months before June 1846]

The document that was claimed by Airy as the original, had the date ("September 1845"), written on it in different handwriting from the rest of the document. Adams had said he left "a short statement of results" but the document that Airy produced contained several hundred digits with long columns of residual angular values to hundredths of an arc second. Also, the document did not list any perturbations, and yet on November 5<sup>th</sup> 1845, Airy had thanked Adams for the paper showing the perturbations.

In the 13 months he is supposed to have had the document, there is no record of Airy showing it to anyone, or any intimation from him to anyone that he was in possession of it.

T o b e  
continued



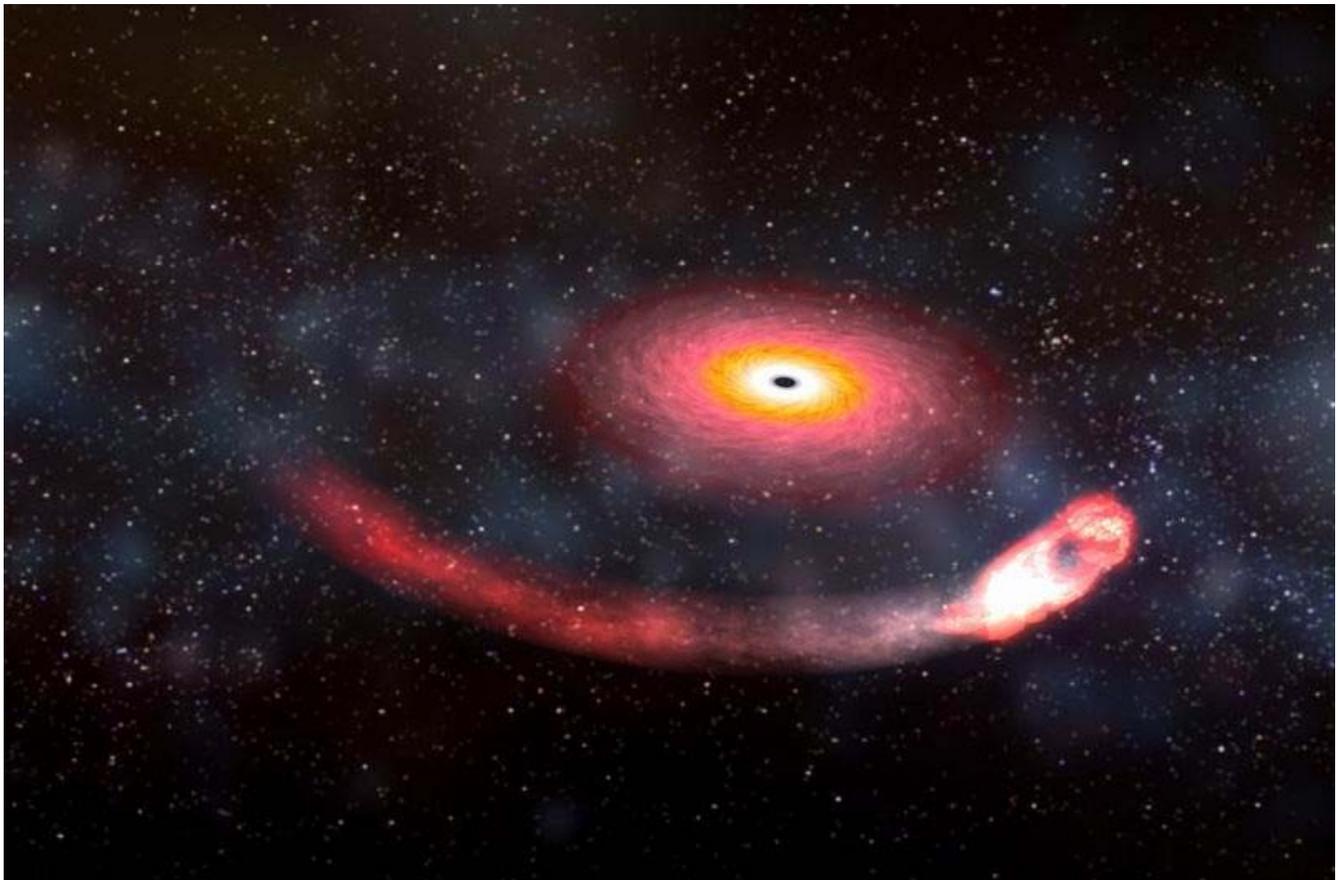
### In A Flash NASA Helps Solve 35-Year-Old Cosmic Mystery

Scientists have solved the 35-year-old mystery of the origin of powerful, split-second flashes of light known as short gamma-ray bursts. These flashes, brighter than a billion suns, yet lasting only a few milliseconds, have been simply too fast to catch — until now.

Through the unprecedented coordination of observations from several ground-based telescopes and NASA satellites, scientists determined the flashes arise from violent collisions in space. The clashes are either between a black hole and a neutron star or between two neutron stars. In either scenario, the impact creates a new black hole.

In at least one burst, scientists saw tantalizing, first-time evidence of a black hole eating a neutron star. The neutron star was first stretched into a crescent, then swallowed by the black hole.

Two recently detected bursts are featured in four papers in Nature magazine. These observations could enable direct detection of exotic gravitational waves that have never before been seen.



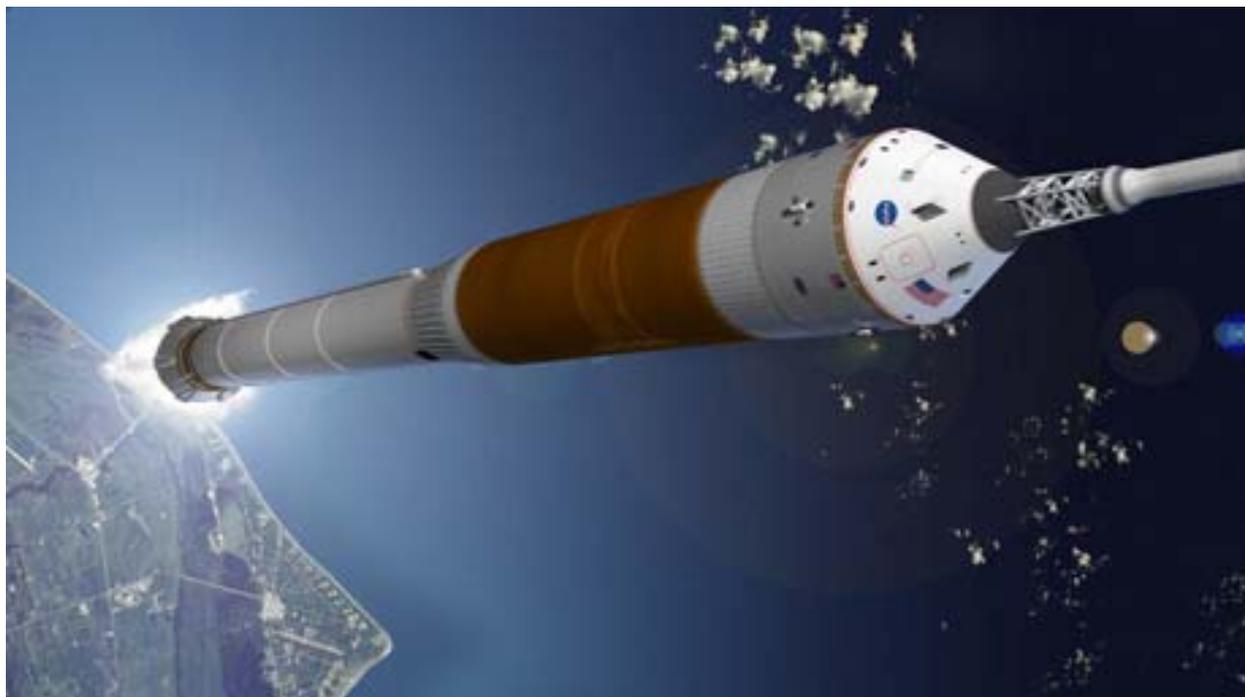
One of the images in an animation of a neutron star being sucked in by a black hole.

## Astronomical website addresses

Go to these alien life websites and give your imagination free rein:

[http://ng.chtah.com/a/tBClg6oASJ4TXAWyithASWbuS.ASOEJv\\$W/ngs7](http://ng.chtah.com/a/tBClg6oASJ4TXAWyithASWbuS.ASOEJv$W/ngs7)

[http://ng.chtah.com/a/tBClg6oASJ4TXAWyithASWbuS.ASOEJv\\$W/ngs32](http://ng.chtah.com/a/tBClg6oASJ4TXAWyithASWbuS.ASOEJv$W/ngs32)



## Back to the moon

An artist's conception depicts NASA's new spaceship, which officials unveiled on September 19 as part of the next generation of spacecraft to take astronauts back to the moon. For more information, see website

<http://news.nationalgeographic.com/news/2005/09/photogalleries/moon/index.html>

## ASSA Symposium 2006

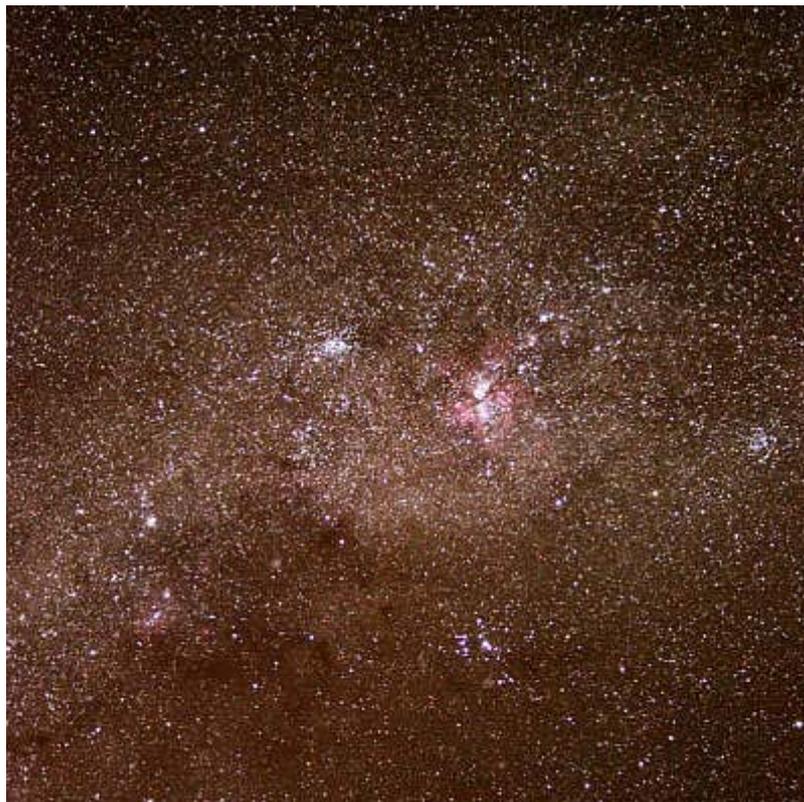
The 2006 ASSA Symposium will be hosted by the Bloemfontein Centre, in association with Boyden Observatory, from 28 to 30 September 2006. Accommodation in a vacation resort overlooking the Modderivier is conveniently available at the foot of the Boyden koppie. The theme will be "**Serious Amateur Astronomy: Linking with Professionals**". The symposium will focus on various topics where the amateur astronomer can make a worthwhile contribution to astronomy. Technological developments have also opened up new opportunities for amateur astronomy.

For more information, you can contact the organizing committee at:

Email address: [mail@assabfn.co.za](mailto:mail@assabfn.co.za)

Telephone numbers: 084 429 9080 (c) / 051 436 5101(h)

You can also start watching the Symposium website at: [www.assabfn.co.za/symposium2006](http://www.assabfn.co.za/symposium2006)



### **Eta Carinae nebula**

Date: 7 May 2005

Camera: Canon EOS 350D

ISO Setting: 800

Exposure: 2x4min

Optics: Canon 18-55mm lens set on 55mm F5.6

Location: Nylsvlei Nature Reserve, South Africa

Photographer: Mauritz Geyser

Image & caption from his website

### **PRETORIA CENTRE COMMITTEE**

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