

2006 Lies Ahead

I trust all had a restful festive season and that 2006 will see the realisation of your New Year resolutions—particularly those of a stellar, planetary or galactic nature.

The uncertainty of my work situation has mostly been resolved. I started work on the 1st of December in Linbro Park near Edenvale. I will need to buy a home closer to work, but will attempt to remain as close to Pretoria as possible. Bapsfontein sounds like a good option—close to Pretoria and work out in the country where the air is cleaner and clearer. I sincerely intend to keep the work load under control so that I can continue my involvement in the Pretoria Centre.

Neville Young (Chairman)

Last month's meeting - by Neville Young

Fred Oosthuizen was in the Chair for the first time—thank you Fred.

Johan Smit then gave some strategically timed advice in a talk entitled “What not to buy for Christmas or A beginners guide to buying astronomical equipment”, noting that “Companies like to separate you from your money” and make impossible claims about telescope capabilities, particularly magnification. Some tips he gave were:

- Maximum magnification = 50 x Aperture in inches.
- Practical magnification = 12 to 25 x Aperture in inches.
- Lowest magnification = Diameter / 7
- Lower F-ratio = wider field of view--better for photography and deep sky work. More critical on eyepiece quality.
- Higher F-ratio = Smaller field of view, higher magnification – better for planetary work. Less critical on eyepiece quality.
- An unstable mount will make any telescope useless.

Knowing the night sky better than most in the

society is Wayne Mitchell, so he was well qualified to present the “What's Up? item. He referred us to the Shiller Crater and the Appenines Mountains on our Moon. Venus, Uranus and Saturn were recommended planetary viewing. The area around Taurus contains Mars as well as the Pleiades. The Magellanic Clouds are also high in the sky at this time of the year.

The main speaker for November was David Bryant, the architect of the original Sutherland observatories. Besides the first-hand historical details, the talk was littered with anecdotes and observations of the characters involved in the construction. The locals at the construction site and in the nearby town Maaitjiesfontein also provided material for amusing tales. A poignant note was the death in a car accident on the notorious road to Sutherland of David Thackeray, director of the Radcliffe Observatory in Pretoria for 23 years from 1951 to 1974.

Observing Evening November 18th 2005 . Michael Poll & Johan Smit

Early in the evening, the crescent Venus was seen. The 12" spent the first part of the evening on this planet. Uranus was also seen. Because it was at its stationary point in mid November, it had hardly moved relative to the background stars. Mars was also well seen high in the North. In the 12", although some dark markings on the equatorial region were seen, no-one could clearly identify a polar cap, although some were convinced that they did see it.

In the north the Square of Pegasus was at its highest, and it was noted how to find the Andromeda Galaxy (M31) using one of the diagonals. M31 was seen, but a search for M33 in Triangulum was unsuccessful. In the south the globular cluster 47 Tucanae was beautifully resolved in some of the telescopes present, including views in the 12". The moon rose at 9.15, and was observed in the 12". The best way to describe this experience would be to say that it was blindingly bright!

Dries van Zyl se webwerf

Dries van Zyl het verlede jaar vir ons 'n praatjie kom gee oor atmosferiese verskynsels (in die atmosfeer van die derde planeet vanaf die son.) Hy het ook 'n webwerf waarop hy foto's van, onder andere, sulke verskynsels geplaas het. Hierdie twee foto's kom vanaf sy webwerf.

Onder: Konjunksie van Venus (regs bo) en Jupiter in die aandskemmer. Heel onder: Jupiter sigbaar op die rand van 'n 22° halo om die maan. Sy webwerfadres is: www.weatherscenes.co.za



The Discovery of Neptune - Part 4 by Michael Poll

Neptune was discovered on September 23rd 1846. Here is a concluding analysis of the history of the discovery:

Adams post-discovery publications.

Eleven days after the discovery of Neptune, Sir John Herschel wrote to the *Athaenaeum* (October 3rd 1846): "The remarkable calculations of M.Leverrier - have pointed out ... nearly the true situation of the new planet, but it was known to me, at that time ... that a similar investigation had been independently entered into, and a conclusion as to the situation of the new planet very nearly coincident with M.Le Verrier's arrived at ...by a young Cambridge mathematician, Mr Adams;- who will, I hope, pardon this mention of his name ... and who will, doubtless, in his own good time and manner, place his calculations before the public".

In fact, Adams did not publish his predicted elements, even after John Herschel's letter had proclaimed them, and it was not until some weeks after the discovery that the world was told what Adams' predictions were supposed to have been. Instead, Adams did something different. Within weeks of the discovery, he correctly ascertained not only the distance of the Neptune, as 30.05 AU, but even the correct position of its node and orbital inclination. He had made use of Challis' retrospectively published recorded positions of Neptune, made on August 4th and August 12th 1846. Le Verrier had categorically stated, in his August 31st prediction, that the mean distance of the planet could not be less than 35 AU, so this was a significant British coup. It is clear that Adams showed no reticence once he could be confident of his calculations. He was the first to ascertain the true elements of Neptune and quickly released these for publication - weeks before he made known his predicted elements, supposedly from the year before. Adams only came out with these "predictions" within the context of the computations from which he had derived them, to the RAS on November 13th.

The French were furious

At a stormy meeting of the Paris Academy of

Sciences on October 19th 1846, Francois Arago, Director of the Paris Observatory fulminated at how "Mr Challis so exaggerates the merit of Mr Adams's clandestine work, that he assigns to the young Cambridge geometer the right to name the new heavenly body" (Challis and Adams had come up with the name 'Oceanus'). Arago described Adams as a "young man who has communicated nothing to the public."

Le Verrier wrote to Airy October 16th 1846: "Why would Mr Adams have kept silent for four months? Why would he not have spoken from the month of June (onwards) if he had had good reasons to give? Why wait until the object has been seen in the telescope?..."

Priority

John Hind worked at the Regent's Park Observatory and was the first Englishman to see Neptune, knowing that it was the planet. Hind had sensed the brewing-up of the prior-prediction claim and he wrote to the Reverend Richard Sheepshanks, the RAS Secretary: "... I am sure you must have noticed the inexcusable secrecy observed by all those acquainted with Mr Adams results ... [a] secrecy which I hold to deprive him of all share in the discovery and I am very glad to find that I am not the only one who thinks so".

References

The principal reference for these four articles is a website: "Neptune's Discovery: The British Case for Co-Prediction" authored by Nick Kollerstrom, of the University of London.

Kollerstrom summarises that, in contrast to the traditional story that Adams' prediction was shamefully ignored, the Neptune File reveals that Adams was actually rather vague, and his predictions for the planet kept changing. At no point was he able to say "point your telescope here" as Le Verrier did. Instead, Adams' predictions ranged over as much as 20 degrees, throwing the observers at Cambridge on a 6 week wild goose chase looking for the planet in the summer of 1846. After the discovery of Neptune in Berlin, which took half an hour, the British, especially Airy,

got together a carefully selected version of the events. Adams' vacillation and mathematical scrupulosity were hushed up and only his early preliminary result (actually the most accurate) was made public. The result was a British takeover. Adams did deserve some recognition, but Kollerstrom believes he ended up with much more than was due to him.

Le Verrier protested at the time, but in vain, because he did not have access to the British documents. Le Verrier did receive many honours, and was later (1854) named director of the Paris Observatory, but Kollerstrom thinks that Le Verrier was personally traumatized by what happened and he ended up as a complete ogre and despot in later years.

See also the following issues of "Sky and Telescope" September 1996 p42 Patrick Moore "The Hunt for Neptune" July 1999 p 93 E C Krupp "Fish Tail"

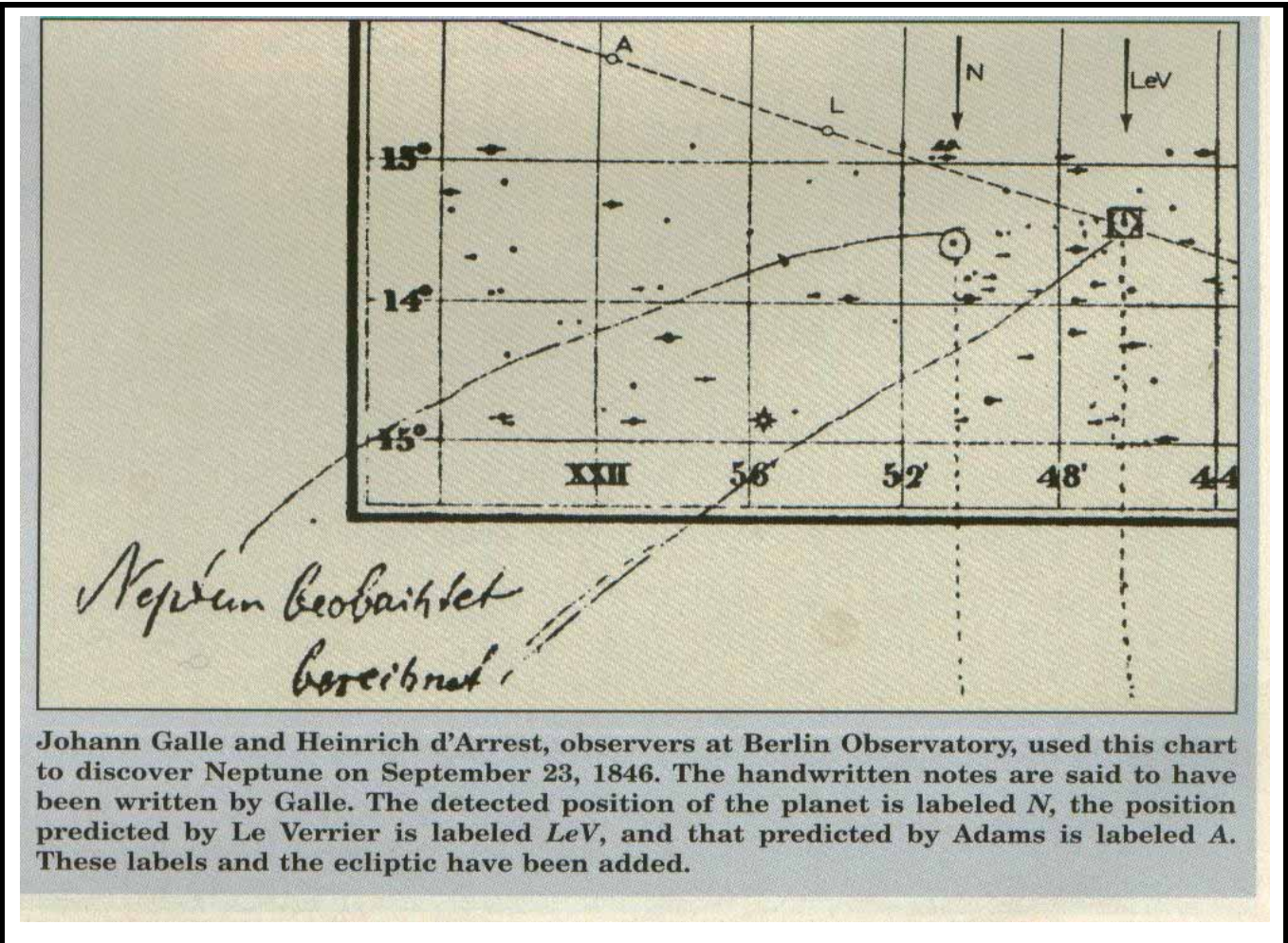
July 2003 p26 William Sheehan "Secret Documents Re-Write the History of Neptune"

Post Script.

Adams eventually served as director of the Institute for Astronomy at Cambridge. The 11.6 inch Northumberland refractor that Challis used to look for Neptune is still at Cambridge. Other astronomers, including Galileo, had seen Neptune through a telescope, but had not recognised it.

Neptune was in Capricornus when it was discovered on September 23rd 1846. (See figure. In the caption the letter 'L' on the ecliptic at 54' is not explained - could this have been Le Verrier's first prediction?). Saturn happened to be just over a degree away from Neptune at the time of the discovery.

On July 10th 2011 Neptune will complete its first circuit of the ecliptic since its discovery.



Johann Galle and Heinrich d'Arrest, observers at Berlin Observatory, used this chart to discover Neptune on September 23, 1846. The handwritten notes are said to have been written by Galle. The detected position of the planet is labeled N, the position predicted by Le Verrier is labeled LeV, and that predicted by Adams is labeled A. These labels and the ecliptic have been added.

“thenewRadiant” website

This website is run out of his own pocket by L Labuschagne of the Cape Centre of the ASSA. It has as one of its objectives to facilitate an easy, friendly, international exchange of amateur astronomy fellowship through observation reports, hints and tips of all kinds - and often just a place to complain about cloudy skies or to ask advice. There are articles, a nice calendar, a little instant "chat" box, country information, etc. It has already become international. He invites the members of our Centre to visit his website at: <http://www.thenewradiant.com>

Light pollution in cities

A romantic evening in Rome is going to become even more enchanting. While enjoying the historic monuments and late night cafes, you will now have a better view of the heavens too.

Rome is the latest major city to begin dimming its lights to prevent light pollution obscuring the night sky and to save energy. And the trend could pick up in 2006 with the publication of an "off the shelf" law that cities anywhere will be able to adopt to combat glare drowning out the stars.

Rome has 170 000 street lights, and stands to save 40 per cent on its lighting bill through its dimming programme. Next to be turned off will be signs in shop windows and hotels, and the already dimmed lights illuminating monuments may be lowered still further.

David Crawford, director and founder of the International Dark-Sky Association based in Tuscon, Arizona, is architect of the model "ordinance" for cutting light pollution. "The ground rules are simple," he says. "Shine light down, not up or sideways; don't over-light; turn off lights when they are not needed; use energy-efficient lights and fixtures; and impose curfews," he says. Illuminated adverts could be switched off at night, for example, as could lighting in parking lots.

The ordinance is still in draft form and must negotiate a public consultation process, but Crawford is confident it could be finalised within a year. Australia already has a national standard similar to the model ordinance and many American cities have also made progress.

From: New Scientist, 19 November 2005

SOHO

SOHO does not refer to a seedy suburb of London, but to the **Solar and Heliospheric Observatory** that moves around the Sun. It slowly drifts around Lagrange point L1, 1.5 million kilometres sunward from Earth. L1 is a spot in space where the gravitational fields of Earth and the Sun cancel each other and keep SOHO in an orbit locked in line with the two bodies, where it enjoys an uninterrupted view of the Sun. There, it constantly observes the Sun, returning spectacular pictures and data of the violent storms that rage across its surface.

Website address: http://www.esa.int/esaSC/120373_index_0_m.html

Ulysses

This is another solar observatory. It orbits the Sun in a highly eccentric six-year orbit that brings it close to the Sun at perihelion and takes it out to the orbit of Jupiter at aphelion. The plane of its orbit is tilted with respect to the plane of the ecliptic, which makes it the first solar observatory able to observe the poles of the Sun. Website address: <http://www.esa.int/science/ulysses>

Second moon around cigar-shaped world

Astronomers have spotted a second moon around a massive, cigar-shaped world at the fringes of the solar system. The discovery suggests multiple moons orbit many large, distant objects - but their unusual orbits raise questions about just how they could have formed. The moons orbit a rocky body called 2003 EL61, which is a particularly bizarre member of the Kuiper Belt - a vast ring of icy objects beyond Neptune. 2003 EL61 rotates once every four hours - faster than any other Kuiper Belt Object (KBO) - and is shaped like a cigar that stretches 2000 kilometres on its longest side - nearly the diameter of Pluto.

In January 2005, a team led by Mike Brown at Caltech in Pasadena, California, US, discovered it is orbited by a moon that may be 300 km wide. The moon takes about 49 days to orbit 2003 EL61 at a distance of 49,000 km. Now, the same team has spotted another, fainter, moon in three of five earlier images taken using the Keck Observatory in Hawaii. The new moon may be just 150 km across and appears to orbit once every 34 days at a distance of 39,000 km. But the new moon travels in a plane that is tilted by about 40° to the orbital plane of the bigger, brighter moon.

Pluto recently became the first KBO known to boast more than one moon. Now, the discovery of a second multiple system "suggests there might be more out there," says Brown. He adds that three out of four of the largest KBOs - Pluto, 2003 EL61 and 2003 UB313 (currently known as the "tenth planet") - all have at least one moon.

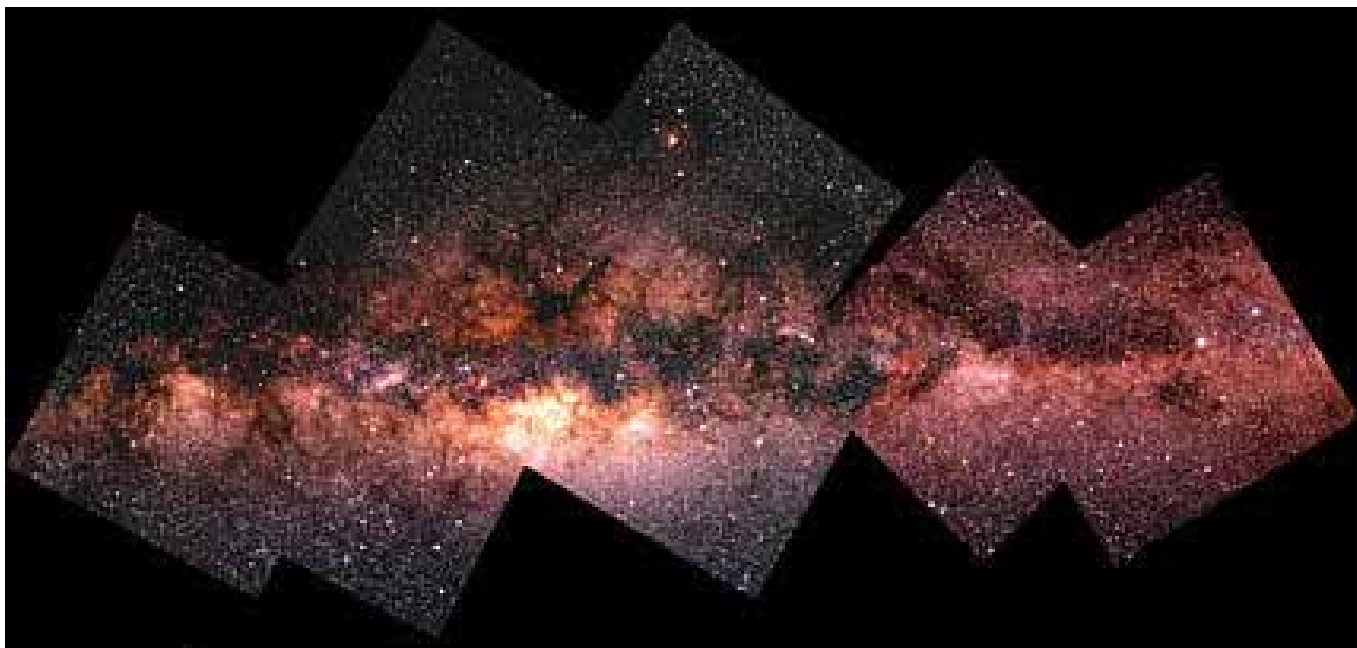
Website address: <http://www.newscientistspace.com/article.ns?id=dn8402>



An artist's representation of the surface of a Kuiper Belt Object with the distant Sun shining faintly in the background.

The Splendour of the Milky Way.

Mosaic of photos of the Milky Way taken by Mauritz Geysler using a Minolta X-300 camera equipped with a 50mm lens at f4 mounted on to an 8" f5 SkyWatcher Newtonian telescope. All images taken with 20 min exposure time using Fujichrome Sensia 400 slide film. Place: Goudrivier farm in the Limpopo Province, about 50km east of the town Ellisras in South Africa. Coordinates: 23°45'10.5" South, 28°12'02.7" East. Altitude: 1000m. Date: 7 August 2004. (Mosaic and caption from his website.)



News notes

- SALT was inaugurated at SAAO on 10 November 2005 by our President. And it was no small affair. Over 1000 invited guests attended the inauguration. Read more about it in MNASSA, vol 64 nos 11 & 12, December 2005, p 200.
- Prof Brian Warner retired at the end of 2004 after 33 years as Head of the Astronomy Department at UCT. His successor is a woman, Prof Renee Kraan-Korteweg.

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