WAS NEWS

Monthly Newsletter of the **W**orthing **A**stronomical **S**ociety
www.was.org.uk

Number 183 **February 2005**

ALMANAC

All times U.T.

February/March

LUNAR

February	Date	Time	Rise	Set
Last Quarter	2nd	07.27	01.07	10.19
New moon	8th	22.28	07.52	16.10
First Quarter	16th	00.16	09.57	02.05
Full Moon	24th	04.54	17.49	07.28
March				
Last Quarter	3rd	17.36	01.44	09.09
New moon	10th	09.10	06.49	18.10
First Quarter	17th	19.19	08.56	02.14
Full Moon	25th	20.58	18.04	05.58

EARTH

February	Sunrise	Sunset
2nd	07.37	16.52
8th	07.27	17.03
16th	07.12	17.17
24th	06.56	17.32
March		
3rd	06.41	17.44
10th	06.26	17.56
17th	06.10	18.08
25th	05.52	18.22

PLANETS (As at February 24th)

	Constellation	Rises	Sets	Mag.
Mercury	Aquarius	07.21	18.18	-1.3
Unfavourable				
Venus	Aquarius	06.49	16.39	-3.9
Unfavourable				
Mars	Sagittarius	04.43	12.35	+1.2
Difficult morning object in the South east				
Jupiter	Virgo	21.16	08.29	-2.4
Brilliant object in the South East				
Saturn	Gemini	13.12	05.18	-0.2
Well placed in the south				
Uranus	Aquarius	07.05	17.33	+5.9
Unfavourable				
Neptune	Capricornus	06.18	15.37	+8.0
Unfavourable				
Pluto	Serpens cauda	02.36	12.06	+13.9
Difficult				

PHENOMENA

Day	Hour	February
14th	11	Mercury in superior conjunction
20th	12	Saturn 5° S. of moon
25th	07	Uranus in conjunction
27th	14	Jupiter 1° N. of moon
		March
6th	07	Mars 4° N. of moon
10th	00	Venus 2° N. of moon
11th	18	Mercury 3° N. of moon
12th	18	Mercury at greatest elongation E. 18°
19th	18	Saturn 5° S. of moon
20th	00	Mercury at stationary point

Minima of Algol

February 16th 04.42 19th 01.30 21st 22.18 24th 19.12
March 11th 03.18 14th 00.06 16th 20.54 19th 17.42

Lunar Occultation's

Times as at Greenwich

Date	U.T.	S.A.O. No	Mag	Phase
Feb	h. m. s.			
13th	18.38.51	92625	8.7	Diss
13th	18.46.59	92628	7.0	Diss
13th	18.54.03	92630	8.6	Diss
14th	18.52.20	93014	8.1	Diss
14th	21.13.53	93039	7.9	Diss
14th	22.24.00	93063	8.0	Diss
15th	19.51.27	75938	9.0	Diss
19th	20.17.21	78968	7.2	Diss
20th	02.03.38	79141	5.6	Diss
21st	00.29.18	79861	5.9	Diss
21st	00.55025	79869	6.2	Diss
March				
13th	19.42.35	92871	8.5	Diss
14th	19.21.56	93281	8.3	Diss
14th	20.54.38	93309	7.7	Diss
14th	21.34.12	93328	4.3	Diss
15th	22.15.20	76436	8.2	Diss
16th	23.32.28	76895	7.7	Diss
17th	00.03.32	76903	6.9	Diss
17th	20.41.30	77604	7.3	Diss
17th	21.24.45	77619	7.1	Diss
17th	21.36.38	77625	5.6	Diss
17th	22.29.30	77675	4.6	Diss
17th	23.36.40	77724	7.3	Diss

My thanks to Graham for passing on the lunar occultation predictions for 2005 supplied by the I.L.O.C. Japan.

The list above is a selection of about 20% of the more easily observed events

Dave Wells

Editors Note

Greetings fellow Earthlings!

So no Titians pulling faces in front of the camera, but still what an event! Nice to see such a success.

In this months Newsletter we introduce a new section for your delight – 'WAS link', see page7 for more details.

Be assured though there will be no reduction in all your normal favourites

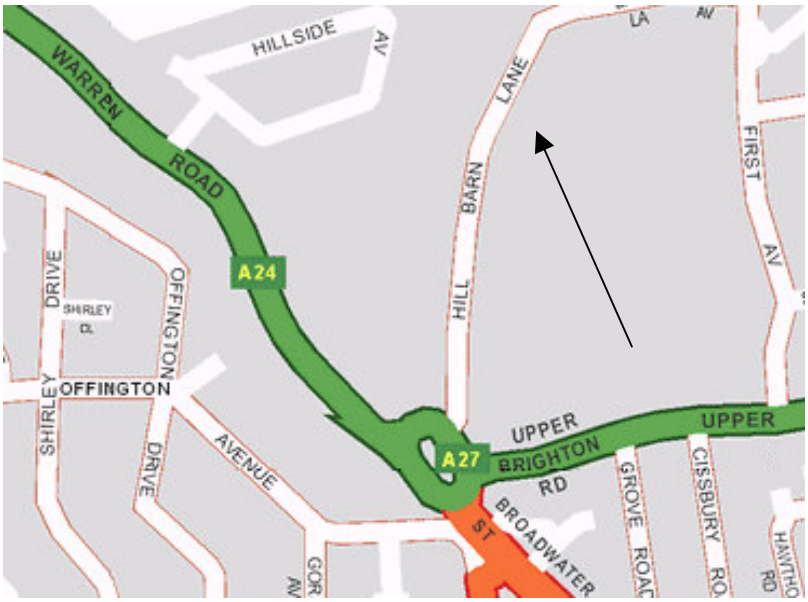
Rob

Dates for your Diary

Hill Barn Observers Night

Alex Vincent

I will be running the observer's nights at our Hill Barn observing site while the observatory awaits a new site. These will take place on Friday evenings starting at 7.30PM. Park at the car park at the northern end of the recreation ground in Hill Barn Lane and walk the short distance to the club house where we will be observing. The gates to the club house car park close at night, but there is a gate to the side for us to walk through. Bring a flask, telescope, binoculars and a camera. Objects to see will be deep sky, Moon, the planet Saturn and the bright Comet Macholz. Any enquiries my telephone number is 07753 282714.



Reports

Solar Section Report - January 2005

Section Director, Brian Halls

My previous solar section report concluded with mention of a fairly active Sun with a magnetically complex spot group 0715 making an appearance.

This group produced some flares over the first few days of the year which generated coronal mass ejections (CME) which in turn affected the space environment around the Earth. This small and compact area was fairly short lived and had begun to decay after it had crossed the central meridian. There was low sunspot activity during this time.

On the 10th a small group, 0720 (N09^0 L=177^0) appeared and over a period of a couple of days grew and took on the appearance of a small, upside down horseshoe and which I described as such at the January monthly meeting. Over the next few days, this group turned into a very large and active area – and can be described as one of the largest spots of the present cycle.

On the 13th, Graham in his daily solar report described the group having become naked eye. On the 12th, this group was a size of 420^{-6}, comprising eight spots. Twenty-four hours later it was a size of 1080^{-6}, with 38 spots making up its size. Over the period of a few days it grew and grew with a resulting complex magnetic structure, which led to violent solar flares. It reached a maximum size 1630^{-6} on the 16th.

The number of other sunspot groups also increased, with most of the spots visible in the northern solar hemisphere.

By the time 0720 had reached the western limb and began to glide out of view on 22nd it was still a size of 0900^{-6}.

As I write this report (1st February) astronomers using the SOHO Michelson-Doppler Imager (MDI) are able to monitor sunspot activity on the far side of the Sun and region 0720 is still very active. By the time you read this copy of WASNews, this group, if still active will be making an appearance.

Reports were received from Graham Boots (20 days) and the Director (3 days) with other details in the article from the daily Space Environment Centre reports and weekly reports from the Solar Influences Data analysis Centre, Royal Observatory of Belgium.

MDF= 2.08; R= 30.75

solar_section@was.org.uk

Observatory Annual Report No.34 – Extra

September 2003 to February 2005

Graham Boots - Acting Curator of the Observatory

Once again the observatory had another very busy session with plenty of varied activity and large attendances.

OBSERVING & IMAGING

The largest attendance ever in the history of the observatory was for the transit of Venus on the 8th June 2004. The sky remained clear throughout and between 40 to 50 members and visitors came along during this event that lasted for over 6 hours. Five telescopes were made available that were used with photographic, video and web cameras as well visual projection. This event led to three written contributions for WAS News.

Typically, half the Friday observer's nights were clear enough for some astronomical viewing to take place. A total of 25 of these events took place with an average attendance of nine. Visitors and friends often joined us during these evenings. Some of these nights enjoyed excellent seeing conditions allowing extremely good views of planets and Moon with very high magnifications able to be used.

Keith Peters has been very busy capturing and processing images with a web cam. These cameras reveal a tremendous amount of planetary detail when used with the computer programme RegiStax. One particular image of Mars taken during its very close opposition passage was sent to Richard McKim, the Mars section director to the British Astronomical Association. He was able to identify over a dozen recognisable features including white evening cloud and highly acclaimed this achievement of the society's team involved. Under good conditions Keith and I found the web cam can only reach stars down to magnitude 5 or possibly 6 when used with a Schmidt/Cassegrain 20cms telescope.

Alex Vincent who has been attending the observatory for 30 years continued to make good use of the piggyback position of the 29 cms Newtonian. He photographed very many eclipsing binary star systems at maximum and minimum magnitude. He also successfully photographed comets C/2001Q4 Neat, C/2002 T7 LINEAR, 2P/Encke and more recently C/2004 Q2 Machholz. Some of us present were able to observe these comets, but they were all faint except Machholz, which was naked eye and reached magnitude 4.1 in January 2005.

We have been fortunate that at the observatory we have a fairly good western horizon. This has on many occasions allowed us to observe Mercury. On the 7th April 2004 we were able to use the 29 cms Newtonian to see Mercury with only a 13% phase, according to the Handbook of the British Astronomical Association, our previous record has been 23%. On that particular evening we saw three Virginids meteors, one of the lesser known meteor showers.

During 2004 we have had two total lunar eclipses both of which were photographed from the observatory site under poor conditions but in each case good results were obtained. Alex and I recorded just five disappearance lunar occultations this session.

After the August 2003 opposition of Mars we continued observing and photographing this planet while the southern polar ice cap shrank and it began presenting a gibbous phase. We used a green filter to see Mars to really good effect. One particular photograph taken by Alex with the C8 would have been considered very good were it not for the advent of web cam imaging results. We have continued making very good use of filters for planetary observations as Jupiter and Saturn dominated most of the winter evening sky. Such was the large tilt of the polar axis (-25.4 degrees on 3rd January 2004) of Saturn we could, at one time see the entire outer edge of the ring system.

Colin Thomson has been joined by a small supporting group on nine special evenings that have been devoted to capturing video images with the Astrovid 2000. Amongst the wide range of objects imaged and recorded was the Orion Nebula and the brighter areas of the nebulosity were revealed on the recording. It is particularly difficult to record nebulosity with this type of equipment. On this occasion we had very good seeing. I thank David Storey for repairing this camera that had shortly before broken down. Some of these recordings have been shown in recent times at our monthly meetings.

Amongst the many deep sky objects we have observed this session was one remarkable object we had not seen before. This was NGC 7662 the 8.6 magnitude planetary nebula in Andromeda known as the Blue Snowball Nebula. To those present it appeared to have a strong greenish tint.

VISITORS

During this session we have received nine groups of Brownies and Beavers totalling 129 children in all. Showing them incredibly bright iridium satellites and passes of the International Space Station gave them much delight. Upon leaving they are given colourful

astronomical brochures. I thank Dave Storey and Alex Vincent for helping out on these evenings that is very important as on one evening the attendance numbered 35. On one particular evening when the sky was cloudy they were given a slide show in the garden. The last group were shown the naked eye comet Machholz C/2004 Q2 in January 2005.

EQUIPMENT

The society has purchased a longer aluminium stepladder for both adults and children who need something to steady them when the eyepiece is in a high position. Also purchased were two older type laptop computers that are currently on loan to members.

THE WAY AHEAD

With temporary closure of the Observatory prior to relocation Alex has been organizing observer's evenings at our Hill Barn Golf Course site. Members have also made use of this site when I have been away.

Over the years observer's evenings have provided a source of new members and donations towards society funds. I hope that members who feel the observatory is the main reason for belonging to WAS will continue their membership while the Observatory is relocated.

WINDLESHAM HOUSE SCHOOL

If all goes well the Observatory maybe relocated in the early part of this year in the grounds of Windlesham House public school just north of Worthing off the A24. Brian Halls and myself met the headmaster, school bursar and head of science at this school; we had a two hour discussion and were shown the proposed site on the 6th November 2004. The staff are very keen for the project to proceed.

This site is around 6 miles from Worthing Pier. We are considering a transport system for those members without transport. At this time planning, insurance and estimates for the foundations are being investigated. The school has 270 pupils aged 8 to 13 and in exchange for allowing the grounds to be used for our Observatory. It is intended that a partnership between ourselves and the school be created. This will provide an important educational facility for the children that will be managed by the staff. On site electricity is available. We will have use of toilets in the nearby cricket pavilion. There is also direct vehicular access from the A24 to the site and parking for about six vehicles, there is also the main car park available for larger gatherings. This site has no history of vandalism. Staff are in permanent residence and there is a CCTV system in operation at various points around the grounds and gates. I have inspected the site at night. There is no significant artificial light and the southern horizon is completely clear, which makes this site particularly attractive.

The area is a Countryside Designated and Protected Area, which means it, has a level of protection and is guarded against future developments. The West Sussex County Council have no plans to install main road street lighting along that part of the A24. The local authorities have also been checked and there are no plans for developments in the area.

I thank all those involved in the operating of the Observatory in particular the regular members who have so often made the effort to turn out on dark, damp and cold evenings. On Friday the 29th October 2004 35 members attended the closing social evening and celebrated the last 34 years. See above photograph.

Articles

Death of a Star

Herbert Zetter

This is no cosmic thermo-nuclear obituary of a star sinking into red gianthood or black dwarfdom nor an attempt to peer into an impenetrable black hole**.** It is fiction **–** the quiet relegation of the Star of Bethlehem**,** no less**,** to oblivion after nearly two millennia of diligent search to identify the celestial phenomenon which marked the Nativity of Christ**.** Almost in the byways of history the Nativity became the base date of modern world chronology and the approach of the 3rd Millennium in 2001 AD stimulated public interest in 1 AD**.**

The Gospel accounts give no precise date for the Birth of Christ. The census which took Mary and Joseph to Bethlehem has not been identified. The call to John the Baptist *"in the fifteenth year of the reign of the Emperor Tiberias"* looks promising. There is no problem with dating Emperors. Tiberias was the second Roman Emperor after the era of the early kings and the Republic. He succeeded on 17th September 14 AD and died on 16th March 37 AD so that the 15th year of Tiberias is 1st January to 31st December 28 AD. There is no obscurity so far but, after his baptism by John, *"Jesus began his work when he was about thirty hears old"*. How long was his Ministry, one, two or three years?

The Council of Nicaea in 325 AD fixed the date of 25th December simply recognising a practice which had grown up over the years. It was near the winter solstice, the Feast of the Unconquered Sun for sun worshippers and near the Saturnalia, a time of great junketing and excess for the Roman world in general. The early Christian Church added the Nativity to the season of merrymaking. The Council did not state the year of the birth.

The Star of Bethlehem in Matthew's Gospel became the key to dating the Nativity as astronomers became skilled in computer reconstruction of the night sky for any time of the year, past or future. Matthew's magi, their number is unspecified, wise men, astronomers, magicians, astrologers in the New English Bible, did not follow a star in the east to Bethlehem. They were travelling westwards from Babylonia and a star in the east would have been behind them. It must have been some portentous celestial event they witnessed in Babylon which sent them off to buy gold, frankincense and myrrh and make the 500 mile trek to Judaea. The first mention of the star is when they arrived in Jerusalem, inquiring, *"Where is he that is born king of the Jews? For we have seen his star in the east and have come to worship him"*. *"Star in the east"* in ancient astronomy means it's rising at dawn with the sun, it's heliacal rising. The only reasonable assumption is that, in an age when astrology was inseparable from astronomy, they had seen the star of kings, the planet Jupiter, in auspicious astrological circumstances, its heliacal rising in the constellation of Judaea. It was an astrological scoop which sent them off to Jerusalem bearing gifts for the new-born Messiah.

It was King Herod who directed them to Bethlehem. He took the matter as a serious threat and obviously accepted the Messianic tradition and the validity of the astrological claims of the magi as all part of the culture of the day. He "*inquired of them diligently what time the star appeared"*. He consulted not astronomers but the chief priests and scribes who came up with Bethlehem as the birthplace of a King of Israel, on what we would see today as flimsy scriptural authority; *"But for you Bethlehem…small as you are among Judah's clans, from you will come a King for us over Israel",* (Micah 5.2).

It was from Jerusalem that the same star the magi had seen in the east, the planet Jupiter, went before them and stood over the place where the young child was. Planets stand still and have retrograde motion occasionally against the fixed pattern of the stars. It could hardly have given a GPS pinpoint location but the magi found the child with his mother Mary in a house in Bethlehem, their astrological prediction justified. This would seem to be some time after Luke's shepherds who were at the stable soon after the birth. The magi went home by a different route to keep the knowledge from Herod, who must have been singularly inept not to have kept track of them. It all seems out of keeping with his record as the greatest builder of his day, restorer of the Temple, builder at Jericho and Masada and of a new seaport Caesarea Maritima, and out of character with his reputation for ruthlessness. In the pious language of scripture, it was a dream which prompted the magi to evade Herod and a dream which prompted Joseph and Mary to take the child to Egypt, again enabling an ancient prophecy to be fulfilled.

Herod slaughtered all the infants of two years and under in the area which does give another clue to the date of the Nativity. Astronomers have searched for celestial spectaculars around the end of Herod's reign to explain the Star of Bethlehem in their attempts to date the birth of Christ. When did Herod die? The Jewish historian Josephus, writing about a century after the event, reports in the conventional style of his times, without a precise date, that Herod died, *"After an eclipse of the moon and was buried before Passover"*. It is astronomers who have fixed the date at 4 BC when an eclipse of the moon occurred a little before the Passover full moon.

For the years in question the night sky shows an apparition of Halley's comet in 12 BC, authenticated in contemporary records, but that seems a bit too early for the nativity. One leading astronomer[1] assesses and rejects all the possible astronomical explanations and settles for a succession of meteors on the disarming grounds that no one can prove him wrong. Various planetary conjunctions of the time must have been brilliant sights such as the triple conjunction of Jupiter and Saturn on 15th September 7 BC[2]. In the astrology of the day[3] 17th April 6 BC gives the most favourable horoscope with the position of Jupiter the planet of kings indicating the birth of a king in Judaea. Neither of course is a star but both dates have their advocates.

The date of Christ's birth has not been determined with any certainty and like all insoluble mysteries is always attracting a new look. The most recent to attempt a

solution is R.M. Jenkins writing in the Journal of the British Astronomical Association, No.114, 6.2004. He recently retired from a career in the space industry during which he was the Manager of the British side of the European Interceptor which investigated Halley's Comet at its appearance in 1986. The Interceptor was aptly named Giotto after the Italian artist who in 1301 depicted the Star of Bethlehem in his painting *The Adoration of the Magi* as a comet, inspired it is thought by the apparition of Halley's Comet at the time. Halley's Comet in 12 BC had already been noted by astronomers in their investigations. Jenkins notes an apparition of the comet in 66 AD a few years before the writing of Matthew's Gospel and that *standing still* describes a comet as much as a planet.

It was in that same year 66 AD that the King of Armenia led a retinue of magi to Rome with gifts for the Emperor Nero. Armenia in the Caucasus lay on the far eastern border of the Roman province of Asia Minor and was dependent on Roman goodwill. The impressive caravan must have used the Roman roads of Asia Minor dotted with churches founded by St. Paul but as for the sea voyage they returned home by a different route! Jenkins comes to the conclusion that Matthew made up the story of the wise men and the star, his imagination inspired by these recent events. He was writing for a Jewish readership and was concerned to show how Jesus was the Messiah foretold in Jewish scripture. It had been prophesied that, *"A star will come forth out of Jacob, a comet will arise from Israel"*(Num.24.17). *"No star, no Messiah",* as Jenkins crisply quotes from another scholar.

Stop searching the night sky of two thousand years ago as the magi and Matthew saw it, reconstructed by the scientific certainties of celestial mechanics. The Star of Bethlehem isn't there. If it were, an astronomical explanation would have been found and agreed upon by now. The answer is much simpler, the imaginative insight of a writer of his times telling a good story to make his point, inspired by the people and events around him to give verisimilitude to his narrative. It does spare accepting all the improbabilities in Matthew and it does avoid accepting the certainty of astrological fulfilment if the account is taken literally. But Matthew was not reporting fact; it was all in his mind. It was a nice touch to have the magi come from Babylonia where the Jews had spent so long in servitude and where they had absorbed so much of their astronomy and calendrical expertise. What a pity Matthew did not call them Babylonian Jews to add more reality to their excitement and their strenuous efforts to welcome the Jewish Messiah.

The paradox, that Jesus was born before the Christian era began, has a simple explanation with astronomical connections. It is due to a mistake made by a certain Dionysius Exiguus, a learned monk in Rome commissioned by the Pope to compile a Table of Easter dates as the current Table was running out. It was based on the Metonic sun/moon calendrical cycle named after the 5th Century BC Athenian astronomer whose explanation is the first surviving account we have although the practice was common in Babylonia before 2000 BC. Briefly, most early calendars were lunar with twelve moons in a year and a thirteen month year occasionally to keep the calendar in time with the sun. The years with the intercalated month were numbers 3, 5, 8, 11, 13, 16 and 19, the *"golden years"* in the 19 year cycle of Meton. It worked. 19 average solar years equal almost exactly 19x12+7 average months. There is no better way of reconciling nature's incompatible timekeepers. The Jews used the Metonic cycle for their calendar to keep the Passover full moon in time with the vernal equinox and the Christian Church to keep the Easter/Passover full moon in harmony with the sun.

The Easter Table up for renewal had been promulgated by the Church in Alexandria, as directed at Nicaea, which had fixed the date of Easter as the Sunday following the first full moon after the vernal equinox. (The Council formulated the Nicene Creed of fundamental beliefs as well as tidying up Christmas Day.) The Bishops of Alexandria had taken the lead in promulgating Easter dates long before Nicaea. Alexandria was the intellectual capital of the Greek speaking world where the bishops rubbed shoulders with the greatest astronomers of the time. As late as 450 AD the Bishop of Alexandria rebuked the Pope of the day during an acrimonious exchange over the date of Easter by reminding him that *"the Church in Egypt is still the mother of this sort of learning"*.

But the Pope was determined to have his own Easter Tables in the long-running Roman assertion of its independence from the Greek churches in the east. Dionysius was commissioned. The common practice then was to number the years by the reigning Emperor and there is the example of that in the Gospels on the year when John the Baptist began his work. A new Emperor began a new series of regnal years. But the Alexandrian Tables were still based on the regnal years of the Emperor Diocletian who was long since gone having abdicated in 305 AD. The Bishops of Alexandria had continued counting by Diocletian years. It is a convincing deduction to assume that they did so to preserve the continuity of their cyclic Easter Tables based on 19 year Metonic units and to avoid the awkward break in numbering at the change of Emperor when the first and last years were fractional and each calendrical year appeared twice in the record.

The Easter Table which Dionysius was to continue ended in 247 *anno Diocletiani* and the new Alexandrian Table would begin in 248. Dionysius had a better idea, to number the regnal years from *"the incarnation of our*

Lord", substituting the rule of Christ for that of earthly Emperors. Not only that, Diocletian was a notorious persecutor of Christians so Dionysius was removing him from the record at the same time as striking a blow for Papal independence. Dionysius had no idea that he was setting his stamp on world chronology. That was not on his mind. *Anno Domini* was marginal to his Easter Table circulated to the Christian churches and it was many centuries before the new chronology became general practice. There is little evidence to show how he worked out that 248 *anno Diocletiani* was 532 *anno Domini* where his Table began but such he did and his calculations were wrong, if Josephus has the circumstances of Herod's death right and if the astronomers have done their work correctly. Dionysius was about right but he probably knew as little about the exact date as the Gospel writers or the Council of Nicaea or for that matter the scholars of today.

[1] "The Star of Bethlehem", Sir Patrick Moore, Canopus, 2001, pp. 105
[2] "The Star of Bethlehem", David Hughes, Pocket Books, 1979, pp.263
[3] "The Star of Bethlehem. The Legacy of the Magi", Michael Molnar, Rutgers University Press,2000, pp.175

Following a suggestion by member Trevor White we welcome you to an exciting new section in the news letter If you have any addresses for Web sites that you feel may be of particular interest to fellow members please submit them and you too could have your name in lights!. - Ed

Was Link

web.canon.jp/Imaging/astro/index-e.html

An interesting reference guide to astrophotography. This provides advice on exposure settings (apertures, shutter speeds and ISO film speeds) and includes example photos. – Submitted by: Trevor White

WAS Ad

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What's on the Box

Saturday 12th February 2005

BBC TWO

12.30 – 13.05: **The Sky at Night**

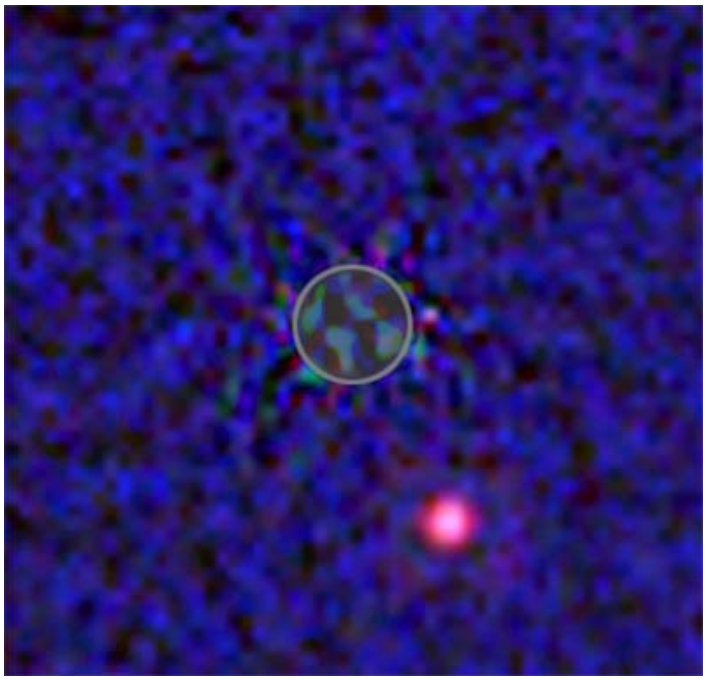
Unveiling Titan. The Cassini-Huygens probe has sent back pictures of the surface of Titan, Saturn's moon. Chris Lintott reports from ESA's mission control in Darmstadt where scientists waited to hear whether Huygens was a success. Patrick Moore talks to the lead scientist of the surface science package, Professor John Zarnecki, about the first results.

WAS News News

Hubble's infrared eyes see suspected extrasolar planet

Esa Hubble Information Center Release

Unique follow up observations carried out with the NASA/ESA Hubble Space Telescope are providing important supporting evidence for the existence of a candidate planetary companion to a relatively bright



Credit: NASA, ESA, G. Schneider (Steward Observatory, Univ. of Arizona, USA), I. Song (Gemini Observ.), B. Zuckerman, E. Becklin (Univ. of California, USA), P. Lowrance (California Inst. of Technology, USA), B. Macintosh (Lawrence Livermore National Laboratory, USA), M. Bessell (Australian National Univ.), and C. Dumas and G. Chauvin (European Southern Observatory)

Astronomers at the European Southern Observatory's Very Large Telescope (VLT) in Chile detected a planet

candidate in April 2004 with infrared observations using adaptive optics to sharpen their view. The VLT astronomers spotted a faint companion object to the brown dwarf star 2MASSWJ 1207334-393254 (aka 2M1207). The object is a candidate planet because it is only one-hundredth the brightness of the brown dwarf (at the longer-than-Hubble wavelengths observed with the VLT) and glimmers at barely 1000 degrees Celsius, which is cooler than a light bulb filament.

Because an extrasolar planet has never been directly imaged before, this remarkable observation required Hubble's unique abilities to do follow-up observations to test and validate if it is indeed a planet. Hubble's Near Infrared Camera and Multi-Object Spectrometer (NICMOS) camera conducted complementary observations taken at shorter infrared wavelength observations unobtainable from the ground. This wavelength coverage is important because it is needed to characterize the object's physical nature.

Very high precision measurements of the relative position between the dwarf and companion were obtained with NICMOS in August 2004. The Hubble images were compared to the earlier VLT observations to try and see if the two objects are really gravitationally bound and hence move across the sky together. Despite the four months between the VLT and NICMOS observations, astronomers say they can almost rule out the probability that the suspected planet is a background object, because there was no noticeable change in its position relative to the dwarf.

If the two objects are indeed gravitationally bound together they are at least 8 billion kilometres apart, about 30 percent farther apart than Pluto is from the Sun. Given the mass of 2M1207, inferred from its spectrum, the companion object would take a sluggish 2,500 years to complete one orbit. Therefore, any relative motion seen between the two on much shorter time scales would reveal the candidate planet to be a background interloper and not a gravitationally bound planet.

"The NICMOS photometry supports the conjecture that the planet candidate is about five times the mass of Jupiter if it indeed orbits the brown dwarf," says Glenn Schneider of the University of Arizona, USA. "The NICMOS position measurements, relative to VLT's, indicate the object is a true (and thus orbiting) companion at a 99 percent level of confidence - but further planned Hubble observations are required to eliminate the 1 percent chance that it is a coincidental background object which is not orbiting the dwarf."

Schneider presented these latest Hubble observations at the meeting of the American Astronomical Society in San Diego, USA.

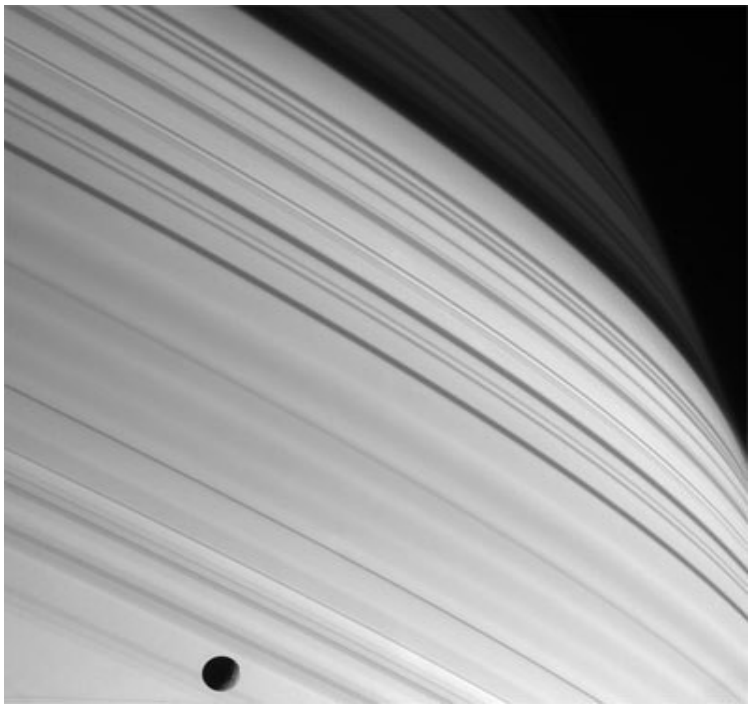
The candidate planet and dwarf are in the nearby TW Hydrae association of young stars that are estimated to be no older than 8 million years. The Hubble NICMOS observations found the object to be extremely red and relatively much brighter at longer wavelengths. The colours match theoretical expectations for an approximately 8 million-year-old object that is about five times as massive as Jupiter.

Further Hubble observations by the NICMOS team are planned in April 2005.

Sun-striped Saturn

Cassini Photo Release

In a dazzling and dramatic portrait painted by the Sun, the long thin shadows of Saturn's rings sweep across the planet's northern latitudes. Within the shadows, bright bands represent areas where the ring material is less dense, while dark strips and wave patterns reveal areas of denser material.



Credit: NASA/JPL/Space Science Institute Download larger image version here

The shadow darkens sharply near upper right, corresponding to the boundary of the thin C ring with the denser B ring.

The globe of Saturn's moon Mimas (398 kilometres, or 247 miles across) has wandered into view near the bottom of the frame. A few of the large craters on this small moon are visible.

The image was taken with the Cassini spacecraft narrow angle camera on Jan. 18, 2005, at a distance of 1.4 million kilometres (889,000 miles) from Saturn using a filter sensitive to wavelengths of infrared light centred at 752 nanometres. The image scale is 9 kilometres (5.5 miles) per pixel.

Diary

9th February 2005 Deep Sky Observing Dr. Stewart Moore Director of the British Astronomical Association Deep Sky Section and Committee Member of the Webb Society

9th March 2005 Astrophotography Impact since 1795 Mike Maunder Astrophotographer & Eclipse Chaser

13th April 2005 Member's Evening Short Talks and Imaging Displays by members

11th May 2005 Southern Africa Large Telescope (SALT) 11 meter Dr Malcolm Coe Southampton University

All Meetings **(bold)** are held on the second Wednesday of every month unless otherwise stated, at Heene Church Rooms, Worthing at 7.30 p.m. Meetings include the latest astronomical work, reports and, photographs by members. For further information please call 01903 521205, on the Internet at *www.was.org.uk* or email: *chairman@was.org.uk*

President

Graham L. Boots

Tel / Fax: 01903 505346

Executive Committee

Chairman: Glen Thomas

20 Wayside Avenue
Durrington
BN13 3JU
Tel: 01903 261723
Email: chairman@was.org.uk

Vice-Chairman: Janet Marshall

32 Court Farm Road
Hove
East Sussex
BN3 7QR
Tel: 01273 501194
Email: janetmarshall32@ntlworld.com

Business Secretary: Christa Sutton

8 Tower Road
Lancing
BN15 9HT
Tel: 01903 523764
Email: christa.sutton@ntlworld.com

Meeting Secretary: Graham Boots

101 Ardingly Drive,
Worthing,
West Sussex
BN12 4TW.
Tel / Fax: 01903 505346
Email: meeting_secretary@was.org.uk

Membership Secretary: Colin Knappitt

41 Cleveland Road
Worthing,
West Sussex
BN13 2ES
Tel: 01903 695044

Treasurer: TBA

Note to Contributors

Contributions & Correspondence for the **March** issue of WAS NEWS should be with the Editor by **March 1st**. All material for inclusion should be sent to the Editor.

Rob Davis
61 Stirling Court Road,
Burgess Hill
West Sussex
RH15 0PS
Tel: (01444) 239205
Email: wasnews@tiscali.co.uk or wasnews@was.org.uk