



WAS NEWS

Monthly Newsletter of the **Worthing Astronomical Society**

Official website: www.was.org.uk

Affiliated websites: www.observatory99.freeserve.co.uk



Number 170

December 2003

ALMANAC

All times U.T.

December/January.

LUNAR

December	Date	Time	rise	set
Full Moon	8th	20.37	15.18	07.41
Last Quarter	16th	17.42	23.55	12.34
New moon	23rd	09.43	08.39	15.30
First Quarter	30th	10.03	12.03	**.**
January				
Full Moon	7th	15.40	15.29	08.35
Last Quarter	15th	04.46	00.23	11.21
New moon	21st	21.05	08.20	15.32
First Quarter	29th	06.03	10.45	00.52

EARTH

December	Sunrise	Sunset
8th	07.52	15.52
16th	08.00	15.51
23rd	08.04	15.54
30th	08.06	15.59
January		
7th	08.05	16.08
15th	08.00	16.20
21st	07.54	16.29
29th	07.44	16.43

PLANETS

(as at November 23rd.)

	Constellation	Rises	Sets	Mag.
Mercury	Sagittarius	08.30	16.41	+3.1
Unfavourable				
Venus	Capricornus	10.07	18.28	-4.0
Low in the south west				
Mars	Pisces	12.00	00.22	-0.1
Visible in the south west				
Jupiter	Leo	22.43	11.47	-2.2
Morning object				
Saturn	Gemini	16.34	08.47	-0.4
Visible most of the night				
Uranus	Aquarius	11.02	21.04	+5.9
Difficult				
Neptune	Capricornus	10.17	19.23	+8.0
Difficult				
Pluto	Serpens cauda	06.26	16.04	+13.9
Unfavourable				

PHENOMENA

Day	Hour	December
9th	06	Mercury at greatest elongation E. 21°
10th	23	Saturn 5° S. of moon
12th	05	Pluto in conjunction
16th	07	Jupiter 3° S. of moon
17th	16	Mercury at stationary point
25th	17	Venus 3°N. of moon
27th	01	Mercury in inferior conjunction
30th	10	Mars 3°N. of moon
31st	21	Saturn at opposition

January

4th	00	Jupiter at stationary point
4th	18	Earth at perihelion [147 M. km.]
6th	14	Mercury at stationary point
7th	01	Saturn 5°S. of moon
12th	13	Jupiter 3°S. of moon
17th	09	Mercury at greatest elongation W.24°

Minima of Algol

December	11th 05.06	14th 01.54	16th 22.42
January	3rd 03.36	6th 00.24	8th 21.18 11th 18.06

Lunar Occultations

Times as at W.A.S. Observatory

Date	U.T.	S.A.O.No	Mag	Phase
December	h. m. s.			
10th	20.32.09	78736	8.6	reapp
12th	21.22.42	80276	9.0	reapp
12th	21.53.13	80288	8.8	reapp
13th	23.33.23	80898	7.7	reapp
14th	23.15.13	99080	6.1	reapp
15th	01.46.54	99117	8.3	reapp
15th	02.58.57	99144	7.8	reapp
15th	03.37.34	99150	7.1	reapp
15th	05.47.05	99172	5.7	reapp
28th	19.20.13	165651	7.6	diss
29th	18.10.25	128587	8.3	diss
29th	21.36.54	128628	6.8	diss
30th	20.00.20	109525	8.9	diss
January	awaiting	data	from	Japan

This is only about 14% of the predictions for the WAS observatory.

Dave Wells

Editors Note

Festive Felicitations!!

Banished to my room whilst Mrs WAS Editor hangs Christmas decorations, I glance opposite at the Neighbours strobing-chasing flashing 'Disney World' light display, which has all but managed to obliterate everything but the full moon from the night sky, I think – thank God for WAS News, I may not be able to see it, but at least I can read about.

But don't think all bon homie has been leached from me by those at No. 60. You'll know different when you feast your eyes on this special festive (collectors) edition of the Newsletter

Merry Christmas and a Happy New Year

Rob

Dates for your Diary

Solstice Drink - Sunday 21st December

The venue for this year's winter solstice drink is **The North Star**, Littlehampton Road, Worthing.

Anyone wishing to join in this astronomical celebration (any excuse for a drink) can meet up anytime after 8pm in the non-smoking section.

The North Star is on the north side of Littlehampton Road, about 300m east of the Durrington Lane roundabout and next door to the Esso garage. If anyone would like more detailed directions please ring Linda/Dave Storey on 01903 264136.

The Hubble Telescope: The First Ten Years

December 3 – January 31 2004
The Blue Gallery
15 Great Sutton Street
London
EC1V
Tel: 020 7490 3833

Selection of the extraordinary images of faraway galaxies, black holes and dying stars brought to us by the Hubble Space Telescope.

Reports

The Planets in December 2003

Glen Thomas - Planetary Section Director

Mercury moves through maximum eastern elongation (visible distance from the Sun) on the **9th** and may be visible in the evenings for a week thereafter. However, Mercury will only be 4° above the SW horizon at the end of civil twilight (**16:35**) so a sea horizon will probably be necessary for observing this planet.

Venus climbs through Sagittarius throughout the month as it heads towards its April peak. The 'Evening Star' will be clearly visible in the SW as the sky darkens after sunset, climbing to an altitude of 14° by the end of the year (look for it around 16:45).

Mars transits (reaches its highest point in the south) around the time Venus during the early evening and, at an altitude of 40°, will still be visible for some months to come. It is, however, now receding rapidly, dimming to magnitude +0.2 by the **31st** and presenting a tiny 8.8" disc. The British Beagle 2 craft, piggy-backing on the Mars Express probe, is due to land on the Red Planet on Christmas morning. It is currently (midnight on 11th/12) closing from around 3/4° NE of the Martian disc, although I can find no estimate of its visual magnitude!

Jupiter spends the month four times larger in the eyepiece than Mars and is equally high in the sky, although it is best seen before dawn (**06:00** on the **11th**, **04:50** on the **31st**).

Saturn is visible through the whole night and is highest shortly after midnight. With its rings spread out it appears wider than Jupiter at 46", although the disc is less than half that. While the planet is less strongly banded than Jupiter it is still possible to glimpse markings on the cloud tops. The Cassini-Huygens spacecraft arrives in the Saturnian system during 2004, passing through the rings on July 01.

Uranus, Neptune and Pluto are not favourable.

The largest asteroid, **1 Ceres**, is moving NW through Gemini and will be 1°.5 north of the waning gibbous Moon around midnight on the **11th/12th**. It will also pass close to the first magnitude star **Pollux** (78 • Geminorum), which is the brightest of the twins in Gemini despite its • label. Look for Ceres half a degree south of Pollux on the evening of the **17th** and the same distance west (right) of the star three days later on the **20th**. At magnitude +7.2, steadily held binoculars should be sufficient to see this minor planet.

Solar Section Report - November, 2003

Section Director, Brian Halls

November began with the disappearance of the large groups responsible for much of the exciting activity that occurred during much of the latter part of October. Regions 10486 (S17⁰ L=284⁰ area/type = 1900/Fkc) and 10488 N08⁰ L= 290⁰ area/type=1610/Fkc) rotated of the disk during the first week of November but, not before 10486 generated a very powerful x-ray flare that peaked somewhere between X30 and X40 – the most powerful ever recorded.

After the disappearance of these groups, anything else that appeared on the Sun was very much an anti climax. Indeed, sunspot activity declined so only one group was on the Sun on the 7th – a C-class group which under normal circumstances at this time in the downward trend of the present with normally sparse numbers of groups being visible cycle would be an interesting object to observe.

Over the next few days sunspot activity began to increase again, with moderately interesting groups being visible. By the 18th, the expected happened. One of the large groups of October reappeared over the eastern solar limb. Now renumbered, as is the custom, 10507 (N10⁰ L=295 area/type= 0890/Eki) still remained a very magnetically complex area. A day later it was joined by another reappearing active area, now numbered 10508 (S17⁰ L=282 area/type= 0700/Eko).

Over the following week, these two groups crossed the solar disk along with other smaller but no less fascinating to observe groups. Although 10507 remained fairly constant during its transit, 10508 began to decay – much of the magnetically distorted fields that had generated it during its October pass, now depleted.

These two groups remained on the Sun until the end of the month along with a scattering of other smaller groups.

Due perhaps to the later rising and early setting of the Sun coupled with poor weather only one monthly report was received, from Graham Boots who observed the Sun on 13 days.

MDF= 3.0 R= 44.3

Notices

Recent Additions To The Was Library

Linda & Dave Storey

The following titles have been added to the library stock.

Gods in the Sky by Allan Chapman
Observer's Guide to Stellar Evolution by Mike Inglis
The Earth in Context by David Harland

Gemini 7 – NASA mission reports
Connecting Quarks with the Cosmos – 11 science questions for the new century
Arrows to the Moon by Chris Gainor
Revealing the Universe by Wallace & Karen Tucker
An Introduction to Radio Astronomy by Bernard Burke and Francis Graham Smith
The Conquest of Space by David Lasser

Articles

Which universe are we in?

Michael A Marshall

In her September talk on Cosmology Caroline Beevis reminded us that there is a universe that we cannot see us that there (but one that is an entity), apart from the universe that we can see (but one that is not an entity). Entity here is as a house that exists as a whole at any one time. A non-expert as myself faces a stumbling block when reading, hearing or thinking about Cosmology without realising which universe is being considered.

The universe we cannot see is the one that exists everywhere at the same time after the Big Bang: we can only see Andromeda 2.2 million years younger than it is at the present time. The characteristics of this universe can nonetheless be extrapolated from those of the historical but visible universe and be kept in our minds. For example, the expansion rate of the present universe extrapolates to 71 kilometres per second per million parsecs (21.8 per million light years) according to WMAP. Considering that light travels at 300,000 Kilometres per second, and dividing the second figure into the third, galaxies at a distance of nearly 14,000 million light years distant at the present time must surely be receding at the speed as to return no light themselves as if having reached a black horizon.

Many years ago I was criticized by a WAS member for this calculation, because according to Einstein distances shrink as recession approaches the speed of light. I take the criticism as a red herring as this horizon distance is not observable but is in the mind as if looking from outside the universe for sake of understanding - God's view as the member angrily accused.

The present but unobservable horizon of see great extent is obviously different from what we might one day see beyond what WMAP can different presently see: we might see the minute extent of the birth of the Big Bang, albeit on the scale of some 15,000 million light years radius when accepting that expansion of the universe was slower in the past. The implication of this scale distortion was remarked in the July the past. 2002 WAS News article "Does the Universe Have an Outside?"

Another difference between the two universes is one concerning the dimensional order. The one we see out there at any one time since the Big Bang takes times in the form of history a spherical shell, other shells sitting at different times in history. That is to say it has two spatial dimensions (albeit curving into the third as intuition tells us) and one time dimension that takes us to different shells. The universe we cannot see outside our minds at any one time occupies not one shell but all shells. That is to say it has three special dimensions, and one dimension of time that takes us to any one time in the history of the universe. Does that not support the view that the second universe is an entity whilst the first is not?

The question left is what is the full extent of the universe now and what is it leading to in the future? As Caroline says, the universe is considered to be open in the sense that it will continue to expand, and as WMAP says the expansion rate is increasing. Added to that it is considered that before the time of the formation of photons, which travel at the speed of light, the very early universe was expanding at a rate vastly exceeding the speed of light. The implication here is that light from most of the universe presently and back in time has not reached us to be noticed and considered: we seem to know less about the full extent than we know about the nature of the dark matter. My provisional answer stands as explained in the aforementioned article.

What's on the Box

Saturday 13th December 2003



12.45-13.05 ~ **The Sky at Night**

The world of astronomy. Patrick Moore takes a look at comets.

Wednesday 17th December 2003



00.30-01.30 ~ **Beagle 2 - A Mission to Mars**

Keith Allen presents this documentary following Professor Colin Pillinger and his team as they endeavoured to send Beagle 2, a small spacecraft capable of conducting pioneering experiments, to the red planet. Putting a human face on pioneering British space science, the film shows them trying to get the project official approval and the money needed for liftoff.



05.00-06.00 ~ **The Ascent of Mars Mountain**

Brian Blessed presents a documentary which follows a unique experiment to try to simulate the experience of

climbing the highest known mountain in the universe - Olympus Mons on Mars. A five-strong team of leading climbers led by Blessed travel to Reunion Island in the Indian Ocean to try out their specially designed space suits for mountain climbers.

Thursday 18th December 2003



00.30-01.30 ~ **Beagle 2 - A Mission to Mars**
as above

Sunday 21st December 2003



20.00-21.00 ~ **Mars**

How NASA scientists put together the unmanned mission to the red planet. It's one of the most ambitious space projects ever - and one mistake could be fatal

Thursday 25th December 2003



08.30-09.00, 11.30-12.00 & 20.30-21.00 ~ **Escaping Earth**

Following the Columbia tragedy earlier this year, what is the future for the Space Shuttle and for manned spaceflight?

Saturday 27th December 2003



18.50-20.25 ~ **Galaxy Quest**

Affectionate satire of Star Trek-style TV programmes in which the stars of a 1970s sci-fi show - now scraping a living through re-runs and sci-fi conventions - are beamed aboard an alien spacecraft. Believing the cast's heroic on-screen dramas are historical documents of real-life adventures, the band of aliens turn to the ailing celebrities for help in their quest to overcome the oppressive regime in their solar system.

Tuesday 30th December 2003



22.00-23.00 ~ **Space Shuttle**

(Human Time Bomb) Explores what happened when the Space Shuttle Columbia fatally exploded during its re-entry into the atmosphere, killing all seven of its crew.

Wednesday 31st December 2003



14.00-15.00~ **Coming Home from Space**

Investigates the cause of the Columbia shuttle break-up as it entered the Earth's atmosphere and how a similar disaster could be avoided in future.

WAS News News

Firestorm of star birth seen in a local galaxy

Space Telescope Science Institute Release



This festively colorful nebula, called NGC 604, is one of the largest known seething cauldrons of star birth in a nearby galaxy. NGC 604 is similar to familiar star-birth regions in our Milky Way galaxy, such as the Orion Nebula, but it is vastly larger in extent and contains many more recently formed stars.

This monstrous star-birth region contains more than 200 brilliant blue stars within a cloud of glowing gases some 1,300 light-years across, nearly 100 times the size of the Orion Nebula. By contrast, the Orion Nebula contains just four bright central stars. The bright stars in NGC 604 are

extremely young by astronomical standards, having formed a mere 3 million years ago.

Most of the brightest and hottest stars form a loose cluster located within a cavity near the center of the nebula. Stellar winds from these hot blue stars, along with supernova explosions, are responsible for carving out the hole at the center. The most massive stars in NGC 604 exceed 120 times the mass of our Sun, and their surface temperatures are as hot as 72,000 degrees Fahrenheit (40,000 Kelvin). Ultraviolet radiation floods out from these hot stars, making the surrounding nebular gas fluoresce.

NGC 604 lies in a spiral arm of the nearby galaxy M33, located about 2.7 million light-years away in the direction of the constellation Triangulum. M33, a member of the Local Group of galaxies that also includes the Milky Way and the Andromeda Galaxy, can be seen easily with binoculars. NGC 604 itself can be seen in a small telescope, and was first noted by the English astronomer William Herschel in 1784. Within our Local Group, only the Tarantula Nebula in the Large Magellanic Cloud exceeds NGC 604 in the number of young stars, even though the Tarantula Nebula is slightly smaller in size. NGC 604 provides Hubble astronomers with a nearby example of a giant star-birth region. Such regions are small-scale versions of more distant "starburst" galaxies, which undergo an extremely high rate of star formation. Such starbursts are believed to have been common in the early universe, when the star-formation rate was much higher. Supernovae exploding in these galaxies created the first chemical elements heavier than hydrogen and helium.

The image of NGC 604 was assembled from observations taken with Hubble's Wide Field Planetary Camera 2 in 1994, 1995, and 2001. Color filters were used to isolate light emitted by hydrogen, oxygen, nitrogen, and sulfur atoms in the nebula and ultraviolet, visible and infrared light from the stars within NGC 604 and the nearby spiral arms of M33. Image processors from the Hubble Heritage team at the Space Telescope Science Institute combined these various filter images to create this color picture.

The Space Telescope Science Institute (STScI) is operated by the Association of Universities for Research in Astronomy, Inc. (AURA), for NASA, under contract with the Goddard Space Flight Center, Greenbelt, MD. The Hubble Space Telescope is a project of international cooperation between NASA and the European Space Agency (ESA).

Diary

December 10 *The Relevance of Astronomy to Human Culture* - Dr Francisco Diego University College London

January 14 2004 *The First 3 Minutes of the Universe* - Bob Turner F.R.A.S.,

February 11 2004 *Solar Neutrinos* - Dr. Robert C. Smith University of Sussex

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: glen.thomas@bigfoot.com

Executive Committee

Chairman: Glen Thomas

20 Wayside Avenue
Durrington
BN13 3JU
Tel: 01903 261723
Email: glen.thomas@bigfoot.com

Vice-Chairman: Bob Turner

21 Beechwood Ave
Worthing
West Sussex
BN13 2HR
Tel: 01903 692522
Email: rfturner@compuserve.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: grahamboots@observatory99.freemove.co.uk
Web Site: www.observatory99.freemove.co.uk

Membership Secretary: Post Vacant

Treasurer: Michael Marshall

84 Bramley Road,
Worthing,
West Sussex.
BN14 9DT
Tel: 01903 823576

Curator of the Observatory: Graham Boots

101 Ardingly Drive,
Worthing,
West Sussex
BN12 4TW.
Tel / Fax: 01903 505346
Email: grahamboots@observatory99.freemove.co.uk
Web Site: www.observatory99.freemove.co.uk

Note to Contributors

Contributions & Correspondence for the **January** issue of WAS NEWS should be with the Editor by **January 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

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