



Number 148

WAS NEWS

Monthly Newsletter of the Worthing Astronomical Society

Official website: www.was.org.uk

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



December 2001

ALMANAC

All times U.T.

Dec./ Jan.

LUNAR

December	Date	Time	rise	set
Last Quarter	7th	19.52	23.28	12.56
New moon	14th	20.47	07.29	15.39
First Quarter	22nd	20.56	12.24	23.51
Full Moon	30th	10.40	15.56	08.16
January				
Last Quarter	6th	03.55	**.**	12.00
New moon	13th	13.29	08.19	15.59
First Quarter	21st	17.46	11.15	**.**
Full Moon	28th	22.50	15.55	07.50

21st	00	Mars 4° N. of moon
28th	08	Saturn 0.2° S. of moon
30th	14	Jupiter 1° S. of moon
January		
1st	06	Jupiter at opposition.
2nd	15	Earth at perihelion (147 million km.
12th	00	Mercury at greatest elongation E. 19
13th	13	Venus 1. N. of moon
14th	12	Venus in superior conjunction
15th	05	Mercury 4. N. of moon
18th	21	Mercury at stationary point
19th	03	Mars 5. N. of moon

EARTH

December	Sunrise	Sunset
7th	07.51	15.52
14th	07.59	15.51
22nd	08.04	15.54
30th	0806	16.00
January		
6th	08.05	16.08
13th	08.01	16.17
21st	07.54	16.30
28th	07.45	16.42

Minima of Algol

Dec	15th 18.42	27th 06.00	30th 02.48
	Jan.		

Lunar Occultations

Times as at W.A.S. Observatory

Date	U.T.	S.A.O.No	Mag	Phase
Dec				
19th	17.27.38	164674	7.6	diss
20th	19.12.04	165221	7.8	diss
22nd	19.56.19	128621	5.8	diss
23rd	18.31.06	128992	8.7	diss
23rd	19.10.17	129007	8.2	diss
23rd	21.10.20	129029	7.9	diss
23rd	22.33.55	109552	7.6	diss
24th	17.57.57	110004	8.0	diss
25th	20.02.59	110516	6.9	diss
27th	21.59.42	93801	6.6	diss
28th	22.20.22	76972	5.8	diss
29th	20.03.33	77915	4.3	diss
Jan 2002				
3rd	02.17.13	99080	6.1	reapp
4th	02.39.22	99553	8.4	reapp
4th	04.51.00	118813	6.6	reapp
5th	02.28.40	119262	6.8	reapp
5th	04.47.25	119297	8.1	reapp
5th	06.34.57	119317	8.2	reapp
7th	05.40.27	139669	6.6	reapp
7th	06.09.44	139671	8.1	reapp
7th	06.26.18	139689	8.5	reapp
7th	06.31.43	139679	8.4	reapp

PLANETS

(as at December 30th.)

	Constellation	Rises	Sets	Mag.
Mercury	Sagittarius	09.12	17.04	-0.8
Unfavourable				
Venus	Sagittarius	07.54	15.44	-3.9
Unfavourable				
Mars	Aquarius	11.02	22.07	+0.7
Visible in the Southwest				
Jupiter	Gemini	16.02	08.24	-2.7
Visible most of the night				
Saturn	Taurus	14.02	05.50	-0.4
Visible most of the night				
Uranus	Capricornus	10.17	19.53	+5.9
Unfavourable				
Neptune	Capricornus	09.37	18.32	+8.0
Unfavourable				
Pluto	Ophiuchus	05.32	15.27	+13.9
Unfavourable				

PHENOMENA

Day	Hour	December
14th	06	Venus 0.8° S. of moon
14th	21	Annular eclipse, central America
15th	08	Mercury 2° S. of moon

This is only about 15% of the predictions for the W.A.S. observatory.

Please note the change to **Smithsonian Astrophysical Observatory** star catalog = S.A.O. I hope this will be of more use to members.

Planetary Report

Glen Thomas

Mercury is not visible during December following superior conjunction on the 4th, but starts a new evening apparition from 4th January. Look close to the SE horizon at the end of evening civil twilight, 40 minutes after sunset at this time of year. You will need a clear horizon, though, as the altitude on the 4th is only 4.5 degrees, climbing to 6.3 degrees above the horizon on the 8th December.

Venus rises in the SE just as civil twilight begins on the 13th December so it may be visible for a few minutes before the sky gets too bright, although binoculars and a clear SE horizon may be needed.

Mars continues to recede, but as it is getting higher in the sky each night it may rise above the turbulent air that has spoilt the view up to now. It rises from 25 degrees to 31 degrees above the horizon during the month as the sky darkens in the early evening, giving the opportunity to see a steady, if diminutive, disk.

Jupiter is at opposition on New Year's Day and is now in retrograde motion, appearing to move slowly westwards past the stars as the Earth, in its smaller faster orbit, overtakes giant planet for a while.

Saturn is a magnificent sight riding high in the sky before midnight, rings spread wide. Take the opportunity this Christmas to show it off to visitors as Saturn like this is guaranteed not to disappoint. Look for Titan, Saturn's largest satellite and the 2004 target for the European Huygens probe. It will be about four diameters North of Saturn on the 8th and the same distance South on 15th December. At visual magnitude 8 you might see it in steadily mounted binoculars. There should be no stars near enough to confuse, so any points of light closer than Titan will be Saturn's other, smaller, satellites.

Uranus, Neptune and Pluto are not suitably placed this month.

Editors Note

Ho! Ho! Ho! And a very Happy, but premature Christmas and New Year to you all.

If all has gone according to plan and **Project Omega** has been executed, you should have in your hand the special (drum roll) limited, (drum roll) collectors edition of the Christmas COLOUR version of WAS NEWS.

Marvel in its quality, rejoice in the Technicolor, and savour its beauty!!!

Excuse me, I've got to go and lay down.

Rob

From the Chairman

Brian Halls

May I take this opportunity to wish all our members the greetings of the Season? Let us hope that the long cold dark evenings of winter are clear and we are able to get outside and look at the night skies without the fear of too much cloud or being caught in a downpour.

Just a few notices for you to ponder about:

1. The Society has been challenged for the SAGAS trophy – an event for those newcomers who are not aware is a bit of fun and allows us to socialise with members from other local astronomical societies. Both Brighton and South Downs AS are having a skittles evening on February 23 at the Barley Mow, on the evening of the next SAGAS meeting in Chichester (February 23). It would be nice if we could organise a team to take part in this event. Let me know if you are interested.
2. The New Year Social will be held at the Heene Church Rooms in January (see the Diary). Could members please volunteer to bring along some items of food (sausage rolls, mince pies, etc) – the sort of item that ends up surplus to the end of year holiday.
3. Talking of the Social, do not forget that there will be the Astro-Art competition (purely for fun – though I am sure we could organise a prize for the best piece). By the term 'art' I mean any piece of photography, drawing, cartoon etc. that has an astronomy theme. I am sure lots of members take astronomical photographs but, for one reason or another do not show them at meetings. Bring them along in January so we can see what members are up to.
4. Do not forget the Solstice Drink at the *North Star* (see Linda Storey's article elsewhere in this newsletter).

The Society is still on the look out for a Secretary – several members of the Committee are, at the moment sharing the various functions of this job; if you would like to know more about the job, please let me know (phone number / e-mail address at back of WASNews).

Dates for your Diary

Lunar & Planetary Photographic Events at the Observatory

Graham L. Boots - Curator of the Observatory

Those wishing to undertake photography of the Moon, Saturn and Jupiter please come to the Observatory (Weather permitting) around 7.00 p.m. on any of the dates listed below.

The Celestron 8 f10 Schmidt/Cassegrain will be in use at prime focus and eyepiece projection method with and without filters. Speed of film (not supplied) can be anything from 50 to 400 ISO colour or black and white. Many adapters are available for your own single lens reflex camera.

I regret automatic cameras are not suitable but we are able to supply SLRs on site. If in doubt about the weather/seeing conditions please telephone 01903 505346

DECEMBER

Friday 21st December 6 day old Moon

Saturday 22nd December 7 day old Moon

Moon is in the western sky with Saturn & Jupiter rising

Solstice Drink

Linda Storey

Friday 21st December

The venue for this year's winter solstice drink is **The North Star**, Littlehampton Road, Worthing. Appropriately named, this pub has been refurbished and is now a very pleasant place to have a drink or two.



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.

Astrofest 2002

February 8th & 9th - Kensington Town Hall London
European AstroFest 2002: a two day conference and exhibition

Forthcoming Astronomical Events

December 2001

Dec 13 - Geminids Meteor Shower Peak

Dec 14 - Annular Solar Eclipse (Visible From Hawaii, Pacific Ocean & Central America)

Dec 14 - Moon Occults Venus

Dec 15 - 35th Anniversary (1966), Audouin Dollfus' Discovery of Saturn Moon Janus

Dec 16 - Comet Wolf Closest Approach To Earth (2.651 AU)

Dec 16 - Asteroid 712 Boliviana Occults TYC 0717-00205-1 (9.5 Magnitude Star)

Dec 17 - Jupiter Occults TYC 1894-00662-1 20.01UT (10.5 Magnitude Star)

Dec 19 - [Nov 21] Comet C/2001 W1 (LINEAR) Closest Approach To Earth (1.512 AU)

Dec 21 - Winter Solstice, 19:12 UT

Dec 22 - Ursids Meteor Shower Peak

Dec 22 - [Nov 24] Comet C/2001 W2 (Batters) Perihelion (1.068 AU)

Dec 22 - Comet P/1993 K2 (Helin-Lawrence) Perihelion (3.110 AU)

Dec 22 - Comet Grigg-Skjellerup Closest Approach To Earth (2.471 AU)

Dec 28 - Moon Occults Saturn Pacific Ocean

Dec 29 - Comet Borrelly Closest Approach To Earth (1.281 AU)

Dec 30 - Lunar Eclipse

Dec 30 - [Nov 20] Comet C/2001 U6 (LINEAR) Closest Approach To Earth (4.209 AU)

January 2002

Jan 01 - Jupiter At Opposition

Jan 03 - Earth at Perihelion (0.983 AU From Sun)

Jan 03 - Quadrantids Meteor Shower Peak

Jan 03 - Comet Wild 4 Closest Approach To Earth (2.280 AU)

Jan 04 - Comet C/2001 T4 (NEAT) Perihelion (8.555 AU)
 Jan 08 - Comet Machholz 1 Perihelion (0.124 AU)
 Jan 08 - Comet Machholz 1 Closest Approach To Earth (0.862 AU)
 Jan 08 - Stephen Hawking's 60th Birthday (1942)
 Jan 09 - Mercury Passes 1.2 Degrees From Neptune
 Jan 11 - Comet Mrkos Closest Approach To Earth (1.702 AU)
 Jan 11 - 215th Anniversary (1787), William Herschel's Discovery of Uranus Moons Titania and Oberon
 Jan 12 - Mercury At Its Greatest Eastern Elongation (19 Degrees)
 Jan 12 - Comet C/1999 U4 (Catalina-Skiff) Closest Approach To Earth (4.415 AU)

Reports

Observatory Report Session 2000/2001 (No: 31)

Graham L. Boots Curator of the Observatory

Over the last year there has been 27 Observer's Nights held on Friday evenings when the night sky has been reasonably clear which bearing in mind the British weather is a surprisingly large portion. On these evenings the average attendance has been seven, which is an increase on the previous year by one. On cloudy Fridays we meet in the Observatory Support Room where there is refreshment facilities and lively astronomical discussions takes place. The use of the computer with astronomical software features prominently on these evenings.

As well as members of the society we have again had plenty of visitors during this session. An astronomy course for children between the ages of eight and thirteen has been held three times at Davison School in East Worthing. These courses raised a total raised £450 towards society funds with more planned. These courses have lead to three group visits to the Observatory on clear evenings with a total attendance of between fifty and sixty people, which included their parents, brothers, sisters and friends. National Science Week held each March gave rise to two clear events and a total of twelve members of the public came along. This event was once again badly affected by the weather with seven other people never achieving a clear evening. We had two groups of Brownies who were blessed with clear skies and which totalled eighteen. Often on Observer's Nights visitors join us. Before leaving visitors are given colourful astronomical leaflets and brochures to remember their visit that the Curator obtains free of charge from The Particle Physics Astronomy Research Council. As Stellar and Deep Sky section director I chose only one constellation this session this being Serpens Clauda. On

Observer's Nights we viewed my chosen objects that lay within this constellation including M17 the Omega Nebula and M16 the Eagle Nebula, which are both emission nebulae. I was able to demonstrate the significant improvement the Lumicon Ultra High Contrast filter makes on objects of this type.

One of the most successful events during this session was the Lunar and Planetary Photographic evening held on the 29th January 2001, the seeing on this occasion was remarkable. The Celestron 8 was used and the seven members and visitors present obtained excellent photographs. All the other planned evenings of this type were clouded out. Good photographic results of Mercury were also obtain earlier that evening and again in May. Uranus and Neptune were attempted photographically by Alex Vincent who also spends much time at the Observatory recording eclipsing binaries at maximum and minimum luminosity and comets for astrometric purposes with his camera. Alex submits most of his results to the appropriate sections of the British Astronomical Association (B.A.A.).

Much use of filters is made and I have purchased two new ones, recently. These have become such an important observing tool that the Curator published a short paper entitled 'Filters for Celestial Objects', which is designed to aid the choice of filters, when observing particular objects. Recently a paper written by the Curator called 'Why Not Green Hot? – Why there are no green stars' was published in the 'Deep Sky Observer' which is the quarterly journal produced by The Webb Society. Members of Worthing Astronomical Society are acknowledged in this paper for their assistance in helping to determine visual star colours. The paper featured ten doubles or triple stars and two single ones observed on Observer's Nights throughout the session.

Fine photographs were taken of the total lunar eclipse on the 9th January 2001 both at and away from the Observatory. Member's photographs taken during this and in previous sessions have been mounted on two display boards to be shown on behalf of the society at astronomical events and at exhibitions. We have to date accrued over fifty photographic boards over the years.

Members at the Observatory observed three meteor showers, these being the Perseids, Leonids and Geminids and completed report forms were sent to the B.A.A. meteor section in each case.

Only four lunar occultation events were timed this session all with the 29.2cms. Newtonian. These were sent to the International Lunar Occultation Centre in Tokyo who this

session published the final reductions for 1997, which contained seven events timed by members of the society.

The Asteroid video camera has continued to be put through its paces. The faintest star so far recorded is 10.8 and the closest separation of two stars is now 10 arc seconds, the field of view on the Newtonian is about $\frac{1}{4}^\circ$ square. Orientation markers have been applied. Group observational sessions are really successful. Recently six members and visitors were able to watch the disappearance of Saturn going behind the Moon and the reappearance an hour later. A recording was made of this event. At present we have a problem in trying to get the video recorder working in cold damp conditions, this kind of equipment is not meant to work under 10°C but we are currently investigating ways to overcome this. Another video recorder has been donated to the society recently. It is planned to connect the video camera with the computer and attempt electronic multiple image stacking in the next session.

Shortly a new finder will be purchased for the Newtonian, which will have a larger field of view, and with less magnification than the present finder, which will make finding objects easier.

Simple computer systems, small telescopes and instruments that have been donated to the society over the years are available for loan to members via the Curator.

In July both the Observatory and the Newtonian telescope received an extensive service.

I thank all those members who have helped in various ways in the operating of the Observatory throughout this session.

*November Lecture Reviewed - Report by
Vanessa Wegner*

Comets Past & Present

Speaker – Alan Drummond

Comets are minor members of the solar system, they are mountain-sized bodies rather than planet sized but in spite of their size they can be quite spectacular. Every 2 to 3 years we see a reasonable sized comet but very spectacular ones are more rare occurring every 20 to 50 years. Alan explained that he has spent most of his observing life waiting for the really big one but now this has been & gone, however in astronomy you never know what is round the corner.

Comets have been known about for a long time, the earliest record dates from the 11th century BC; Halley's comet came back in about 1059 BC so possibly this record relates to Halley's comet.

Records of comets become more frequent as you go forward in time, this does not mean there were more comets but rather we were getting better at keeping records. Ancient people speculated whether comets were astronomical objects or atmospheric, a clue pointed out early on was that a comet's tail would always point away from the sun, nevertheless Aristotle thought that comets existed in the atmosphere.

This hypothesis was accepted until the renaissance. The issue was not settled until 1577 when there was a spectacular comet, even more amazing than Hale-Bopp, it had a long tail & its brightness was comparable to Venus. It was discovered in Peru but was also observed by Tycho in Europe. Tycho noticed that it had a negligible parallax & this helped him realise that it was not an atmospheric object as he was able to measure that it was further away from the earth than the moon.

In 1680 a comet appeared that had a tail 20 to 30 degrees in length before it disappeared towards the sun, when it reappeared it had a tail 70 degrees long. Sir Isaac Newton tried to work out what sort of path it was taking; originally he thought it was two separate objects, one going towards the sun & another coming away from the sun. Then Newton thought it was one object moving in a straight line. What was interesting about this comet is that its path took it very close to the sun which explains why it was so brilliant, the pressure & the solar wind would have caused this.

In 1682 Edmund Halley used Newton's method to determine orbits of comets & in 1695 he realised that the comet of 1682 had the same orbit as 2 earlier comets, Halley came to the conclusion that all three comets were actually the same comet. Halley stated that the orbits were not open orbits at all but closed orbits & the comet would return. Comet famously said "I dare venture to tell that it will return again about the year 1758" which of course it did.

Moving on to more recent comets, 1970 Comet Bennett was the first comet Alan observed. It was a dawn object & very bright at magnitude 1 with a tail of 10 to 15 degrees, it developed two tails, which is a feature of many major comets, a dust tail, & a gas tail. Alan showed some slides of Comet West, which was a truly spectacular comet, & Comet Levy. In 1985 Halley's comet returned but in one of the worse observing circumstances for a

thousand years due to being at its brightest when it was furthest away.

In 1994 Shoemaker-Levy-9, which was orbiting around Jupiter famously crashed into the planet, Alan saw the affects of the impact with a 4-inch reflector.

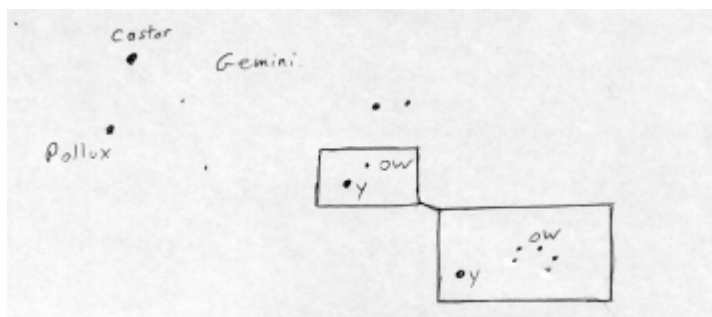
Alan appropriately ended his talk with slides of Hale-Bopp (1997), which caused a sensation due to its brightness & the many clear nights, which occurred for all to easily observe it. Hale-Bopp was the most luminous comet since Tyco's comet in 1577.

Alan gave the audience a fascinating insight into one of the most beautiful & still mysterious wonders of the night sky.

Articles

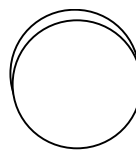
Eclipse of OW Geminorum

Alex Vincent

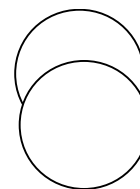


The long period eclipsing star 'OW Geminorum' will be at minimum on January 3rd / 4th 2002. This star has a period of 3.4459 years (1258.63 days) and at minimum it is of magnitude 8.2 and drops to 10.0 at minimum. The duration of the eclipse lasts 16 days and so observations should be made between December 26th and January 14th. The primary star is almost totally eclipsed at minimum.

The orbit of OW Geminorum is elongated and therefore secondary minima are to one side of the primary minima and the next one is due around October 26th 2002. The amplitude will be much shallower at secondary minimum. The star is at RA 06h 31m 42s and dec +17° 04.9' (2000.0). It is about 1½ degrees from the 2nd magnitude star Gamma Geminorum. Good observing.



Primary eclipse



Secondary eclipse

The system of OW Geminorum comprises of a bright white F2 star and a cooler G8 component. The bright star at minimum is as close to being a total eclipse without actually being one.

Notices

Gift Of A Telescope

Quite a while ago the society was given a partly completed 20 cm's Dobsonian reflecting telescope.

It does need a lot of work to complete and will need a number of purchases such as a eyepiece holder/focuser, eyepieces, finder and possibly a new flat secondary mirror. The main mirror appears sound.

Any one interested please contact Graham Boots on 01903 505346

Annual Fees

The annual membership fee is now due. Please make your cheques payable to Worthing Astronomical Society for the appropriate sum.

Ordinary Membership £14.00
Family Membership £21.00
Junior Membership £ 6.00

Student membership (as defined in the constitution) is free.

If you have not paid your membership subscription by the end of December, this shall be the last WASNews you will receive.

Christmas Quiz for WAS News

Brian Halls

Name these astronomers or space scientists. Name the books in which they appear and the author:

1. The headstrong woman astronomer received radio instructions from the vicinity of the star Vega, to construct a device to traverse space.
2. This scientist was confronted with what he at first thought was a ghost of an astronaut who had disappeared on a space mission 10 years previously – but he was not a ghost – however he had an important message for the scientist and mankind
3. Some considered this space scientist crazy, but he built a rocket to intercept a planet coming into the solar system; his two unwitting companions went into space with him and came face to face with a mad Emperor.
4. “The chances against anything man-like on Mars are a million to one” were the words of this Victorian astronomer. Sadly, the inhabitants of Woking were to find out how incorrect he was.

Answers at the New Year Social.

What's on the Box

Friday 14th December 2001

BBC TWO

01.05 - 01.35 ~ Final Frontier

From the National Space Centre in Leicester, astronomers Dr Paul Roche and Alex Barnett present a look at the latest developments in the world of space science and astronomy

Saturday 15th December 2001

BBC TWO

11.50 – 12.10 ~ The Sky at Night

(The Star of Bethlehem) Guide to astronomy. Patrick Moore, David Hughes and Mark Kidger attempt to track down the original Star of Bethlehem. Although it is often assumed to have been Venus, the experts argue that this cannot be the case

WAS News News

A Giant Star Factory in Neighbouring Galaxy

Space Telescope Science Institute news release



Galaxy NGC 6822. Credits: NASA, ESA, and The Hubble Heritage Team (STScI/AURA) Acknowledgment: C. R. O'Dell (Vanderbilt University) and L. Bianchi (Johns Hopkins University and Osservatorio Astronomico, Torinese, Italy)

Resembling curling flames from a campfire, this magnificent nebula in a neighbouring galaxy is giving astronomers new insight into the fierce birth of stars as it may have more commonly happened in the early universe. The glowing gas cloud, called Hubble-V, has a diameter of about 200 light-years. A faint tail of nebulosity trailing off the top of the image sits opposite a dense cluster of bright stars at the bottom of the irregularly shaped nebula.

NASA's Hubble Space Telescope's resolution and ultraviolet sensitivity reveals a dense knot of dozens of ultra-hot stars nestled in the nebula, each glowing 100,000 times brighter than our Sun. These youthful 4-million-year-old stars are too distant and crowded together to be resolved from ground-based telescopes. The small, irregular host galaxy, called NGC 6822, is one of the Milky Way's closest neighbors and is considered prototypical of the earliest fragmentary galaxies that inhabited the young universe. The galaxy is 1.6 million light-years away in the constellation Sagittarius.

Diary

January 9 – Society New Year Social

February 13 – *The Moon* by Peter Gill (Eastbourne Astronomical Society)

March 13 - *The Aurora* by Neil Bone (South Downs Astronomical Society, Astronomy Now)

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: worthing_astronomical_society@hotmail.com

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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.

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