



WAS NEWS

Monthly Newsletter of the Worthing Astronomical Society

Official website: www.was.org.uk

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



Number 144

July 2001

ALMANAC

All times U.T. for B.S.T. add one hour.

July. / August.				
LUNAR				
July	Date	Time	Rise	Set
Full Moon	5th	15.04	20.31	03.26
Last Quarter	13th	18.45	23.45	11.59
New moon	20th	19.44	03.14	20.15
First Quarter	27th	10.08	12.48	23.20
August				
Full Moon	4th	05.56	20.19	04.13
Last Quarter	12th	07.53	22.50	13.20
New moon	19th	02.55	04.48	19.57

6th	23	Jupiter 1° N. of Venus
12th		Perseid meteor shower
14th	03	Saturn 0.2° N. of moon
15th	15	Uranus at opposition
15th	20	Jupiter 0.4° S. of moon
16th	13	Venus 2° S. of moon
20th	02	Mercury 3° S. of moon

Minima of Algol

July	13th	22.54	31st	03.42
August	3rd	00.30	5th	21.24
			23rd	02.12

EARTH			
July	Sunrise	Sunset	
5th	03.50	20.19	
13th	03.58	20.13	
20th	04.07	20.06	
27th	04.17	19.56	
August			
4th	04.29	19.43	
12th	04.41	19.29	
19th	04.52	19.15	

Lunar Occultations

Times as at W.A.S. Observatory

Date	U.T.	Z.C.No	Mag	Phase
July	h. m. s.			
11th	01.46.03	3450	8.5	reapp
17th	01.45.46	620	6.1	reapp
19th	05.12.20	976	2.9	diss
19th	06.08.55	976	2.9	reapp
22nd	20.21.49	1485	7.1	diss
26th	21.38.49	1976	7.0	diss
26th	22.06.43	1978	6.6	diss
28th	22.44.47	2213	5.8	diss
29th	23.06.11	2353	4.5	diss
August				
1st	00.16.24	2630	5.0	diss
10th	00.39.37	208	7.0	reapp
13th	02.47.59	581	6.8	reapp
14th	01.25.50	720	8.4	reapp

PLANETS

(as at July 27th.)

Constellation	Rises	Sets	Mag.
<u>Mercury</u>	Gemini 03.19	19.30	-1.4
Unfavourable			
<u>Venus</u>	Taurus 01.17	17.16	-4.0
Brilliant morning object in East			
<u>Mars</u>	Ophiuchus 17.03	00.09	-1.6
Visible in the southern sky.			
<u>Jupiter</u>	Gemini 01.46	18.05	-2.0
Just visible low E.N.E. around 03.00			
<u>Saturn</u>	Taurus 00.31	16.16	+0.2
Low E. N. E. before sunrise			
<u>Uranus</u>	Capricornus 20.34	06.17	+5.7
Favourable			
<u>Neptune</u>	Capricornus 19.50	04.50	+7.8
Favourable			
<u>Pluto</u>	Ophiuchus 15.27	01.37	+13.8
Favourable			

PHENOMENA

Day	Hour	July
9th	18	Mercury at greatest elongation W. 21°
12th	22	Jupiter 2° N. of Mercury
15th	08	Saturn 0.7° N. of Venus
17th	13	Saturn 0.6° N. of moon
17th	18	Venus 0.3° S. of moon
19th	00	Jupiter 0.2° N. of moon
19th	23	Mars at stationary point
30th	12	Neptune at opposition
30th	15	Mars 6° S. of moon
August		
5th	22	Mercury in superior conjunction

This is only about 25% of the predictions for the W.A.S. Observatory. If you are interested there are some Occultation's of Planets later in the year so get in some timing practise beforehand. Z.C. No. 976 = mu Geminorum

Planetary Report

- Mercury.** Is at superior conjunction on August 5th therefore too close to the Sun for observation
- Venus.** Morning object in the east.
- Mars.** Evening object in the southwest, stops it's retrograde motion on July 19th and fades in magnitude as it moves away.
- Jupiter.** Morning object in the east before dawn
- Saturn.** Morning object becoming more favourable in August
- Uranus & Neptune.** Are both at opposition and suitably placed for observation.

Editors Note

Well disaster has struck, my computers hard drive has failed, leaving me with a right royal headache, so apologies in advance if this months issue of WAS News appears somewhat thrown together. Also apologies to those of you who normally receive WASNews electronically – you may not!!!!!!!

On a far jollier note I hope everyone enjoys his or her summer recess, and I will see you all at the September meeting

Rob

Dates for your Diary

Observing Night August 11, 2001

Brian Halls

Ferring Beach is the venue for a summer observing night on August 11. Mars will be low in the sky but with a unobstructed horizon it will be hopefully well placed for those who attend to see it.

The Moon will be waning at this time and will rise at 22.27 UT. Hopefully it will not interfere too much with observing Perseids (the maximum of which is on 12 August).

For the first time it is proposed that the BBQ be held at the same venue, so there will be food available as well. Volunteers to prepare food and cook the BBQ are requested – anyone willing to help in this, please contact me (email and telephone at back of this issue of WASNews).

Whirlpool Star Party

David Bell, Shannonside Astronomy Club

Our line-up of speakers for the event, which will be held on the 14th, 15th and 16th of September in Dooley's Hotel, Birr, Co Offaly, is now complete. It runs as follows.

Halton C Arp, well known I'm sure to most astronomers. Halton, whose unorthodox views about the redshift of distant galaxies, forced him to leave America some 20 years ago, because he was refused access to the large telescopes. He has been working from Germany since.

Jack Newton, the famous astrophotographer.

Florence and Kenneth Wood, authors of Homers Secret Iliad, wherein they argue (persuasively I think) that the Iliad is based on astronomy.

Dr Andy Newsam, an expert on robotic telescoping.

Sir Isaac Newton's alter ego, Professor Mike Edmunds, who plays the part of Sir Isaac as an old man looking back on his life and times.

Frank Prendergast, head of the Geomatics Department for the Dublin Institute of Technology, who will tell us about the long term effects of changes in Earth's orbit on climate and the alignment of prehistoric monuments.

John Flannery and some of his IAS colleagues will tell us about their Eclipse trip to Zimbabwe.

Reports

Solar Eclipse June 2001

Nick Quinn & Linda Croft

We are pleased to report that we saw the Total Solar Eclipse from Zambia on June 21st. Our site was 600km as the Eagle flies, or two days by Land Rover, from Lusaka on the banks of the upper Zambezi river in western Zambia. We were part of a tour organised by the H R MacMillan Space Centre in Vancouver, Canada, the group consisting of three other Britons, two British expatriates (from Hong-Kong and California), five Americans, one Frenchwoman and six Canadians. The guides/drivers/couriers were from Botswana and Zambia. At the eclipse site were two other small groups of people made up of Americans, Britons and Swiss. Although the 'accommodation' at the eclipse site was in tents, local Zambians had built a toilet/shower area and a kitchen/dining area complete with bar! Running water was provided thanks to the Zambezi, a 'header' tank and jerry cans.

Zambians we met en-route were keen to get hold of 'eclipse glasses' as the government had not been able to supply them (unlike neighbouring Angola where the authorities did get their act together!). We were able to hand out a few spare ones left over from 1999, and try to impress upon them that they should share them around and that it was safe to look at the Sun once it was fully eclipsed. Luckily some members of the group were wearing eclipse tee-shirts which could be used to illustrate our explanations.

The sky remained totally clear of cloud before, during and after the 3 minutes 54 secs of totality, although there was some haziness due to the extensive 'biomass burning' that goes on in Southern Africa during the winter months. The corona was typical of 'solar maximum', not unlike that seen at the 1999 eclipse. There was an extremely bright prominence visible throughout totality as well as others visible at 2nd and 3rd contacts. Due to our location (less than 3 km south of the centre line) and a deep valley on the limb of the Moon, we were blessed with a very long diamond-ring at third contact. We saw shadow bands at both 2nd and 3rd contacts. Jupiter and Sirius were easily seen during totality, and although we didn't see Venus, somebody else at our site did manage to spot it very low down on the western horizon.

Other astronomical highlights included Comet Linear 2001/A2, an easy naked-eye object; Mars, Scorpius and Sagittarius high overhead; Crux, Alpha & Beta Centauri, the Eta Carina nebulae, globular clusters Omega Centauri and 47 Tucane; and the Zodiacal light through Leo and Virgo during the early evening hours. Oh, and the game viewing from the Chobe National Park in Botswana was pretty good too!

Comet Linear 2001/A2

Nick Quinn

Comet Linear 2001/A2 was an easy naked-eye object from the southern hemisphere and should now be visible from here in the early hours. Has anybody seen it yet? It is currently on the border of Cetus and Pisces.

Local Time	U.T.	RA	Dec	M	E.D.	S.D.	E
2001 Jun 30 0.00	Jun 30 0.00	00 52 11.4	-06 43 31	-	0.2438	1.0411	89
2001 Jul 1 0.00	Jul 1 0.00	00 40 30 0	-04 56 31	-	0.2438	1.0531	92
2001 Jul 2 0.00	Jul 2 0.00	00 28 53.4	-03 09 16	-	0.2446	1.0653	95
2001 Jul 3 0.00	Jul 3 0.00	00 17 24.3	-01 22 49	-	.02463	1.0776	98
2001 Jul 4 0.00	Jul 4 0.00	00 06 5.1	+00 21 52	-	0.2487	1.0899	101
2001 Jul 5 0.00	Jul 5 0.00	23 54 58.3	+02 03 53	-	0.2519	1.1024	103
2001 Jul 6 0.00	Jul 6 0.00	23 44 5.9	+03 42 28	-	0.2558	1.1150	106
2001 Jul 7 0.00	Jul 7 0.00	23 33 29.6	+05 16 57	-	0.2605	1.1277	109
2001 Jul 8 0.00	Jul 8 0.00	23 23 11.0	+06 46 48	-	0.2659	1.1405	111
2001 Jul 9 0.00	Jul 9 0.00	23 13 11.3	+08 11 41	-	0.2719	1.1533	114
2001 Jul 10 0.00	Jul 10 0.00	23 03 31.4	+09 31 20	-	0.2786	1.1663	116
2001 Jul 11 0.00	Jul 11 0.00	22 54 11.9	+10 45 39	-	0.2858	1.1793	118

Preliminary Solar Eclipse Report

Brian Halls

Like Nick and Linda, I was lucky to observe the total solar eclipse from Africa, however from Zimbabwe (not far from the Mozambique frontier).

The Explorers Tours observation site was only a 3 hour drive north of Harare, on the banks of the Ruya River (a tributary to the waters that ultimately flow into the Zambezi), in the grounds of the Maname School, accessible only by a 20 km drive by bus over dirt track roads.

The river is partly dried up, though a healthy flow of water was still flowing through the area, so we were able to set up our cameras and telescopes on the sandy 'beach' that existed.

Both seeing and conditions were very good, with no cloud present. As Nick and Linda were further west of our site, totality lasted slightly shorter at 3m 13s, however the long diamond ring effect was observed, though I missed the shadow bands that were seen (however, WAS member Paul Carter was at the same site as myself, and observed them).

Certainly a spectacular and unforgettable event.

Solar Section Report ~ June 2001

Section Director, Brian Halls

Sunspot activity at the start of the month was moderate. Sunspot active area 9475 (N18⁰ 020⁰) was still an E-class group though the number of sunspots making up its body had decreased compared with the previous several days.

There were however, quite a large number of groups on the Sun during the first week of the month, all in various states of activity.

The spottiest period occurred mid-month (17 separate active area on 15 June), most of which were C and D type groups. Though spotty, solar activity was generally stable about this time.

Active area 9503 (N14⁰ 139⁰) reached naked eye visibility about June 20 and remained like this for a couple of days (those observing the eclipse in Africa noted the naked-eye visibility of this particular group). It peaked in size about this time and began to shrink in size once more.

Articles

What is an Eclipse

Bob Turner

On June 22 a small Axx class group, region 9511 appeared on the Sun and over the next few days grew moderately in size – however it was its complex magnetic structure that gave rise to a short lived but very bright x-ray flare, just after 0h UT on June 23. Possibly associated with a coronal mass ejection (CME), Boulder, Colorado, sent out an Astro Alert, with the possibility of auroral activity occurring.

“Solar x-rays are categorized using letters on a logarithmic scale. The weakest solar x-ray category is the A class. This is followed, (in order of increasing energy) by classes: B, C, M and finally X. Each successive x-ray class is a power of 10 stronger than the preceding class. So X-class x-rays are 10 times more intense than M-class x-rays and 100 times stronger than C-class x-rays. Each class is subdivided into 10 logarithmically spaced parts beginning at 1.00 and ending at 9.99... So a class M1.00 solar flare is just slightly more energetic than a class C9.99 solar flare. Major solar x-ray flares are those that attain a peak x-ray amplitude of at least M5.00. A class M4.99 solar flare is therefore (technically) considered to be a minor solar flare.”* The x-ray flare of June 23 was X1.26.



Picture Courtesy of Mike Beales of the BAA solar section

Those with ordinary (white light) telescopes, and who were following sunspot activity by daily projection the solar image onto a piece of white card, were treated to several large groups also about this time. Activity decreasing as the month closed. Once it had produced its powerful flare, region 9511 complex magnetic structure disappeared and the spot group vanished over the western solar limb on June 30.

* Description of flares from Astro Alert of June 23.

There cannot be anyone who has not been exposed to the eclipse print deluge with so many articles being written, most of which tell you when and how to look and very few examine what it is you will be looking at.

The experience of a total eclipse is wonderful even if you do not understand what it is you are seeing but to look with knowing eyes will add to the adventure.

Although the Sun is far bigger than the Moon, over 400 times its diameter, it is also much further away and so by a strange coincidence the apparent diameter of these objects appears the same. This strange quirk of fate means that the Moon only just covers the Sun and so during totality all you see of the Sun is its atmosphere or the gas surrounding our Star.

The Sun, like the Earth, has an atmosphere but in the Sun's case it is much bigger and extends farther out into space. Also the Sun is constantly active, radiating material away from its surface that that gives us our spectacular view when the Moon covers the disc.

The closest bit of the Sun we see during totality is the Sun's photosphere, which looks very red because it is predominately Hydrogen that admits light at the red end of the spectrum. This photospheric layer is not a true surface as the Sun does not have one, but is the drop off of pressure of opaque gas that takes on the appearance of surface.

The energy at the top of the photosphere is 64,000 kilowatts per square meter, or 64,000 one bar electric fires in an area you could hold in your arms. With a temperature about 6,000 degrees centigrade this is why the Sun is so dangerous to look at.

Extending out of the photosphere are the clouds of hydrogen gas in great loops and swirls they are called prominence and should be easily seen, as they are also very red. Further out is the Sun's atmosphere, called the corona, has a blue greenish tinge and extends many times the Sun's diameter.

As the Sun goes into totality you can see the leading edge of the photosphere and as it emerges the trailing edge that creates the diamond ring effect as the first rays of the Sunshine down the lunar valleys. The Moon at this eclipse is 1.03 times bigger than the Sun so the

photosphere at the sides will not be visible, but of course large prominence will be seen.

The Sun's outer atmosphere differs with the solar 11-year cycle becoming more elongated and having a tendency to group at the solar equator at sunspot minimum and being symmetrical around the Sun at sunspot maximum. As we are approaching maximum the expectancy is the symmetrical view but until totality starts we have no way of knowing.

Notices

From the Chairman....

Brian Halls



Brian Halls: Picture Courtesy of Brian Halls

Newsletter

Due to change of employment, I am unable to continue photocopying WASNews, as I have done over the last few months, so if there is anyone with access to a photocopying machine / laser printer that could be utilised for the job, either at home or work, please let me know. Naturally, any expenses incurred shall be reimbursed by the Society.

At the moment, several members have opted to receive WASNews in electronic format, and if you would like to be added to the list, again please contact me. The format used is Microsoft Word, but if you do not have MSWord on your PC something called a Word viewer can be downloaded from the Microsoft website that allows Word documents to be read (though not altered or written to).

Positions Vacant

The Society is still on the lookout for a Secretary, who will be the focus for incoming correspondence, information for new members, and organising speakers

for meetings, setting agenda and taking minutes of committee meetings (though any of these jobs can be split with the assistant secretary). Do not worry about being thrown in at the 'deep end' – members of the executive committee now sharing the Secretary's job will be there to help and advise.

So if you feel you would like to have a go at either the position of Secretary or Assistant Secretary (or for that matter Chairman or any other Executive Committee post) the Society's AGM in October will be a good time to start.

What's on the Box

Thursday 12th July

BBC TWO

01.30 ~ Final Frontier

The latest in the world of Astronomy. Featuring some Cambridge rocket students, an eclipse special and some moon gazing with David Whitehouse.

WAS News News

ESA and NASA set new Cassini-Huygens plan

NASA News Release

Managers for an international mission to Saturn have announced a revised plan to work around a telecommunications problem and avoid loss of scientific data after the Cassini spacecraft releases the Huygens probe to descend to the surface of Titan, Saturn's biggest moon, in 2005.

The new plan will change the planned release date and geometry for the part of the mission in which the Huygens probe will parachute into the thick atmosphere of Titan. The new date will be Jan. 14, 2005, seven weeks later than originally planned. The plan will also position the Cassini orbiter farther away during that descent.

After six months of analysis by the European Space Agency (ESA)-NASA joint Huygens Recovery Task Force, senior management from both agencies and members of the Cassini- Huygens scientific community have endorsed the mission modifications. The analysis was undertaken after the Huygens probe telecommunications problem was identified last autumn.

The Cassini-Huygens mission was launched in 1997. Engineers last year identified a design flaw in the Huygens communications system. Without a change in flight plans, the Huygens receiver would be unable to compensate enough for the Doppler shift in radio frequency between the signal emitted by the probe and the one received by the orbiter. A Doppler shift happens when the distance between a transmitter and receiver is changing, and Cassini originally would have been rapidly approaching Titan during Huygens' descent. This would have resulted in the loss of important data from the probe during its trip through Titan's atmosphere.



An artist's concept of Huygens dropping toward the moon Titan. Photo: ESA

When Cassini arrives at Saturn in July 2004, it will, within the first seven months, complete three flybys of Titan instead of two as originally planned. Then, in February 2005, Cassini will resume the rest of its four-year prime mission as originally planned, studying the planet and its rings, moons and magnetic environment. The changes to the mission plan will use about one-fourth to one-third of Cassini's reserve supply of propellant. The reserve supply is carried for unforeseen

needs such as this and for possible use if the mission were to be extended beyond 2008.

"This recovery plan will allow us to meet all of the mission's scientific objectives," said Bob Mitchell, Cassini program manager at NASA's Jet Propulsion Laboratory, Pasadena, CA. "It has the additional advantage of giving us a close look at Titan before releasing Huygens."

This week, European Space Agency Director of Science Professor David Southwood and NASA Associate Administrator for Space Science Dr. Edward Weiler gave the go-ahead for Cassini and Huygens teams to implement the recommendations of the Huygens Recovery Task Force.

To ensure that the pioneering probe returns as much data as possible, the plan shortens Cassini's first two orbits around Saturn and adds an additional orbit that provides the required new geometry for Huygens' descent to Titan. Cassini's arrival date at Saturn on July 1, 2004, remains unchanged. However, its first flyby of Titan will now occur on Oct. 26, 2004, followed by another on Dec. 13. The Huygens probe will be released toward Titan on Dec. 25 for an entry into the moon's atmosphere 22 days later.

To reduce the Doppler shift in the signal from Huygens, Cassini will fly over Titan's cloud tops at an altitude of about 65,000 kilometres (40,000 miles), more than 50 times higher than formerly planned. The new plan also calls for several modifications to ensure maximum efficiency of the Huygens communications system. These include pre-heating the probe to improve tuning of the transmitted signal, continuous commanding by the orbiter to get the best possible performance by the receiver, and changes in the probe's on-board software. Shrouded in an orange haze, Titan is one of the most mysterious objects in our solar system. It is the second largest moon (after Jupiter's Ganymede) and the only one with a thick atmosphere. The atmosphere excites scientific interest, since it may resemble that of a very young Earth.

The mission is an international collaboration of NASA, ESA and the Italian Space Agency. JPL, a division of the California Institute of Technology in Pasadena, manages it for NASA's Office of Space Science, Washington, DC.

Diary

August 11 ~ Ferring Beach 19.30 hrs onwards:
Observing Perseids, Mars and society summer BBQ.
(See article).

September 12 ~ Africa Eclipse – members are encouraged to bring their pictures/ slides to show.

October 5 – 7 ~ BAA Variable Star Section Meeting –
Alston Hall, Preston. Speakers include, Dr Allan
Chapman, Prof Gordon Bromwich.

October 10 ~ AGM

October 20 ~ SAGAS Meeting – Planetarium,
Chichester. Pre-booked only.

*All monthly meetings (**bold**) are held at the Heene Church
Rooms, Heene Rd, Worthing @ 7:30pm*

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Note to Contributors

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

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