



WAS NEWS

Monthly Newsletter of the Worthing Astronomical Society

Official website: www.was.org.uk

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



Number 152

April 2002

ALMANAC

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

April/ May.

LUNAR

April	Date	Time	Rise	Set
Last Quarter	4th	15.29	02.10	09.35
New moon	12th	19.21	05.34	18.29
First Quarter	20th	12.48	09.58	02.14
Full Moon	27th	03.00	19.57	05.08
May				
Last Quarter	4th	07.16	02.13	10.34
New moon	12th	10.45	04.29	19.50
First Quarter	19th	19.42	10.22	01.30
Full Moon	26th	11.51	20.18	03.56

EARTH

April	Sunrise	Sunset
4th	05.30	18.38
12th	05.12	18.52
20th	04.55	19.05
27th	04.40	19.17
May		
4th	04.27	19.28
12th	04.14	19.41
20th	04.02	19.53
27th	03.54	20.02

PLANETS

(As at April 27th.)

Constellation	Rises	Sets	Mag.
Mercury Taurus	05.13	21.16	-0.4
Evening object W.N.W.			
Venus Taurus	05.42	21.39	-3.9
Visible in the West just after sunset			
Mars Taurus	06.04	22.18	+1.6
Visible in the West in the evening			
Jupiter Gemini	08.15	00.40	-2.2
Visible in south-western skies			
Saturn Taurus	06.32	22.23	+0.1
Visible in western skies			
Uranus Aquarius	02.46	12.43	+5.9
Unfavourable			
Neptune Capricornus	02.02	11.08	+7.9
Unfavourable			
Pluto Ophiuchus	21.48	07.49	+13.8
Small hours object			

PHENOMENA

Day	Hour	April
13th	10	Mercury 4° N. of moon
14th	19	Venus 3° N. of moon
16th	00	Mars 2° N. of moon
16th	20	Saturn 0.8° S. of moon
18th	23	Jupiter 2° S. of moon

May

4th	04	Mercury at greatest elongation E.21°
4th	06	Saturn 2° S. of Mars
7th	12	Saturn 2° S. of Venus
10th	20	Mars 0.3° S. of Venus
13th	12	Neptune at stationary point
13th	22	Mercury 2°N. of moon
14th	08	Saturn 1° S. of moon
14th	19	Mars 0.6° N. of moon
14th	23	Venus 0.8° N. of moon
15th	19	Mercury at stationary point
16th	12	Jupiter 2° S. of moon

Minima of Algol

April	15th 05.12	18th 02.00	20th 22.48
May	Inconveniently situated for observation		

Lunar Occultations

Times as at W.A.S. Observatory

Date	U.T.	S.A.O.No	Mag	Phase
April	h. m. s.			
15th	20.03.28	93619	8.4	diss
17th	20.50.34	77318	8.7	diss
17th	20.50.53	77319	8.9	diss
17th	21.13.27	77332	8.5	diss
17th	21.50.28	77355	7.8	diss
17th	22.08.14	77365	8.9	diss
17th	22.57.08	77413	6.4	diss
18th	22.58.11	78572	6.7	diss
19th	20.12.10	79470	8.0	diss
19th	20.24.29	79477	7.9	diss
19th	21.36.37	79505	9.0	diss
19th	21.38.45	79516	8.7	diss
19th	21.53.27	79524	8.1	diss
19th	22.27.55	79534	8.7	diss
19th	22.51.03	79549	8.5	diss
19th	23.14.07	79561	8.4	diss
21st	22.22.48	98640	7.8	diss
21st	22.35.38	98638	8.3	diss
21st	22.44.56	98646	8.4	diss
22nd	20.58.33	99150	7.1	diss

This is only about 20% of the predictions for the W.A.S. Observatory.

Presented by Dave Wells

Editors Note

Hello all again, regrettable space is always a premium, so all my pearls of wisdom are squeezed out once again to next month. So until then – clear skies!

Rob

Dates for your Diary

Comets

Alex Vincent

Comet 2002 C1 Ikeya-Zhang

Date	RA		Dec		Mag
	h	m	°	ç	
Apr 11	00	09.3	49	59.9	4.6
Apr 17	23	07.6	56	51.0	4.9
Apr 23	21	35.2	61	05.1	5.3
Apr 29	19	44.4	61	14.5	5.7
May 5	18	11.9	54	29.4	6.1
May 11	17	10.6	45	57.6	6.6

This comet was last seen in 1661 and may have been seen in February 1273, and February 877. Halley thought that the comet of 1661 was periodic and he linked it to the comet of 1532. This comet seems to have a period of some 341 years and so its next return will be in 2343.

Comet C/2001 OG108 (LONEOS)

Date	RA		Dec		Mag
	h	m	°	ç	
Apr 11	07	26.6	85	29.4	9.2
Apr 17	09	07.2	68	47.7	9.3
Apr 23	09	21.6	51	13.9	9.6
Apr 29	09	28.7	35	54.1	10.0

This comet is circumpolar and is visible all night although it is rather faint.

Comet 2001 F1 (Utsunomiya)

Date	RA		Dec		Mag
	h	m	°	ç	
Apr 11	00	05.1	+28	20.9	6.4
Apr 14	00	35.5	+30	48.4	6.0
Apr 17	01	08.6	+32	32.4	5.8
Apr 20	01	43.4	+33	20.5	5.6
Apr 23	02	18.1	+33	07.1	5.5
Apr 26	02	50.7	+31	56.2	5.6

This comet goes through Pegasus, Andromeda & Perseus during this period and is best viewed in the morning sky.

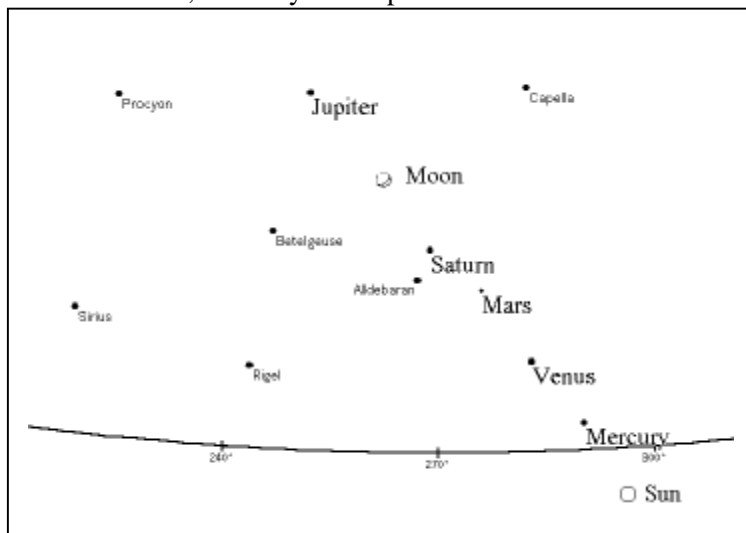
The above co-ordinates for all three comets are for Epoch 2000.0.

Observing the Planets in May

Glen Thomas - Planetary Section Director

Meeting at the High Salvington Honeysuckle Lane car park.

The first opportunity will be on May 10th, two days after the monthly meeting, when Venus and Mars will be close enough to be seen in the same telescopic field of view, with Saturn, Mercury and Jupiter also visible.



The second will be on the May 13th with the chance to spot a 26-hour-old Moon as it arrives to join the party (May 14th if cloudy).

Come along as the sky darkens, more details in May's WASNews.

Reports

Solar Section Report - March 2002

Brian Halls Section Director

The sunspot activity of February continued over into the start of March. For the first week, sunspot groups were plentiful but, consisted of mainly small groups – sunspot region 9845 (N17° L=016°) was an exception and classed as an F-class group.

By the second week, groups were still plentiful but the number and quality were reduced – though again another large group was present and of naked-eye visibility - region 9866 (S10° L=189°).

By mid-month the number of groups began to drop but rose again by the start of the third week and, this general trend continued for several days only for sunspot numbers and active group numbers to drop once more before rising

once more by the end of the month – two large groups being visible on the solar disk.

On the 18th and 20th there were two coronal mass ejections (CME's) that were directed towards Earth – and an alert regarding possible aurora activity were announced. There are no reports of these aurora being visible from southern England.

Reports were received from Graham Boots and the Director.

MDF = 7.22 (N= 3.75 ; S = 4.00)

R = 100.9

Planetary Section Report - April 2002

Glen Thomas

Mercury emerges from the glare of the Sun into a good evening apparition by the end of the month. Look for it in the west around 2100 BST (9pm) from the 17th onwards. See the chart for April 18 for its location at the end of the line of five planets marking out the plane of the ecliptic.

Venus is a bright evening object, climbing up the western sky throughout the month.

Mars is dimming, but still visible as the sky darkens.

Jupiter rides high throughout the evening, setting after 3am.

Saturn sets before midnight by the middle of the month. Look for the largest moon, Titan, four diameters north of the planet on the 14th and 30th and the same south on the 6th and 22nd. Titan is occulted by the Moon on the 16th at 2155 BST, followed at 2203 by Saturn itself, with both reappearing at about 2224.

Uranus rises in the mornings around the start of nautical twilight, so it may be visible in small telescopes or binoculars.

Neptune is a morning object, fainter than Uranus but rising earlier and so a little better placed for observing.

Pluto now rises before midnight, but is best observed when it is highest in the sky between 4 and 5 am. More congenial hours will be possible later in the year. A 20 cm (8 inch) telescope or larger and a good finder map (look out for one in a future WASNews!) will be needed to locate Pluto.

40 Harmonia, an asteroid of magnitude 11.8, passes within 10 arcseconds of a magnitude 9.9 star in Gemini, in the same medium power field as the star Mebsuta, and just 2° north of Jupiter.

If you watch it with at least a 12 cm (5 inch) telescope with fairly high magnification you should see clear movement within a few minutes around 2315 - 2330 BST on April 24th. Relative to the star Harmonia will move from position angle 310° to 040° in that time (Position angle is measured anticlockwise from north. (The star is TYC 1897-1557-1 at RA 06h 43m, dec +24° 55', which is ¼° SW of Mebsuta, epsilon or 27 Geminorum.)

February Lecture Reviewed – Report by Brian Halls

The Moon

Peter Gill

Peter began his talk by describing the evolution of the Moon. With the aid of several sequential slides, the evolution of the Mare Imbrium was shown, from the initial asteroid impact that excavated a large crater and the scattering of material and that effect on lunar features, to the present day, via infilling by lava and subsequent impact events.

The craters and other features were created as a result of impact of meteors or asteroid type bodies – the lunar far side is far more cratered than the near side that we see all the time; lunar mare are almost unknown on the far side of the moon – a result of the tidal effects of Earth pulling much of the mare material towards the lunar hemisphere that faces us continuously.

The crater formation period occurred early during the history of the solar system and quietened down over billions of years as the source of material, debris left over from the cloud that the Sun and planets formed was used up.

Peter showed some of Galileo's early telescopic observations of the Moon and described how the work of early lunar cartographer, Riccioli remains with us today; many of the lunar 'seas' and craters keep the names that he assigned them over 300 years ago.

The Moon is our nearest celestial object and is an easy object to observe with a telescope or even a pair of binoculars. Peter described how easy it was to produce drawings of lunar features and showed some work of other observers including the fine art work of Harold Hill.

This well attended meeting learnt about observing the Moon and I am sure several of those present have been inspired to go out and do some lunar astronomy.

The Aurora

Neil Bone

Neil started the lecture with some spectacular slides of The Leonids observed on Nov 18th 2001 in the USA, for observers in the UK The Leonids will return on Nov 19th of this year & the predictions for a shower are very positive which is just as well as the next opportunity is not until 2098.

Neil explained that observing from his flat in Edinburgh is not easy; indeed his observatory is floodlit by Edinburgh Castle! However Neil showed some interesting slides of different atmospheric phenomenon, in this country we tend to benefit from clear afternoon's but cloudy evenings which although not wonderful for evening astronomy does allow for observations of Sun Dogs & Corpuscular Rays which are beautiful long rays of sun light. On the negative side the atmosphere has robbed us of observing the corona of the sun apart from during a total solar eclipse. The corona's shape is affected by how many sunspots there are, if there are lots of sun spots then its shape is very even, minimum sun spots cause long rays. The corona is constantly changing, sometimes very dramatically as images taken by Sky Lab reveal, the first image shows a prominence, a later image depicts a coronal mass ejection, an eruption which sends over a billion tonnes of gas through space at almost a million miles per hour, such eruptions can happen many times a day. Comets also reveal the affects of this solar wind; Comet Iron Tail, which famously had a straight blue tail, this affect is caused by the solar wind.

If a coronal ejection blasts in the Earth's direction some of the charged particles will enter the atmosphere & are attracted to the Earth's poles. The particles spiral along the Earth's magnetic field lines towards the north & south Polar Regions. Gas in the atmosphere interacts with the particles & glows, creating the aurora. There are certain times when aurora are more frequent, such as just ahead or just after maximum sun spot cycles, however the display in Nov 1991 caught everyone by surprise because there were no sun spots. Usually in the South of England observers would only see a harmonious glow, however in April 2000 when many people were observing the conjunction of Jupiter, Saturn & Mars an amazing aurora display followed.

The aurora are characterised by the beautiful colours & ghostly shapes but what determines these differences? Red colours are caused by oxygen high in the atmosphere, more then 150km above ground & hydrogen at about 120km above the ground. Green & yellow colours are

caused by oxygen a little lower in the atmosphere, at 90 – 150 km above the ground. Rays are the most common shape; they stretch up in columns from the horizon & are known as a rayed band. A folding arc, resembling ribbon folds is called a band. These amazing displays had quite an affect on our ancestors; in the middle ages there were reports of battles in the sky & swords dripping with blood. Aurora can have a practical impact on man, causing major power black outs.

Neil's fascinating lecture was accompanied by stunning slides of these beautiful & ghostly displays & was very well received by the audience.

Notices

Astro Alert List

Graham L. Boots

The society has a list of members with their telephone numbers which acts as a chain with a member who spots a sudden unforeseen astronomical event to telephone the next member on the list and so on. Such events could be an aurora or a naked eye super nova or a comet discovery. If you would like to be on the list Please contact Brian Halls on 01903 521205 or Email worthing_astronomical_society@hotmail.com

Let Brian know the latest time of night you wish to be contacted which can be up to 1.00 a.m. or 12.00 a.m. or 11.00 p.m. or 10.30 p.m or anytime of the night. Very occasionally there is a test alert just to test out the strength of the chain and seek out any errors or changes. Once you are added to the new list you will receive a copy, which comes with instructions on how to use it.

Exhibition

Graham Boots

From Saturday the 2nd November to Saturday the 16th November 2002 the society is staging an exhibition in the display area at the entrance of the Worthing Central Library, Richmond Road, Worthing. All members are invited to contribute materials and items of interest.

I have booked the wall space which measures 12 foot long by about 8 foot high, the display boards (one side only) which measures 22 foot long by 6 foot high and the lockable glass display cabinet which is 6 foot by 2 foot and is 6 inches deep.

There is a security camera upon this area but as it is by the entrance I do not recommend valuable or precious personal items be included. We may announce the exhibition in the local press.

We are able to set up our exhibition on the 2nd November from 2.00 p.m. and it must be taken down before midday on the 16th November. Having met and spoken to the Area Librarian labels are not to be hand written, here I can help by producing your labels, with sticky backs if required, by computer.

It is intended that for the most part the items on display will be member's own work but I am very open to suggestions and have some ideas of my own such as a Hubble Space Telescope display. Coloured brochures and information about our society will be available for the public to take including our meeting programme.

We have staged an exhibition at this library on two previous occasions but the last one was many years ago. They were well received and we had no problems. We have over 6 months to prepare but I would like to hear from contributors as soon as possible so planning can begin. This is an excellent opportunity to display our work to the public and gain members also this library facility is free.

Please contact Graham Boots on 01903 505346 or Email gboots@observatory99.freeserve.co.uk

Library Book Amnesty

Further to last months notice in WAS News the librarians have had some success in liberating missing library books. Listed below are the books still outstanding.

We have to report however the enormous pressure that the librarians are under to release the LIBRARY POLICE from their lead lined stasis capsules cryogenically stored below Heene Road Church Hall.

The ends to which these creatures will go to in an effort to reclaim what is theirs cannot be reported in a family newsletter. - For all our sakes - return what is over due.

In the centre of Immensities	RB
Astronomy	PM
The Night Sky	JH
Stars at a Glance	AS
Astronomy (The evolving Universe)	AB
Radio Astronomy	KG
Our Universe	CH
Black Holes	DJ
The Origin of the Universe	RT
Seasonal Star Charts	RB
Comets (Video)	JR
Atlas of the Universe	PL
The Telescope	Mr. S
The Beginners Guide to Astronomy	JR
The Amateur Astronomy	RT

Black Holes	NG
Hunting Down the Universe	GT
A Brief History of Time	NG
Hubble Space Telescope	Mr& Mrs C
The Lighter side of Gravity	DJ
Universe	GB
Illustrated Guide to the Night Sky	WS
The Universe	GT
Universe	AC
Star Hopping	SM
Burnham's Celestial Handbook 1, 2 & 3	KP

What's on the Box

Friday 12th April 2002



01:00 to 01:35 ~ Final Frontier

From the National Space Centre in Leicester, astronomer Dr Paul Roche presents the latest developments in space science and astronomy

Saturday 13th April 2002



04:05 to 04:30 ~ Hitch-Hiker's Guide to the Galaxy
Douglas Adams's epic adventure in time and space. Fit the third.

Sunday 14th April 2002



14:05 to 14:30 & 22:30 to 23:00~ Hitch-Hiker's Guide to the Galaxy
Douglas Adams's epic adventure in time and space. Fit the third.

Thursday 18th April 2002



01:50 to 02:00 ~ What Have The 90s Ever Done For Us?
Never mind the Millennium Dome - life on the Mir Space Station and in Biosphere 2 was truly out of this world

Friday 19th April 2002



02:30 to 03:00 ~ The KT Event
Programme investigating the theory that a huge meteor collided with Earth 60 million years ago and killed off the dinosaurs

03:00 to 03:30 ~ The Nature of Impacts and Their Impacts on Nature
How scientists know if craters on the Earth's surface were caused by crash-landing rocks from space

WAS News News

Mystery of R Coronae Borealis and other helium stars solved

Dr Simon Jeffery - Armagh Observatory, Northern Ireland

Posted By: Royal Astronomical Society

Astronomers Dr Simon Jeffery of the Armagh Observatory and Dr Hideyuki Saio of Tohoku University, Japan, have finally solved a long-standing mystery concerning the creation of two particular kinds of rare stars. They have found that a class of variable stars named after their prototype R Coronae Borealis (RCrB), and a related group called 'extreme helium stars' are the products of mergers between pairs of white dwarf stars. What kind of star results from the merger depends on the composition of the white dwarfs. The research is to be published in the Monthly Notices of the Royal Astronomical Society.

R CrB stars and their hotter cousins, the extreme helium stars, are highly unusual. While most ordinary stars are typically three-quarters hydrogen (by weight), these oddities have hardly any hydrogen on their surfaces. Instead, they are made primarily of helium, with some carbon, traces of hydrogen and other peculiarities. For some time, astronomers have suspected that they are the mixed-up remains from inside old stars, where nuclear fusion has created helium, carbon and other chemical elements. The question has been, how did it happen?

The problem has haunted Simon Jeffery for much of his career. He began studying extreme helium stars about 20 years ago, and his collaboration with Hideyuki Saio started in 1985. A breakthrough came when Jeffery realised that the helium stars are giving out more energy than they produce inside them by nuclear processes. That meant they must be shrinking. Observations he made of four helium stars with the orbiting International Ultraviolet Explorer (IUE) observatory demonstrated that they were getting hotter by 30120 degrees per year. And observations of some pulsating helium stars showed that they are 90% the mass of the Sun.

Saio, an expert on computer modelling, developed the simulations of stellar mergers needed to convince other astronomers that two white dwarfs coming together could explain the observations. It was a difficult job. Conventional thinking said that if you added hydrogen

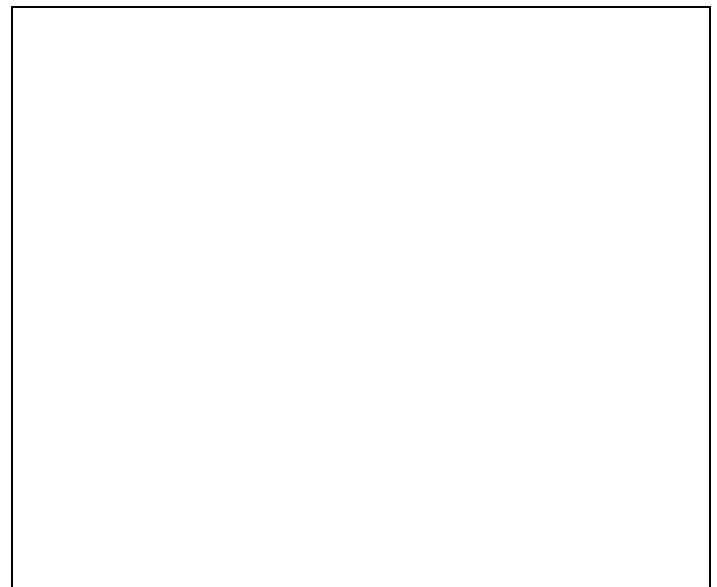
from one white dwarf to another, it would either just be blown away or there would be a supernova explosion. But what would happen if you added helium?

White dwarfs are the cores left over when old, evolved stars blow off their outer layers. They are by no means all the same and their compositions cover a bewildering range. A simulated merger between two helium white dwarfs produced a star matching very closely the properties of a nitrogen-rich helium star called V652 Herculis. A merger between a carbon-oxygen white dwarf and a helium white dwarf matched the shrinking helium stars Jeffery had observed with IUE and explained very well the properties of RCrB stars and extreme helium stars.

"There are still some unanswered questions, though" says Jeffery. "The actual merger, when one white dwarf is ripped apart by its companion, is likely to be extremely violent, taking a matter of a few minutes. We don't yet know how the material will be spread out - into a big disk around the star perhaps - or what happens as the new helium star expands by a factor of 10,000".

A Bow Shock Near a Young Star

Hubble Space Telescope – March 6th 2002



The Hubble Space Telescope continues to reveal various stunning and intricate treasures that reside within the nearby, intense star-forming region known as the Great Nebula in Orion. One such jewel is the bow shock around the very young star, LL Ori, featured in this Hubble Heritage image.

Diary

Secretary: *Post Vacant*

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Note to Contributors

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

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April 10 *The Planet Vulcan*, by **Dr David Brand**.

May 8 *White Dwarfs*, by **Konrad Malin-Smith FRAS (Croydon AS)**,

June 12 *Extra Planetary Systems* by **Kevin Apps (Previously of Sussex University)**

July 10 *Members Evening* –members get a chance to show what they have been doing over the last year.

July 13 Summer SAGAS Meeting, Portsmouth Naval Base, Hampshire.

September 11 *The Moon – a Biography* by **Dr David Whitehouse (BBC On-line Science Editor)**

October 9 to be advised

November 13 *Getting Started with CCD Astronomy* by **Alan Smith (Christchurch Hospital Observatory and Horsham Astronomical Group)**

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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