



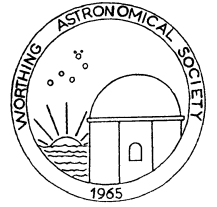
Number 154

WAS NEWS

Monthly Newsletter of the Worthing Astronomical Society

Official website: www.was.org.uk

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



June 2002

ALMANAC

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

June./July.

LUNAR

June	Date	Time	Rise	Set
Last Quarter	3rd	00.05	01.21	11.47
New moon	10th	23.46	03.19	20.01
First Quarter	18th	00.29	12.20	00.42
Full Moon	24th	21.42	20.25	03.02
July				
Last Quarter	2nd	17.19	** . **	11.48
New moon	10th	10.26	03.25	20.52
First Quarter	17th	04.47	12.54	23.41
Full Moon	24th	09.07	20.41	03.40

EARTH

June	Sunrise	Sunset
3rd	03.47	20.10
10th	03.44	20.16
18th	03.42	20.20
24th	03.44	20.22
July		
2nd	03.48	20.20
10th	03.55	20.16
17th	04.03	20.09
24th	04.12	20.01

PLANETS

(As at June 24th..)

Constellation	Rises	Sets	Mag.
Mercury Taurus	02.45	18.15	+0.2
Just past greatest elongation W. 23°			
Venus Cancer	07.03	22.34	-4.0
Visible in the West after sunset			
Mars Gemini	04.57	21.21	+1.8
Unsuitably placed			
Jupiter Gemini	05.25	21.27	-1.8
Unsuitably placed			
Saturn Taurus	03.10	19.12	+0.1
Unsuitably placed			
Uranus Aquarius	22.55	08.57	+5.8
Morning object			
Neptune Capricornus	22.09	07.17	+7.9
Morning object			
Pluto Ophiuchus	17.54	03.56	+13.8
Have you seen it yet.!!			

PHENOMENA

June

13th 04	Jupiter 2° S. of moon
13th 22	Venus 1° S. of moon
21st 14	Mercury at greatest elongation W. 23°

July

2nd 12	Saturn 0.2° N. of Mercury
3rd 13	Jupiter 0.8° S. of Mars
6th 04	Earth at aphelion (152 million km.)
8th 12	Saturn 2° S. of moon
9th 09	Mercury 2° S. of moon
10th 23	Jupiter 3° S. of moon
11th 04	Mars 2° S. of moon
13th 15	Venus 4° S. of moon

Minima of Algol

June Inconveniently situated for observation			
July 13th	02.30	15th 23.18	18th 20.06

Lunar Occultation's

Times as at W.A.S. Observatory

Date	U.T.	S.A.O.No	Mag	Phase
June	h. m. s.			
14th	21.27.28	80604	8.3	Diss
14th	22.40.34	80631	8.0	Diss
18th	22.39.52	138923	8.2	Diss
July				
14th	20.32.12	118916	8.4	Diss
14th	21.34.07	118933	8.6	Diss
14th	21.46.01	118940	8.7	Diss

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

Presented by Dave Wells

Editors Note

Greetings & Salutations all. As we move into the summer months with increased daylight, you'll find there's still plenty of exciting Astronomical objects and events to keep you occupied, - read on!!!

Rob

Dates for your Diary

Penumbral Lunar Eclipse

Alex Vincent

On the evening of June 24 2002 there will be a penumbral eclipse of the moon. The eclipse begins at 20:18, mid eclipse is at 21:27 and the eclipse ends at 22:34.5. All times are UT.

The magnitude of the eclipse is only 0.209 and so it may not be noticeable. This eclipse is lunar Saros No. 149, which began as a 0.065 penumbral on June 13 1984, becomes a 0.054 umbral on August 29 2110 and becomes total on April 16 2489.

Reports

Planetary Section Report ~ June 2002

Glen Thomas

The jinx that normally befalls organisers of WAS observing session's only brought cloud and rain on the first two attempts in May. The reserve day was a success, bringing sixteen people up onto Salvington hill! It was windy and cold, but the five naked eye planets and the two-day-old Moon were all observed, although Mercury was very difficult. A variety of optical aids were brought by members, ranging from binoculars to an eight-inch telescope.

As that wonderful five-planet grouping disperses some of the planets are lost in the glare of the Sun to reappear as morning objects a little later in the year. But all is not lost! As we begin to lose sight of the inner planets the cold outer planets begin to move towards centre stage.

Mercury has moved past the Sun to become a morning object, but is not very favourable this month. Look for it less than 3° above the NE horizon as the sky brightens around 4 am at the end of the month.

Venus is still clearly visible after sunset showing about a ¾ illuminated gibbous phase.

Mars is close to Jupiter and a crescent Moon on the 12th,

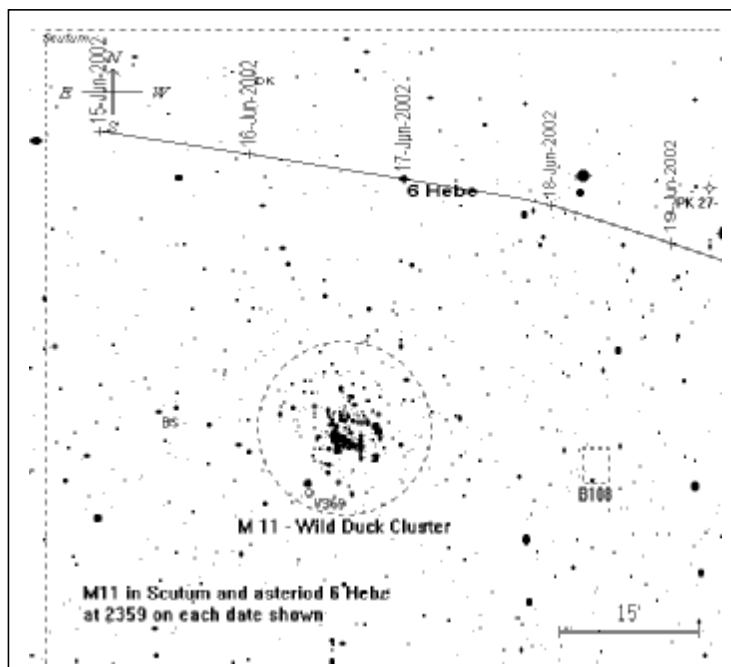
but only 4° above the horizon at the end of civil twilight (when the Sun is 6° below the horizon and the sky is darkening, about 10 pm during June), so it is a difficult target.

Jupiter is approaching solar conjunction, so it is very close to the horizon at the end of civil twilight. May be seen in the first half of the month.

Saturn is past solar conjunction; on it's way to becoming a visible morning object next month.

Uranus and Neptune are now far enough away from the Sun to be visible 20° above the horizon to the SSE before dawn twilight. Both planets are binocular objects, although Uranus, at magnitude 5.7, is technically a naked eye object in good conditions. A telescope will be required to see them as clearly non-stellar.

Pluto reaches opposition this month making it as favourable as it gets. You will need at least a 20 cm (8") telescope and a reasonably dark sky as Pluto is around magnitude +14. See May's WASNEWS for a finder chart.



Between the 16th and 18th the asteroid 6 Hebe passes very close to M11, the Wild Duck Cluster, in Scutum. At around magnitude 9, Hebe will be bright enough to easily identify and, at less than 1/3° from M11, would make a good photograph for anyone able to image through their telescope. The accompanying chart has a ¾° field showing M11 and the position of 6 Hebe at midnight each evening. The brightest stars shown are mag. +6, the dimmest +13.

N.B. All times BST.

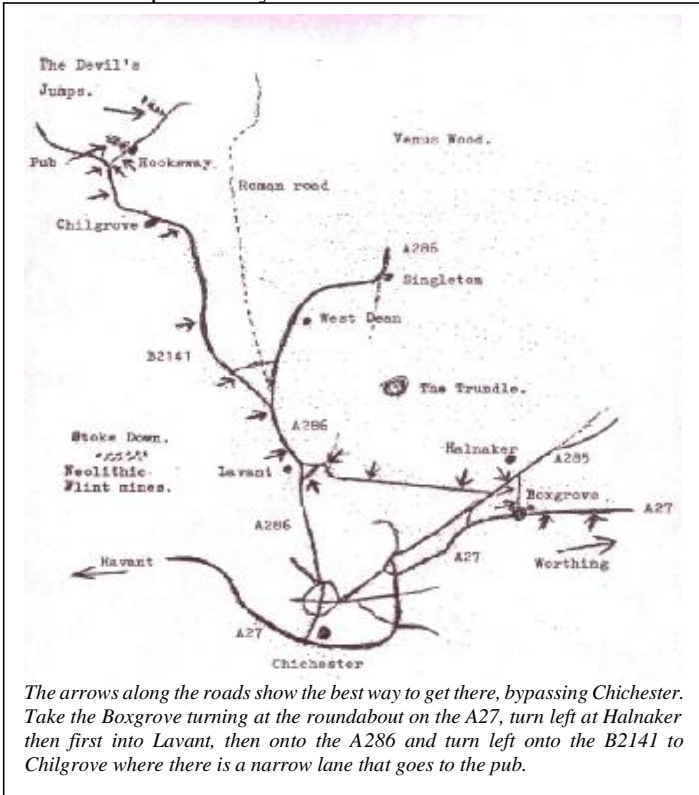
The Summer Solstice.

Alex Vincent

The Solstice on June 21 is usually celebrated by WAS members at the North Star Pub. I, with a few members join the archaeological groups to celebrate it at The Devil's Jumps, Hooksway near Chilgrove some ten miles north of Chichester. Other WAS members are welcome to come, and the map shows how to get there from the A27 near Chichester.

We watch the sun setting and drink a pour a libation at The Jumps, which are a group of Bronze Age barrows built between 1800 & 1600 BC. They are on the alignment of the setting sun on June 21. This is a good evening out and we are going to do it each year as a memorial to C. Ainsworth who passed away last year. He did a lot for archaeology.

We park at the Royal Oak Pub at Hooksway (where you can order food for later) and walk for about a mile to the site. We meet at the WEA in Union Place, Worthing at 18:30. Hope to see you there.



Solar Section Report ~ May, 2002

By Section Director, Brian Halls

Despite the cloud, rain and high winds, May was a well-observed month – members observed the Sun on a total of 28 days. Reports were received from, Graham Boots, Nick Quinn, Brian States and, the Director.

Sunspot activity remained very much the same as previous months, with sunspot groups and numbers rising and falling as active longitudes rotated into view.

During the first week of the month, region (active area) 9934 (S17° L=211° size/type 580 Eki on 4th) was the largest group on the solar disk until it rotated out of view on the 16th. During this period, the Sun was extremely active – Brian States recording 19 active sunspot areas on the 5th.

By mid-month, sunspot groups began to decrease - though the quality of sunspot groups did not alter – a large naked eye group (9957 N08° L= 015°, size/type 830 Fkc), was present.

On the 22nd, a large coronal mass ejection (CME) occurred, spewing large amounts of matter in the direction of Earth. This event arrived in the vicinity of Earth much earlier and stronger than was at first anticipated – and auroral activity was observed at high latitudes.

Activity began to increase a little; sunspot group 9934 reappearing as 9973 on 27th (S16° L=213° size/type 880 Ekc on 31st).

Provisional sunspot data:

MDF = 10.26
R = 128.66

Notices

Library Book Amnesty

Coming along nicely with the returns, thank you.

As you can see the 'to be returned' list decreases
Still outstanding are: -

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

Items Given to WAS

List compiled by Graham Boots on the 16th May 2002

Recently member Peter Bartlett has given the following items to the society and on behalf of our membership I express sincerely thanks to Peter.

There are 147 slides that are available to members to borrow for any lectures you wish to give or for your own interest or research.

Peter has also given us a 4" f 8.5 Newtonian reflecting telescope with equatorial mount and heavy metal tripod made by Charles Frank of Glasgow, probably around the early 1960s. There are also two eyepieces which are brass mounted, a 70 mm Huygenian and a 6 mm Ramsden. We have used both recently on our own 12" Newtonian and they are excellent. We have checked out the telescope at the observatory. All optics are on very good quality but both mirrors need realuminizing, once these are done this equipment will be made available for loan to members.

List of Slides

Deep Sky

9 slides, all deep sky objects and all black and white. Taken around 1970/71 by Mr. C. H. Aldridge of Shoreham-by-Sea, optician & amateur astronomer. Excellent image quality and fully labelled.

56 slides. All black and white dating from the first half of the 20th century. Taken by Hale, Hooker, Lick, Yerks observatories/telescopes and 48" Schmidt Camera in the U.S.A. also by South African Observatory. Included are a few lunar, solar and planetary slides. Slides are numbered which corresponds to an information sheet in English and a more comprehensive sheet in German. This is not a completed set.

8 slides of deep sky subjects, 3 are unlabelled also one of the Royal Greenwich Observatory when at Herstmonceux also one slide showing different types of stellar radiation.
10 slides in all.

Solar System

15 slides of most objects within the solar system. Mainly black & white. Phases, rotation and seasonal changes are dealt with. Some are not labelled.

14 slides in black & white, which compliment the item above. None are labelled.

Moon

6 black & white slides. All are labelled and are of good quality.

10 black & white slides. None are labelled. Probably Ranger lunar spacecraft photographs.

10 black & white slides by Zeiss of West Germany. None are labelled. Probably taken from Apollo 11. An asteroid and comet are included.

Spectral Analysis

17 slides, some in colour. The subject is approached with some astronomical connections.

If any items are of interest please contact Graham Boots
Tel., 01903 505346 or
gboots@observatory99.freemove.co.uk

Articles

Give us back our 11 days

R F Turner F R A S

If you are setting a trivia quiz one of the more intriguing questions you can ask is:

“ What happened on the 12th September 1752 “

The answer to this question is “nothing as it was cancelled through lack of support” as in that year September had only 19 days.

Most people have heard of this event but few know the true story of this world wide modification to the calendar and almost no one understands why it happened or the complications it made in greater Europe.

This is a story that started in 1582 and was not completed until 1929. It is a tale of ignorance, suspicion, intrigue and religious bigotry. A series of events that defy understanding that must have led to many unnecessary problems for merchants and travellers over the 347 years it took to get the date right.

Events started in 1582 when a Jesuit Astronomer, Christopher Clavius persuaded Pope Gregory XIII that the calendar was running 10 days behind the sky. In the observatory room of the Vatican at noon on the 21st of March of that year he showed that the spot of sunlight entering the room from a predetermined hole in the roof on to the marked floor was in the wrong place. The tiny blob of sunlight was 60 centimetres north of the equinoctial position of Aries showing that the Sun had passed through the Vernal Equinox 10 days earlier.

This revelation must have caused quite a stir in Ecclesiastical circles, important enough to be depicted in a fresco still to be seen in the Vatican. And so with the authority of the Pope and the Church of Rome behind him the stage was now set for Clavius to start to reform the World's calendar.

Resetting the Vernal Equinox to the 21st of March and fixing a pattern of leap days so discrepancies did not reoccur was only a small part of the problems that faced the Papal Astronomers. The real difficulty lay in the incompatibility between the Earth and the Moon for fixing holy days.

Calendar problems had first become apparent with the old Roman system, which had, by the reign of Julius Caesar, become so confused that that it was almost three months ahead of the planting seasons. The Julian reforms had adopted a Solar year of 365.1/4 days with a leap year every four years, which, although a great improvement, still gave a discrepancy of 1.1/2 hours every 19 Julian years

In the first century of the Christian era, after Caesar's new calendar was fixed, it was simple to keep the Hebrew calendar in step, by adding when necessary, a 13th Lunar month. This had solved problems like Easter, which traditionally had been the Sunday following the Jewish Passover and is dependant on the cycle of the Moon to fix the date.

By Pope Gregory's time the Earth Moon relationship had had a period of 1500 years to get out of step so not only was the Church looking at a reform of 10 days but the resetting of religious festivals.

The Papal decree that followed set down that "In order to fix the calendar for all times a system of adjusting leap years was to be adopted" This in fact meant that when the incremental differences reached a whole day the nearest leap day would be left out so in every 400 years the "Gregorian Calendar" would have only 97 leap days in place of the previous 100 leap days set by Julius Caesar.

If this work had been completed by 1510 or 1520 it would have probably have been universally adopted and faded into history, but by 1582 the Christian world was severely divided by Protestant reformation and so any decree from the Church of Rome was a matter of both religious and political contention.

Roman Catholic Countries were encouraged to adopt the new calendar and so the pattern of change begins

October 1582 Italy, Spain, Portugal and Poland all drop 10 days from the calendar between the 4th and the 15th of that month

November 1582 Part of France around Strasbourg adjusts

December 1582. The rest of France follows the 10 day change

December 1582 Belgium and the Catholic States of the Netherlands drop the last 10 days of the year

October 1583 Half of Austria drops 10 days

December 1583. the rest of Austria follows the October lead

Thus by the end of 1582 half of Europe was now 10 days ahead of its neighbours.

The religious divide in Europe was expressed in many ways, some forcibly. Protestant Germany was very much against the new calendar and Denmark would have nothing to do with the "Catholic idea"

So now begins the confusion, which was to persist for 117 years with two different calendars and two different sets of religious days. It is strange to report that little of the day-to-day problems have come down to us in archive material but obviously the traders and navigators of Europe had to make their adjustments.

On the century year of 1700 the leap day would add yet another daily increment to the problem so Germany and Denmark finally abandoned the Julian pattern in February to be followed in the following year by Switzerland and then in March 1701 the Protestant states of the Netherlands.

So now we have all Europe, with the exception of Britain, Sweden and Russia, unified with a single calendar.

After two centuries of resistance the turning point came on the 25th of February 1751 by a presentation to the House of Lords of a bill by Lord Chesterfield

“An act for regulating the commencement of the year and for correcting the calendar now in use”

Based on a paper to the Royal Society by Lord Macclesfield, a prominent amateur astronomer, the bill provided for the dropping of 11 days between the 2nd and the 14th of September 1752 and so the date was set for Britain and her Colonies to make the change.

In the run up to the change militant Protestantism was rife and a slogan of “give us back our 11 days” resulted in many exchanges between religious factions but very little civil disobedience. In fact the change when it eventually arrived seems to have gone rather smoothly despite the folklore that persists to this day of riots in the streets.

Like all good stories the tale does not end there as the French revolutionary’s in a bout of anticlerical zeal on the 5th of October 1793 brought in for all France a “calendar of reason”

This calendar had 12 months each of which was divided into three 10-day weeks. To align it with the Gregorian system every year would also have 5 or 6 revolutionary or special days and each day running from midnight was split into 10 hours. A one hundredth part of every hour became the decimal minute so while greater Europe enjoyed 1440 minutes every day Citizen Robespier had only 1000 so we must ponder on how he adjusted his watch or how he ever arranged to meet anyone.

Needless to say there was considerable resistance to these changes but the system persisted for eight years until Napoleon Bonaparte, in 1801 reinstated a Sunday every seventh day instead of every tenth day.

On the 1st of January 1806 France finally capitulated and adopted the Gregorian calendar for the second time.

1867 sees Alaska change on the advent of its purchase from Russia soon to be followed by Japan in 1873.

China was somewhat slower to adopt the system, which was introduced in 1912 but had to wait until 1929 to become accepted.

World War one brought modification of the calendar to all eastern Europe, Bulgaria, Lithuania, Latvia, Estonia, Russia, Yugoslavia and Romania and only Greece held out until May 1923.

By 1929 the whole World was on the same date three hundred and forty seven years after the little dot of sunlight hit the wrong place on the Vatican floor.

There is however a post script to this story. The Greek orthodox church in 1923 adopted an improved Gregorian calendar with leap days added every 2900 and 3300 years

So when we get to the twenty ninth century Greece will be one day ahead, I suggest a diary note will be appropriate

What’s on the Box

Friday 14th June 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

06:00 to 06:30 ~ Design for an Alien World

Following the fortunes of a team of space scientists as they develop experiments to work on the surface of Titan, Saturn's largest moon



21:00 to 23:15 ~ 2010

Sci-fi adventure drama about a joint Russian-American voyage to Jupiter to discover exactly what happened to an ill-fated exploratory mission nine years earlier. Sequel to Stanley Kubrick's seminal '2001: a Space Odyssey'. Including a cameo appearance by Arthur C Clarke, who penned the novel on which the screenplay is based

Sunday 16th June 2002



14:05 to 14:30 & 22:30 to 23:00 ~ The Hitch-Hiker's Guide to the Galaxy

Douglas Adams's epic adventure in time and space. Fit the twelfth: In which all is resolved, everyone lives happily ever after and pigs fly. With Peter Jones

Tuesday 18th June



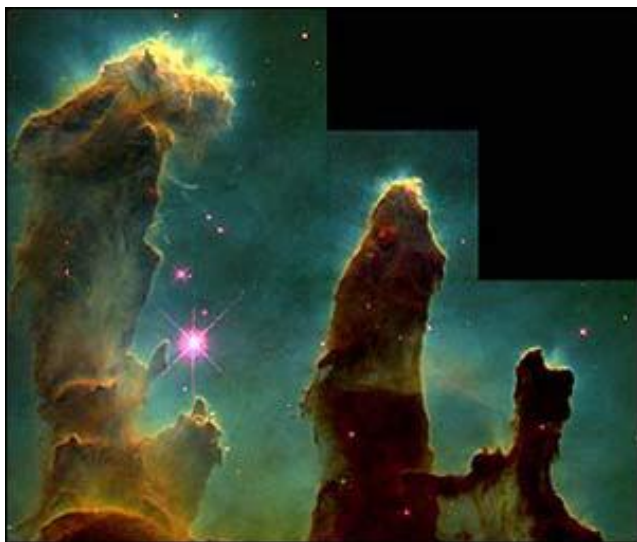
00:30 to 00:45 ~ Ever Wondered?

Vicki Butler-Henderson turns space tourist for the holiday of a lifetime

WAS News News

Hubble's 'Pillars of Creation' are fading

Dr David Whitehouse BBC News Online science editor



It is the most famous picture ever taken by the Hubble Space Telescope. Released in 1995, the image - dubbed the Pillars of Creation - has become an icon for the grandeur and beauty of the cosmos.

The awesome pillars are several light-years long, big enough to stretch from our Sun to its nearest stellar neighbour.

The Eagle Nebula, as it is known, was described at the time as a region of intense star formation; you can see bright stars sprinkled across the image and embedded in the vast columns of gas and dust.

Now, however, the latest observations (looking at wavelengths outside the optical region of the spectrum) suggest the Eagle is anything but a stellar breeding ground - it is, in fact, producing very few stars and fading fast.

A different picture

Professor Rodger Thompson, of the University of Arizona, US, has been observing the Eagle Nebula using the Nicmos (Near-infrared camera and multi-object spectrometer) on the Hubble Space Telescope.



He told BBC News Online: "They look like very dark, dense columns of gas and dust. But when you view them in the infrared, you get a different picture."

The infrared images show that the Pillars of Creation do not contain a lot of material and that star formation is coming to an end. The only place where stars are being born is at the very tips of the pillars.

The nebula - the word comes from the Latin for cloud - has been influenced by a cluster of very bright, type O stars nearby. They have shaped and illuminated the nebula (and initiated star formation within it) whilst at the same time working to destroy it.

The O stars, much larger and far more luminous than our Sun, would have formed quickly when the nebula was young. Although such stars burn for only a few million years at most, their influence on the development of the nebula has been profound.

Just a handful

The radiation and stellar winds from the O stars have evaporated much of the material from the nebula.

In some parts of the nebula, however, the outpourings of the O stars have met resistance. Unable to evaporate very dense regions of dust and gas, these outpourings have instead compressed material, triggering a burst of star formation.

Protected from the O stars' ravages behind a dust "capstone", huge pillars have reached out into space.

"The optical picture alone is very confusing," Professor Thompson told BBC News Online. "You need to look in the infrared to understand what is going on and what happened in the past." Although the tips of the pillars do act as a stellar nursery, astronomers now think even there not many stars are being formed - certainly no more than a handful.

Undiminished beauty

"In the tips, we can see five or six places where stars are forming. But we don't know if they are multiple or single stars or even if they are reflections from dust clouds," said Professor Thompson.

"The next step is to use the Chandra X-ray telescope to home in on the young stars in the Eagle Nebula because they radiate a lot of X-rays. That way we can take a census of what is exactly in these pillars."

There is no denying the beauty of the original Hubble image, but for some, knowing that the pillars will fade in a million years or so means the picture has lost a little of its appeal.

This revised analysis of the Eagle Nebula is in stark contrast to what we now know about star formation in the mighty nebula in Orion.

Evidence gathered in recent years has shown it to be an even more vigorous site of star birth than had been thought, with tens of thousands of stars being born.

Diary

June 12 *Extrasolar Planetary Search by Kevin Apps (Previously of Sussex University)*

June 21 Solstice night get together at the North Star Public House 7.30pm.

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)*

September 21 BAA Annual Exhibition Meeting, Cavendish Laboratory, Cambridge.

October 9 *A.G.M.*

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

December 11 *TBA by Owen Brazell editor of "The Deep-Sky Observer" published by the Webb Society.*

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

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