WAS NEWS

Monthly Newsletter of the **W**orthing **A**stronomical **S**ociety

Official website: www.was.org.uk
Affiliated websites: www.observatory99.freeserve.co.uk

Number 174 **April 2004**

ALMANAC

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

April / May

LUNAR

April	Date	Time	Rise	Set
Full Moon	5th	11.03	18.55	05.40
Last Quarter	12th	03.46	02.57	09.58
New moon	19th	13.21	05.03	19.11
First Quarter	27th	17.32	09.46	02.19
May				
Full Moon	4th	20.33	19.23	04.14
Last Quarter	11th	11.04	02.03	10.33
New moon	19th	04.52	03.55	20.40
First Quarter	27th	07.57	11.18	01.26

EARTH

April	Sunrise	Sunset
5th	05.26	18.41
12th	05.11	18.52
19th	04.56	19.04
27th	04.39	19.18
May		
4th	04.26	19.29
11th	04.14	19.40
19th	04.03	19.52
27th	03.53	20.03

PLANETS (As at April 27th.)

	Constellation	Rises	Sets	Mag.
Mercury	Pisces	04.20	17.39	+2.4
Unfavourable				
Venus	Taurus	06.06	23.34	-4.5
Brilliant in the south west				
Mars	Taurus	06.50	23.31	+1.6
Evening object				
Jupiter	Leo	13.32	03.15	-2.3
Brilliant evening object				
Saturn	Gemini	08.08	00.26	+0.1
Visible in the south west				
Uranus	Aquarius	02.59	13.25	+5.9
Unfavourable				
Neptune	Capricornus	02.11	11.30	7.9
Unfavourable				
Pluto	Serpens cauda	22.13	07.57	+13.8

PHENOMENA

Day	Hour	**April**
17th	01	Mercury in inferior conjunction
19th	06	Mercury 3° N. of moon
19th	13	Partial eclipse of Sun
22nd	23rd	April lyrid meteor shower zhr. 15
23rd	11	Venus 1° N. of moon
23rd	20	Mars 2° S. of moon
25th	07	Saturn 5° S. of moon
27th	28th	Alpha scorpiid meteor shower zhr. 5
30th	05	Jupiter 3° S. of moon
30th	13	Mercury at stationary point

May

2nd	08	Venus at greatest brilliancy
4th	21	Total eclipse of moon
5th	03	Jupiter at stationary point
12th	13th	Alpha scorpiid meteor shower
14th	20	Mercury at greatest elongation W.26°
16th	21	Mercury 2° S. of moon
17th	12	Neptune at stationary point
17th	22	Venus at stationary point

Minima of Algol

April 21st 02.48 23rd 23.36 26th 20.24

May Inconveniently situated

Lunar Occultation's Times as at W.A.S. Observatory

Date	U.T.	S.A.O.No	Mag.	Phase
April	h. m. s.			
25th	21.36.54	79150	8.8	Diss
25th	21.37.18	79106	8.8	Diss
25th	22.06.01	79122	7.9	Diss
25th	22.59.26	79142	6.7	Diss
25th	23.18.09	79164	7.8	Diss
26th	20.54.45	79850	8.9	Diss
26th	20.59.33	79855	8.0	Diss
26th	21.02.43	79861	5.8	Diss
26th	21.26.06	79869	6.2	Diss
26th	21.44.27	79874	8.5	Diss
26th	21.44.56	79876	8.7	Diss
26th	22.02.58	79883	9.0	Diss
26th	22.05.12	79888	8.5	Diss
26th	22.21.53	79886	8.5	Diss
27th	21.26.43	80494	8.6	Diss
27th	21.40.31	80496	7.5	Diss
27th	23.17.57	80529	7.0	Diss
28th	22.34.08	98761	7.9	Diss
28th	23.51.56	98783	8.0	Diss
29th	23.21.33	99210	7.8	Diss
May				
2nd	21.26.34	139129	7.5	Diss
10th	02.52.49	189249	6.9	Reapp
22nd	22.03.22	78804	7.5	Diss

This is only about 20% of the predictions for the W.A.S. Observatory, full list available on E-mail.

Dave Wells

Editors Note

Welcome, Welcome one and all to this months WAS News. Information, Articles and lovely colour (only via email!!!) pictures, all squeezed into six hand crafted pages – how can you resist!

Rob

Dates for your Diary

Total Lunar Eclipse

Alex Vincent.

On Tuesday evening May 4 2004 there will be a total lunar eclipse. The moon will rise during the initial partial umbral phase at about 19h 23m and totality starts at 19:57. Mid eclipse will be at 20 32 and totality ends at 21:08. The moon leaves the umbra at 22:12 and the penumbra at 23 09. All times are UT.

I am doing an eclipse watch down at Worthing Pier on this evening starting at about 19:00 UT (8 PM BST). All members and friends are welcome. Bring your own camera and tripod and please feel free to photograph not only the moon in eclipse, but the members and friends present for the society photograph album. If in doubt about the weather telephone me on my mobile 07753 282714.

Reports

The Planets in April 2004

Glen Thomas Planetary Section Director

Mercury reaches inferior conjunction on the **17th**, when it passes less than 2° north of the Sun. The next two maximum elongations (western in May and eastern in July) are difficult to observe, so if you missed the excellent evening aparition in March you will have to wait until September (mornings) for another chance.

Venus is still over 30° above the horizon at the end of civil twilight during the middle of April, but it is now past it's glorious best. **Venus** reaches inferior conjunction on **Jun 08** and its long awaited transit of the Sun.

Mars spends the next month around 7° W of **Venus**, although it is over 6 magnitudes (300 times) dimmer; **Mars** is twice as far away as the Sun and four times further than the larger **Venus**.

Jupiter transits around 2200 and is the brightest object in the night sky after **Venus** (and the Moon later in the month).

Saturn is continuing its descent into the West towards **Mars** and **Venus**, making a nice grouping by early **May**. (See May's WASNews for details of a High Salvington observing sessions, probably on May 21/22.)

Uranus Neptuneare still too close to the Sun for easy observing.

Pluto is slowly returning to visibility, and might be glimpsed in Serpens when the sky is at its darkest. Look with a large instrument around **0200-0230** in the South. Best around opposition, **Jun 07**.

Three asteroids currently can be seen brighter than magnitude 10:
1 Ceres (+8.5 in Gemini, 15° NE from Saturn),
5 Astraea (+9.8 in Virgo),
7 Iris (+9.9 in Leo).

March lecture reviewed by Vanessa Wegner

Transit of Venus

Robin Gorman

The last time Venus crossed the face of the sun was 1882, this rare event makes the next transit on June 8th a momentous occasion. The first recorded transit of Venus was observed by Jeremiah Horrocks in 1639, although Kepler predicted Venus crossing the sun just a few years earlier in 1631, however this was not observed by anyone in Europe and he did not predict the next transit observed by Horrocks.

Venus transits occur in pairs, each event in the pair is separated by eight years, the pairs occur at intervals of 121 and 105 years. This can be illustrated by the table below:

Date 1600 - 2300	Mid Transit (hours UT)	Visibility from UK
1631 Dec 7	05.21	Egress
1639 Dec 4	18.27	Ingress
1761 June 6	05.19	Egress
1769 June 3 - 4	22.26	Ingress
1874 Dec 9	04.07	Invisible
1882 Dec 6	17.06	Ingress
2004 June 8	08.21	Visible throughout UK
2012 June 5 – 6	01.31	Egress
2117 Dec 11	2.52	Invisible
2125 Dec 8	16.06	Ingress
2247 June 11	11.42	Visible throughout UK
2255 June 9	4.18	Egress

Jeremiah Horrocks only realised that the transit was due to take place a few weeks before the actual event and he was only able to observe the beginning of the planet's journey as the sun was about to set. Horrocks showed great promise as an astronomer but sadly died only one year later, due most probably to a brain haemorrhage.

Lomonosov observed the 1761 transit from St Petersburg, he realised the planet had a fuzzy edge to it and correctly speculated that Venus must have an atmosphere. Captain Cook famously observed the 1769 event in Tahiti, he was sent to carry out this observation specifically.

The 2004 transit could hardly be more favourable, the event will be visible from the whole of the UK and a vast part of the globe. It is also of very long duration, 6 hours and 12 minutes. This is so important astronomically and historically it would be worth travelling to a different part of the UK if the weather forecast for the South Coast is poor.

An interesting effect which can be witnessed at ingress or egress (the entry & exit stages of a transit) is the "black drop". Gilbert White a famous naturalist observed the 1769 transit from his back garden in Selborne, Hampshire. The speaker has visited his garden and was surprised to see a hill in his field of view, which must have hampered some of his observation. Gilbert White wrote that he "saw the planet Venus enter the disk of the sun just as it was setting, the spot being very visible." This is literally a spot occurring on the limb probably caused by the earth's atmosphere; this makes timing very difficult but does add an extra interesting dimension.

On June 8th the sun will rise at 3.45, ingress will occur at 5.19 and egress at 11.23am. To put this event into perspective it is worth noting that the last wholly visible transit of Venus from the UK occurred 720 years ago in 1283ad. Although Venus will cross the sun again in 2012, only the last 70 minutes will be visible.

Robin Gorman`s enthusiastic & informative talk was well received and succeeded in producing a sense of anticipation and the realisation that we are very fortunate to be able to see such a rare and interesting occurrence.

Articles

Past Life On Mars

Alex Vincent.

The recent discovery of evidence that water once flowed on Mars, and also being salty (suggesting a sea), makes it even more likely that life did exist on the planet at one time. Now we need to find past life in the form of fossils embedded in the rocks.

It is also worth investigating the rocks themselves in the vicinity where the sea once existed because they may be the remains of sea creatures, which existed on Mars many millions of years ago. We have this here on Earth such as chalk and flint, which were once sea creatures. So why not the same for Mars?

Aurora ~ Explaining the Explainable

R F Turner FRAS

One of natures most beautiful and spectacular sights is the Polar Aurora, more popularly known as the northern and southern lights.

The lights extend across the sky in a series of bands, arcs, arches, veils and filaments. Sometimes sharply defined, sometimes defuse but always impressive. Colours range from white to yellow, red, green and blue. and several colours may be present at the same time in the same in the same structure.

In real time the structures of the aurora change rapidly and as they are very feint they become exceedingly difficult to photograph. A normal camera will photograph between 100 to 1,000 ASA while a video camera operates between 1,000 to 5,000 ASA but to capture the aurora successfully, so as not to get movement, you need about 1,000,000 ASA.

The eye however has no such restriction and only directly viewing will show the beauty of this wonderful effect.

Aurora form in an oval around the poles about 20º to the sunward side and about 30º to the night side and the Earth rotates under these ovals every 24 hours.

The lights as we see them are being formed in a similar way to what's going on in a neon light tube used in advertising signs but they are a great deal bigger extending from 50 miles above the Earth's surface to nearly 400 miles up.

Between 60 to 150 miles the colour is predominately green but will show white, yellow or blue and above 150 miles the main colour is red. At the very bottom at 50 miles the aurora can take on a pink fringe which is a mixture of red and blue.

The effect is caused by charged particles driven off the Sun arriving in our upper atmosphere and colliding with the atoms of nitrogen and oxygen that form our air. The aurora normally stays within the oval at each pole but if there is a sever storm on the sun additional charged particles reaching us increases the activity and drives the to lower latitudes in the north and higher latitudes in the southern hemisphere.

Solar storms have over the years have created aurora that have been reported at very low latitudes. Tiberius Ceasar thought Ostia was burning viewed from his palace in Rome and sent the army to put out the fire and many other references exist in Greek and Chinese sources.

Material, mainly charged protons and electrons, flowing out from the Sun approach the Earth and are effected by the planets magnetic field which deflects them away from the Earth creating a vast magnetotail down wind. This magnetic sheath is about 40 to 60 Earth radii wide and over 1,000 Earth radii long.

Because of the Earth magnetic field the top lobe has a different polarity from the bottom or southern lobe. These lobes are separated by a sheet of electric current that flows across the mid plane of the tail.

This system however leaks at the poles and allows some of the charged particles to enter the Earth's atmosphere causing the aurora.

The charged particles collide with oxygen and nitrogen atoms which absorb the energy and then immediately re-emit the energy at a discrete frequency.

The principal emission lines are molecular nitrogen at 3914 and 4278 angstroms, atomic oxygen at 5577, 6300 and 6364 angstroms and atomic nitrogen at 6611 and 6768 angstroms which accounts for the distinctive colours. Wavelengths in angstroms define the colours of each frequency going through the spectrum from red to blue as the frequency diminishes.

So the aurora has become an indicator of Solar storms occurring about a day behind the event and have therefore become somewhat predictable. Most people however have never seen this great night time spectacle due to the amount of street lighting which completely floods out the auroral lights.

Notices

Observatory Transfer Sub Committee

Graham Boots

A sub committee is being formed to deal with the transfer of the observatory to a new location.
So far the sub committee consist of:-

Alex Vincent Chair
Geoffrey Woodward
Brian Halls
Graham Boots

It is hoped that a local, secure and easily accessible site can be found. Any thoughts or ideas should be directed to any one of the above named, either verbally or in writing giving as much useful information as possible.

For a central contact point please use:-

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grahamboots@observatory99.freeserve.co.uk

Any other members who wish to join the sub committee would be welcome.

What's on the Box

18th April 2004

BBC TWO

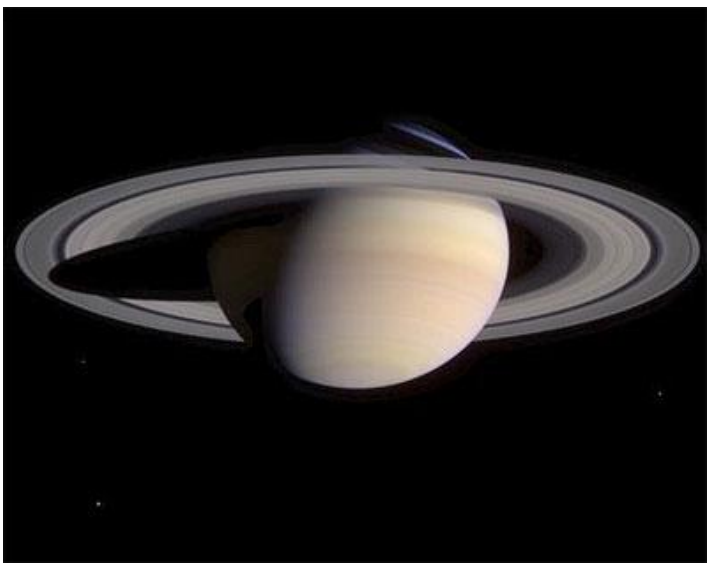
05:15 ~ 05:30: **Background Brief - Impact: Planet Earth**

Janice Acquah investigates the possibility of an asteroid colliding with the Earth

WAS News News

Spots on Saturn

NASA Photo Release



As Cassini closes in on Saturn, its view is growing sharper with time and now reveals new atmospheric features in the planet's southern hemisphere.

Atmospheric features, such as two small, faint dark spots, visible in the planet's southern hemisphere, will become

clearer in the coming months. The spots are located at 38 degrees south latitude.

The spacecraft's narrow angle camera took several exposures on March 8, 2004, which have been combined to create this natural colour image. The image contrast and colours have been slightly enhanced to aid visibility.

Moons visible in the lower half of this image are: Mimas (398 kilometres, or 247 miles across) at left, just below the rings; Dione (1,118 kilometres, or 695 miles across) at left, below Mimas; and Enceladus (499 kilometres, 310 miles across) at right. The moons had their brightness enhanced to aid visibility.

The spacecraft was then 56.4 million kilometres (35 million miles) from Saturn, or slightly more than one-third of the distance from Earth to the Sun. The image scale is approximately 338 kilometres (210 miles) per pixel. The planet is 23 percent larger in this image than it appeared in the preceding colour image, taken four weeks earlier.

Mars Express snaps stunning view of Louros Valles

European Space Agency News Release

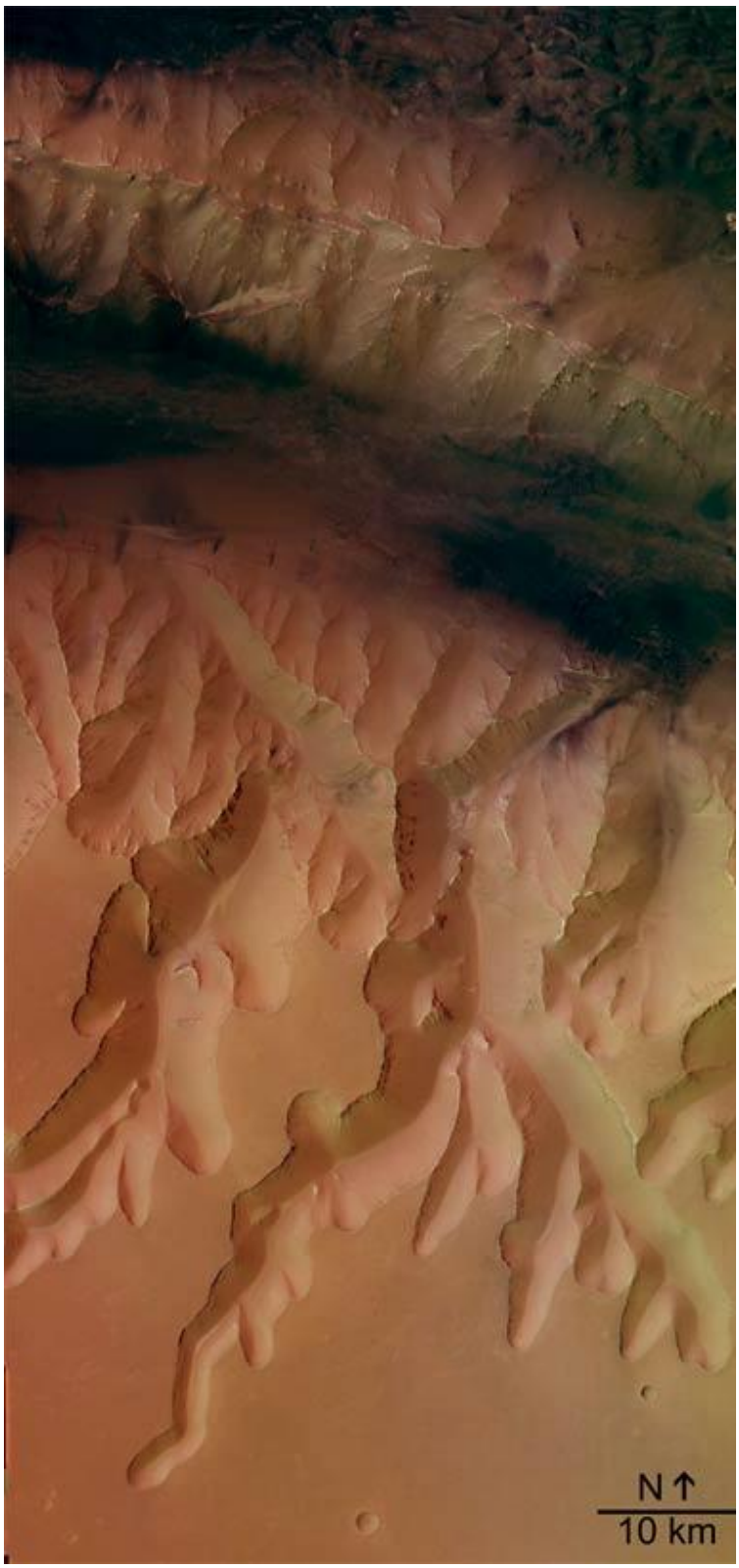
This latest image show a system of sapping channels, called Louros Valles (named in 1982 after river in Greece), south of the Ius Chasma canyon which runs east to west.

This image were taken by the High Resolution Stereo Camera (HRSC) on board ESA's Mars Express during orbit 97 from an altitude of 269 kilometres. The image has a resolution of about 13 metres per pixel and are centred at 278.8° East and 8.3° south. The colour image has been created from the nadir and three colour channels. North is at the right.

The Ius Chasma belongs to the giant Valles Marineris canyon system on Mars. The Geryon Montes, visible at the right of this image, is a mountain range which divides the Ius Chasma into two parallel trenches. The dark deposits at the bottom of the Ius Chasma are possibly related to water and wind erosion.

'Sapping' is erosion by water that emerges from the ground as a spring or seeps from between layers of rock in a wall of a cliff, crater or other type of depression. The channel forms from water and debris running down the slope from the seepage area.

This is known from similar features on Earth, but on Mars it is thought that most of the water had probably either evaporated or frozen by the time it reached the bottom of the slope.



Diary

14th April 2004 Isidis Planitia – Beagle 2 Landing Site on Mars Dee Levers Memorial Lecture. Dr David Rothery – Open University Dept. of Earth Sciences.

12th May 2004 Member's Contributions. Various short talks and slides / video display. Members show and describe their current activities.

9th June 2004 History of the WAS Observatory Graham Boots - Curator of the Observatory

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
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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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