

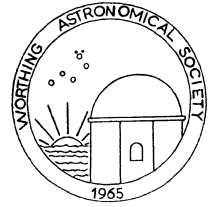


WAS NEWS

Monthly Newsletter of the Worthing Astronomical Society

Official website: www.was.org.uk

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



Number 162

March 2003

ALMANAC

All times U.T. For B.S.T. add 1 Hour

March./April.

LUNAR

Month	Date	Time	Rise	Set
March	New moon	3rd	02.35	07.24
	First Quarter	11th	07.15	09.44
	Full Moon	18th	10.35	18.17
	Last Quarter	25th	01.51	02.49
April	New moon	1st	19.19	05.58
	First Quarter	9th	23.40	09.09
	Full Moon	16th	19.36	18.41
	Last Quarter	23rd	12.18	02.27

EARTH

Month	Sunrise	Sunset
March	3rd	06.42
	11th	06.25
	18th	06.09
	25th	05.53
April	1st	05.37
	9th	05.19
	16th	05.04
	23rd	04.49

PLANETS

(as at March 25th.)

Planet	Constellation	Rises	Sets	Mag.
<u>Mercury</u>	Pisces	06.08	18.40	-1.8
Unfavourable				
<u>Venus</u>	Aquarius	04.52	14.49	-4.0
Magnificent morning object visible just before dawn				
<u>Mars</u>	Sagittarius	02.52	10.46	+0.6
Morning object visible low in the south east				
<u>Jupiter</u>	Cancer	12.50	04.21	-2.4
Visible in the south				
<u>Saturn</u>	Taurus	09.17	01.28	0.0
Visible in the west				
<u>Uranus</u>	Aquarius	05.01	15.08	+5.9
Unfavourable				
<u>Neptune</u>	Capricornus	04.17	13.27	+8.0
Unfavourable				
<u>Pluto</u>	Serpens	00.18	10.05	+13.8
Difficult				

PHENOMENA

March

Day	Hour	Phenomenon
15th	02	Jupiter 4° S. of moon
22nd	00	Mercury in superior conjunction
23rd	05	Pluto at stationary point
25th	18	Mars 3° N. of moon
29th	14	Venus 4° N. of moon

April

2nd	22	Mercury 4° N. of moon
4th	03	Jupiter at stationary point
7th	22	Saturn 3° S. of moon
11th	10	Jupiter 4° S. of moon

Minima of Algol

March	13th 19.48	28th 03.54	31st 00.42
April	2nd 21.30	20th 02.24	22nd 23.12

Lunar Occultations

Times as at W.A.S. Observatory

Date	U.T.	S.A.O.No	Mag	Phase	
March	13th	19.09.48	79568	8.9	diss
	13th	20.40.26	79610	8.0	diss
	13th	23.10.01	79674	8.8	diss
	16th	19.47.57	99172	5.7	diss
April	6th	19.18.22	76658	6.8	diss
	7th	22.39.29	77252	6.9	diss
	8th	20.07.53	78296	8.1	diss
	8th	21.38.24	78340	9.0	diss
	8th	21.58.31	78360	8.9	diss
	8th	22.05.15	78365	8.5	diss
	8th	23.00.25	78415	8.2	diss
	9th	21.13.26	79307	8.5	diss
	9th	21.38.21	79326	9.0	diss
	9th	21.38.25	79324	9.0	diss
	9th	21.52.44	79317	8.5	diss
	9th	22.20.14	79349	8.9	diss
9th	22.23.41	79351	8.7	diss	
10th	22.27.17	80105	8.0	diss	
11th	20.29.48	80693	8.1	diss	
11th	20.46.34	80697	9.2	diss	
11th	22.35.48	80735	8.4	diss	
12th	19.33.30	98955	3.5	diss	

This is only about 18% of the predictions for the WAS. Observatory.

Dave Wells

Editors Note

Greetings all! I hope your month has been good and you've all been able to contain yourself whilst waiting for this issue of WAS News – well, at last the wait is over!

This month's eagerly anticipated issue is replete with all that's happening in the Sky above. Read on.

Rob

Dates for your Diary

April 4 – No observatory night with Graham on this Friday, but Alex Vincent has an alternative for you at Hillbarn, phone him on Mobile: 07753 282714 for details.

April 25 – Sunday 27 – BAA Winchester Weekend, King Alfred's College, Winchester; £100 (£110 for non-BAA members). Anyone just wishing to attend the **Observers Workshop** on the Saturday the cost is £20 per delegate. Anyone wishing to attend the Sunday lectures the cost is £17. Prices include lunch and VAT. As the Society is an affiliated member of the BAA, **one** WAS member will be able to attend at BAA membership price. For further details contact the Acting Secretary.

July 12 – SAGAS annual convention. This year hosted by Horsham AS and which will be held at Christ's Hospital School just outside Horsham. Some of the speakers include John Mason, Adrian Catterall, and Lee McDonald. It is hoped that Dr Alan Chapman will be able to speak as well.

For further details contact the Acting Secretary.

Reports

The Planets in March 2003

Glen Thomas - Planetary Section Director

Mercury passes through superior conjunction in the middle of the month and so is not observable.

Venus is now at an elongation of 40° (it's angle from the Sun), down from a maximum of 47° on **Jan 11th**, and shows a distinct if small (15") gibbous phase in a telescope. As it moves away from us it will shrink in size but increase its phase, becoming closer to the horizon as the morning sky brightens.

Mars is visible in the SSE just before dawn, but little detail is visible yet on its surface. At only 7" across and 13° altitude it will be a challenge to see a steady disc through the turbulence of the atmosphere. A *Nature* journal article presents a new theory for the formation of the Martian 'gullies' to add to the water ice and carbon

dioxide landslide ideas - melted snow! Place your bets now.

Jupiter is still prominent all night. As the giant planet orbits slowly around the Sun, Earth spends a while in the same plane as the Galilean moons. This means that there are many mutual occultations and eclipses of one moon by another, in addition to the usual transits across the planet's face. For details check the Internet: <http://skyandtelescope.com/>

Saturn is getting faint enough for it to be mistaken for a bright star now but it is still well placed during the evenings. It is a large and rewarding sight with the rings well spread and the ring divisions and several of the moons visible in modest telescopes.

Uranus and Neptune are too close to the Sun to observe.

Pluto is now a morning object rising before 2 am at the beginning of the month and before midnight by the end. It reaches an altitude of around 20° before dawn lightens the sky too much, but will be tricky until much later in the year, and in any case needs an aperture of *at least* 20 cm (8 in).

Asteroid **4 Vesta** is moving through the constellation of Virgo and reaches naked eye brightness for those able to observe from a dark sky (magnitude of 5.9 by the end of the month). Use binoculars and record the field on different nights to locate the brightest of asteroids. Look 4° southwest of 47 ε Virginis on the **18th** and 1° south of 30 ρ Vir by the **28th**.

Deep Sky Section – Spring 2003

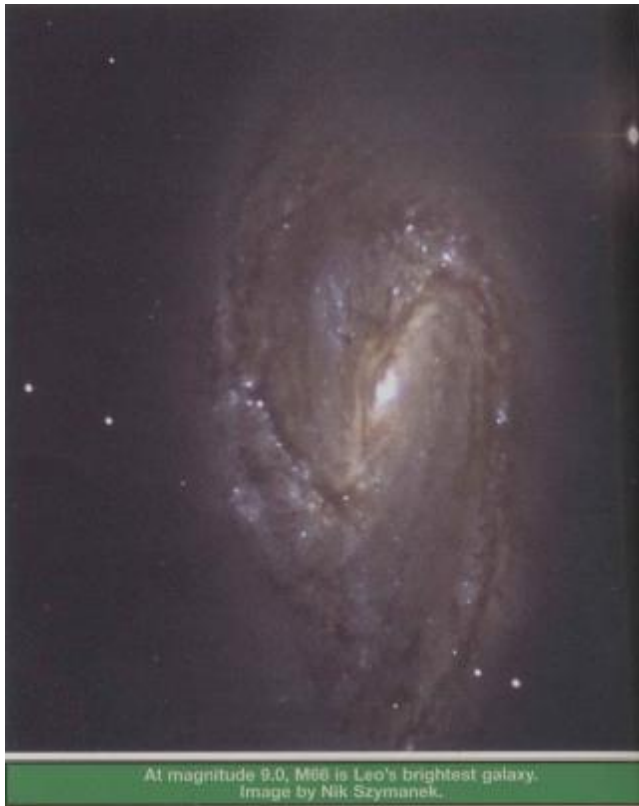
Graham Boots - Deep Sky Section Director

For autumn 2002 I chose the constellation of Aquarius. Little did I know how disastrous the weather was going to be? It was the worst autumn I can remember and after recent years that is really saying something.

When I chose Aquarius I was aware that within a few months it would soon enter the evening twilight sky and we would no longer be able to observe the objects within it that I had chosen, so time was not on our side if the weather let us down, which it did. In terms of observing the night sky on observer's evenings held each Friday, we achieved next to nothing from October to December inclusive.

The only object we managed to observe in Aquarius was the globular star cluster, M2. We observed this object twice, each time under very poor seeing. The Deep Sky Section article in WAS News that I devoted to Aquarius appeared in July 2002 edition and my intention is to return to this constellation from August onwards this year.

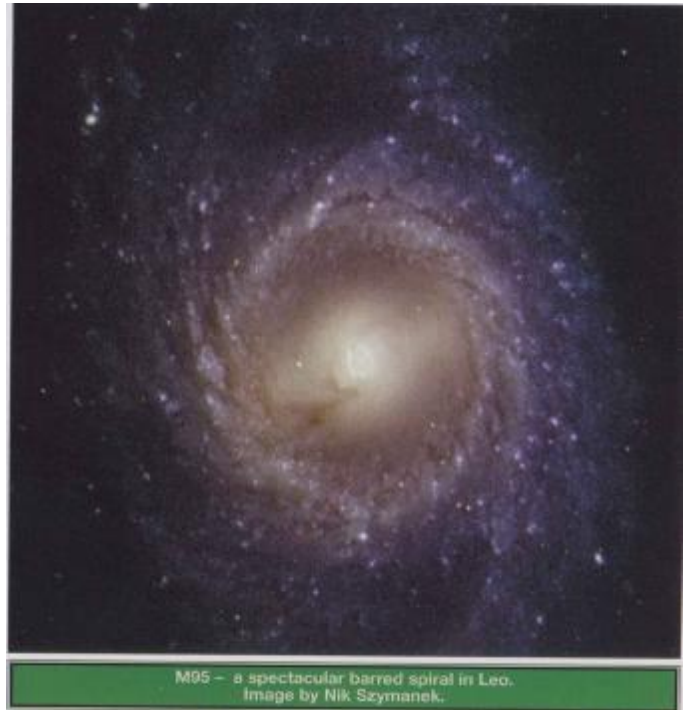
However, on the plus side all these cloudy Fridays gave us the opportunity to press on with the computer imaging system in conjunction with the black and white video camera installed on the 29.2 cms Newtonian which is now complete, tested and in use with Adobe Photoshop.



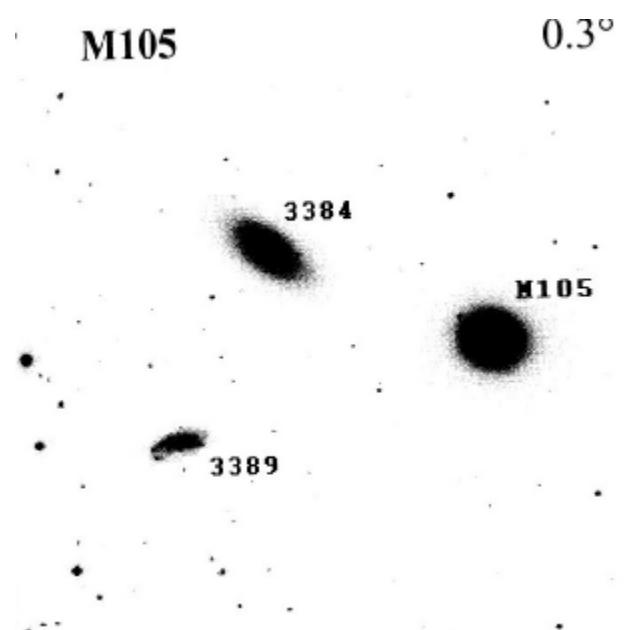
For the spring months I have chosen the constellation of Leo. This constellation is well placed through spring and summer being high in our sky. In the tail of Leo the Lion there are two close groups of galaxies each containing three separate galaxies with the faintest of these six being magnitude 9.8.

Given reasonable seeing conditions the 29.2 cms f 5.6 Newtonian should show us all of them. The first group contains M65 and M66, which are only $1/3^\circ$ apart and share a similar line of declination. They are both spirals tilted at an angle to us. The magnitudes are 9.4 and 9.0 respectively. See the photograph of M66 by Nik Szymanek that accompanies this article.

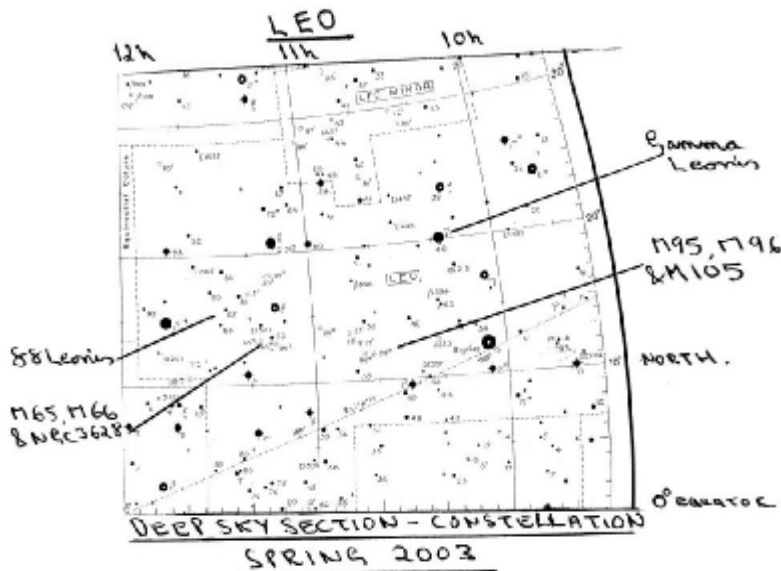
Just north of this pair is the edge on spiral, NGC3628 at magnitude 9.5. These three galaxies are within $1/2^\circ$ of each other and therefore it is possible to see all three within the same low power/wide angle eyepiece.



The next group of three galaxies contains M95, a barred spiral at magnitude 9.8, see photograph shown here taken by Nik Szymanek, M96, a spiral at magnitude 9 and M105 an elliptical galaxy at magnitude 9.3 which has a diameter of 4.5 minutes of arc. These three galaxies are somewhat more widely spaced than the previous three. However, within 10 minutes of arc of M105 there are yet two other galaxies, NGC3384 at 9.9 and NGC3389 at 11.9. If the seeing is really good and Leo is high in the sky we should see these as well, making eight in all. See the photograph showing the two fainter galaxies close to M105 that accompanies this article.



Finally two coloured double stars. Gamma Leonis, both components are described as golden orange. This is a binary system with a period of 620 years. The magnitudes are 2.2 and 3.5 with a position angle of 125° and a separation of only 4.4 seconds of arc (Norton's 1989 18th edition). The other double star is 88 Leonis, described as yellow and lilac at magnitudes 6.4 and 8.2 (I remember looking at this pair of stars and few years ago and still recall the distinct lilac shade) the separation is 15.4 seconds of arc and position angle is 326° (Norton's 1924 15th edition)



All are welcome to come to the observatory on any Friday (except Good Friday) evening and see these objects. Please study the diagram, which shows the positions of the objects I have mentioned that accompanies this article.

Later this year I will recall to mind the objects I chose in Aquarius by reproducing part of the original article published last July and at the same time give an account on how we got on observing the objects in Leo, weather willing.

Solar Section Report - February 2003

Section Director, Brian Halls

After many months of prolonged sunspot activity, there was a marked drop in the number of groups that were visible.

SYNOPSIS

The month began moderately, with most sunspot groups in the southern solar hemisphere. The largest group at this time was sunspot region 100276 ($S13^\circ$ $L=162^\circ$ area/class= 0260 Eai). This group remained fairly stable over several days until it began to decay before disappearing at the west solar limb on 14 February.

The second week of the month saw a sizable increase in the number of sunspot groups as the sunspot bearing longitudes drifted once more into view. Many of these active sunspot regions were of the C and D type classification.

Activity reached a low on the 17 February when only one small sunspot group 100288 ($N12^\circ$ $L=346^\circ$ area/class 0050 Dso) was reported visible by the Space Environment Centre (SEC) at Boulder in Colorado. Our own Brian States recorded two spots for the day. Activity once more began to slowly increase with the activity predominant in the northern solar hemisphere for much of the latter part of the month.

By the last day of February southern groups were once more revolving into view and activity increasing again.

SOCIETY

Members of the Society observed the Sun on 20 days during the month – observations being received from the Curator, Graham Boots, Brian States and, the Director.

MDF = 3.12 (N = 1.7; S = 1.6) R = 43.9

THE SUN & COLUMBIA

No doubt like myself, you were saddened by the news tragic news of the loss of the seven astronauts and the Orbiter *Columbia* at the beginning of the month.

As I write this just over a month later, how hot plasma generated during the fiery re-entry got under the skin of the Orbiter's left wing remains a mystery and a topic of speculation.

Just recently it was drawn to my attention that a regular magnetic storm alert was released by the SEC at lunchtime on 1 February and is reproduced here:

Space Weather Message Code: WARSUD

Serial Number: 26

Issue Time: 2003 Feb 01 1344 UTC

WARNING: Geomagnetic Sudden Impulse expected

Valid From: 2003 Feb 01 1345 UTC

Valid To: 2003 Feb 01 1400 UTC

IP Shock Passage Observed: 2003 Feb 01 1305 UTC

A "Geomagnetic Sudden Impulse" is a severe but short geomagnetic storm that affects the upper regions of the atmosphere.

This one lasted only 15 minutes but it hit one minute after Entry Interface, (contact with the atmosphere.) *Columbia* reached Entry Interface north of Hawaii at 13:44UT. NOAA (the National Atmospheric & Oceans Administration of whom the SEC is an integral part) issued the official "Geomagnetic Sudden Impulse" warning also at 13:44UT. The geomagnetic shock from

the solar storm hit Earth's atmosphere at 13:45UT. *Columbia's* first telemetry out of the ordinary ("off nominal" in NASA-parlance) was at 13:52UT just off the coast of California. The solar storm lasted until 14:00UT.

It is more than likely that the magnetic storm and the sequence of events that ended in tragedy is just a bizarre coincidence – and begs the question how could a magnetic storm cause a breach in the skin of the shuttle Orbiter? We can only await the end of the no doubt lengthy investigation and enquiry into the actual loss of a fine crew and vessel.

Young Moon Club

Glen Thomas - Lunar Section Director

The earliest visibility of the new Moon is important for the Islamic calendar, but for amateur astronomers there is an interesting task here - how early can the new Moon be seen?

It depends on many factors, such as the time between Sunset and the Moon setting the day after the New Moon, the angle the ecliptic and the Moon's orbit make with the horizon, position of the Moon in it's elliptical orbit, transparency of the atmosphere, and geographic latitude of the observer.

Wait until after the Sun has set then scan with binoculars if available. Those with aligned telescopes and a clear western horizon might use setting circles to find the Moon around sunset and perhaps the evening before for some dates.

The table shows the different situations for each month a day or so after the New Moon when it may be visible, with May and end of June being perhaps the best. (Data calculated using Alcyone Software's *Planet's Visibility*, for Worthing; 0°49'N 0°26'W.)

date	sun set	moon set	diff sets	moon phase	moon age
2003 Mar04	17:47	19:16	1:29h	2.7%	39:12h
Apr03	18:36	20:29	1:52h	3.5%	47:18h
May02	19:23	20:38	1:14h	1.5%	31:09h
Jun01	20:05	21:49	1:44h	2.6%	39:45h
Jun30	20:18	21:28	1:09h	1.3%	25:40h
Jul30	19:50	21:01	1:11h	2.9%	36:58h
Aug29	18:54	20:00	1:05h	5.6%	49:28h
Sep27	17:49	18:37	0:47h	3.7%	38:40h
Oct27	16:46	17:47	1:00h	6.9%	51:56h
Nov25	16:04	17:02	0:57h	4.5%	41:05h
Dec25	16:00	18:14	2:14h	7.4%	54:17h

Keep an eye on WASNews for details of organised observing sessions.

February Lecture Reviewed - Report by Vanessa Wegner

Astronomical Imaging from La Palma

Nic Szymanek & Ian King



Nik opened the lecture by describing the beautiful island of La Palma & the superb observing conditions, which attract professional astronomers worldwide. The observatory is 8000 feet high & protected from light pollution by international law. The natural shape of the island is fairly aerodynamic contributing to fantastic observing conditions. The island is fascinating even for non-astronomers. There is a volcano so vast it has its own weather system! Many images of La Palma show some spectacular low-level cloud but such conditions only last a few minutes & do not impact on observing. The site is in the same league as observatories in Chilli & Hawaii.

The Isaac Newton Group of Telescopes on the island consists of a 4.2 metre William Herschel telescope, (known to the locals as Big Willie for obvious reasons), a 2.5 metre Isaac Newton & a 1 metre Jacobus Kapteyn. Sadly the Kapteyn telescope will be closing this year & the Isaac Newton in 2004. There are many other strange & wonderful instruments dotted around the island, one of the largest is a 4.9 metre Italian telescope called Galileo.

Nik & Ian have full access to the site, which is extremely unusual for amateurs, it is a reciprocal relationship, they undertake promotion work for the observatory & can use the images they produce in their own work.

Nik proceeded to explain that astrophotography could either be very easy or very hard. The least complicated

What's on the Box

Saturday 15th March 2003

4

20:00 to 21:00 ~ **Space Shuttle**

(The Human Time Bomb?) An investigation into the recent space tragedy when the shuttle Columbia disintegrated as it re-entered the atmosphere. Was it a genuine one-off disaster - or an accident waiting to happen? The programme attempts to go beyond the immediate technical failures to look back over almost three decades of space shuttle design and uncover the deeper reasons behind the tragic event.

Thursday 20th March 2003

4

04:15 to 05:15 ~ **Extreme Universe**

Documentary examining the catastrophic consequences of Earth being hit by one of the thousands of asteroids or comets that exist within our solar system.

WAS News News

Pioneer 10 sends last signal

NASA News Release

After more than 30 years, it appears the venerable Pioneer 10 spacecraft has sent its last signal to Earth. Pioneer's last, very weak signal was received on Jan. 22, 2003.

NASA engineers report Pioneer 10's radioisotope power source has decayed, and it may not have enough power to send additional transmissions to Earth. NASA's Deep Space Network (DSN) did not detect a signal during the last contact attempt Feb. 7, 2003. The previous three contacts, including the Jan. 22 signal, were very faint with no telemetry received. The last time a Pioneer 10 contact returned telemetry data was April 27, 2002. NASA has no additional contact attempts planned for Pioneer 10.

"Pioneer 10 was a pioneer in the true sense of the word. After it passed Mars on its long journey into deep space, it was venturing into places where nothing built by humanity had ever gone before," said Dr. Colleen Hartman, director of NASA's Solar System Exploration Division, NASA Headquarters, Washington. "It ranks among the most historic as well as the most scientifically rich exploration missions ever undertaken," she said.

"Originally designed for a 21-month mission, Pioneer 10 lasted more than 30 years. It was a workhorse that far exceeded its warranty, and I guess you could say we got our money's worth," said Pioneer 10 Project Manager, Dr. Larry Lasher.

Pioneer 10 was built by TRW Inc., Redondo Beach, Calif., and was launched March 2, 1972, on a three-stage Atlas-

Centaur rocket. Pioneer 10 reached a speed of 32,400 mph needed for the flight to Jupiter, making it the fastest human-made object to leave the Earth; fast enough to pass the moon in 11 hours and to cross Mars' orbit, about 50 million miles away, in just 12 weeks.

On July 15, 1972, Pioneer 10 entered the asteroid belt, a doughnut-shaped area that measures some 175 million miles wide and 50 million miles thick. The material in the belt travels at speeds up to 45,000 mph and ranges in size from dust particles to rock chunks as big as Alaska.

Pioneer 10 was the first spacecraft to pass through the asteroid belt, considered a spectacular achievement, and then headed toward Jupiter. Accelerating to a speed of 82,000 mph, Pioneer 10 passed by Jupiter on December 3, 1973.

The spacecraft was the first to make direct observations and obtain close-up images of Jupiter. Pioneer also charted the gas giant's intense radiation belts, located the planet's magnetic field, and established Jupiter is predominantly a liquid planet. In 1983, Pioneer 10 became the first human-made object to pass the orbit of Pluto, the most distant planet from the Sun.

Following its encounter with Jupiter, Pioneer 10 explored the outer regions of the solar system, studying energetic particles from the Sun (solar wind), and cosmic rays entering our portion of the Milky Way. The spacecraft continued to make valuable scientific investigations in the outer regions of the solar system until its science mission ended March 31, 1997.

Since that time, Pioneer 10's weak signal has been tracked by the DSN as part of a new advanced-concept study of communication technology in support of NASA's future Interstellar Probe mission. At last contact, Pioneer 10 was 7.6 billion miles from Earth, or 82 times the nominal distance between the Sun and the Earth. At that distance, it takes more than 11 hours and 20 minutes for the radio signal, travelling at the speed of light, to reach the Earth.

"From Ames Research Centre and the Pioneer Project, we send our thanks to the many people at the Deep Space Network (DSN) and the Jet Propulsion Laboratory (JPL), who made it possible to hear the spacecraft signal for this long," said Pioneer 10 Flight Director David Lozier.

Pioneer 10 explored Jupiter, travelled twice as far as the most distant planet in our solar system, and as Earth's first emissary into space, is carrying a gold plaque that describes what we look like, where we are, and the date when the mission began. Pioneer 10 will continue to coast silently as a ghost ship into interstellar space, heading generally for the red star Aldebaran, which forms the eye of the constellation Taurus (The Bull). Aldebaran is about 68 light-years away. It will take Pioneer 10 more than two million years to reach it. Its sister ship, Pioneer 11, ended its mission September 30, 1995, when the last transmission from the spacecraft was received.

Diary

March 12 *Indoor Astronomy (observatory-remote operating) - Dr. Lilian Hobbs Southampton AS*
April 9 *TBA (members night, provisionally)*
April 25 – 27 BAA Winchester Weekend, King Alfred's College, Winchester
May 14 *Woman Astronomers - Martin Lunn M.B.E., F.R.A.S., Curator of Astronomy, Yorkshire Museum, York*
June 11 *The Planet Mars - Jerry Workman Bsc., F.R.A.S.*
July 9 *White Dwarf Stars – Konrad Maylin-Smith Croydan AS*
July 12 SAGAS annual convention
September *TBA*
October *TBA*
November 12 *Space Weather - Dr. Andrew Coates of Mullard Space Sciences Laboratory University College London*

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

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