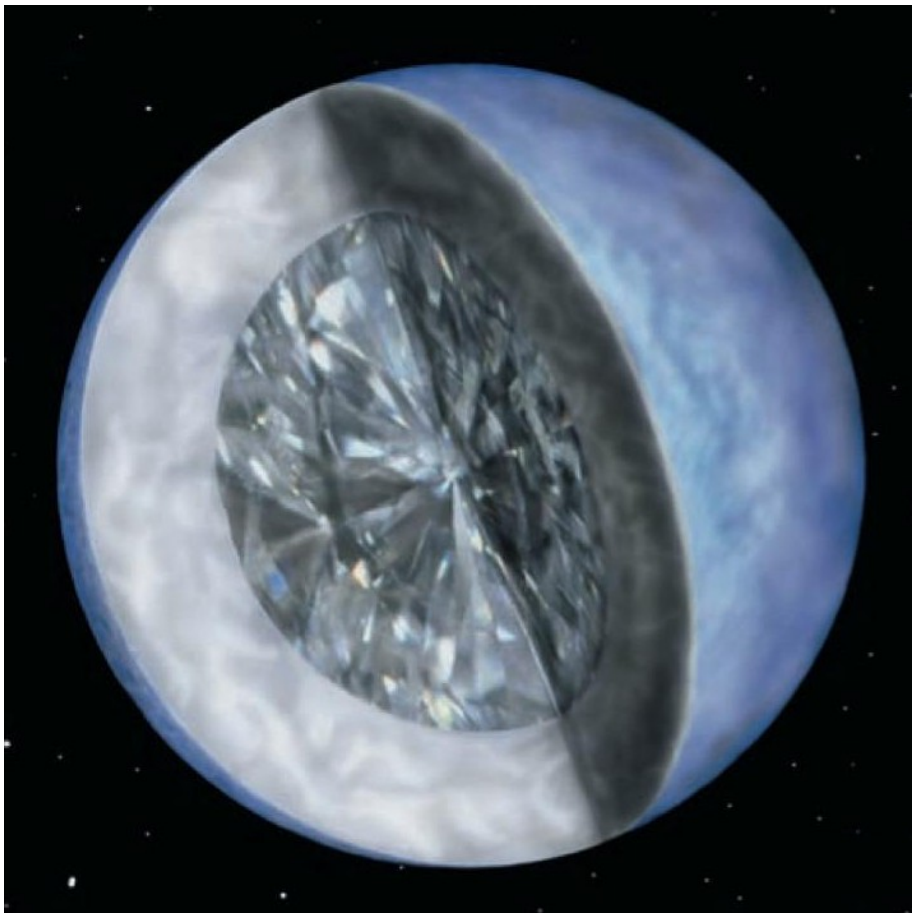
Thanet Astronomy Group

Astronomy for Everyone in Plain English

NEWSLETTER

September 2015



BPM 37093 A Variable White Dwarf Star (Lucy)

Contents

Executive Committee Messages

The executive committee messages have now been moved to page 3 to ensure that these important messages are seen first.

Star Viewing Party

Depending on the clouds

We are hoping to hold a star viewing party this Sunday Night 27th / Monday Morning 28th September.

Please keep an eye on your emails, as we will be sending out an email on Sunday afternoon to confirm plans.

The main attraction is the :-

Full Moon / Harvest Moon / Super Moon / Blood Moon / Total Eclipse of the Moon

We will also be looking at a variety of :-

Constellations, Planets, Deep Sky Objects like M42 the Orion Nebula,
M31 the Andromeda Galaxy, M13 a Globular Cluster, Etc.

The location will be near the shelter on the cliff top at Dumpton Gap.
Time from about 8pm Sunday night - till after 5:30am Monday Morning
The Partial Eclipse Starts at 2:07am and ends at 5:27am
Total Eclipse Starts 3:11am and ends at 4:23am

There will be plenty to see in the evening well before the eclipse for those that can not stay all night.

We are looking for support and help in organising this event including :-
Of course Telescopes and :-

Tent, Chairs, Gas Barbecue, Cooking, Food of all sorts, Sandwiches, Drinks Etc.

Its up to you how good you make this :-)

X Marks The Location

Executive Committee Messages

Christmas Dinner

The Thanet Astronomy Group Christmas dinner this year will be held on our members meeting night Wednesday 2nd December 2015 at the West Bay Cafe.

There will be a 3 course dinner and entertainment, we will also be holding a raffle (if you wish to donate any prizes, please let us know).

Prices for the dinner are yet to be confirmed, but if you wish to attend could you please let us know so we can advise Alan and Kate of numbers.

We will be sending out an email once we receive confirmation of prices.

Newsletter

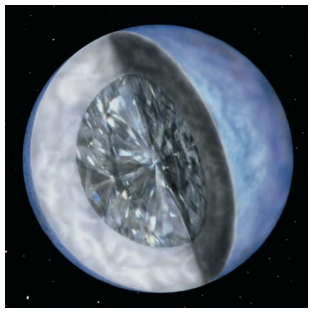
We regret that from this newsletter issue 12, September 2015 we will be changing to a bimonthly issue. So the next issue will be issue 13, October and November 2015.

It takes the few people that contribute to the newsletter Many Days of work to produce it, and this can not continue. If any members would like to offer to produce any pages on a regular monthly basis we would be very grateful.

If there is enough support then we will reinstate the monthly issue.

Danny, George, Gill.

About the Cover Picture



BPM 37093 A Variable White Dwarf Star (Lucy)

So, I have chosen this month's cover story to be about a Variable, White Dwarf Star, strangely with the common or nickname “LUCY”. It was the strange name that hooked me, honestly!! It was nothing at all to do with Diamonds.....

The story goes like this … A long time ago in a galaxy far far away (*oops that's Star Wars, sorry ;-*) but it's still good for this star - A star, just like our Sun, was born out of the gas and dust in a nebula about 50 light years from Earth in the constellation called Centaurus.

You can look up the constellation 'Centaurus' or the star 'BPM37093' also known as 'V886' in Stellarium and find where it is in the sky, but you won't be able to see it for two reasons. First is because it's a southern hemisphere star and second because its apparent magnitude is 14.0. But at least you will know where it is.

Lets look first at what a ***'white dwarf'*** is, a white dwarf is what stars the size of our Sun turn into after they have finished burning all their nuclear fuel. At the end of this stage, the star explodes most of its outer shell, about half of its matter, into space, creating a planetary nebula.

The remaining hot core of the star (the White Dwarf) has a temperature exceeding 100,000 Kelvin, whereas the original stars temperature was only about 5,800 Kelvin. This makes a white dwarf over 17 times hotter than the star it was formed from. It is also a very dense star, almost one million times the density of water. Eventually the white dwarf itself will die as it cools, it will finally become a Black Dwarf which is the last stage of almost all stars up to 1.4 times the mass of our Sun.

So enough of that, and back to Lucy, a Variable white dwarf. By the way 'Variable' simply means its magnitude or brightness changes. For those that want it the hard way ...Lucy is a type DAV or ZZ Ceti (generally variable stars with hydrogen rich atmospheres [DAV], and the rate at which they vary or pulsate is in the range of 30 seconds to 25 minutes [ZZ Ceti]) a star which also has an unusually high mass approximately 1.1 times that of our Sun.

I digress but the above is important, and here comes the interesting bit. According to *The Smithsonian/NASA Astrophysics Data System,* it was predicted over 40 years ago that the cores of the coolest pulsating white dwarfs should eventually crystallise. So what is so good about that, well that would depend on what the crystal was. It is believed that the crystal formed would be a Diamond! In the case of BPM37093 about 90% of the star! Which is the most massive pulsating white dwarf star known. Hence the name Lucy from the Beatles song “Lucy in the sky with Diamonds”.
Danny

Thanet Astronomy Group Contact Details

Executive Committee

Chairman	Daniel Day	01843 228 904
Treasurer	George Ward	01843 292 640
Secretary	Gill Palmer	07543 942 245

Committee

Volunteers	George Cozens	07970 181 395
Members	Sheila Bull	07791 892 057
Newsletter	Janet McBride	01227 364 092
Newsletter	Tracy Howes	07917 710 638
Library	Janet McBride	01227 364 092
Web Site	Danny Day	01843 228 904
JAC & Gill	Gill Palmer	01843 848 064

Thanet Astronomy Group
Member's Meetings
Dates and Times

9th September 2015 at 8pm
7th October 2015 at 7.30pm
4th November 2015 at 7.30pm
2nd December 2015 at 7:30pm
6th January 2016 at 7:30pm
3rd February 2016 at 7:30pm
2nd March 2016 at 7:30pm
6th April 2016 at 7:30pm
4th May 2016 at 7:30pm
1st June 2016 at 8pm
6th July 2016 at 8pm
3rd August 2016 at 8pm

All Member's meetings will be held at the :-

West Bay Cafe,
Sea Road,
Westgate-on-Sea,
Kent.
CT8 8QA

Advertisement

WEST BAY CAFE

Sea Road - Westgate-on-Sea
CT8 8QA

Location :-
This Family Friendly Cafe is situated on the promenade just beside the sandy beach. Opposite the junction of Sea Road and Rowena Road. Westgate-on-Sea. CT8 8QA.

Access :-
via a flight of steps behind the cafe.

Disabled Access :-
via the main entrance to the bay and a slope at the cafe door.

West Bay Cafe run by Alan and Kate and has a very friendly atmosphere.

Alan outside the new style West Bay Cafe

There is a wide variety of good food and drinks at very reasonable prices and there are always special offers.

There is seating both inside and outside for those extra hot days.

A Typical Sunset at the West Bay Cafe

The Sunsets at the West Bay Cafe are Spectacular.

With a meal, some friends, and a pint or two.

What more could you ask for!

West Bay Cafe have hosted Thanet Astronomy Group since September 2013.

We would like to say a
HUGE THANK YOU to Alan and Kate
for all the help and support they have shown us over the last year.

Please use this Brilliant Seaside Cafe and Tell Your Friends.

What we did last month

August 2015

Saturday 1st Public Outreach Meeting

Today was another very hot Sunny day, so the telescopes were out and pointing at the Sun. We were again looking for Sun spots. Many people were interested in what we were doing and had a look. Gill had quite a few children attending the JAC & Gill Club and they all wanted to do the planets walk around the bay.

Wednesday 5th Members Meeting

George Ward gave one of his amazingly popular star-hopping talks. Star Hopping from the constellations **Ursa Major, Ursa Minor, Cygnus, Cassiopeia** and **Cepheus**. Star hopping is the technique of using the few constellations you can find as sign posts to find other constellations and objects in the night sky. Each constellation you can find, will point you to several other objects and this will rapidly increase the number of constellations and stars you can locate.

Saturday 8th Public Outreach Meeting

Today was very clear and most telescopes where aimed at the Sun which had a huge sunspot. So we spent a lot of the afternoon trying to get good pictures of the huge sunspot. As Gill was on holiday Niamh stepped in and was very busy teaching the JAC & Gill Club children all about astronomy.

Saturday 15th Public Outreach Meeting

There were only a few small sunspots visible on the Sun today. We had a few members of the public looking through the telescopes at the Sun and at the other targets on the horizon. We even had a flyby of a plane which was on its way from the Herne Bay air show and again on its way back.

Saturday 22nd Public Outreach Meeting

Today was very hot! A lot of us had to sit in the shade but when we ventured out into the sunshine to look through the telescopes, we had a very nice view of the Sun which had a large group of sunspots. It was very busy at the Cafe and quite a few people wanted to know what we were looking at. Gill had her pop up tent in action to shelter the Juniors from the Sun.

Saturday 22nd Stargazing Evening

We held a late notice Stargazing Evening. Even though the day was very hot, the evening had cooled and there was a fairly strong wind. Even with the wind wobbling the telescopes a little bit we still managed to get a lovely view of the Moon and Saturn.

Saturday 29th Public Outreach Meeting

There was a little rain today, a few people asked what we were looking at. But otherwise a quiet day.

With only 7 meetings this was a very quiet month at Thanet Astronomy Group.

Our thanks go out to all that helped to make all this possible !

Tracy Howes / Danny Day.

Junior Members Page

Following the exciting news last month of the New Horizons' success at taking and sending exclusive photos of Pluto back to Earth, our youngest member who is only 3 (soon to be 4!) has followed this progress closely and become fascinated in finding out more about dwarf planets.

At last week's meeting, he proudly showed me his illustrations of the 10 named Dwarf Planets, so far, as well as showing other members his scale drawing of our Solar System!

Large Asteroid Belt objects Ceres, Pallas and Vesta

In 1801 the first minor planet to be discovered, along with other objects between Mars and Jupiter was Ceres. At the time they were thought to be planets. Over the next 50 years the number of planets reached 23!! Clearly something had to be done and astronomers decided to call the smaller objects Asteroids. This brought the planet count back down to Eight including the recently discovered Neptune in 1846.

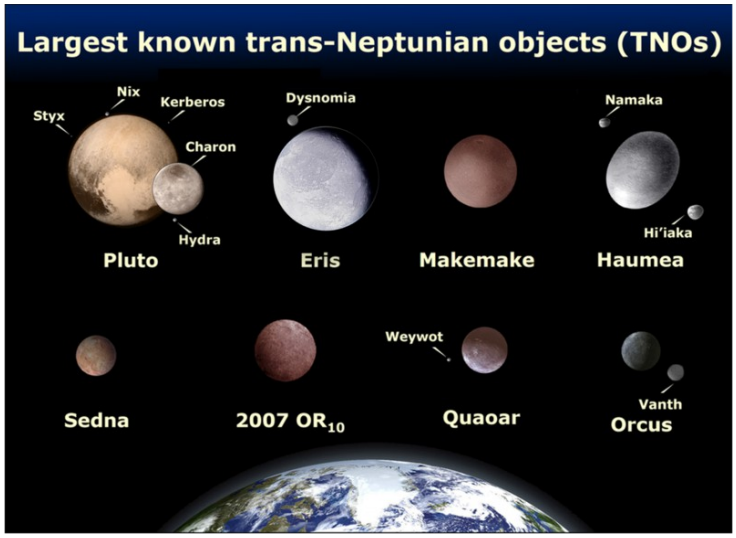
In 1930 Pluto was discovered and this took the planet count to Nine, by now, along with thousands of smaller objects, (asteroids and comets). It was not until 1978 when Pluto's moon Charon was discovered that it became possible to measure Pluto's size with any degree of accuracy. This led to the realisation that Pluto was more of an asteroid than a planet.

By 2005 three more trans-Neptunian objects in the outer Solar System had been discovered Quaoar, Sedna and Eris. As a result of this the International Astronomical Union decided that some reclassification was needed.

Three new categories were defined : (1) Planets, (2) Dwarf Planets and (3) Small Solar System Bodies.

Which is why we no longer have 9 planets in our Solar System, otherwise there might be thousands to remember in our JAC and Gill rhyme...

"My Very Easy Method Just Speeds Up Names"!!!



Plutoids

Charlotte and her home make Pluto with Whale and Heart shaped features

Gill Palmer.

What's in the sky this month

This month we are going Moon Mad

What to see on the night of Sunday 27th and very early morning of Monday 28th September
Moon (Full Moon - Harvest Moon - Super Moon – Blood Moon - Total Eclipse of the Moon)

It has long been believed that people go a little '***strange***' on the night of a full moon. Although there is little proof that this is a fact, the belief has worked its way into our language. The words '***Lunacy***' and '***Lunatic***' are two examples. These are derived from the word ***Lunaticus*** meaning 'of the moon'.

Full Moon
Question: What is a Full Moon? Answer: A Full Moon occurs when the Moon is on the opposite side of the Earth to that of the Sun. From the night side of the Earth we can look up at the Moon, with the direct light of the Sun blocked by the Earth, while the day / near side of the Moon is fully lit by the Sun.

The (*absolute maximum)* Full Moon will be at about 3:50am in the morning of the 28th. However you can see the Full Moon at any time after it rises (about 6:30pm on the night of the 27th).

Harvest Moon
Question: What is a Harvest Moon? Answer: A Harvest Moon is the Full Moon closest to the ***Autumnal Equinox*** this can be as much as two weeks before or after the Autumnal Equinox. This year the closest Full Moon to the Autumnal Equinox will be at about 3:50am in the morning of the 28th. So our Moon is both a Full and a Harvest Moon.

Super Moon
Question: What is a Super Moon? Answer: A Super Moon is a Full or New Moon closely coinciding with the point nearest to Earth in its orbit. This is called '***Perigee***' the furthest point in an orbit is called '***Apogee***'. The term Super Moon is a popular modern folk law term, the technical name for a Super Moon used by astronomers is a '***Perigee Full Moon***' or '***Perigee New Moon***'.

Tonight's Super Moon will be the closest of the year at only 356,896km or 221,754 miles (measured from the centres of the Moon and Earth). The Moon's orbit around Earth is elliptical (egg shaped) so the distance between us constantly varies, at Perigee it's about 356,877km and at Apogee its about 406,388km.

As the gravity of the Moon is mostly responsible for our tides, and the closer the Moon the stronger the gravity, the Super Moon will produce a higher than normal tide. The point of Perigee will be at about 2:46am in the morning of the 28th. So now we have a **Full Harvest Super Moon.**

Blood Moon
Question: What is a Blood Moon? Answer: A **Blood Moon** is the fourth and final total eclipse of a set of four consecutive total eclipses of the Moon, with no partial eclipses in between, spaced at 6 lunar months (Full Moons) apart, a '***Lunar Tetrad*** '. This night's Moon is also a Blood Moon. But we still have not finished... there is one more lunar spectacle tonight.

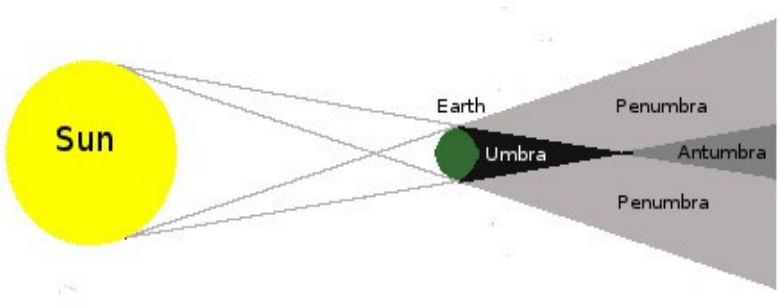
What's in the sky this month

This month we are going Moon Mad

Total Eclipse of the Moon

If you're still up and about between 1:12am and 6:22am on the morning of the 28th and there is a clear sky, you will observe a ***Total Eclipse of the Moon***.

Question: What is a Total Eclipse of the Moon. Answer: A Total Eclipse of the Moon occurs when the Moon passes through the shadow of the Earth. The darkest area is called the '***Umbra***', this is the full shadow of the Earth. The '***Penumbra***' is the lightest area, as this is only a partial shadow caused by the Earth. The '***Antumbra***', which will not have any effect on the eclipse, is the mid shaded area of shadow which extends past the point of the umbra.



How the shadows work

Full Moon

The Eclipse timings are as follows.

In the early morning of the 28th September

Penumbral Eclipse Begins at 1:12am

The first phase is where the Moon begins to enter the '***Penumbra'***. This area is only slightly shaded and it is **NOT** likely that you will see any effect !

Umbral Eclipse Begins at 2:07am

The second phase is where the Moon begins to enter the '***Umbra***'. This is where you will see the edge of the Moon start to noticeably darken and change to a reddish brown. This effect will slowly move across the entire Moon.

What's in the sky this month

<u>This month we are going Moon Mad</u>

<u>Total Eclipse Begins at 3:11am</u>
This is the third phase where the whole of the Moon is now within the Earth's '***Umbra***'. This is the point where the *<u>Total Eclipse of the Moon</u>* begins.

<u>Mid Total Eclipse at 3:47am</u>
This ia the mid eclipse point where the whole Moon has been eclipsed since 3:11am and will remain eclipsed until 4:23a.

The following illustrations show the eclipse first shortly after the partial eclipse has begun then as it will look during the full eclipse, and finally shortly before the partial eclipse finishes.

Total Eclipse Starting

Total Eclipse of the Moon

Total Eclipse Ending

<u>Total Eclipse Ends at 4:23am</u>
This is the point where the *<u>Total Eclipse of the Moon</u>* ends. The Moon is now moving out of the '***Umbra***' back into the partly shaded '***Penumbra***' on the opposite side of the Earth's shadow.

<u>Umbral Eclipse Ends at 5:27am</u>
This is the point where the Moon is now totally within the partly shaded '***Penumbra***' on the other side of the Earth's shadow. This is where you will be most unlikely to see any more effects.

<u>Penumbral Eclipse Ends at 6:22am</u>
This is the point where the Moon finally leaves the partly shaded '***Penumbra***' and the eclipse is now over.

George Ward.

Member's Page

Comet Catalina

Comet Catalina (C/ 2013 US10)

The Oort Cloud comet Catalina first discovered on 31st October 2013, by the Catalina Sky Survey which scans the night skies searching for hazardous near Earth objects that could pose a danger to Earth. Catalina was first believed to be an asteroid which had, by impact with another object, been knocked out of its normal orbit however it is now clear that it is a comet.

Before Catalina entered the planetary region of our Solar System in 1950 it had an orbital period of several million years, but due to the gravitational influences of the planets and especially the Sun by the time it leaves the planetary region in 2050 it will be on an ejection path. It will be leaving our Solar System for good. So this is your only chance to see it Ever!!

It is hoped that Catalina will be one of the most striking comets seen over the last few years. Its image was captured by Astro imager Ian Sharp in August. The comet's head, the coma, glows green as the gas and dust particles burn off the front. It has twin tails similar to comet Hale Bopp which passed over in the 1990s.

Sadly at the moment, during Catalina's approach to the Sun it is a southern hemisphere object. It will reach perihelion or the nearest point of its orbit to the Sun on the 15th November 2015 in the southern hemisphere after which the comet will head towards the northern hemisphere, crossing the celestial equator on the 17th November, making it a northern hemisphere object.

On New Year's Eve Catalina will pass close to the bright star Arcturus in the constellation of Bootees and on the 17th January Catalina will pass through Ursa Major. The comet should be visible with the naked eye but more easily seen with binoculars or a telescope. See below to find the comet.

Enjoy the sight if there are clear skies, it won't be coming back!!

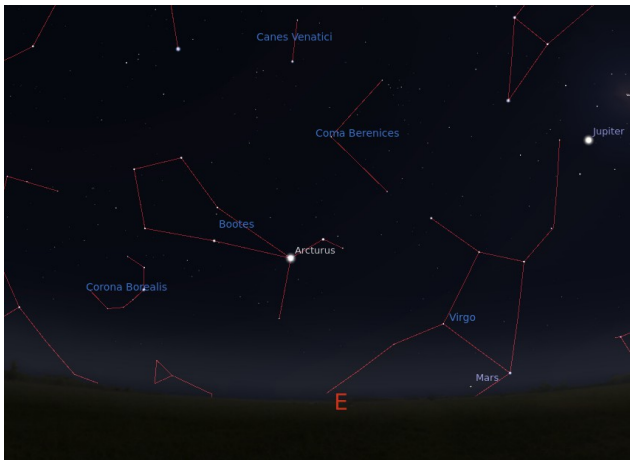
Member's Page

Comet Catalina

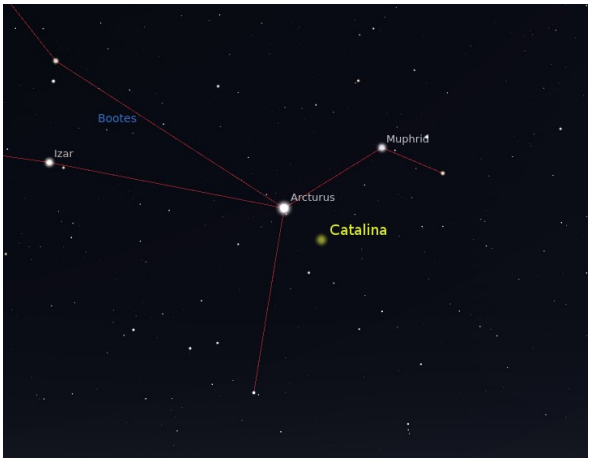
Where to find Comet Catalina

See the two sets of pictures below that show wide angle and close up illustrations of Catalina's position in the night sky.

The first set shows the position on the 31st December at 2am when the comet is very near the bright star Arcturus in the constellation Bootes. Bootes is a late riser at this time of year so you will need to stay up quite late.

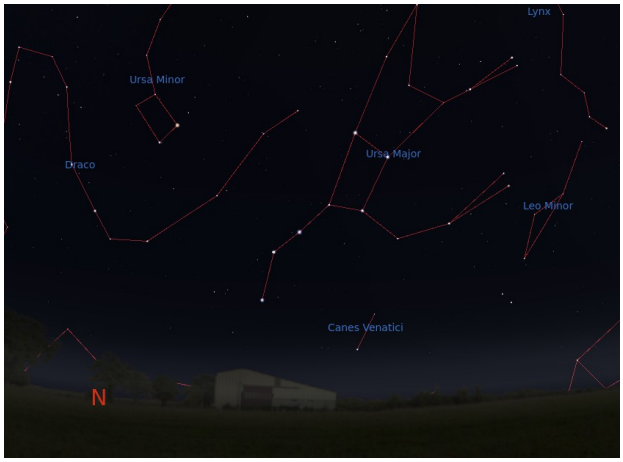


Wide angle view showing the constellation Bootes



Close up showing the position of Catalina in Bootes

The second set shows the position on the 17th January at 8pm when the comet is very near the bright star Mizar in the constellation Ursa Major (the 2nd star in the handle of the asterism 'The Plough').



Wide angle view showing the constellation Ursa Major

Close up showing the position of Catalina in Ursa Major

Bernie Levesque

Did You Know ?

The Speed of Light

The speed of light is 186,000 miles per second or 299,792,458 metres per second. This means that everything you see is seen delayed a little. Well a very, very, very little!

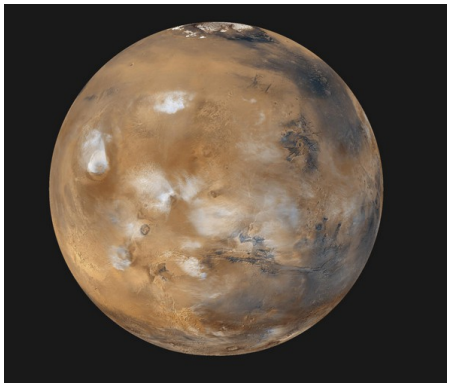
But as things get further away this little delay gets bigger. When looking at objects on Earth the delay is not that important.

When we look at the Moon, Sun and the planets the delay becomes more significant. In the case of observing the stars, deep sky objects like nebula and galaxies the delay becomes Huge!!!

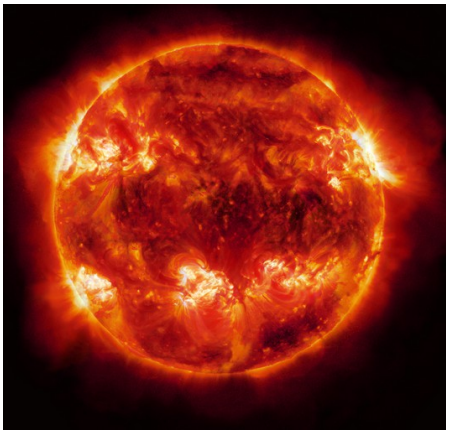
Light Delay from Earth to :-

Moon	1.3 Seconds
Mercury	8.1 Minutes
Mars	8.3 Minutes
Sun	8.5 Minutes
Venus	12.6 Minutes
Jupiter	44.5 Minutes
Saturn	83.4 Minutes
Uranus	163 Minutes
Neptune	243 Minutes
Pluto	249 Minutes
Voyager 1	797 Minutes

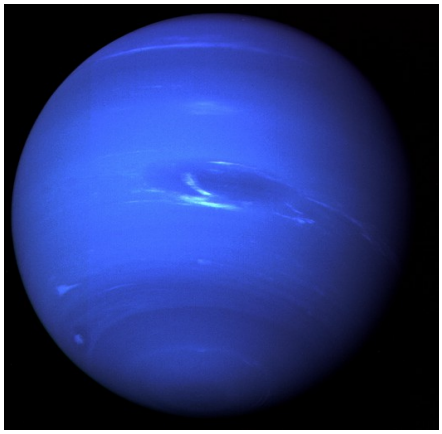
The Moon



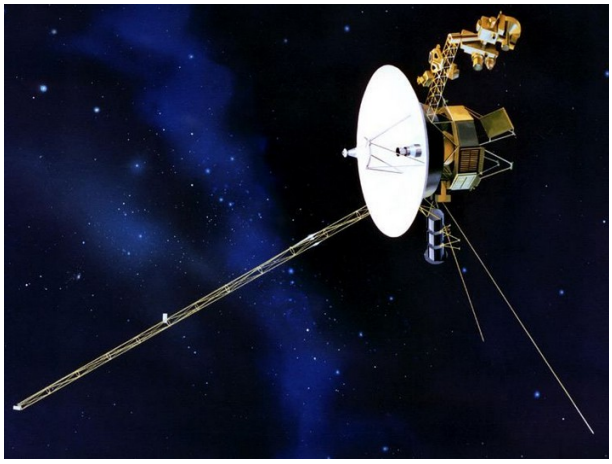
Mars



The Sun



Neptune



Voyager 1

Did You Know ?

The Speed of Light

The Oort Cloud	1 Year
Proxima Centauri	4.2 Years
Pleiades	440 Years

Open Star Cluster Pleiades

Orian Nebula M42	1.5 Thousand Years
Trifid Nebula	9 Thousand Years
Centre of the Milky Way	25 Thousand Years

The Orion Nebula M42

Large Magellanic Cloud	160 Thousand Years

The Trifid Nebula

Did You Know ?

The Speed of Light

Andromeda Galaxy	2.5 Million Years
Whirlpool Galaxy	37 Million Years

The Andromeda Galaxy

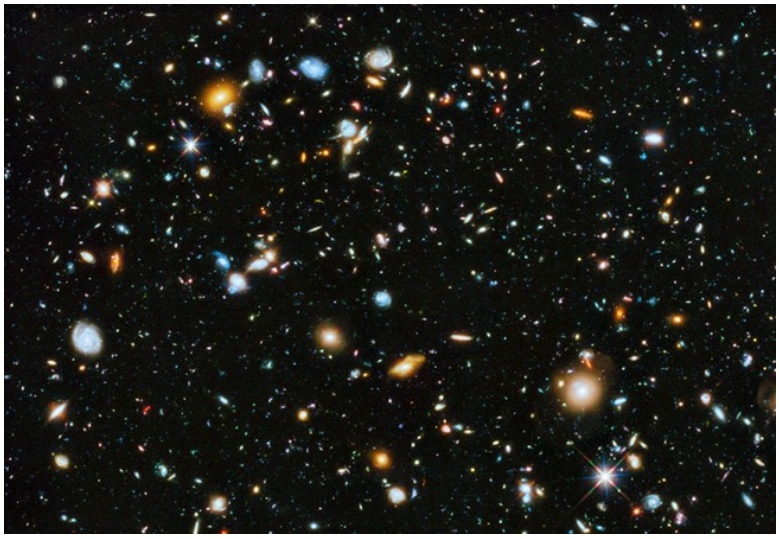
Tadpole Galaxy	420 Million Years
Cloverleaf Quasar	11 BILLION YEARS

The Tadpole Galaxy

Hubble Ultra Deep Field	13 BILLION YEARS
WMAP	13.4 BILLION YEARS

As all the objects are moving, orbiting planets, stars, galaxies etc. the distances had to be calculated at some point in time and that was 1st July 2005.

Danny.



The Hubble Ultra Deep Field

Junior Astronomers Club (JAC & Gill)

The school Summer Holidays have come and gone in the blink of an eye and our Junior members have continued to drop in on our Saturday meetings from all over the country and from abroad. We have had visitors from Iwade near Sittingbourne, London and even Sweden and Belgium.

Unfortunately, the weather wasn't very kind to our local Junior members, so viewing nights were limited and if there were any opportunities to go Stargazing, it was well past their bedtime!

However, last Friday there was finally a chance to go Stargazing before they had to go back to school! We met at Westbrook car park on the promenade below the Sunken Gardens and seven eager Junior Astronomers were rewarded with a glimpse of the Summer Triangle and an almost Full Moon!

There was a "WOW!!!" from our youngest member, who is only 5 years old, as she looked through Danny's telescope and saw the craters on the Moon close up!

JAC & Gill Members at the Stargazing evening

A member's first ever astro photo

One budding 10 year old Astro Photographer was ecstatic as he managed to take his first photo of the Moon on his camera before the clouds obscured it from view!

Our twin 9 year old Astronomers brought their own telescope and were able to view the Moon clearly for the first time, with the help of our resident Junior Chairman, George Harvey!

Unfortunately, the weather was still unkind to us and it was too cloudy to view all the Circumpolar Constellations but our old faithful, The Plough, pointed the way to Polaris, the Pole Star, so that we could find North to see our way home to bed.

Reach for the Stars, Junior Astronomers!

Gill Palmer.

Adult Word Search

ALBIREO	ANDROMEDA	ATMOSPHERE
BINARYSTAR	CELESTIAL	COMET
CYGNUS	MAGNITUDE	METEORITES
PEGASUS	PERSEIDS	PHOTOSPHERE
POLARIS	SHOOTINGSTAR	SUNSPOTS

B A F S U S A G E P R E P B M
S D Y T T E M O C F I L G R A
I E R C Y G N U S I G X K W G
R M I A T M O S P H E R E J N
A O L S T C E L E S T I A L I
L R A N R S E T C L U O K S T
O D R Y C Z G M E T Z U V D U
P N K S L M N N C O N G F I D
R A T S Y R A N I B R J L E E
G B W D V L R Z T T Y I J S E
S R T J B Y B S A U O S T R B
L A H I A L H W A C Z O S E D
Z F R E R E H P S O T O H P S
Y E Y H V W S T O P S N U S I
O B B G V F S B P P K C I U S

Junior Word Search

ASTEROID	**COMETS**	**CYGNUS**
SATURN	**STAR**	**SUNRISE**
SUNSET	**UNIVERSE**	**VENUS**

A M C Y G N U S A

M E S I R N U S Y

O S T W T D T E C

D C A M B E K Q K

J Y R N R U T A S

D D C O M E T S I

U N I V E R S E U

V D E C S U N E V

I V S U N S E T L

We hope that you find the Adult and Junior word searches interesting and that they inspire you to look up any of the words you don't know *Absolutely Everything About* :-)

If you like these please let us know and we will continue to produce them.

We are thinking of adding a crossword as well in future newsletters. If you like this idea please let us know.

Comments Please : you all know the email address !

Member's For Sale and Wanted

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