

Wadhurst Astronomical Society

Newsletter

May 2013

MEETINGS

APRIL MEETING

The meeting was introduced by Phil Berry. He said that the Society is always looking for ways of improving Wadhurst Astronomical Society and with this in mind, there were some questionnaires which he asked if members would please take away, fill in and return at a later meeting. There are 20 questions and any suggestions would be very welcome. The forms will also be available at the next meeting.

Phil then introduced Pieter Morpurgo, talking about his involvement with the BBC's Sky At Night programme as producer over many years. Pieter had worked for the BBC for 30 years and during that time had directed and produced many familiar programmes such as Nationwide, Panorama, That's Life and many others but his most familiar programme was as producer of The Sky at Night having made close on 250 episodes.

The Sky at Night – a Producer's View. 1981 to 1998

Pieter Morpurgo

During his association with the Sky at Night programme, Pieter said that although the programmes could be complex and variable, this led to a fascinating series of tales of how the programmes were made.

The studio episodes were often done in just one "take". But by carefully managing the programme's budget it was possible to make many of the episodes on location around the world. When on location, a number of items for different episodes would be recorded at the same time to economise on travel.

We were taken on a fascinating tour of the world's observatories, the crew often visiting more telescopes than the professional astronomers themselves did.

Pieter began with the story of a visit to the McMath Solar Telescope at Kitt Peak in Arizona when, on the first day the crew left the camera in the hotel at the bottom of the mountain. On the second day when filming was due to take place, they couldn't even see the telescope for the mist. Ever since then, he filmed whenever it was possible to do so and then selected the best shots during editing back in London.

He met many interesting people, one of them being Clyde Tombaugh at Lowell Observatory in Flagstaff, Arizona where Clyde had discovered Pluto back in 1930.

Sky at Night made one programme about the 200-inch telescope on Mount Palomar and the observatory staff asked if they could continuously show a copy of the programme in their visitor centre where they did so for many years.

Mount Hopkins in Arizona has an observatory on its summit and we were told that a replacement mirror was cast in 1998 at a glass laboratory at the bottom of the mountain where the molten glass was spun in a rotating oven to produce a concave shape. The rotation was kept going even during the cooling process. This meant that there was less glass to be removed during the final grinding process to produce the precise shape required. Also inside the glass were porcelain poles to displace some of the glass and reduce the overall weight.

To get the finished mirror up to the top of the mountain over the very narrow, steep road, the mirror even had to be turned on its side to get round the hairpin bends.



The tortuous road up to the observatory on Mount Hopkins

On one occasion Patrick Moore was left at the bottom of Meteor Crater in Arizona whilst the crew took a shot from a helicopter showing the whole rim of the crater and Pieter said Patrick felt this was the loneliest he had ever felt in his entire life. We were told later that rattle-snakes could sometimes be heard around the crater...

For programme continuity, Patrick Moore always had to wear the same style and colour of clothes, often a dark suit and on one occasion they visited the United Kingdom Infra-red telescope on Hawaii where there was snow on the ground and it was bitterly cold. From here the crew went to the Parks Radio Telescope in New South Wales in Australia where the temperature at one time rose to 120° C! Patrick was not happy.

On a visit to the Jet Propulsion Laboratory in Pasadena, California to cover the Uranus pass by Voyager from inside the control gallery where images were being received directly from the mission, another continuity problem arose when Patrick Moore's shirts, all one colour for editing purposes, disappeared at the hotel and in their place were two tins of cat food. After enquiries, the shirts reappeared and the tins of cat food mysteriously vanished. No explanation.

All over the world, Patrick was recognised and Pieter said he never ignored people but would always spend time talking to them even though he had no idea who they were. He was also so well known among the astronomers that he always received a great welcome where ever he went.

Another observatory the programme visited was La Silla Observatory in the Atacama Desert in Chile. Here thirteen countries are involved but on enquiring why the telescopes hadn't got names, the reply was that they would have spent so much time discussing names that no astronomy would have been done, so they are just called them what the telescopes did. It was here that the crew learnt never to go anywhere without drinking water in the high altitude hot desert because it is so very dry that it can be dangerous to be without water for even the shortest time.

In 1989, Sky at Night returned to JPL for the last time to witness the Neptune pass and also make a separate programme as a compilation of the whole Voyager mission. The BBC crew were the only broadcaster allowed inside the

control room when it was in operation which Pieter said was a great privilege and honour. He said they were seeing pictures directly from the spacecraft which had never been seen before.

Patrick Moore was so well known around the world that whilst they were making these two programmes, CNN asked if he would be prepared to link their news coverage and after some discussion it was agreed that he should, although it meant that he was rushing between the two areas. Patrick would rarely say no to that kind of a request.

Many more visits to observatories and stories of the Programme's adventures were related by Pieter in such an enthusiastic way that there was not a sound from members until the end of his talk.

John Wayne Snippets from the Scientific World

This month, John introduced us to a number of thought-provoking suggestions and called his talk:

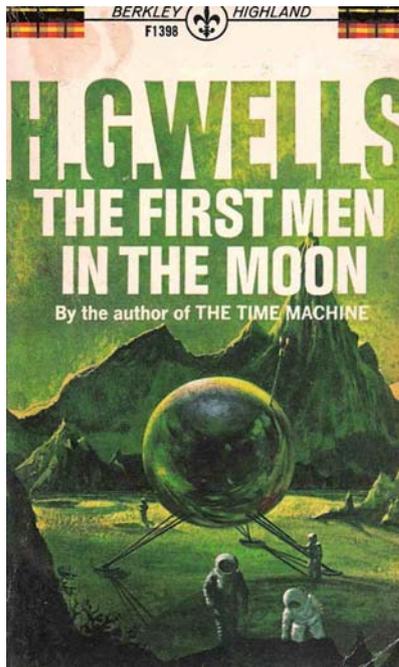
What If?

Now, we all know that necessity is the Mother of Invention. Ok, - we have all heard this statement. So what I would like to do is to look back at a couple of inventions that I am going to tag "what if" they hadn't been discovered or invented?

I will be looking forward – very far forward.

For instance, 60 odd years ago, did we know about lasers?

110 years ago, getting something that was heavier than air off the ground in a sustained manner was considered an impossibility. Now we have aeroplanes etc.



The cover of H. G. Wells' "The First Men on the Moon" first published as far back as 1901

When H. G. Wells wrote "The First Man on the Moon" in 1901, this was completely science fiction, but not now....

Projecting these thoughts forward it has been 'questimated' that we know about 5% of the things that we will know in 50 years time and we don't even know what these things are...

We think that we are quite clever and intelligent – and perhaps we are, amongst the things that surround us. If we look back in our history we can sensibly see that we have made improvements over the last 10,000 years or so. I'm not interested in the details but only the trends. It took us many hundreds of thousands of years to make fire and to form the

first flint tools. Through the Egyptian, Greeks and Roman empires we made steady progress with our inventions. Then came the dark ages where everything stood still or regressed for some 1,000 years.

Supposing that our world had developed say 1 million years earlier – this time period is absolutely nothing when compared to the age of the Universe – which has now been recalculated to 13.798 billion years old (that was on 22nd of March 2013 and still counting!)

Looking forward now – has anyone heard of the Dyson Globe? This has nothing to do with the vacuum cleaner.

How does the Human Race compare with other species that are out there? Those who are observant will notice that I did not say 'possibly' or 'maybe' out there, but 'just out there'. How far have they progressed with colonising other planets or star systems? Have they conquered superfast time travel? We are all led to believe that the speed of light is an absolute barrier – is it?

Or can we leap into a worm hole and travel to another part of the Universe?

Am I being daft?

Is my imagination stretching too far?

In the 15/16th century school children learnt with a horn book – words printed on wooden boards that they held in their hands. Could they ever have dreamt in their wildest dreams of an iPhone?

Just 2 short memorable statements about computers that have been said in my lifetime:

Computers in the future may weigh no more than 1.5 tones. (Popular Mechanics 1949)

and probably the most famous of all:

I think there is a world market for maybe 5 computers – Thomas Watson – Chairman of IBM 1943.

The Dyson Globe is a hypothetical megastructure that would surround or orbit a sun to enable civilisations to gather sufficient energy to power their needs. This was originally proposed by Freeman Dyson in 1960. This idea is ridiculous isn't it? Smacks of Larry Niven's 1971 science fiction "Ringworld".

Well let us just think about this. We have a space station up there making electricity from the Sun. Scientists are developing 1-atom thick *graphene* and ultra-strong carbon nanotubes. So is it possible that we could develop our power from this source?

Where do we get the materials from? Lasso a comet – this is already being talked about with detailed plans. Expensive, yes but if we keep growing in numbers there may be no alternative.

There are still a huge number of questions that we are a long way from solving or even understanding. What is *Dark Matter*; or *String Theory*, just to name a couple? Are there other intelligent life forms out there who may be a couple of millions years ahead of us in development? I think almost certainly, yes – will we ever find them or contact them? – probably better if we didn't!

Over to you to ponder our future and understanding of the Universe...

10 Simple Spring Objects

Over several meetings, our Director of Observations has presented a series of talks for beginners, and to be truthful, also useful to most members.

Brian Mills continues this theme with another of his brilliant talks for beginners, this time turning to the spring night skies.

Following the winter skies, the spring night sky might seem to be rather dull, but there is plenty to interest members either by eye or using just binoculars.

Object 7 – Crater

Extending a line to the right from the bottom two stars of Corvus we arrive at a little triangle of stars forming part of the constellation called The Crater.

Object 8 – Hydra

Brian returned to the two stars called the Twins and said that if we draw a line down towards the horizon, we come to a very obvious group of stars which is the head of constellation of Hydra, the Water Snake. This is a very long constellation that extends well below the horizon.

Object 9 – M67

Back to the constellation of Cancer and just continuing to the south of the two central stars is M67, another open cluster. It consists of about 600 members, has an age of somewhere between 3.5 and 5 million years old. It is fainter than M44 at 6.2.

Object 10 – M3

Drawing a line up from Arcturus we come to close stars in Boötes. From this line if we complete an equatorial triangle to the right we find M3. This is a globular cluster which is much denser than the previous two clusters we looked at. It has a group magnitude of 6.2 and should be easy to see with binoculars. It contains half a million stars and its age is about 8 billion years old.

Finally Brian pointed out that just to the right of M3 is the North Galactic Pole.

He then gave the Sky notes for May which follow in detail later in the Newsletter.

MAY MEETING

Wednesday 15th May 2013 – Professor Louise Harra will be speaking about the Sun. “Solar Activity – Are we at a Maximum?”

Meetings begin at 1930 although members are invited to arrive anytime after 1900 as this is a good time to exchange ideas and discuss problems and also relax before the meeting.

The venue as always is held in the Upper Room of the Methodist Church at the east end of Wadhurst Lower High Street, opposite the entrance to Uplands College. (For those with SatNav – the post code is TN5 6AT)

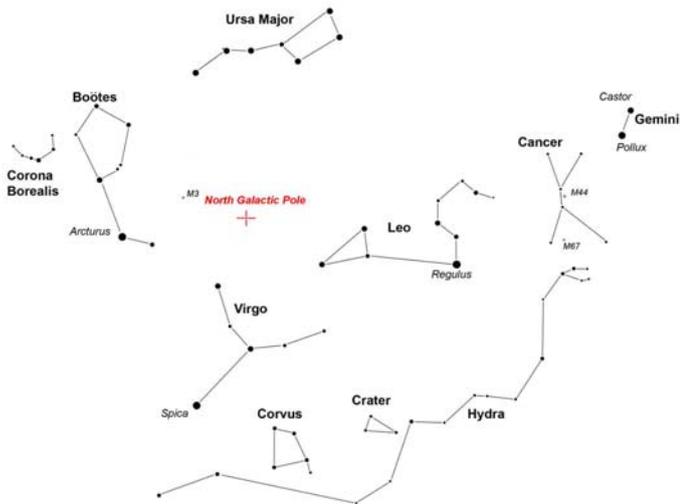
Anyone is welcome but non-members are asked if they wouldn't mind contributing £2 towards costs.

FUTURE MEETINGS

Wednesday 19th June 2013 – Open Evening. An evening to look at and talk about telescopes.

Wednesday 17th July 2013 – John Vale-Taylor gives a useful talk; “Astrophotography on a Shoestring”.

There is no meeting in August but an Astro-barbecue is organised for **Saturday 24th August 2013**. It will be in Wadhurst and will begin at 1900. More details will be announced nearer the time, but this has been a very enjoyable event in previous years involving some astronomy and is well worth putting your diary. It is the August Bank Holiday weekend.



Object 1 - Cancer

Taking a line through the back two stars of the plough, going south we come to a bright star at the base of what looks like a backward question mark. This bright star is Regulus the reverse question mark above it is the head of Leo the lion in the constellation of Leo. To the right are two stars known as the Twins, Castor and the lower one, Pollux in Gemini. Right in the middle of a line drawn between Regulus and Pollux is something that looks like an elongated cross. Although not very bright, this is part of the constellation of Cancer.

Object 2 – M44

Just to the right of the middle of this cross is a cluster of stars and is known as M44. It is an open cluster of stars and is sometimes known as the Beehive or Praesepe. It has a collective magnitude of around 3.7, its age is about 600 Million years old and is thought to have about 1,000 stars in it.

Object 3 – Boötes

Taking a curved line continuing from the handle of the Plough we come to a first magnitude star, Arcturus. Just above this are the stars that form the constellation of Boötes.

Object 4 – Corona Borealis

To the left of Boötes is a short curve of stars forming the crown of Corona Borealis.

Object 5 – Spica

Following the line round to the right we come to a bright star, Spica in Virgo and from here the constellation of Virgo can be seen.

Object 6 – Corvus

Continuing the curved line from the handle of the Plough, we come to a fairly obvious quadrilateral formation of stars. This is the Constellation of Corvus.

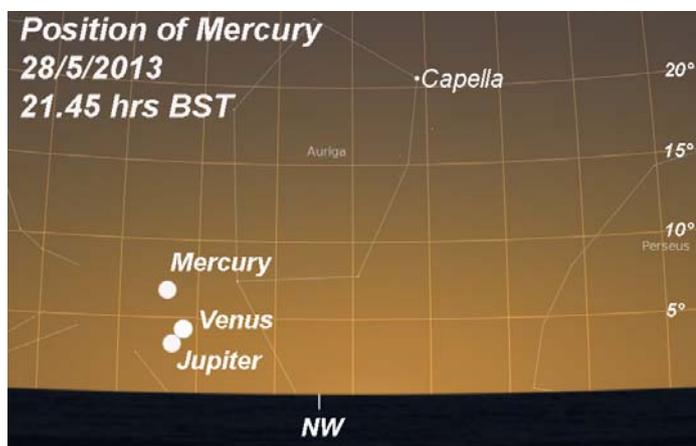
Wednesday 18th September 2013 – Steve Tonkin will be talking about “Binocular Astronomy”

OTHER NOTES AND INFORMATION

SKY NOTES FOR APRIL

Planets

Mercury will pass through a superior conjunction (on the far side of the Sun) on the 11th and so will not be visible until the end of the month, even then observation will be hampered by twilight. Its position is shown low in the north west at the end of civil twilight (Sun 6° below the horizon) in close company with Venus and Jupiter. Venus, at magnitude -3.8, should be easier to find as it is much brighter than Mercury at -0.7. Please remember that you must **NEVER** sweep for planets when the Sun is still above the horizon as you risk permanent blindness.

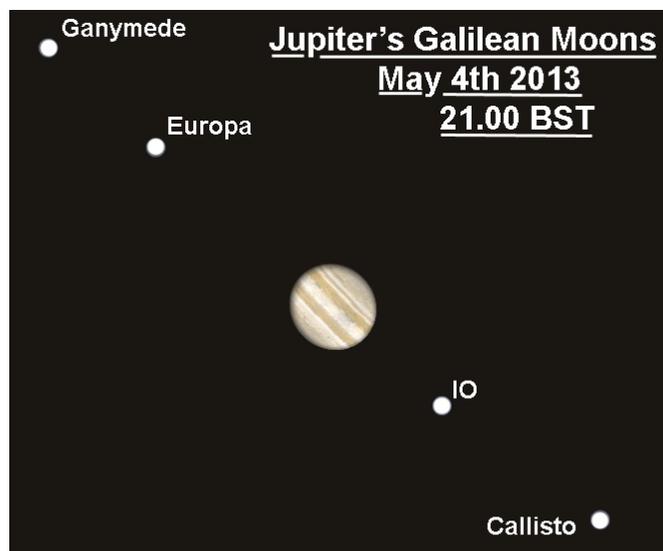
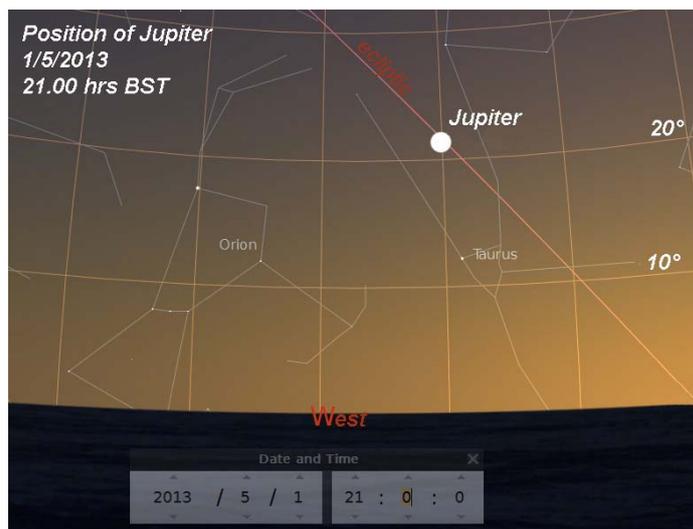


Venus continues to move steadily east of the Sun and will continue to do so until November 1st when it reaches greatest elongation. The bad news for UK observers is that as the apparent distance between the planet and the Sun increases, the angle that the ecliptic makes with the horizon becomes more shallow during the evenings as we get further into the year. By the time of greatest elongation Venus will only be approximately 7° above the horizon (on the Sagittarius/Ophiuchus border) when the Sun is 6° below it, so twilight will always be present.

At magnitude -3.8 it currently lies in Aries, but during May it crosses the border into Taurus where it remains for the rest of the month.

Mars was in conjunction with the Sun on April 17th/18th, and although it is now moving west of the Sun to become a morning object it will not be observable this month.

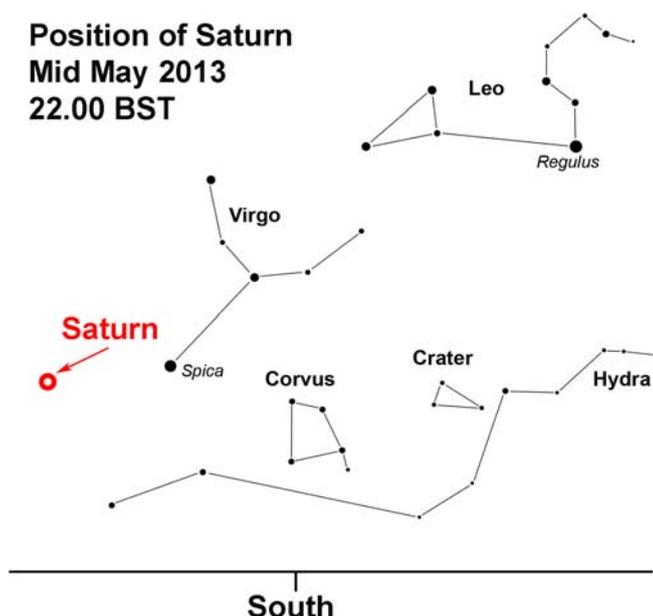
Jupiter is still visible in the west after sunset but it is creeping gradually closer to a solar conjunction on June 19th. It currently lies in Taurus, at magnitude -1.9, as shown in the diagram below. If you have binoculars or a small telescope take this opportunity to look at the planet and its four largest moons before it is lost in the twilight at the end of the month. An example of how they appear is shown for May 4th (purely as an example) when, at the time given there will be two moons on either side of the planet.



Saturn was at opposition on the 28th of April and is therefore observable for most of the night. At magnitude +0.2 it begins May in Libra but due to its retrograde motion, moves into adjoining Virgo in the middle of the month where it stays until early September. It then returns to Libra once more. It's position is shown on the map and from that you can see, if you compare it to those in previous Newsletters, it is moving very slowly. In fact it isn't until January 2015 that it leaves Libra and moves eastwards into Scorpio.

The ring plane is currently tilted at an angle of just over 17° to us, so the planet is a lovely sight in even a small telescope. This angle will increase during the year and by the end of December will be more than 22°.

**Position of Saturn
Mid May 2013
22.00 BST**



25 th	22.46	-4.5	23	276 W
26 th	22.40	-2.2	24	278 W
27 th	22.43	-2.5	20	282 WNW
28 th	22.37	-2.9	21	283 WNW
29 th	22.17	-4.9	9	347 NNW
29 th	22.40	-4.4	18	286 WNW
30 th	22.02	-5.1	13	346 NNW
31 st	22.37	-4.8	16	291 WNW

The Night Sky in May (Written for 22.00hrs BST mid month)

In the north Ursa Major lies close to the zenith with its tail straddling the meridian. On the other side of the pole the “W” of Queen Cassiopeia is also on the meridian with Camelopardalis and Cepheus to the left and right of her respectively.

Camelopardalis, despite being a large constellation, has no bright stars to speak of and none above fourth magnitude. It does however have a smattering of distant galaxies, one of which is a binocular object (NGC 2403) and several open clusters (NGC 1502 and Collinder 464).

Cepheus, on the other hand, is brighter and more obvious, and was one of Ptolemy’s original 48 constellations. As well as containing some moderately bright open clusters (NGC 7160, NGC 7380 and NGC 7510) it is also home to delta Cephei, the prototype for Cepheid variables. These stars were of the utmost importance in finding both the scale of our galaxy and ultimately the universe.

Towards the east the large and rather faint summer groups of Ophiuchus, Serpens and Hercules are holding sway, although Deneb and Vega from the Summer Triangle are making their presence felt. Hercules contains several globular clusters, one of which (M13) is the most majestic in the northern sky at magnitude 5.8 although not readily visible to the naked eye, it is a superb sight even in a moderate telescope. It can be found on a line drawn between eta and zeta and lying slightly closer to the former. The other globular, which tends to be overlooked in favour of its brighter neighbour is M92 at magnitude 6.3. It lies between eta and iota Herculis.

As with many things, the easiest way to find Hercules is via Ursa Major. Draw a curved line through its tail and on until it reaches the bright star Arcturus in Boötes. Then locate Corona Borealis which lies close to Boötes, and draw a line from Arcturus through its brightest star (Alphekka). This points to “The Keystone”, a quadrilateral of stars that makes up part of Hercules’ body.

Lunar Occultations

In the table below I’ve listed events for stars down to around magnitude 7.0 that occur before midnight although there are many others that are either of fainter stars or occur at more unsociable hours. DD = disappearance at the dark limb. The column headed “mm” (millimetres) shows the minimum aperture telescope required for each event. **Times are in BST.** Please remember that the Society has telescopes that members can borrow, all of which are suitable for the following events.

May	Time	Star	Mag	Ph	Alt °	% illu	mm
14 th	22.43	ZC 1091	6.5	DD	13	20	40
20 th	23.24	SAO13855 6	7.2	DD	26	77	100
21 st	21.49	ZC 1853	4.8	DD	29	85	40

Phases of the Moon for May

Last ¼	New	First ¼	Full
2 nd	10 th	18 th	25 th
31 st			

ISS

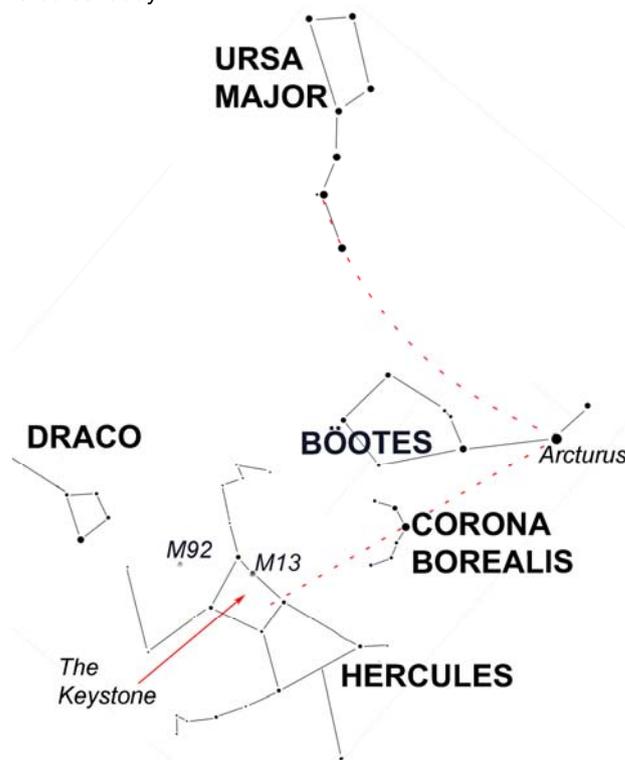
There are no evening passes of the ISS this month that are visible from Wadhurst. If you wish to check the visibility from other areas please go to: www.heavens-above.com

Iridium Flares

The flares that I’ve listed are magnitude -2 or brighter although there are a lot more that are fainter or occur after midnight. If you wish to see a complete list, or obtain timings for somewhere other than Wadhurst, go to: www.heavens-above.com

Remember that when one of these events is due it is sometimes possible to see the satellite before and after the “flare”, although of course it will be much fainter at those times. **Times are in BST.**

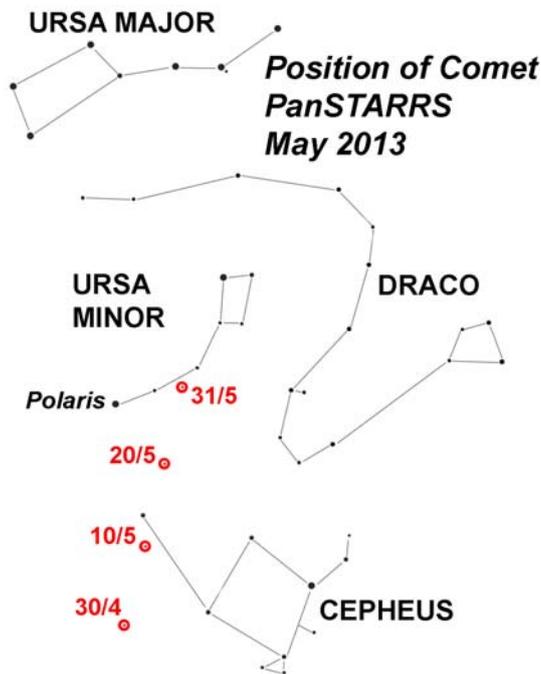
May	Time	Mag	Alt°	Az°
4 th	22.59	-2.5	16	278 W
10 th	21.31	-3.4	18	347 NNW
15 th	20.51	-6.5	29	343 NNW
16 th	20.45	-5.8	30	342 NNW
20 th	22.57	-6.9	29	265 W
23 rd	22.48	-6.7	26	272 W



Looking south Hydra is fully visible close to the horizon with the small constellations of Corvus and Crater riding on the back of the water snake. The head of the snake is quite obvious below Cancer and can be found using the “Twins” as approximate pointers. The rest of the constellation sprawls across a large portion of the sky, but despite this it contains no bright stars although there are a number of fainter galaxies. In terms of area Hydra is the largest in the sky, followed by Virgo which coincidentally is located just north of it. Here lies the “Virgo Cluster”, a large collection of galaxies forming part of the “Supercluster” which itself may contain in the order of 10,000 galaxies.

In the west Orion has already disappeared and both Gemini and Auriga are close to setting. Cancer is still well placed and the open cluster M44 is a pleasing sight in binoculars or a rich field telescope.

Comets



Comet C/2011 L4 Pan-STARRS is moving northwards but sadly it is also becoming fainter. The most recent estimate suggests that at this time (end of April) it is magnitude 7 which means of course it is now a binocular object. The good news is that it has become circumpolar so it is always above the horizon. The map shows how the comet's position will change during May.

Comet ISON 2012 S1 caused something of a media frenzy when it was announced earlier this year that it would be “brighter than a full Moon”. The reality is that at a recent BAA meeting we were told by one of the Comet Section Officers that the gradual brightening that had been taking place had stopped and the comet had remained at the same magnitude (around 14) for some time. This makes forecasting its brightness at perihelion (its closest approach to the Sun) almost impossible. As it will be towards the end of the year before it becomes visible in our skies there is still time for it to get “back on track”.

Brian Mills

NASA SPACE PLACE

Exploring the Water World

Diane K. Fisher

In some ways, we know more about Mars, Venus and the Moon than we know about Earth. That's because 70% of our

solar system's watery blue planet is hidden under its ocean. The ocean contains about 98% of all the water on Earth. In total volume, it makes up more than 99% of the space inhabited by living creatures on the planet.

As dominant a feature as it is, the ocean—at least below a few tens of meters deep—is an alien world most of us seldom contemplate. But perhaps we should.

The ocean stores heat like a “fly wheel” for climate. Its huge capacity as a heat and water reservoir moderates the climate of Earth. Within this Earth system, both the physical and biological processes of the ocean play a key role in the water cycle, the carbon cycle, and climate variability.

This great reservoir continuously exchanges heat, moisture, and carbon with the atmosphere, driving our weather patterns and influencing the slow, subtle changes in our climate.

The study of Earth and its ocean is a big part of NASA's mission. Before satellites, the information we had about the ocean was pretty much “hit or miss,” with the only data collectors being ships, buoys, and instruments set adrift on the waves.

Now ocean-observing satellites measure surface topography, currents, waves, and winds. They monitor the health of phytoplankton, which live in the surface layer of the ocean and supply half the oxygen in the atmosphere. Satellites monitor the extent of Arctic sea ice so we can compare this important parameter with that of past years. Satellites also measure rainfall, the amount of sunlight reaching the sea, the temperature of the ocean's surface, and even its salinity!

Using remote sensing data and computer models, scientists can now investigate how the oceans affect the evolution of weather, hurricanes, and climate. In just a few months, one satellite can collect more information about the ocean than all the ships and buoys in the world have collected over the past 100 years!

NASA's Earth Science Division has launched many missions to planet Earth. These satellites and other studies all help us understand how the atmosphere, the ocean, the land and life—including humans—all interact together.

Find out more about NASA's ocean studies at:

<http://science.nasa.gov/earth-science/oceanography>

Kids will have fun exploring our planet at The Space Place:

<http://spaceplace.nasa.gov/earth>.



Caption: This image from September 2012 shows that the Arctic sea is the smallest recorded since record keeping began in 1979. This image is from NASA's Scientific Visualization Studio at Goddard Space Flight Centre.

This article was provided by the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.

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www.wadhurstastro.co.uk

SAGAS web-site www.sagasonline.org.uk

**Any material for inclusion in the June 2013 Newsletter
should be with the Editor by May 28th 2013**