

Wadhurst Astronomical Society Newsletter October 2012

MEETINGS

COMMITTEE MEETING

Members of the Committee are respectfully reminded that there is a meeting on Tuesday the 9th of October 2012. The meeting begins at 1930 and is held at Phil Berry's house for which we are very grateful.

As always any member of the Society is very welcome to come along but please let Phil know first. The meetings usually take between one and two hours during which time ways of promoting the Society are discussed and events such as talks and observing sessions are looked at. Needs of the Society are talked about and ways of achieving it.

You would be very welcome to come and see how the Committee work on your behalf and we are always looking for new ideas particularly in helping to make the Society what members want.

SEPTEMBER MEETING

The evening started off by Phil Berry announcing the sad news that since our last meeting Douglas Hall had died. His funeral on the 26th August was attended by several members and a donation was made by the society to Hospice in the Weald in line with the wishes of his family instead of a floral tribute. Besides having an interest in astronomy Douglas was an accomplished artist and a slideshow of beautiful paintings and drawings that Douglas had made for many publications and art galleries over the years was shown during the breaks. Everyone remarked on how impressed they were with the paintings and how talented Douglas was. He will be sadly missed by many of his friends.

Phil also announced that the remembrance service for our former committee member Michael Harte who died earlier in the summer is to take place at St. Peter & Paul Church, Wadhurst at 2:30 pm on Saturday 6th October. Michael was a very prominent figure in the community and a member of many societies in the village as well as the choir and it is expected that the service will be very well attended by many in the community.

Phil then introduced tonight's speaker, none other than our very own member Ian King.

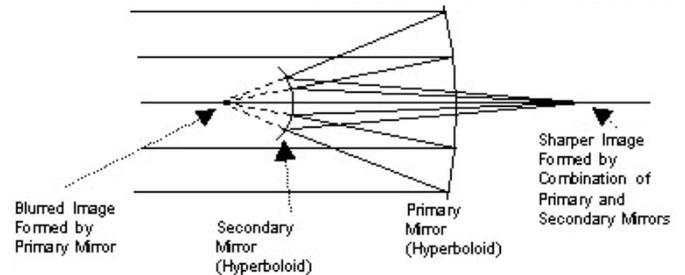
Ian has been involved in astro-imaging for many years, and together with Nik Szymanek was one of the first astro-imagers to branch out from film to digital astro-imaging. Ian is now considered one of the leading astro-imagers and suppliers of astro-imaging equipment in the UK.

His talk entitled "The Creation of the IKHAROS" is the story of how Ian embarked on an 8 year mission to bring to market his own Ritchey Chrétien designed telescope. His aim was to enable amateur astronomers to take advantage of the superior optics of this type of telescope at a fraction of the cost that was normal for one of this design and quality. Ian informed us that Ritchey Chrétien optics are more often found on high-performance professional telescopes costing many thousands of pounds.

The Creation of the IKHAROS

Ian King

Ian started by explaining the design and benefits of the Ritchey-Chrétien telescope which is a specialised design of a Cassegrain telescope first designed in the early 20th century. The telescope has a [hyperbolic primary mirror](#) and hyperbolic [secondary mirror](#) designed to eliminate optical errors ([coma](#)). The mirrors for this design are very difficult to manufacture compared to normal Cassegrain mirrors.



Ritchey-Chrétien telescope

They have a large field of view free of optical errors compared to the more conventional configurations.

Ian's mission started off by taking him to southern Italy 8 years ago, where he had discovered a small manufacturer that was making high quality Ritchey-Chrétien telescopes. This first visit involved Ian encountering temperatures of over 40 degrees. He showed us photographs of a delightful old town where he stayed and an ancient hotel where he was accommodated which appeared to be hewn out of the mountain rock!

Ian then described a frustratingly long succession of unsuccessful attempts to get the timescales and exacting high quality optics he required. Unfortunately the saying "Never do business with anyone south of Rome" turned out to be true and Ian's requirements were found to be beyond the capabilities of the small manufacturer and Ian was forced to look for another supplier. Eventually, he found some UK engineers who believed they could rise to the occasion with a trussed design that brought many advantages to the enclosed tube assembly of traditional telescopes. The scope was so impressive that when he showed the design for the first time at AstroFest 2008 he sold it within 15 minutes!

There then followed a long quest to get a reliable source for the highest quality Ritchey-Chrétien optics and after several more years of research and disappointment which Ian explained in a way that left the audience wondering how he ever managed to succeed, he finally managed to bring together the UK engineer and incredibly high quality optics he desired. As a result, today Ian's IKHAROS Carbon Fibre Trussed Ritchey-Chrétien brings to the amateur astronomer one of the highest specification telescopes that, until recently was only in the domain of the professional astronomer.

Ian then showed us some images of Phil Berry's 8" red version of the telescope mounted on his M-Uno mount in Phil's

observatory and some blueprints of Brian (not to be out done) Mills' 12" red version which he has on order.

Ian then showed some of the astonishing images he had recently taken from his home using the telescope, including one of IC5070 the Pelican Nebulae that showed some incredible fine detail compared to earlier images taken a few years ago when he embarked on his quest.

Ian finished his talk by showing us how he is now starting to use one of his 10-inch Carbon Fibre trussed telescopes remotely via the internet in a high altitude observatory that he shares with Nik Szymanek in Spain, called Astrocamp, which is located at a place called Nerpio. The telescope is set on an ASA Direct Drive mount. The benefits of this are that Ian and Nik will have many more clear nights to image compared to what is possible in the UK. We look forward to seeing more of his amazing astro-images in the future.

Brian Mills' talk for Beginners'

Brian Mills then gave a brief talk about the Moon - the second in his series of beginners' talks.

First he described the Earth-Lunar distance and how it varies because the Moon's orbit is an ellipse. He also looked at the comparative sizes and said that Moon was approx one quarter the size of Earth and that this relationship in size was unusual in that most satellites are much smaller in comparison to their parent planets.

We then looked at the composition of the Moon and one theory is that it was formed by a Mars sized object striking the Earth a glancing blow before carrying on into space. The debris left behind from this collision coalesced into the Moon.

Next we looked at the rotation period of the Moon around the Earth and the Moon's captured rotation.

Brian looked at why we see the phases and explained that more detail is seen on the surface when the Moon is partly illuminated. Finally we looked at the mechanics of eclipses and saw how eclipses vary due to the Moon's varying distance from Earth making its apparent size vary.

Brian concluded with some brief sky notes detailing planetary positions. Some details on the coming graze occultation were also given

The meeting was closed by our Chairman, John Vale-Taylor

Phil Berry

OCTOBER MEETING

Wednesday 17th October 2012 – Bob Seaney is giving a talk on "The Lick Observatory"

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.

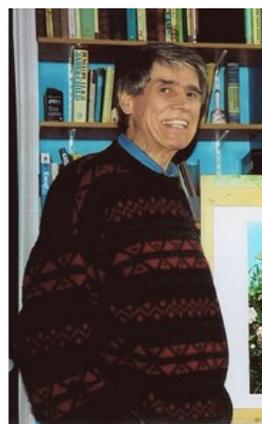
FUTURE MEETINGS

Wednesday 21st November 2012 – Member, Jan Drozd talks about "Early Pioneers in Astronomy"

Wednesday 12th of December, the second Wednesday of this month – Member Paul Treadaway continues his story of building his own telescope. His talk is called "The T200 Telescope First Light"

OTHER NOTES AND INFORMATION

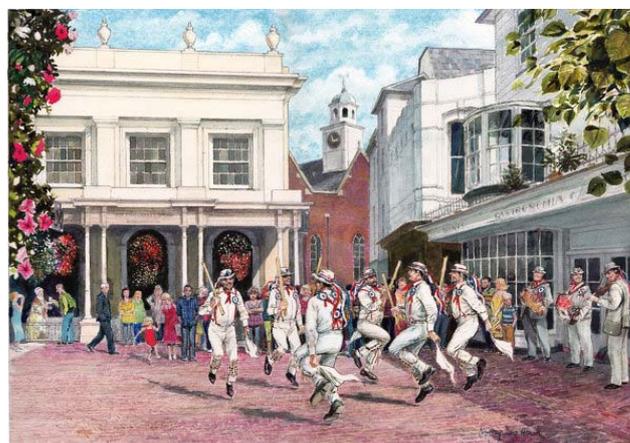
THE SAD LOSS OF DOUGLAS HALL



We are all very sad to learn of the loss of Douglas Hall. He had been a member of the Society for many years and had a long interest in astronomy. He referred to himself as an armchair astronomer and enjoyed the meetings until his recent illness.

Many members remember with pleasure his chats in the pub after our meetings, often talking of his art.

Douglas, who was 80 had lived in Tunbridge Wells for the past 50 years, was a very talented and sympathetic artist and illustrated many children's books. But that was not where his art ended. One of his pictures shows a scene of Morris Dancers at the Pantiles. Another recent painting that had taken him over a year to research and complete showed again the Pantiles but included many famous people associated with Tunbridge Wells.



Morris Dancers at the Pantiles

The warmth and detail are captured as can be seen in the picture as shown above.

We shall miss him and his friendly company very much.

ADVANCED CCD IMAGING COURSE

On Saturday December 1st 2012, Ian King is doing an "Advanced CCD Imaging Course".

This is an all day course (9.30 – 5.00) costing £35 with lunch provided.

It takes place in one of the domes (the Yapp 36" reflector) at Herstmonceux.

For further information go to the link below:-

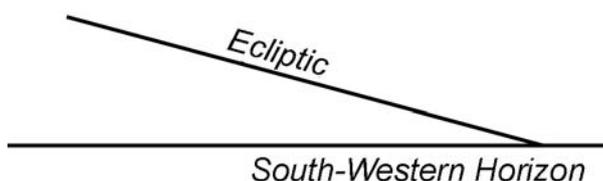
http://www.iankingimaging.com/show_products.php?category=169

SKY NOTES FOR OCTOBER

Planets

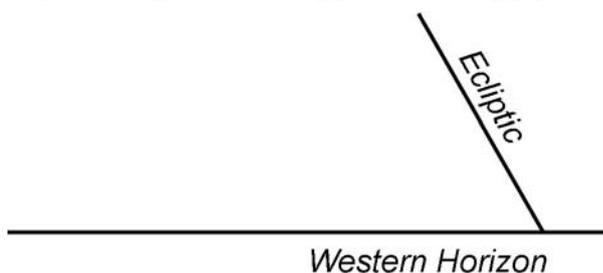
Mercury reaches greatest eastern elongation on the 26th but is very poorly placed for observation from the UK this month despite being 24° away from the Sun. The problem is that during the early evening at this time of year the ecliptic makes a very shallow angle with the horizon so that Mercury is only a few degrees above the horizon as the Sun sets.

The Ecliptic - Mid October Evenings



However, six months later (or earlier) at the same time in the evening, the angle is much larger. The effect of this is that a planet setting soon after the Sun will be on view for considerably longer allowing it to be viewed in a darker sky.

The Ecliptic - Mid April Evenings

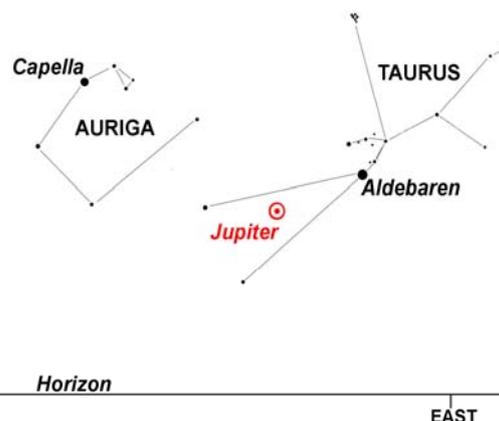


Venus is a brilliant object in the morning sky at magnitude -4.0 in the constellation of Leo, although it moves into Virgo towards the end of the month. By the middle of October it rises at 04.00 which is three and a half hours before the Sun, at which point the planet will be more than 30° high. Although its magnitude is fairly constant this month, the phase of Venus is increasing whilst its apparent angular diameter is decreasing as it moves further away from us and towards a superior conjunction in March next year.

Mars at magnitude +1.2 is very low in the south west throughout the month and is never more than 10° above the horizon at sunset making it a difficult object to observe. Its brisk west to east motion carries it from Libra, through Scorpius and into Ophiuchus during October.

Jupiter is an evening object at magnitude -2.6 in the constellation of Taurus as shown in the map.

Position of Jupiter - 15th October 2012 at 22.00BST



I have drawn the planet's position for mid month, but as it moves relatively slowly the map will be valid throughout October and beyond. At the start of the month it rises at 21.15 (BST) but by month's end this has become 18.15 (GMT). The position of the ecliptic at this time of year (and time of night) means that Jupiter will cross the meridian at an elevation of 60°, providing excellent views as it approaches opposition in December. During October it reaches its first stationary point (on the 4th) after which it begins to move retrograde (east to west).

Saturn is heading towards a superior conjunction on October 25th and is therefore unobservable this month.

Lunar Occultations

This month there are only four reasonably bright occultations that occur before midnight although there are many others that are either of fainter stars or take place at more unsociable hours. There is now an extra column headed "mm" (millimetres) to show the minimum aperture telescope required for each event. DD = disappearance at the dark limb. Times are in BST.

Oct	Time	Star	Mag	Ph	Alt °	% illu	mm
19 th	18.57	SAO 185584	6.3	DD	11	24	40
20 th	19.59	XZ44520	7.1	DD	13	35	70
21 st	17.54	SAO 162816	5.7	DD	20	45	70
26 th	18.48	SAO 128427	5.6	DD	24	91	60

Phases of the Moon for October

Last ¼	New	First ¼	Full
8 th	15 th	22 nd	29 th

ISS

Below are details of passes of the International Space Station (ISS) that occur before midnight and are magnitude -2 or brighter. The details of all passes including those visible from other areas can be found at www.heavens-above.com. Please remember that the times and directions shown below are for when the ISS is at its **maximum** elevation, so you should go out and look a few minutes beforehand. Times are in BST.

Oct	Mag	Time	Alt°	Az.
13 th	-2.6	20.00	39	SSE
14 th	-2.1	19.11	28	SSE
15 th	-3.4	19.58	68	SSE
16 th	-2.9	19.09	51	SSE
17 th	-3.4	19.56	86	N
18 th	-3.3	19.07	81	SSE
19 th	-3.4	19.54	78	N
20 th	-3.3	19.05	81	N
21 st	-3.5	19.52	87	N
22 nd	-3.3	19.02	80	N
23 rd	-3.2	19.49	67	SSW
24 th	-3.3	19.00	84	SSW
25 th	-2.3	19.47	39	SSW
26 th	-2.7	18.57	55	SSW

Iridium Flares

The flares that I've listed are magnitude -3 or brighter although there are a lot more that are fainter, occur after midnight or at a lower altitude. 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 in advance of the "flare", although of course it will be much fainter at that time.

Oct	Time	Mag	Alt°	Az.
6 th	19.04 BST	-5	55	N
30 th	17.50 GMT	-8	54	NNE
31 st	17.42 GMT	-3	56	NNE

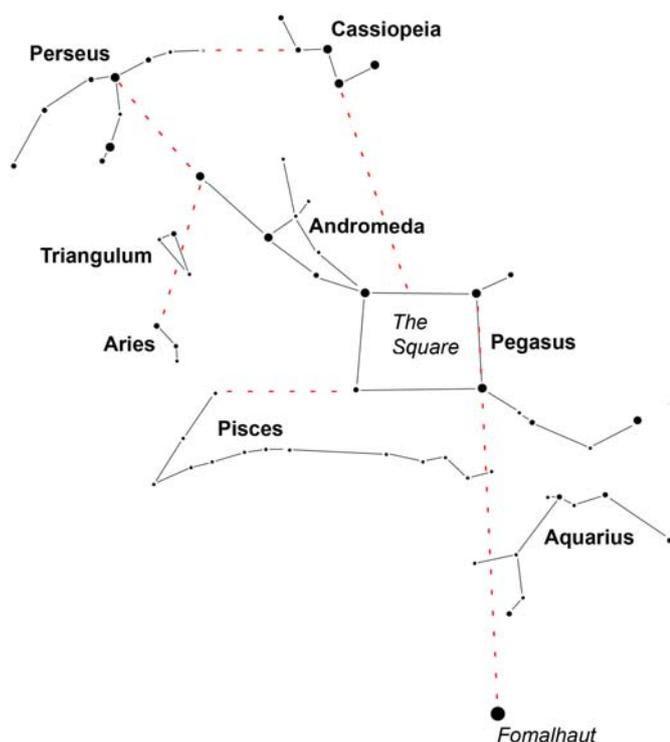
The Night Sky in October

(Written for 22.00hrs BST mid month)

In the north Ursa Major lies as close to the horizon as it can get whilst on the opposite side of the pole Cepheus and Cassiopeia are not far from the zenith.

Looking east Taurus and Auriga have now cleared the horizon whilst Perseus above them is prominently placed. The double cluster in the sword handle is a fine sight in binoculars.

Towards the south Andromeda is on the meridian with Aries and Triangulum to its east. Now is an ideal time to find Fomalhaut, the brightest star in the constellation Piscis Austrinus (The Southern Fish). The simplest way to do this is to draw a line through the two stars on the western side of the Square of Pegasus and continue it on towards the horizon until you come to a bright star which will be Fomalhaut.



The west is still dominated by the Summer Triangle as some of the fainter constellations from that season, such as Ophiuchus and Serpens disappear from view. Arcturus has set but Hercules and Corona Borealis are still on show.

Forthcoming Occultations

There are some occultations of reasonably bright stars, in the coming months, that I have listed below and some of which are mentioned above in the occultation section. If you are interested in joining us to observe some or all of them (possibly from Ashdown Forest) please let me know. Maps are available of the location that we use.

Times are in BST unless otherwise stated.

Date	Time	Mag	Moon data	mm
19 th Oct 2012	18.57	6.3	moon 24% 11° high.	40
21 st Oct. 2012	17.54	5.7	moon 45% 20° high	70
26 th Oct. 2012	18.48	5.6	Moon 91% 24° high	60
16 th Nov. 2012	16.05 GMT	3.8	Moon 11% 15° high	120
17 th Nov. 2012	17.05 GMT	4.9	Moon 20% 17° high	40
23 rd Nov. 2012	21.48 GMT	5.8	Moon 81% 42° high	50

Graze Occultation - September 22nd 2012

Despite unbroken sunshine during the day, the early evening heralded the arrival of several layers of cloud that unfortunately hid not only the Moon but also the magnitude 6.8 star that we had hoped to see graze past the southern lunar limb. Seven hardy souls turned up which meant that (with one non-observing assistant) we would have been able to man six locations that had been previously surveyed across Ashdown Forest. Sadly we were thwarted by the weather but there may be another opportunity to observe a graze later this year. I offer my thanks to John Vale-Taylor, Ian McCartney, John Wayte, Eric Gibson and Alan Goddard who turned out that night. Thanks also to Phil Berry who as well as being present on Saturday night, gave up an afternoon to help survey the sites we had planned to use.

The next possible graze occurs on Sunday December 16th at 19.00hrs GMT. The star for this event is magnitude 6.8 with the Moon only 16% illuminated. The bad news is that the star is only 9° above the horizon at the time, although careful choice of sites should help. The good news is that the event occurs 13° from the cusp. The line of mean graze crosses the coast between Brighton and Saltdean and then runs roughly north east to pass just north of Robertsbridge and Bodiam Castle and then south of Rolvendon. This is a northern limit graze, meaning the event is at the Moon's northern limb, so we would need to be south of the line that I've described. Hopefully we can find suitable sites with a good south westerly horizon. If you are interested in either observing or helping out on the night, please let me know. The assistance of non-observers is always very much appreciated.

GMT

Don't forget that British Summer Time will end at 02.00 (BST) on Sunday 28th October 2012. Greenwich Mean Time (GMT) will last until March 31st 2013.

Brian Mills

NASA SPACE PLACE

Doing Science with a Spacecraft's Signal

By David Doody

Mariner 2 to Venus, the first interplanetary flight, was launched August 27 fifty years ago. This was a time when scientists were first learning that Venus might not harbour jungles under its thick atmosphere after all. A Russian scientist had discovered that atmosphere during the rare Venus transit of 1761, because of the effects of sunlight from behind.

Mariner 2 proved interplanetary flight was possible, and our ability to take close-up images of other planets would be richly rewarding in scientific return. But it also meant we could use the spacecraft itself as a "light" source, planting it behind an object of our choosing and making direct measurements.

Mariner 4 did the first occultation experiment of this sort when it passed behind Mars as seen from Earth in July 1965. But, instead of visible light from the Sun, this occultation experiment used the spacecraft's approximately 2-GHz radio signal.

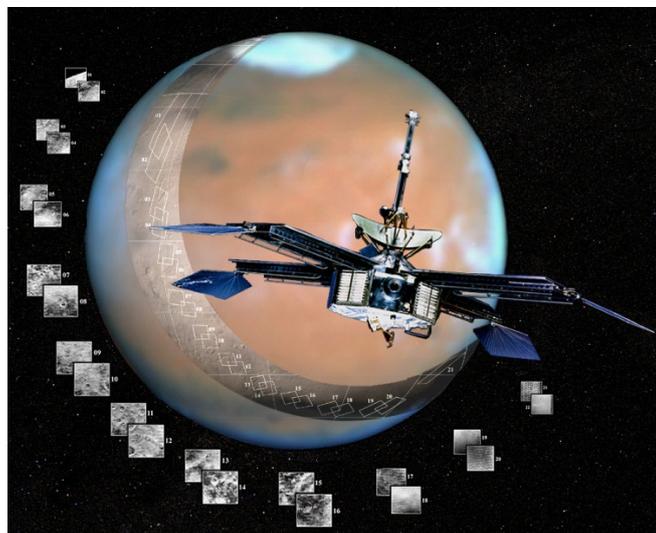
The Mariner 4 experiment revealed Mars' thin atmosphere. Since then, successful radio science occultation experiments have been conducted at every planet and many large moons. And another one is on schedule to investigate Pluto and its companion Charon, when the New Horizons spacecraft flies by in July 2015. Also, during that flyby, a different kind of radio science experiment will investigate the gravitational field.

The most recent radio science occultation experiment took place September 2, 2012, when the Cassini spacecraft carried its three transmitters behind Saturn. These three different frequencies are all kept precisely "in tune" with one another, based on a reference frequency sent from Earth. Compared to observations of the free space for calibration just before ingress to occultation, the experiment makes it possible to tease out a wide variety of components in Saturn's ionosphere and atmosphere.

Occultation experiments comprise only one of many categories of radio science experiments. Others include tests of General Relativity, studying the solar corona, mapping gravity fields, determining mass, and more. They all rely on NASA's Deep Space Network to capture the signals, which are then archived and studied.

Find out more about spacecraft science experiments in "Basics of Space Flight," a website and book by this author, <http://www2.jpl.nasa.gov/basics>

Kids can learn all about NASA's Deep Space Network by playing the "Uplink-Downlink" game at: <http://spaceplace.nasa.gov/dsn-game>.



Caption:

In this poster art of Mariner 4, you can see the parabolic reflector atop the spacecraft bus. Like the reflector inside a

flashlight, it sends a beam of electromagnetic energy in a particular direction. Credit: NASA/JPL/Corby Waste

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Any material for inclusion in the November 2012 Newsletter should be with the Editor by October 28th 2012