

# Wadhurst Astronomical Society Newsletter May 2018

## MEETINGS

### APRIL MEETING

The April meeting was introduced by Phil Berry. The visit to the Royal Astronomical Society library, arranged by Brian Mills will take place on the 22<sup>nd</sup> of May at Burlington House, Piccadilly, London; where those going, meet at 1400 outside the Society, which is just inside the archway and to the left. We will be visiting the library and there are some requests to see historic material such as books by Robert Hooke, photographic plates taken by Isaac Roberts of Crowborough and material left by Local amateur astronomer, James Nasmyth from Peshurst who invented the Coudé Focus and made plaster casts of some of the Moon's craters.

Phil said the number of visitors is limited to 20 and at the time of our April meeting there were still 8 places left. Anyone still interested in going should contact Brian Mills as soon as possible.

Phil told the meeting that an article about street lighting in the area had been printed in the local Focus handbook. A copy of this article follows later in the newsletter.

Finally, we were told that originally tonight we were to have had a talk on "Daylight Astronomy" by Barry Soden, but sadly he is ill and Phil said that he was very pleased to welcome in Barry's place, Melanie Davies who has delighted us on a number of occasions with her talks.

Melanie is founder and science director of Creative Space, a community interest company delivering talks on astronomy.

### **Astrology Meets Astronomy – Divination and Philosophy**

*Melanie Davis FRAS*

As we know, if anyone refers to Astronomy as Astrology today, people get very excited and upset, but Melanie began her talk by saying without Astrology we wouldn't have Astronomy.

Many centuries ago, the two were inseparable. Astronomy studied the location and movement of the stars and planets, which Astrologers used to make many predictions, such as people's behaviour depending on when they were born or when to go to war.



A painting by Antoine  
Caron depicting  
astrologers being  
advised by  
astronomers

Astrologers were very important people and part of their power came from certain predictions they could make from the position and events of objects in the night sky. In ancient Egypt, the pyramids had been built on very accurate lines in the direction of the North Celestial Pole. Today, Polaris indicates the direction of the Earth's northern axis, but 5,000 years ago, the Earth's celestial north pole was close to a star called Thuban in the constellation of Draco. Because of precession the axis of the Earth is slowly moving in a circle, taking 26,000 years to complete, and so we have a very good example of the effect of precession.



Egyptian pyramids at Cairo, Egypt  
They were built to align with the celestial pole 5000 years ago

Melanie told us that, the temple of Amun Re at Karnak was aligned with the midwinter sun. There are also a number of small Egyptian pyramids that are in exactly the right position to match the Pleiades.

Next we were told of the Nebra Sky Disk that Jan Drozd has spoken to us about before in one of his talks. It is a bronze disk dating from around 1600 BC and weighing in the region of 2 kilos and about 300 mm across. It came from a region in Germany but recent analysis shows that some of the metal actually came from Cornwall. The disk shows the Pleiades and different phases of the Moon and also includes the angles the Moon will be at for different times.



The Nebra Sky Disk found in Germany and dating from around 1600 BC

Melanie spoke of the Mesopotamian astrological star catalogues that date from as early as 1200 BC and included names such as Betelgeuse and Rigel, names still used today.

The Berlin Gold Hat is a Bronze Age device that is a spiral column showing the Lunar-Solar calendar. It was used throughout Europe from about 1400 to 800 BC and because there are not a whole number of Lunar Cycles throughout the year, the device shows when a thirteenth month needed to be added to bring everything back into line. Only three or four columns are known to still exist.

In 525 BC, the Persians conquered Egypt and we were told that there would have been a lot of influence on Egyptian astrology. It was later in this period that the first Zodiac was produced in around the first century BC.

In 1902 a wooden box was recovered from a wreck off the coast of a Greek island called Antikythera and inside this box was found a device now called the Antikythera Mechanism.



Front view of the Antikythera mechanism



Back view of the Antikythera mechanism

We were told that it was an ancient clockwork analogue computer dating from about 205 BC and used to predict astronomical positions and eclipses for calendar and astrological purposes.

Next, Melanie told us about the Enuma Anu Enlil tablets that dealt with Babylonian astrology and dating from around 164 BC. They describe the movement of stars and planets and on a tablet one comet's passage through the sky is detailed. From research, this turns out to be Halley's comet, although it wasn't so called for another two thousand years.

Chinese astronomers kept very accurate records of events in the night sky and in 1054, they recorded the appearance of an object suddenly appearing and shining with the brightness of the Sun both night and day. They referred to it as a Guest Star and the brightness lasted for 3 months. At that position we now see the Crab Nebula and at the centre is a Pulsar.

The Mayans were also active in astrology and Melanie talked about the El Caracol Observatory in Mexico built around 800 AD. She said that Venus was a very important planet to the Mayans and this observatory was built to line up with the rising and setting of Venus at certain times. It was believed that certain battles were timed to the motions of Venus.

The Astrolabe was a device used to measure the inclination of stars and planets and used by Islamic astrologers, astronomers and navigators and was used to predict the position of the Sun, Moon and stars. Astrolabes were in used between the 8<sup>th</sup> and 13<sup>th</sup> centuries.



The Astrolabe used between the 8<sup>th</sup> and 13<sup>th</sup> centuries



Many countries used astrology to suggest when they should plan events and go to war. Much money was invested in astrology and this in turn helped to develop astronomy.

Even medical students at one time were taught astrology which was used to determine the best time to have an operation.

One interesting detail Melanie spoke of was the development of the Zodiac. There are 13 constellations across the Ecliptic but the ancient astrologers were so superstitious that they excluded Ophiuchus.

Finally Melanie added that Astrology and Astronomy were part of each other and it wasn't until Isaac Newton in the seventeenth century, said that Astronomy was a science on its own and must be regarded as a separate discipline.

### **Our new Director of Observation**

Following the break our Chairman, Brian Mills, introduced our new Committee Member, Ian McCartney who has taken on the role of Director of Observation. Ian invited members to offer suggestions as to what they would like the Society to do. One thing suggested was that we occasionally talk about member's telescopes, how to set them up and tips on the best ways to use them.

A couple of years ago members took their telescopes and cameras up onto Ashdown Forest on a particularly clear night and then discussed processing images from cameras. Ian thought this might be something members might like to do again.

He suggested that if anyone has any thoughts of what would interest members, to contact any Committee Member or send an email to the Society via the address in the contacts list at the end of the newsletter and they will see what can be arranged.

### **Snippets from the World of Science**

*John Wayte*

John said that for every pound spent on space exploration, £8 comes back to Earth and is used in the community.

He then asked the question: What do these three things have in common – Obama, tomatoes and Mars?

In 2010, President Obama gave a speech on human missions to Mars. Also a Dutch company, Agro-Control investigated the best way to fertilize and grow tomatoes in space, taking only the bare minimum of minerals to achieve this. The company experimented with an enclosed environment, providing just 16 minerals and carefully monitored growth, water used, organic waste, carbon dioxide and oxygen levels the plants used. The experiment was so successful that the enclosed system is now being sold all over the world and this system would also work on Mars.

So, John said that from Obama's speech came something that is going to benefit us all.



For the second part of John's talk, he played an interesting video of a Tour of the Moon created from actual footage by the Goddard Space Centre and NASA.

This video can be seen by going to YouTube and selecting "Tour of the Moon – Goddard".

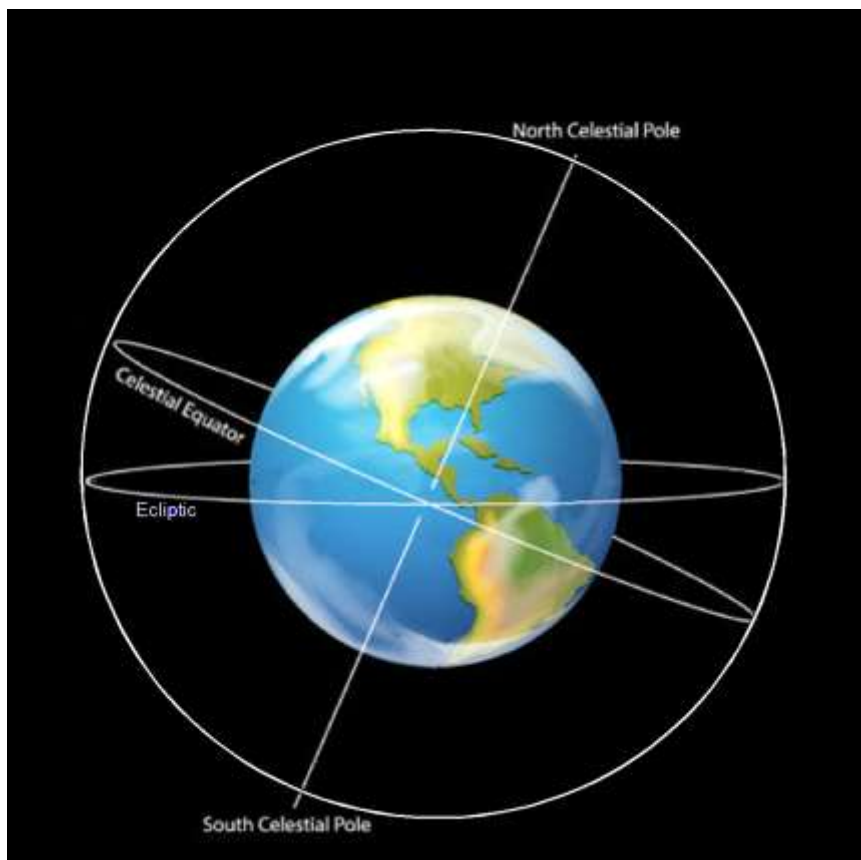
## The New GCSE Syllabus on Astronomy

Brian Mills FRSA

Since the GCSE syllabus for astronomy changed last September, Brian thought it a good opportunity to follow the course.

Briefly, the subjects covered so far began with the structure of the Earth as reported in the July 2017 newsletter. In the October newsletter, celestial observation and the constellations were discussed, then in the December 2017 newsletter, Brian continued with a description of Messier objects and the different types of objects in the sky, including meteors. Then finally he spoke of the way the positions of objects in the sky are measured.

After a short review of what he covered in the last part, Brian continued with Celestial Observations. Previously, we had learnt that the Celestial Equator is used as the zero reference for Declination (Dec) measuring in degrees positively to the North Celestial Pole at  $+90^\circ$  and negatively to the South Celestial Pole at to  $-90^\circ$ . The First Point of Aries was the zero reference for Right Ascension (RA) and measuring eastwards in hours to 24, each hour measuring  $15^\circ$ . We had also learnt about Precession.



Brian now spoke about using Setting Circles when setting up a telescope that has an Equatorial Mount, and lining up the telescope with the orientation of the Earth in space and then using known bright stars to line up on. A motorised drive then keeps the telescope following an object. Today, most telescopes use GoTo mounts where an object is requested and the computerised drive does the rest.

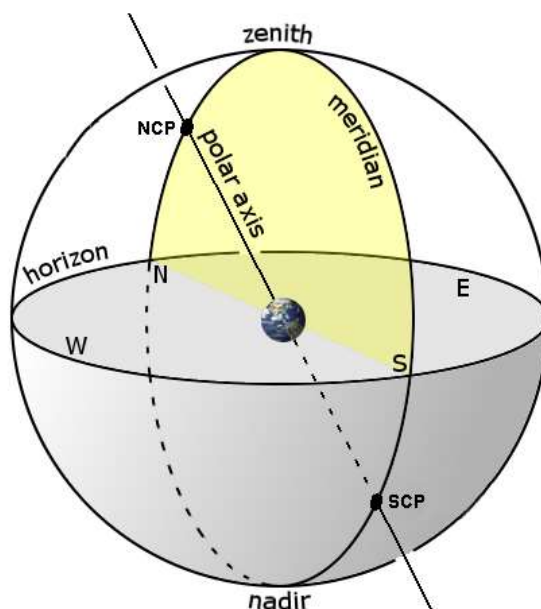
We were told that the RA/Dec system isn't the only coordinate system. We can also use the Altitude/Azimuth system (Alt/Az) where the zenith, - the point immediately overhead, is at  $90^\circ$  and the Altitude is measured from  $0^\circ$  at the local horizon.

The Azimuth starts from North and is measured to the east. East is at  $90^\circ$ , South is at  $180^\circ$ , West is at  $270^\circ$  and then back to North at  $360^\circ$  or  $0^\circ$ .

Diurnal Motion is the apparent daily motion of the stars around the Celestial Poles.

Cardinal Points are N, S, E and W, and Brian pointed out, when we are looking out into space, East and West are opposite to how we see the points when looking down at a map.

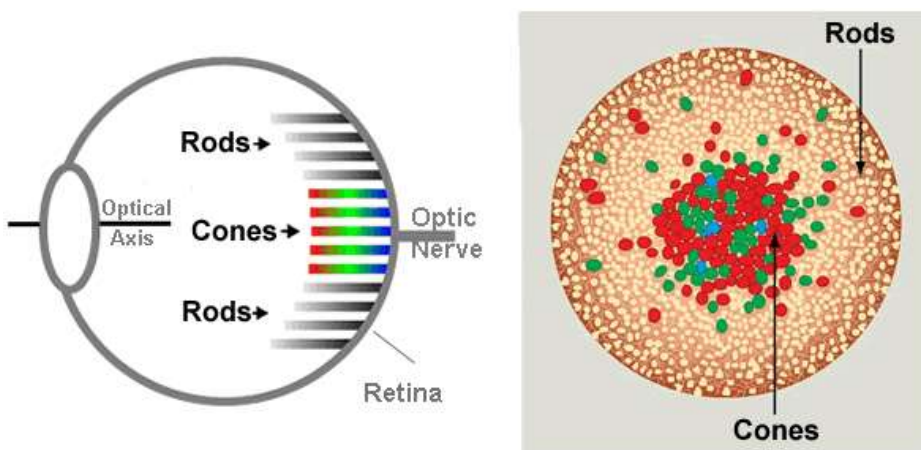
Meridian is the Great Circle passing through North and South Celestial points and the N and S cardinal points on the observer's horizon. The Zenith and Nadir (opposite of the Zenith) are also on this circle.



Circumpolar objects are objects in the sky that don't set from given latitudes such as Ursa Major Cassiopeia and M31 from our latitude for example. Brian also added that to measure the altitude of Polaris (almost exactly the Celestial North Pole) then that is our latitude.

To complete this part of the syllabus, Brian talked about Practical observing with the naked eye. The eye needs about 20 to 30 minutes to adjust to the dark conditions and objects are best observed at their highest point on the meridian (Culmination).

There are two types of photoreceptive cells in the human eye. The Rods are sensitive to light and dark but are not colour-responsive, and need time to adapt.



The colour sensitive cells are the Cones but need a certain amount of light to react. As Brian told us, this means we don't see colour in faint stars or nebulae. He added that the cones tend to be around the central axis of the back of the eye and that when looking at a faint object, we can use 'Averted Vision' where, by looking slightly away from the object we can see it more clearly, so using the rods rather than the cones.

**MAY MEETING**

**16 May 2018** – Colin Stuart tells us “ How to Weigh the Universe”

Meetings will take place at Uplands College, Lower High Street, Wadhurst and are held in classrooms IL5 and IL6 which are in the blue walled classroom block at the far end of the drive from the main gate and up by the tennis courts. Signs will direct you. There is car parking near the block although this needs to be cleared before 2230 when the gates close. The postcode is TN5 6AZ.

Meetings begin at 1930 prompt although members are invited to arrive anytime after 1900, as this is a good time to exchange ideas and discuss problems and also help set things up before the meeting starts.

Anyone is welcome but non-members are asked if they wouldn't mind contributing £3 towards costs.

## FUTURE MEETINGS

**20 June 2018** – Our Chairman, Brian Mills FRAS takes “SOFIA and Airborne Observing” as his subject.

**18 July 2018** – The highly entertaining Dr David Mannion tells us about “Astronomical Numbers”.

**There is no meeting in August**

**19 September 2018** – WAS member Will O’Brien talks on “Dynamics of Charged Particles in Planetary Magnetic Fields”.

### **Reprint from the April issue of the Wadhurst, Tidebrook and Stonegate Churches Focus**

*By Felicity Harvest (Chair Wadhurst Parish Council)*

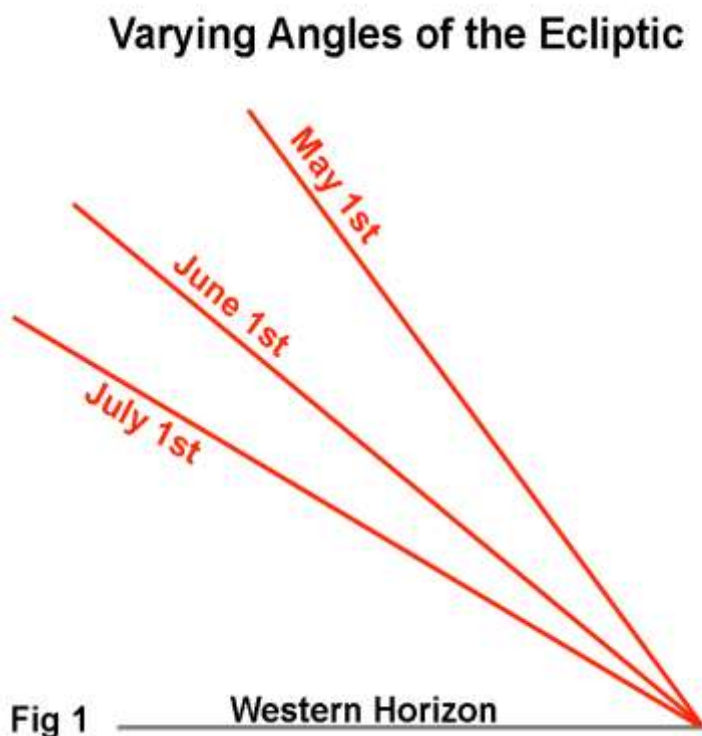
We have now commissioned the work to make some of our most light-polluting street lights more dark-sky friendly. I’d like to thank **Phil Berry** and the **Wadhurst Astronomical Society** for their help throughout this process, which has been a long one. To compliment this work, please do consider the lighting around your own home or business: could you replace lights, which are on throughout the evening or even all night with motion-sensitive versions to reduce light pollution? Do you really need those lights to be on at all? We had a meeting with representatives of Wealden District Council, and our dark skies could clearly be an important part of what we can offer visitors.

## SKY NOTES FOR MAY 2018

### Planets

Mercury reached greatest western elongation at the end of April and is therefore still a morning object although it is very poorly placed for observers in the UK. At sunrise on May 1<sup>st</sup> it is just under 5° in altitude and, given its magnitude of +0.4, it will be extremely difficult to find. Following this it moves back towards the Sun to reach superior conjunction on June 6<sup>th</sup>.

Venus is becoming a more conspicuous evening object as it draws away from the Sun. At the beginning of the month it sets two and a half hours after the Sun although, by month’s end this has only increased to two and three quarter hours. This is despite the elongation of Venus (its angular distance from the Sun) increasing from 27° to 34°. The cause of this apparent anomaly is the changing angle that the ecliptic makes with the horizon, which is illustrated in fig 1 by comparing that angle on the first of May, June and July. You can appreciate that the closer the ecliptic is to the horizon, then the shorter the time that elapses between the Sun and then Venus setting.



However, Venus is still a striking object, at magnitude -3.9, in the west as soon as the Sun has set. Its brightness is gradually increasing as the planet grows in apparent size as it moves closer to the Earth. As this happens its phase decreases from 88% to 80% during the month.

Mars is visible in the morning skies rising at 02:00 at the beginning of May although by the end it will rise an hour earlier. It will be late June before it is once again an evening object. The red planet begins the month in Sagittarius but its swift westwards (direct) motion brings it to the border with Capricornus on the 14<sup>th</sup>. A waning gibbous Moon is 2° north of the planet on the morning of the 6<sup>th</sup>. The planets size and brightness both gradually increase as it moves towards opposition on July 27<sup>th</sup>. Its position in the early morning during mid May is shown in fig 3.

Jupiter reaches opposition on May 9<sup>th</sup> when it will be at its closest to the Earth and therefore will appear at its largest and brightest this year. The gas giant's magnitude will peak at -2.5 and its apparent equatorial diameter will be 44.8" (44.8 arc seconds) compared to 41.9" around the poles. A body this shape is referred to as an oblate spheroid. The bulge at the equator is caused by centrifugal force brought about by the high rotation speed of Jupiter, which, at nine hours and fifty-five minutes, is the fastest of all the solar system planets. At the time of opposition Jupiter will rise at dusk and reach the meridian, due south, at 01.00 when it will be 23° in altitude. Although this may seem to be low in the sky, things will only get worse at the oppositions of 2019 and 2020 when Jupiter's altitude will be 16° and 17° respectively. Following that the situation begins to improve until in 2024 its altitude will be a very respectable 61°. A 97% waning Moon will be 3° north of the planet on May 27<sup>th</sup> as it moves retrograde through Libra.

With a disk of the size described above, small telescopes should show at least a hint of the cloud bands that encircle the planet. Of course even binoculars that are rigidly mounted will allow you to follow the nightly movement of the four largest, Galilean, moons as they on occasions pass across the face of the planet or disappear into its shadow.



Saturn is also a morning object rising at 01:00 at the beginning of the month and 23:00 by the end. It is still moving retrograde within the borders of Sagittarius, a little to the north of the “Teapot” asterism. On the 18<sup>th</sup> it is just one and a half degrees north of M22, a globular cluster at magnitude +5.1. By the middle of May it has grown in apparent size to 17.8" and in magnitude to +0.3. This growth will continue as Saturn approaches opposition on June 27<sup>th</sup>. The northern face of the rings continues to be presented towards the Earth at just over 25° thanks to the tilt of Saturn's axis.

**Lunar Occultations**

In the table below I've listed events for stars down to magnitude 7.0 that mostly 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, RD = reappearance at the dark limb and RB = reappearance at the bright limb. The column headed “mm” (millimetres) shows the minimum aperture telescope required for each event. **Times are in BST.**

May	Time	Star	Mag	Phase	Altitude °	% illumination	mm
19 <sup>th</sup>	22:12	ZC 1202	7.1	DD	24	25	60
19 <sup>th</sup>	23:54	ZC 1217	6.2	DD	9	25	40
25 <sup>th</sup>	21:34	ZC 1923	7.0	DD	34	86	90



## Phases of the Moon for May

Last ¼	New	First ¼	Full
8 <sup>th</sup>	15 <sup>th</sup>	22 <sup>nd</sup>	29 <sup>th</sup>

## ISS

Below are details for passes of the International Space Station (ISS) this month where its brightness is in excess of -2.0. The details of other passes, including those visible between midnight and dawn, can be found at [www.heavens-above.com](http://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 at least five minutes beforehand. **Times are in BST.**

May	Time	Mag.	Alt°	Az.		May	Time	Mag.	Alt°	Az.
20 <sup>th</sup>	23:43:05	-3.9	61°	SSE		26 <sup>th</sup>	21:40:18	-3.9	74°	SSE
21 <sup>st</sup>	22:50:35	-3.5	43°	SSE		26 <sup>th</sup>	23:16:48	-3.8	79°	N
22 <sup>nd</sup>	21:58:06	-3.0	29°	SSE		27 <sup>th</sup>	22:24:07	-3.7	79°	N
22 <sup>nd</sup>	23:34:20	-4.0	86°	S		28 <sup>th</sup>	23:07:58	-3.9	88°	S
23 <sup>rd</sup>	22:41:45	-3.9	68°	SSE		29 <sup>th</sup>	22:15:15	-3.7	81°	N
24 <sup>th</sup>	21:49:11	-3.6	48°	SSE		29 <sup>th</sup>	23:51:37	-3.5	45°	SSW
24 <sup>th</sup>	23:25:36	-3.8	80°	N		30 <sup>th</sup>	22:59:00	-3.8	64°	SSW
25 <sup>th</sup>	22:32:57	-3.9	89°	NNE		31 <sup>st</sup>	22:06:19	-3.9	83°	SSW

## Iridium Flares

The flares that I've listed are magnitude -3.0 or brighter although there are many 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](http://www.heavens-above.com). 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 then. **Times are in BST.**

May	Time	Mag	Alt°	Az.°		May	Time	Mag	Alt°	Az.°
1 <sup>st</sup>	21:31	-5.9	18°	349° (N)		20 <sup>th</sup>	22:40	-4.3	19°	282° (WNW)
2 <sup>nd</sup>	21:22	-6.1	21°	348° (NNW)		20 <sup>th</sup>	23:47	-7.1	42°	237° (WSW)
3 <sup>rd</sup>	21:15	-6.2	23°	348° (NNW)		21 <sup>st</sup>	21:57	-5.5	12°	291° (WNW)
4 <sup>th</sup>	23:30	-6.8	31°	247° (WSW)		23 <sup>rd</sup>	22:46	-3.8	13°	293° (WNW)
12 <sup>th</sup>	22:59	-6.9	27°	264° (W)		23 <sup>rd</sup>	23:34	-5.8	41°	243° (WSW)
14 <sup>th</sup>	22:57	-4.3	24°	269° (W)		23 <sup>rd</sup>	23:35	-4.7	39°	244° (WSW)
17 <sup>th</sup>	22:39	-3.6	16°	284° (WNW)		27 <sup>th</sup>	23:20	-4.7	38°	251° (WSW)
18 <sup>th</sup>	23:23	-5.2	47°	239° (WSW)		31 <sup>st</sup>	22:13	-3.2	35°	261° (W)
18 <sup>th</sup>	23:56	-4.4	42°	233° (SW)		31 <sup>st</sup>	23:05	-5.5	35°	260° (W)

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

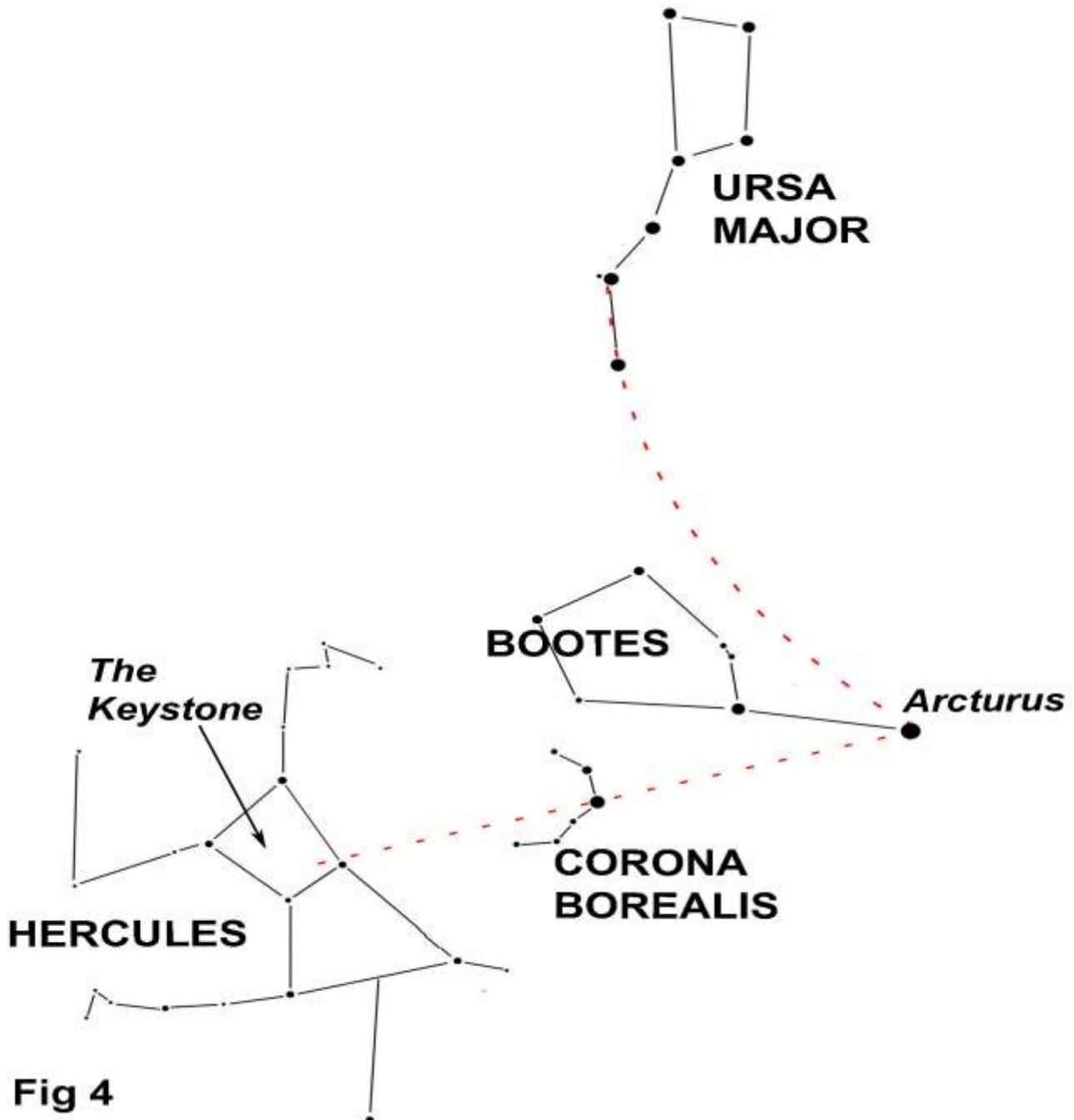
In the south the body of Hydra, the water snake, lies parallel to the horizon whilst the small constellations of Corvus, the crow and Crater, the cup, ride on its back. Corvus contains few deep sky objects although it is home to the so-called Antennae Galaxies, NGC 4038 & 4039, where two spirals can be seen interacting. At magnitude 10.7 a 200mm instrument is needed to show them well visually although they also radiate strongly in X-ray wavelengths. Just across the northern border of Corvus, in neighbouring Virgo is M104, the Sombrero Galaxy. This is an elliptical galaxy seen almost edge on with a striking dark dust lane where star formation is thought to be occurring. Of course, any shortage of galaxies in Corvus is balanced by a plethora of them in Virgo where the aptly named Virgo Cluster of galaxies is resident. Leo also has its fair share of such objects of which one of the most imaged is the Leo Triplet that lies a little to the south of theta Leonis. It consists of two Messier objects, M65 and M66 at magnitudes 9.3 and 9.0 respectively, plus slightly fainter NGC3628 at magnitude 9.5.

The body of the water snake reaches almost to the west where its head can be found just south of Cancer. The bright winter groups have mostly disappeared although the celestial twins lie just beyond due west and are still 30° in altitude. One of the last remnants to disappear will be Capella in Auriga that is still prominent in the north-west at the moment.

Towards the north Ursa Major is almost overhead though that actual distinction rests with the small constellation of Canes Venatici, the hunting dogs belonging to Boötes. Of the galaxies contained within its borders M51 is by far the best known for being the first one to be identified as being spiral in nature. Although it was identified by Messier in 1773, it was not until the 3<sup>rd</sup> Earl of Rosse identified it as such using what was then the world's largest telescope at Birr Castle in 1845.

Ursa Minor points north towards its larger cousin whilst below it Cassiopeia straddles the meridian due north. Just to the west of the familiar "W" are the Heart and Soul nebulae both at magnitude 6.5.

In the east the summer constellations in waiting are beginning to show their hand. Two of the three members of the Summer Triangle, Deneb and Vega, are already twenty and thirty degrees in altitude respectively, with the final member, Altair, soon to join them. Hercules and Corona Borealis lie due east with Arcturus a little further west. A line drawn from Arcturus through Alphekka (alpha Coronae Borealis) and onwards will bring you to the "Keystone" which forms the lower part of the strong mans body. Hercules is drawn "upside down" so that his head lies close to the border with northern Ophiuchus.



**Meteors**

The Eta Aquarids can be seen from April 25<sup>th</sup> to May 20<sup>th</sup> with maximum activity expected on the night of the 5<sup>th</sup>/6<sup>th</sup> May. This is primarily a southern shower and with the Sun in nearby Aries and a waning gibbous Moon in Sagittarius, conditions are not ideal. The ZHR is predicted to be 40 though the minimal altitude of the radiant will seriously impact this.

**Advance Warning**

June 27<sup>th</sup> – Saturn at opposition.

Brian Mills FRAS

**2018 SUBSCRIPTIONS**

Subscriptions to the Wadhurst Astronomical Society became due from the 1<sup>st</sup> of January 2018, but at the AGM it was reluctantly decided that an increase had become necessary. On March 1<sup>st</sup> they rose by £2 to £20 per adult and £27 for two family members at the same address. Members under 17 years of age and students remain free.

Subscriptions can be paid either by cheque made payable to Wadhurst Astronomical Society or as cash at the meetings or by post to:

John Wayte  
Members Secretary

Wadhurst Astronomical Society  
27 Pellings Farm Close  
Crowborough  
East Sussex  
TN6 2BF

The Subscriptions can also be paid via electronic banking to:

**Wadhurst Astronomical Society**

Account Number **35104139**

Sort Code **60-22-15**

Putting your name as the **Reference** so we know who is paying.

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#### **What's It Like Inside Mars?**

*By Jessica Stoller-Conrad*

Mars is Earth's neighbor in the solar system. NASA's robotic explorers have visited our neighbor quite a few times. By orbiting, landing and roving on the Red Planet, we've learned so much about Martian canyons, volcanoes, rocks and soil. However, we still don't know exactly what Mars is like on the *inside*. This information could give scientists some really important clues about how Mars and the rest of our solar system formed.

This spring, NASA is launching a new mission to study the inside of Mars. It's called Mars InSight. InSight—short for Interior Exploration using Seismic Investigations, Geodesy and Heat Transport—is a lander. When InSight lands on Mars later this year, it won't drive around on the surface of Mars like a rover does. Instead, InSight will land, place instruments on the ground nearby and begin collecting information.

Just like a doctor uses instruments to understand what's going on inside your body, InSight will use three science instruments to figure out what's going on inside Mars.

One of these instruments is called a seismometer. On Earth, scientists use seismometers to study the vibrations that happen during earthquakes. InSight's seismometer will measure the vibrations of earthquakes on Mars—known as marsquakes. We know that on Earth, different materials vibrate in different ways. By studying the vibrations from marsquakes, scientists hope to figure out what materials are found inside Mars.

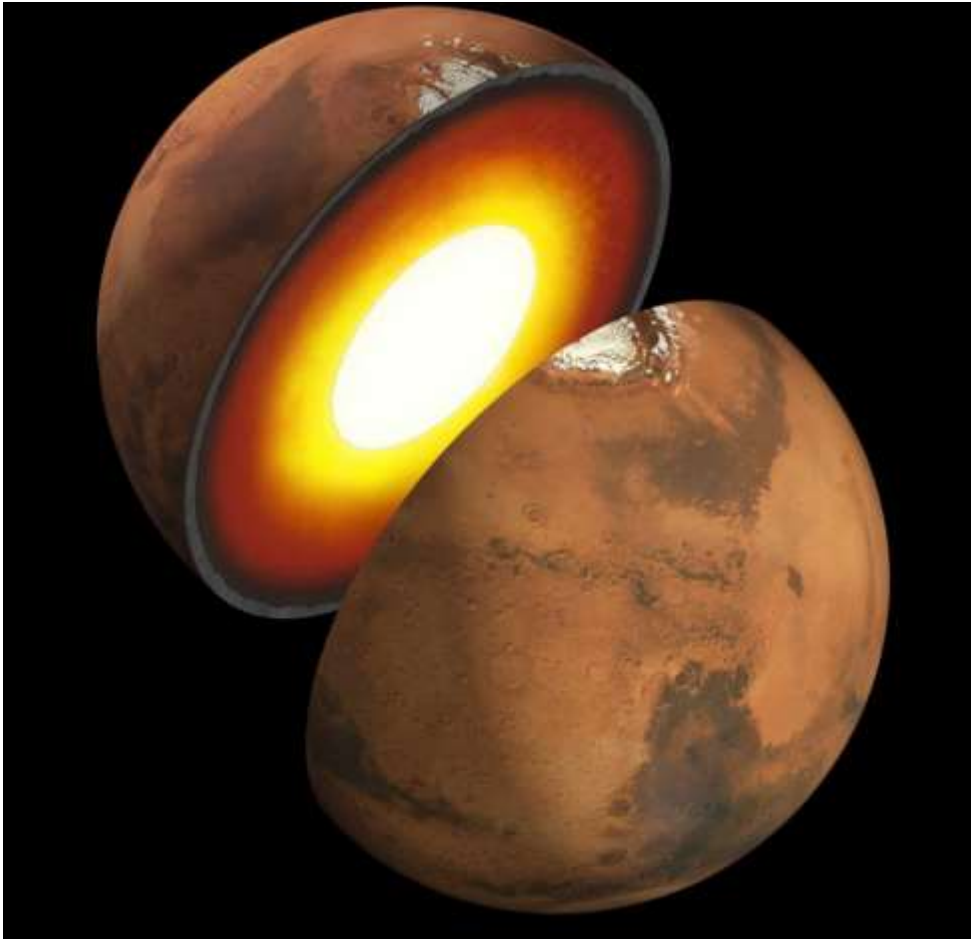
InSight will also carry a heat probe that will take the temperature on Mars. The heat probe will dig almost 16 feet below Mars' surface. After it burrows into the ground, the heat probe will measure the heat coming from the interior of Mars. These measurements can also help us understand where Mars' heat comes from in the first place. This information will help scientists figure out how Mars formed and if it's made from the same stuff as Earth and the Moon.

Scientists know that the very center of Mars, called the core, is made of iron. But what else is in there? InSight has an instrument called the Rotation and Interior Structure Experiment, or RISE, that will hopefully help us to find out.

Although the InSight lander stays in one spot on Mars, Mars wobbles around as it orbits the Sun. RISE will keep track of InSight's location so that scientists will have a way to measure these wobbles. This information will help determine what materials are in Mars' core and whether the core is liquid or solid.

InSight will collect tons of information about what Mars is like under the surface. One day, these new details from InSight will help us understand more about how planets like Mars—and our home, Earth—came to be.

For more information about earthquakes and marsquakes, visit: <https://spaceplace.nasa.gov/earthquakes>



*Caption: An artist's illustration showing a possible inner structure of Mars. Image credit: NASA/JPL-Caltech*

## CONTACTS

**General email address to contact the Committee**  
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Secretary - Phil Berry 01580 291312

Treasurer - John Lutkin

Membership Secretary - John Wayte

Newsletter Editor - Geoff Rathbone 01959 524727

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Librarian - Phil Berry

Catering Manager - Jim Cooper

SAGAS Representative - Eric Gibson

**Wadhurst Astronomical Society** website:  
[www.wadhurstastro.co.uk](http://www.wadhurstastro.co.uk)

**SAGAS** website:  
[www.sagasonline.org.uk](http://www.sagasonline.org.uk)

**Any material for inclusion in the June 2018 Newsletter should be with the Editor by May 28<sup>th</sup> 2018**