

Wadhurst Astronomical Society Newsletter February 2013

MEETINGS

JANUARY MEETING

Annual General Meeting

Our Chairman, John Vale-Taylor welcomed members to the Annual General Meeting and said that last year had been another success for the Society with guests and member speakers whom he thanked. He said he hoped members were satisfied with the way the Society and meetings were being run. To this end he requested members present if they would complete a questionnaire asking for suggestions to improve the Wadhurst Astronomical Society.

John said that we are now in our new session and Membership subscriptions which are now due can be given or sent to our Treasurer whose details follow later in the Newsletter. Subscriptions have been held at the previous rate yet again which we think gives good value.

He introduced our Secretary Phil Berry who reviewed the events and meetings of the last year, including the Astro-barbecue held at the home of Brian Mills. In the past the barbecue has been hosted by Michael Harte and his wife, but sadly Michael died and we needed to find another venue. He thanked Brian and his wife, Jean.

A visit had been made to the South Downs Planetarium arranged by SAGAS. Members had very much enjoyed the talks and demonstrations held in the planetarium itself.

Phil then looked at talks and events arranged for the forthcoming year listed later in the Newsletter. This year the Astro-barbecue will be held on Saturday 24th August with details to follow later in the year.

Our Treasurer, Mike Wyles gave his report, saying that we now had £434.99 in our current account and a bank reserve of £501.24 having bought new equipment including three stop watches to time occultation observations, and a BBQ which we now need.

The Newsletter Editor asked if members were happy receiving the Newsletter in pdf format. One or two members still preferred the email version in Microsoft Word which he said is not a problem. He then looked at items covered in the issues and asked if members would like to see anything else. No suggestions were made but can always be made at any time.

Our director of Observations, Brian Mills announced that the Society's new website was now up and running and is now up-to-date and that amongst all his other duties he is now our new webmaster, for which we are all very grateful. He said how indebted we were to the late Michael Harte who had successfully run the town website for very many years.

Registax is a free software programme used to stack multiple images of planets and Brian said that it was

intended to hold an introduction to Registax at some time during the year. This introduction would be followed later by a practical evening.

The Chairman then introduced tonight's talk given by our own Secretary.

Android Astronomy

Phil Berry

Tonight's talk is an introduction to what is available to the amateur astronomer in the form of an "app" for the modern Android mobile phone.



The Google-Android symbol

Phil said that a few years ago he had purchased the Celestron "Sky Scout"; a device one pointed at the sky and looked through the eyepiece to find out what objects were visible, together with a wealth of information and data but was not all that easy to use.

Over the past few years smart phones have appeared and Phil showed the HTC Sensation XE with dual processor and expandable memory. It is hundreds of times more powerful than the processors used during the Lunar Landings.

Recently, Google have brought out the Asus Nexus 7 with a 1.2 GHz quad core processor with RAM expandable up to 32 Gb. Phil said the top of the range had a sim card the same as a mobile-phone. Away from home the Android phone will provide a Wi-Fi hot-spot.

In passing, Phil told the meeting that MIT manufactured a device with 2K of Memory and 32K of Storage running at 1 MHz (1966) and was fitted into the complete Apollo lunar landing CPU!

There is no licence to purchase therefore a phone equipped with Android is cheaper.

The big advantage of the Google backed Android phone is that the operating system is open source software and we were told that this enables anyone to develop new mobile apps. There are now well over 700,000 thousand Android apps with thousands related to astronomy alone although Phil said quality was variable.

Google Play is the Android app store. It makes things easier to have a Google email account and everything you download or install is kept carefully for all your Android devices. They are very easy to install and are often free. Those you pay for are often only a few pence and any updates continue to be available for any downloaded apps.

Using the search facility to find astronomy related apps also provided reviews and these are always worth checking out before downloading. You are given 15 minutes to try them out before accepting them. Many apps do have short adverts.

Phil then looked at some of the available astronomy apps he uses although he said there wasn't time to show all the features. They are "Astro Panel", "Sun Surveyor", "3D Sun", "Lunar Map HD" and "Mobile Observatory".

Astro Panel

This was described as a weather app for astronomers and is free. It provides information on Cloud cover, Seeing, Transparency, Humidity, Wind, Temperature Lunar Phase and Altitude and ISS passes (localised automatically).

The main screen shows information on the above for different times of the day. Touching any graphic reveals a box with a detailed explanation. Information is often displayed in different ways with submenus for other options.

Selecting ISS Passes takes us straight to the "Heavens Above" website and from here it is possible to choose different ranges of dates.

Sun Surveyor

There is a free version but for £4.25 you get a more detailed app that includes the Moon. As Phil said, this is particularly useful when planning occultation observations.

The 3D Sun page allows you to select your site and shows a graphic representation of where the Moon or Sun will be at any time of the day or night.

Map View shows a satellite image of the Earth at the selected location and provides for a number of personalised layers. As a demonstration, Phil used the location of our meeting venue and predicted that the Moon would be at a certain altitude above the Greyhound pub at 2130, which was verified following the close of the meeting.

There is an AR; Augmented Reality Camera which allows information to be superimposed on the output from the smart phone's camera so that a scene of the horizon for instance can carry information about Sun and Moon over several hours.

3D Sun

NASA's STEREO mission is a pair of satellites orbiting either side of the Sun, providing images of the total surface. "3D Sun" provides a 3D image and the free app can be set up to alert one of events such as Coronal Mass Ejections. The app also provides up to date news of solar events and activity. Touching a news item provides more detail about that particular item, together with descriptions and graphs where appropriate.

The sun can be viewed in different wavelengths so providing different information about the surface.

Lunar Map HD

Lunar Map HD costs just 63 pence and provides astonishingly detailed images of the surface of the Moon. It provides high detail maps of both sides of the Moon, US Geological high resolution relief maps of the surface, colour coded details and searchable labels. There is also the ability to rotate and enlarge the Moon's image through the touch screen.

There is an enormous amount of detail including the various landing sites. There is a search facility to allow features to be found together with data.

Phil showed an image of the surface of the Moon he himself had taken ten years ago with his Nexstar 5 and it was quite fascinating to compare his image with the detailed surface map.

Mobile Observatory

Finally Phil showed the "Mobile Observatory" app that had cost £3.49. He said there was too much on the main menu to demonstrate them all at the meeting, so he attempted just a few.



Mobile Observatory opening screen

"Sky View" is a night sky map and we were shown how easy it was to touch an object such as Betelgeuse and a whole page of detailed information and data was displayed.

"Live View" allows one to look at a particular point in the sky to reveal a live screen from which it is possible to select an object to reveal more details. There is a search facility which results in a screen of the sky with an arrow appearing for a few seconds, pointing to the object.

"Events" shows notices about events taking place and worth seeing. This comes with a selectable alarm to make sure you don't miss it.

There were many more features such as eclipse predictions and positions of the Galilean Moons.

Phil finished by saying he felt the Mobile Observatory app is the most comprehensive and versatile app currently available, particularly when you want to use the Moon to find the pub!

Scientific Tit-bit

John Wayte

Has NASA lost interest in the Moon? Well, if rumours are true then in addition to a hovering Moon Base there are further rumours that they want to lasso a small asteroid and drag in into lunar orbit for further study!

Keck Institute For Space Studies has confirmed that NASA is studying their plans to capture a small 7-metre near-earth asteroid and put it into moon orbit. The cost has been estimated at \$2.6 billion and would be scheduled for the next decade.

Any cross-reference between spacemen lassoing an asteroid and a cowboy doing the same with cattle is purely coincidental. Just don't wait for the arrows says John.

Mercury

Brian Mills

As part of Brian's "Beginners Talks" series he spoke this month about the planet Mercury starting with why we never see the full face of the planet from Earth. As he explained, Mercury is closer to the Sun than we are and so when it is at superior conjunction; in line with the Sun but on the far side, we would see the full face if it weren't for the Sun. Also, at inferior conjunction; in line with the Earth on this side of its orbit, we would only have the unlit face or its silhouette in a transit of Mercury across the face of the Sun). At other times, when above the horizon and the Sun is still below we only see it partially lit.

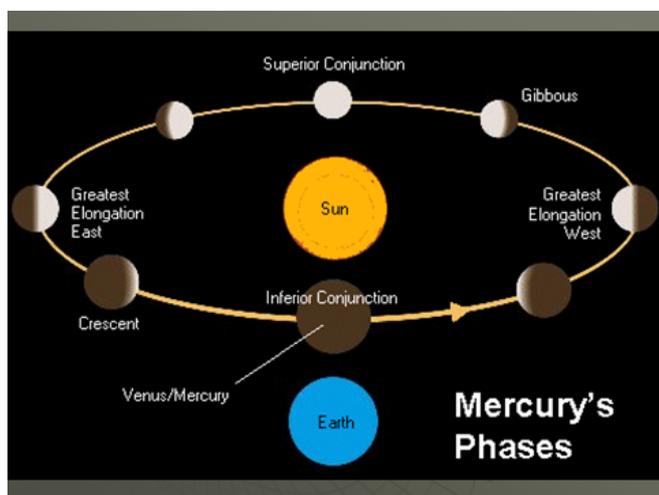


The planet Mercury taken by NASA's Messenger Mission

The planet has a diameter of 4,878 km making it not much bigger than our Moon. It is estimated that the crust is between 100 and 200 km thick and the mantle, 600 km thick leaving a molten core, 1,800 km deep. There is the possibility that the planet was involved in a collision at some time in its ancient past.

Mercury's elliptical orbit takes it as close as 47 million km from the Sun and as far as 70 million km with an average orbital speed of 50 km a second. It has an axial tilt of only 0.027°, the smallest of all the solar planets. A year on Mercury is just 88 Earth days, but due to its rotation a day is 176 Earth days.

Next Brian looked at the plan view of the orbital paths of the inner planets and showed that the maximum elongation of Mercury; the furthest west or east it can be from the Sun when viewed from Earth is only 28° making it difficult to observe being so close to the Sun. The diagram also showed why we see the different phases. By contrast, Venus has a maximum elongation of 47°.



We were shown a slide of the transit of Mercury across the face of the Sun taken in 1971. The next two transits of Mercury will be on 9th of May 2016 at 18.42 (GMT) and again on 19th of November 2019 at 18.04 (GMT).

Brian noted missions that have approached Mercury:

Mariner 10 in 1974/5 three fly-bys

Messenger in 2008/9 flybys and still in orbit

A future mission to Mercury is **BepiColombo** planned for launch in 2015 and due to arrive at the planet in 2019. This mission is to provide better mapping and to study Mercury's magnetosphere.

Brian followed with the Sky Notes. Further details later in this Newsletter

FEBRUARY MEETING

Wednesday 20th February 2013 - Jan Drozd, a Society member, is giving another of his enjoyable talks about the background history of astronomy. His talk this time is called "Astronomy, Astrology and Pseudo-Science".

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 20th March 2013. Dr. David Mannion gives a talk entitled "Cosmology Revealed"

Wednesday 17th April 2013 – "The Sky at Night", a talk about the programme given by the BBC producer.

Wednesday 15th May 2013 – Professor Louise Harra will be speaking about the Sun.

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

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

OTHER NOTES AND INFORMATION

ANNUAL SUBSCRIPTIONS

We have now entered the Society's new session, and again, the subscriptions remain the same as in previous years. Membership for the year is still £15.00 and £20 for two members within the same family at the same address. Children and students under 17 are free and always welcome.

Subscriptions can be made at the meetings, preferably by cheque payable to "Wadhurst Astronomical Society" or can be posted to our Treasurer, Michael Wyles at:

31 Rowan Tree Road

Tunbridge Wells

Kent

TN2 5PZ

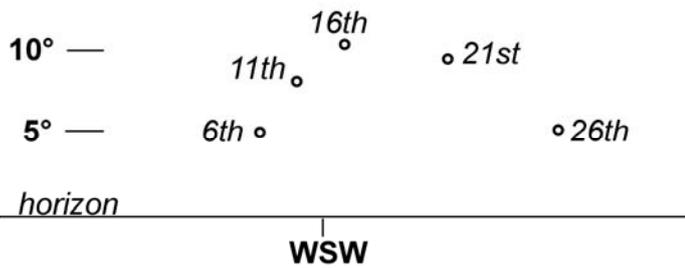
Visitors to meetings are asked to donate £2 as a contribution towards costs.

SKY NOTES FOR FEBRUARY

Planets

Mercury puts on its best evening show this year during February when it reaches greatest eastern elongation on the 16th. The diagram shows its position in altitude and azimuth relative to the horizon, and is drawn for when the Sun is 6° below the horizon which corresponds to the end of civil twilight and the beginning of nautical twilight. **Remember you must never "sweep" for Mercury when the Sun is above the horizon.** It is at its brightest up until the 7th when it is -1.1, after which it fades to -0.9 by the 16th. By the 21st this has dropped to +0.5.

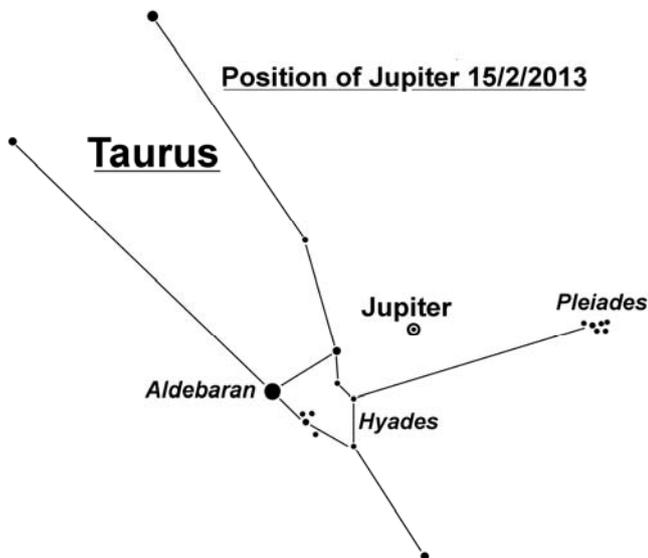
Position of Mercury - February 2013



Venus is not visible from the latitudes of the UK this month as it heads towards a superior conjunction on March 28th.

Mars is to all intents and purposes lost to the solar glare this month as it too heads towards a conjunction with the Sun, this time in April.

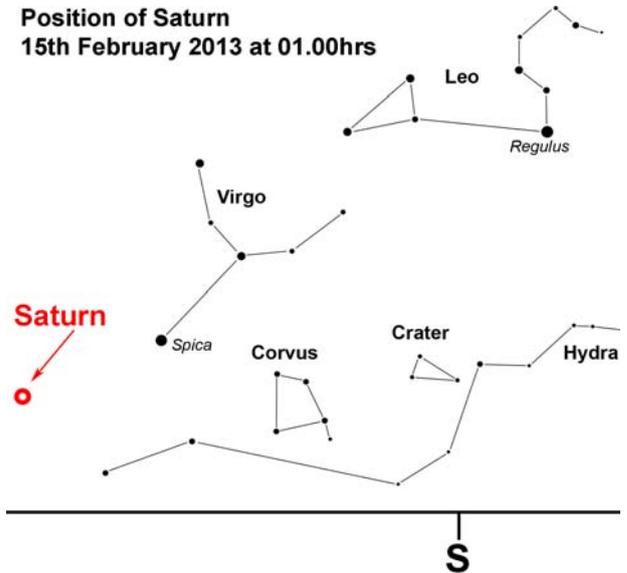
Jupiter is still a brilliant evening object in Taurus setting around 01.30 by the end of the month. It is still moving direct through Taurus (west to east) whilst its brightness gradually diminishes. Make the most of it while it is still high in the sky - binoculars will show all four of the Galilean moons and a small telescope will give a hint of the cloud belts that encircle the planet.



Saturn rises at 01.00 hrs at the start of the month, but by the end this has become 23.15 hrs bringing the planet into the "evening object" category. It lies in the constellation of Libra at magnitude +0.5 and is moving direct until it reaches its first stationary point on the 21st. After this it begins to move retrograde (east to west) and continues to do so until July 11th when it once again assumes its direct motion.

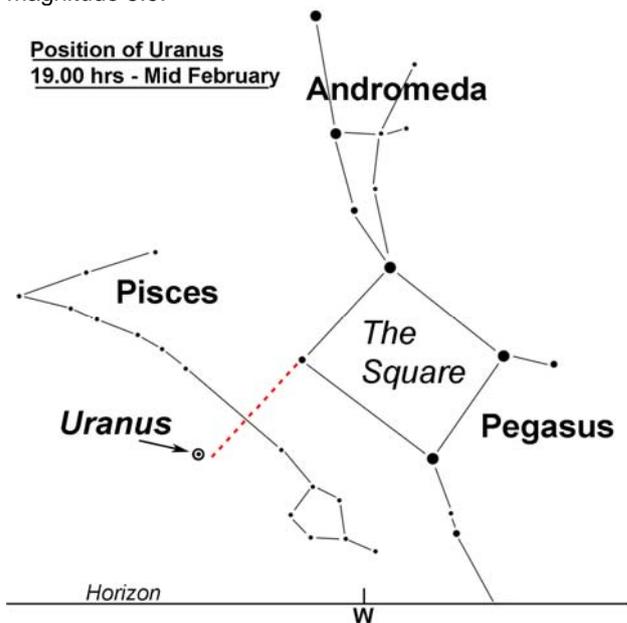
The ring system now presents itself superbly to the Earth with an apparent tilt of 19° making it an excellent target for medium sized telescopes although small instruments will give a hint of the beauty of the planet that Galileo thought had two moons close by its side because he was unable to resolve the rings.

Position of Saturn 15th February 2013 at 01.00hrs



Uranus has moved very slightly over the course of the last month and can be located by drawing a line towards the horizon using the two leftmost stars in the "Square of Pegasus", and continuing the line for about the same distance again. The planet is then just to the east of this point as shown in the diagram. It is just on the borderline of naked eye visibility at magnitude 5.9.

Position of Uranus 19.00 hrs - Mid February



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 others that are either of fainter stars or occur at more unsociable hours. DD = disappearance at the dark limb. There is now a column headed "mm" (millimetres) to show the minimum aperture telescope required for each event. **Times are in GMT.**

Please remember that the Society has telescopes that members can borrow, all of which are suitable for the following events.

Feb	Time	Star	Mag	Ph	Alt °	% illu	mm
12 th	17.52	15 Piscium	6.5	DD	21	7	40
16 th	17.23	ZC423	6.3	DD	55	39	70
18 th	18.36	ZC691	6.3	DD	59	59	50
18 th	18.42	XZ5904	7.2	DD	59	59	70

Phases of the Moon for February

Last ¼	New	First ¼	Full
3 rd	10 th	17 th	25 th

ISS

Below are details of passes of the International Space Station (ISS) that occur before midnight and are magnitude -3.0 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 GMT.**

Feb	Mag	Time	Alt°	Az.
13 th	-3.4	19.19	77	SSE
14 th	-3.0	18.19	58	SSE
15 th	-3.3	19.05	83	N
16 th	-3.3	18.14	85	SSE
17 th	-3.3	18.59	78	N
18 th	-3.3	18.08	80	N
19 th	-3.4	18.54	89	N
20 th	-3.3	18.03	80	N
21 st	-3.1	18.48	67	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. **Times are in GMT.**

Feb	Time	Mag	Alt°	Az.
2 nd	16.59	-5.9	23	SW
4 th	16.56	-5.6	21	SW
4 th	18.13	-7.6	41	S
5 th	17.41	-3.1	15	WNW
10 th	19.21	-5.2	43	SE
13 th	17.37	-4.2	39	SSW
14 th	19.05	-8.0	47	SE
14 th	19.06	-4.5	47	SE
17 th	17.21	-7.0	37	SSW
18 th	18.51	-3.0	49	SSE
24 th	18.25	-5.0	51	S
28 th	19.43	-8.1	48	ESE

The Night Sky in February

(Written for 22.00hrs GMT mid month)

In the north, two stars of the Summer Triangle (Deneb and Vega) skirt the horizon whilst above them Ursa Major climbs towards the zenith to the east of the meridian as Cassiopeia to the west of it sinks lower.

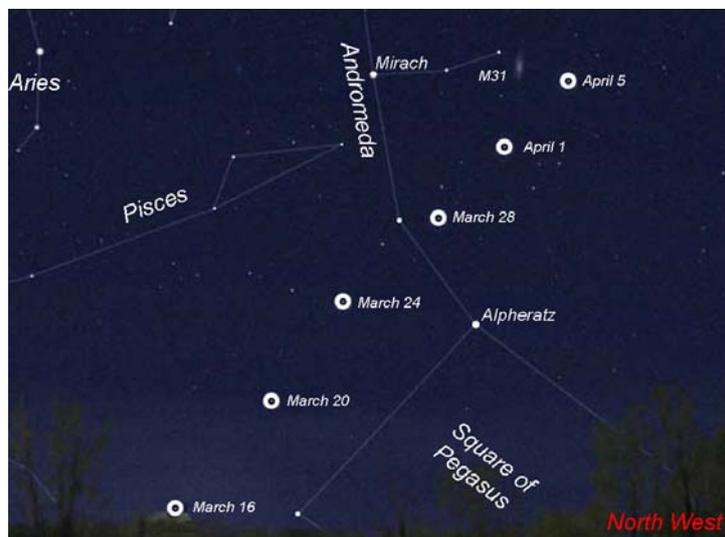
Moving to the east we see that the bright star Arcturus in Boötes has risen and along with it the arc of stars that forms Corona Borealis. Leo is now well placed as are the collection of faint constellations that surround it. These are Coma Berenices, Canes Venatici, Sextans and Leo Minor.

Towards the south Gemini and Canis Minor lie on the meridian whilst the most striking of the winter constellations lie a little west of it. If you have a very good horizon in this direction, now is the time to see how much of Canis Major you can identify and whether you can see anything of Puppis. Its two northernmost stars lie only 5° lower than Sirius.

In the west Capella and Aldebaren are both still prominent with the constellation of Perseus lying between them with the lovely double cluster still well positioned for binocular viewing.

Advance Warning for March

Comet C/2011 L4 Pan-STARRS is being closely followed as it heads towards perihelion (its closest to the Sun) on March 10th, although its brightness predictions have been downgraded. The current feeling is that it may reach first magnitude when at its best although comets are notoriously difficult to predict. The map (initially drawn for 19.45 hrs on March 16th) shows its position through the second part of March and early April as it makes its way in the direction of the north celestial pole passing just to the west of the Square of Pegasus.



Occultation Observing

The occultation and telescope evening planned for Uplands on January 18th had to be cancelled due to cloud cover and snow. The idea was to help less experienced members to set up their telescopes correctly with mounts correctly polar aligned and then observe and time two total lunar occultations shortly after. This would hopefully provide them with the experience necessary to take part in upcoming graze occultations which are technically and observationally more demanding.

The plan is to try and hold the postponed event on February 18th, again at Uplands when we plan to arrive at 17.30 hrs to allow some setting up time. The two events that we will try to observe and time are those in the occultation table above listed for the 18th. The stars in question are not as bright as for the previous event, but as you can see they only require telescopes with an aperture of 50 and 70 mm respectively. As there will not be another WAS meeting before this event can you please e-mail me to say if you are interested in coming along? Many of you have already expressed an interest in previous similar evenings, but it would help with planning if you could still make contact so that I know who to expect and also who to contact if for some reason it has to be called off.

Brian Mills

NASA SPACE PLACE

The Art of Space Imagery

By Diane K. Fisher

When you see spectacular space images taken in infrared light by the Spitzer Space Telescope and other non-visible-light telescopes, you may wonder where those beautiful colours came from. After all, if the telescopes were recording infrared or ultraviolet light, we wouldn't see anything at all. So are the images "colorized" or "false coloured"?

No, not really. The colours are translated. Just as a foreign language can be translated into our native language, an image made with light that falls outside the range of our seeing can be

“translated” into colours we can see. Scientists process these images so they can not only see them, but they can also tease out all sorts of information the light can reveal. For example, wisely done colour translation can reveal relative temperatures of stars, dust, and gas in the images, and show fine structural details of galaxies and nebulae.

Spitzer’s Infrared Array Camera (IRAC), for example, is a four-channel camera, meaning that it has four different detector arrays, each measuring light at one particular wavelength. Each image from each detector array resembles a greyscale image, because the entire detector array is responding to only one wavelength of light. However, the relative brightness will vary across the array.

So, starting with one detector array, the first step is to determine what is the brightest thing and the darkest thing in the image. Software is used to pick out this dynamic range and to re-compute the value of each pixel. This process produces a grey-scale image. At the end of this process, for Spitzer, we will have four greyscale images, one for each for the four IRAC detectors.

Matter of different temperatures emit different wavelengths of light. A cool object emits longer wavelengths (lower energies) of light than a warmer object. So, for each scene, we will see four greyscale images, each of them different.

Normally, the three primary colours are assigned to these gray-scale images based on the order they appear in the spectrum, with blue assigned to the shortest wavelength, and red to the longest. In the case of Spitzer, with four wavelengths to represent, a secondary colour is chosen, such as yellow. So images that combine all four of the IRAC’s infrared detectors are remapped into red, yellow, green, and blue wavelengths in the visible part of the spectrum.

Download a new Spitzer poster of the centre of the Milky Way. On the back is a more complete and colourfully-illustrated explanation of the “art of space imagery.” Go to: spaceplace.nasa.gov/posters/#milky-way.

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www.sagasonline.org.uk

Any material for inclusion in the March 2013 Newsletter should be with the Editor by February 26th 2013



This image of M101 combines images from four different telescopes, each detecting a different part of the spectrum. Red indicates infrared information from Spitzer’s 24-micron detector, and shows the cool dust in the galaxy. Yellow shows the visible starlight from the Hubble telescope. Cyan is ultraviolet light from the Galaxy Evolution Explorer space telescope, which shows the hottest and youngest stars. And magenta is X-ray energy detected by the Chandra X-ray Observatory, indicating incredibly hot activity, like accretion around black holes.

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