CYGNUS

Newsletter of the Norwich Astronomical Society

(registered Charity No. 2620968)

President: Mark Thompson FRAS

SOLAR OBSERVERS AT KELLING

Seething Astronomical Observatory
Toad Lane, Thwaite St. Mary, Norfolk NR35 2EQ

http://www.norwich.astronomicalsociety.org.uk

N 52 00 419 E 001 25 116

Summer 2014

CONTENTS

3. Editorial & Chairman's Report
4. Moonwatchers
6. New members
7. Sue's Stellar Suggestions
9. Stars and Their Xs
12. Sketchpad
14. Yuri's Day
16. The Dark Side is Growing.
18. Kevin's Les Gobards Diary
19. S.I.N. in the Sun
21. Clavius
22. Crossword
23. Caroline's Codeword
24. Forthcoming Talk Dates

COVER

Three NAS members viewing the Sun.
Pictures taken at the Spring Star Party, Kelling Heath.

DISCLAIMER

Cygnus is a quarterly publication produced by and for members of the Norwich Astronomical Society.

Opinions expressed in Cygnus are those of the contributors only and do not reflect those of the Society.

SOCIETY CONTACTS

Chairman:

Andy Gardiner
andyg@shedcity.demon.co.uk

Secretary:

Dave Cook
10 Eastern Way
Lowestoft
Suffolk NR32 2HE
Mobile: 07849090443
dasilvor@rarius.co.uk

Treasurer:

Graham Starling

Membership Secretary:

Tracey Money
nasmembership@icloud.com

Committee:

Keith Colman
keithhobbit10@yahoo.co.uk

David Provan
davidprovan@ntlworld.com

Mark Turner
marqueturner2000@yahoo.co.uk

Yet Wha Lam
yetwha@yahoo.co.uk

Matthew Woolley
matthew@swampy.me.uk

Tom Latham
tcl1963@hotmail.com

Chris Grimmer
chris.grimmer@googlemail.com

Cygnus Editor:

Graham Sparrow
cygnuseditor@norwich.astronomicalsociety.org.uk
or
sparrows56@btinternet.com

EDITORIAL

This issue's cover shows Tatjana, Francis and Keith (aka the Hobbit) looking through my PST at Kelling Heath. The Spring Star Party skies were not the best we could have wished for. I took my 200mm Dob for what turned out to be something of a rest cure for it, as it got very little use. The skies were claggy even when they weren't cloudy. Most nights saw folk either in their caravans and tents drinking tea, or in the bar imbibing stronger stuff ('space, the fine ale frontier'!).
However, it was an enjoyable event, despite the weather, and as ever it was good to meet up with fellow enthusiasts.

Solar scopes were out again at the Science in Norwich event in The Forum on June 1st. Andy Gardiner's account of that is on page 19. Page 14 sees an account of Yuri's Day and if you turn to page 16 you'll find an article by Shaun Reynolds, plus a couple of his images.

And below the Chairman's Report. It should be worth reading—he took long enough writing it!

Graham

CHAIRMAN'S REPORT

It's the summer issue of Cygnus already and the end of 'the season'. Summer solstice is nearly upon us, the nights will start getting longer, and for some the wallets will lighten!

I'm glad to say that life as Chairman has quietened down a bit from the hectic times of a few months ago. The season's Public Open Nights were as busy with some excellent talks. Yuri's Day was successful, if not quite the draw that we hoped - even with the lure of the Russian space suit that we managed to borrow and Ruth and Tatiana wore (not both at the same time obviously!). Vix Southgate delivered a good lecture and to the hot-dog van must be given a mention for the excellent home made sausage and chilli sauce!

The group visits during the week are something that many totally overlook. These events are integral to our Society's ethos and it's only a few stalwarts that regularly help out (you know who you are). Members talks and workshops have been well attended with some excellent speakers, both internal and external. For all these events I extend my thanks to all who have helped in whatever capacity. As always, more contributors would be better - ideas or contacts to Dave Cook please.

The 2014-15 calendar is currently being finalised. If any members wish to volunteer to help - anything from lecturing at an open night or group visit through to making tea, please make yourself known. The NAS forum is a good place to start but you can speak to anyone on the Committee (the list is inside the front cover of this learned tome).

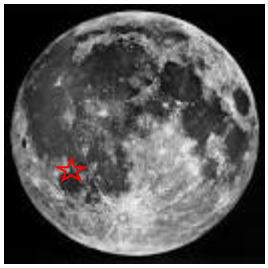
The proposal from the AGM to change the financial end-of-year is to go ahead, meaning that members will be asked to renew from the 1st September this year rather than the normal 1st January. Current members have already paid for the last four months of the year therefore there will be an adjustment to the renewal fee to compensate. It will be a bit awkward, but hopefully only for this year, before things become simpler in the long term.

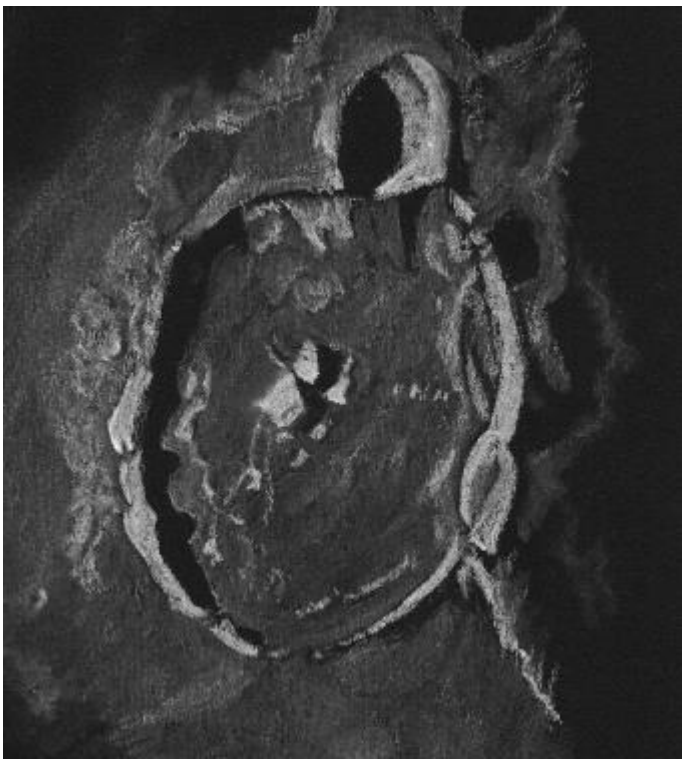
Thanks once again to all who helped during the 2013-14 season and I hope the next will be as good.

Andy G.

MOONWATCHERS

Gassendi





My white-on-black drawing of Gassendi, made in March this year.

Hugging the north shore of the Mare Humorum , Gassendi is one of my favourite craters. Yet until March of this year it was one that I had had limited success in drawing. Looking back at my first attempt, made in 2007, I can hardly recognise the crater in my sketch as being Gassendi, but practice has resulted, if not in perfection, at least in reasonable drawings, some of which illustrate this article.

If I'm honest my early lack of success was probably down to my reluctance to start a drawing, for Gassendi is a crater packed with detail—a challenge to any lunar artist. It is this detail that makes it such a fascinating crater to observe.

Lunar cartographer T.G. Elger (1838—97) wrote that Gassendi was 'one of the most beautiful telescopic objects on the Moon's visible surface, and structurally one of the most interesting and suggestive'. Observing the crater through my bino-viewer I am inclined to agree with him; a stunning sight through any eyepiece at any power, when seen at a magnification of x400 through the bino the view is jaw dropping.

The crater is named after Pierre Gassendi, a 17th century mathematician and astronomer who was first to observe the transit of Mercury that had been forecast by Kepler. It is about 110 kilometres in diameter, but is quite shallow, its walls rising to a maximum of only 2.8 km. Its cluster of central peaks, reaching 1200 metres in height, is easy to spot, as are many of the smaller hills that are scattered across its floor. So is the ridge, concentric with the southern rim. However, the network of rilles can be more of a challenge and not all are easy to detect. They are especially evident to the south-east. The drawing I have included to show these rilles is a cheat, being part of one I made, not at the eyepiece but from a detailed photograph, as my contribution to a get well card for Mark Shepherd (it clearly worked as Mark is a picture of health these days!).

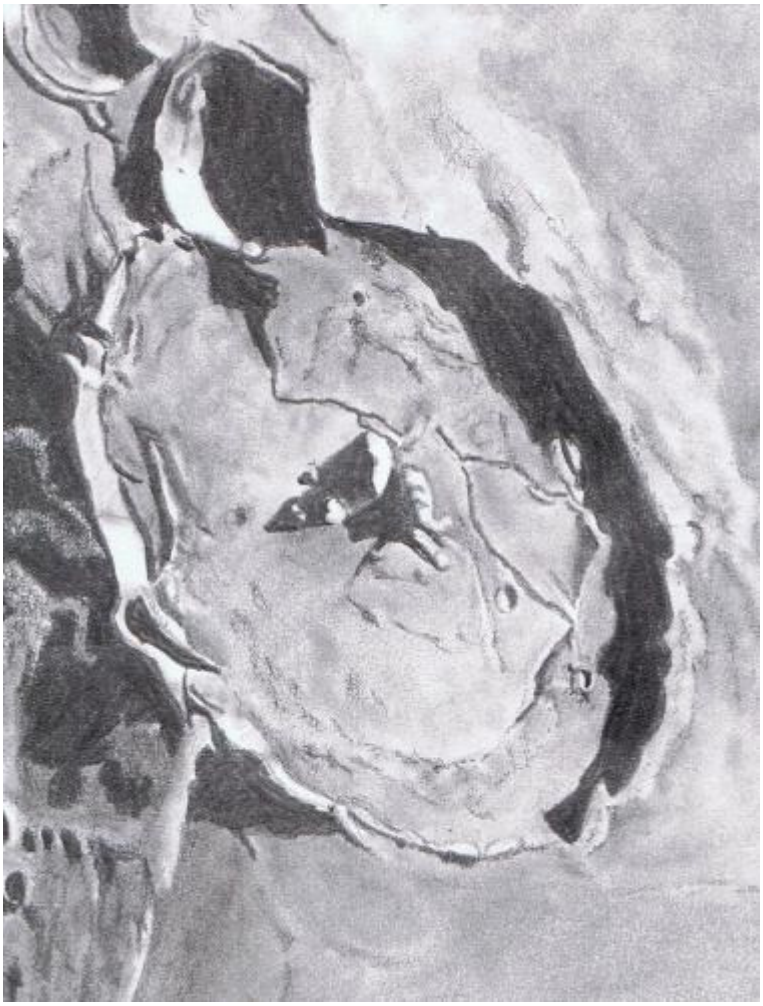
Gassendi's wall is higher in the north than in the south and the crater tilts down towards the Mare Humorum. Seen with lower powers, the wall appears to have been breached in the south and one might imagine that lava from the mare had flowed into Gassendi. However, higher magnification shows the wall to be continuous, so this could not have happened. The wall in the north is interrupted by Gassendi A, a crater some 33 km across and over 3 km deep, giving Gassendi the appearance that some observers have likened to 'a ring adorned with a pearl'.

Gassendi is by no means a typical impact crater and for some time was considered to have been volcanic in origin, but now it is generally accepted that magma from Humorum intruded, welling up through the breccia underlying Gassendi and causing the floor to uplift and fracture. This explains the crater's shallowness.

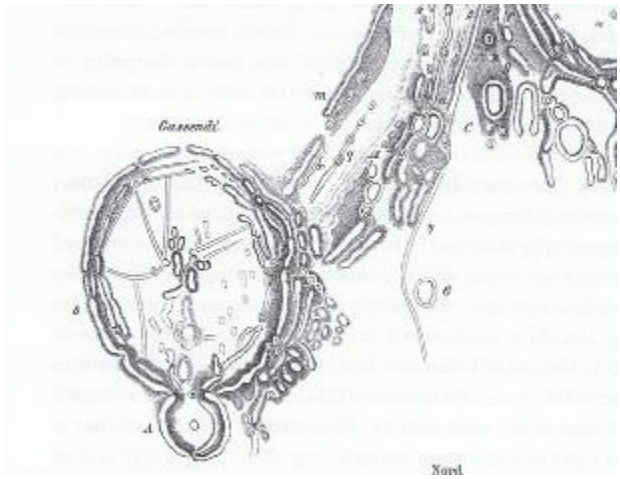
Gassendi is another area of the Moon's surface where transient lunar phenomena are said to have been observed. TLPs are infrequent events but do seem to favour regions rich in rilles — Aristarchus and Alphonsus are two other examples — and there have been reports of flashes and red and orange glows in and close to Gassendi.

As I have said before, I have never witnessed a TLP, but keep an open mind. The late Sir Patrick Moore was a firm believer in such phenomena, but even he said that many reports must be considered spurious, with observers likely to have been tricked by effects of the Earth's atmosphere. It is interesting to note, however, that the Gassendi area is one where space probes have detected radon gas emissions.

Perhaps one day soon one of the many NAS imagers will capture such an event!



A pencil drawing of Gassendi showing the system of rilles in detail.
These are also shown in the image overleaf.



Above: detail of an engraving by Johann Friedrich Julius Schmidt (made c.1878).

Right: a rather more recent picture. Detail of an image made this year by our own Chris Grimmer. (The full image can be seen in the bonus pages of the e-version of Cygnus.)

So if you haven't looked at Gassendi yet, turn your scope Moonwards and see the delights it has to offer. It can even give the deep sky enthusiasts something to occupy their time when the Moon is 'in the way' as it is best seen three days after first quarter. And if you do take a look don't forget to send any images, drawings and/or observing notes in to Cygnus!

Graham Sparrow

NEW MEMBERS

Rafiat Enny Busari
Gillian Lee & John Hay
Debbie Ashton
James Peach & family
Huda Ahmed Abd el Latif & family
Colin Jeffries
James Wills
Mary Ellen
Steven Gray
John & Beverley Child
Eric Lingwood
John Copsey
Philip Mills
Stephen Gregory
Andrew Sutkowski & family
Lucy Hewitt

Frank Dutton

SUE'S STELLAR SUGGESTIONS

HERCULES

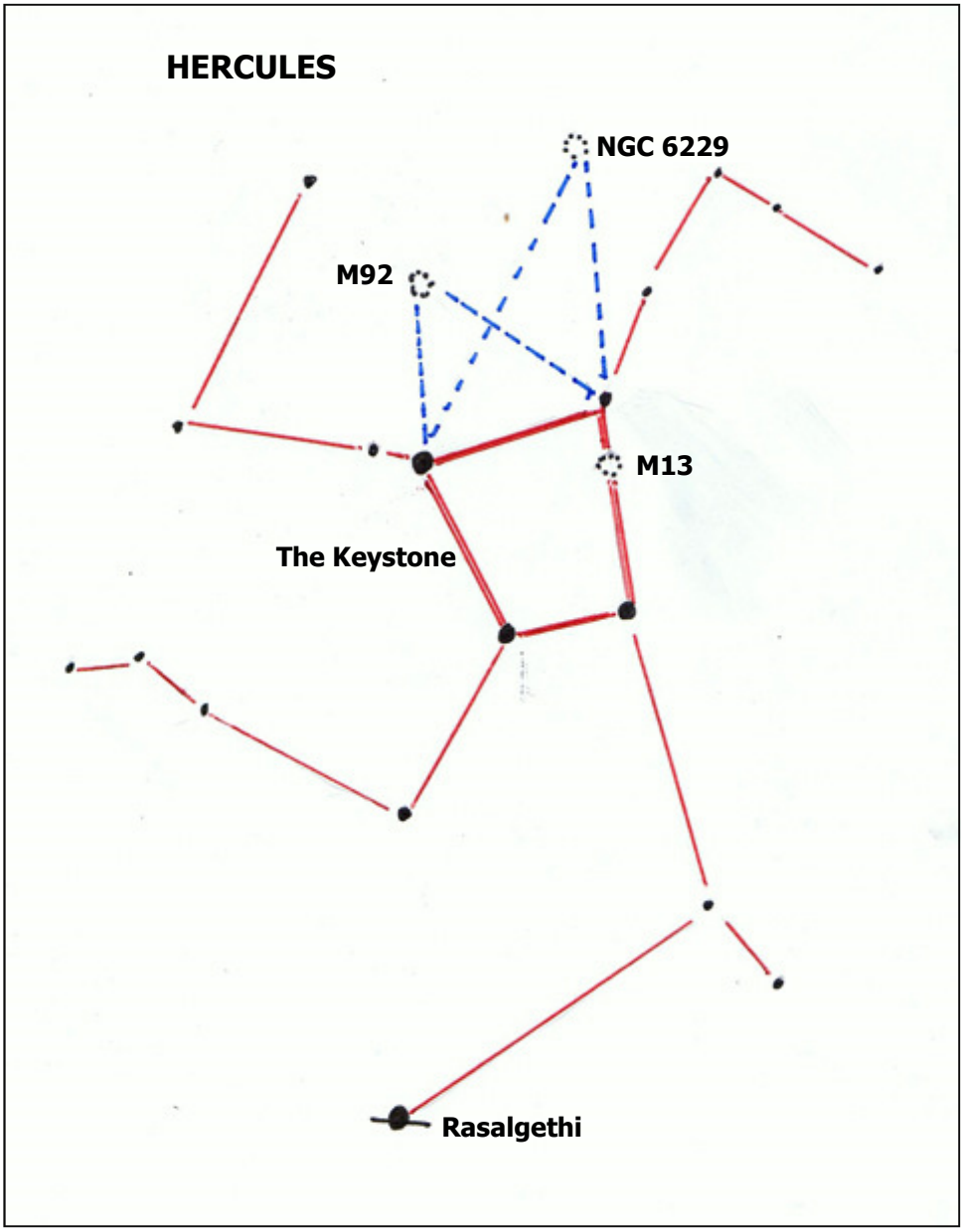
Although the summer months can be a little disappointing for stargazing, with the sky never really dark, this can be helpful to anyone who is just starting to find their way around the night sky. As darkness falls only a few of the brightest stars are visible, so learning to recognise these with a star chart is much easier than picking the patterns from the crisp, dark skies of winter. To the north we see easily the shape of the Plough to one side of the Pole Star and the 'W' of Cassiopeia to the other. To the south we can see the three bright stars marking the corners of the Summer Triangle. These are Vega, the alpha star of Lyra, Deneb, the tail of the Cygnus the swan, and Altair in Aquila. As the sky darkens we then make out the fainter stars of these constellations. One other bright star is also clearly seen; this is the red giant Arcturus and is easily identified if we remember to follow the arc of the Plough's handle and 'arc to Arcturus'.

If we take a line from Arcturus to Vega, about midway we see some fainter stars making a pattern known as **The Keystone**. This forms part of the constellation **Hercules**. It can be tricky to pick out the Keystone to start with; what you are looking for are four stars making a slightly squashed rectangle. There are two stars below these four, making a slightly larger mirror image of the Keystone. Sue French describes it as a butterfly with wings open. This fairly large constellation has more stars above and below.

The best known deep sky object in Hercules is the **Great Globular Cluster**, **M13**. This is found on one side of the Keystone, about two thirds of the way up from the lower right hand star to the top star on that side. My small refractor shows a bright smudge, whilst larger apertures will reveal a beautiful array of stars. It is probable that this globular cluster contains about a million stars; its diameter is estimated to be about 150 000 light years and it lies about 20 000 light years away.

Looking above the Keystone we find another wonderful globular cluster: **M92**. If M13 were not nearby we would all be singing the praises of this beautiful rich cluster. This is not all… there is another globular cluster nearby, which Messier did not catalogue but which is in the New General Catalogue as **NGC 6229**. When you have taken time to study M13, use the chart to find these other two. I imagine a triangle using the top two stars of the Keystone with M92 an equal distance above, and using the same two stars making a larger, right-angled, triangle with NGC 6229 above.

Hercules is also home to one of my favourite double stars. This is **Rasalgethi**. I see this as the hero's toe, whilst others see it as his head! This depends on which way up you regard the constellation to be. Rasalgethi is the alpha star of Hercules, a red giant, but even so is not especially bright. This is because it is thought to be 430 light years away and is a variable star, so it is sometimes easier to see than at other times. This is one instance when I like to ask for help from one of my fellow star-gazers. I will ask a friend to use his 'GOTO' scope to find it, then check through his finder to see just where it is. I can then move my own scope to the same place. It's at times like this that I really enjoy observing alongside others at the club!



Sue Napper.

STARS AND THEIR Xs:

SPICA

A colourful trio of bright stars and planets strung out over the southern horizon makes the late nightfall worth waiting for this summer. Between ruddy Mars to the right and yellowish Saturn further to the left is sparkling bluish Spica, brightest star in the constellation of Virgo. The blue tinge indicates Spica is a hot star, much hotter than the Sun. On closer observation, Spica is a binary where both stars are by far the hottest and most powerful stars we've looked at in this series. The brighter of the two is so hot and powerful that it produces x-rays in a very different way to the Sun.

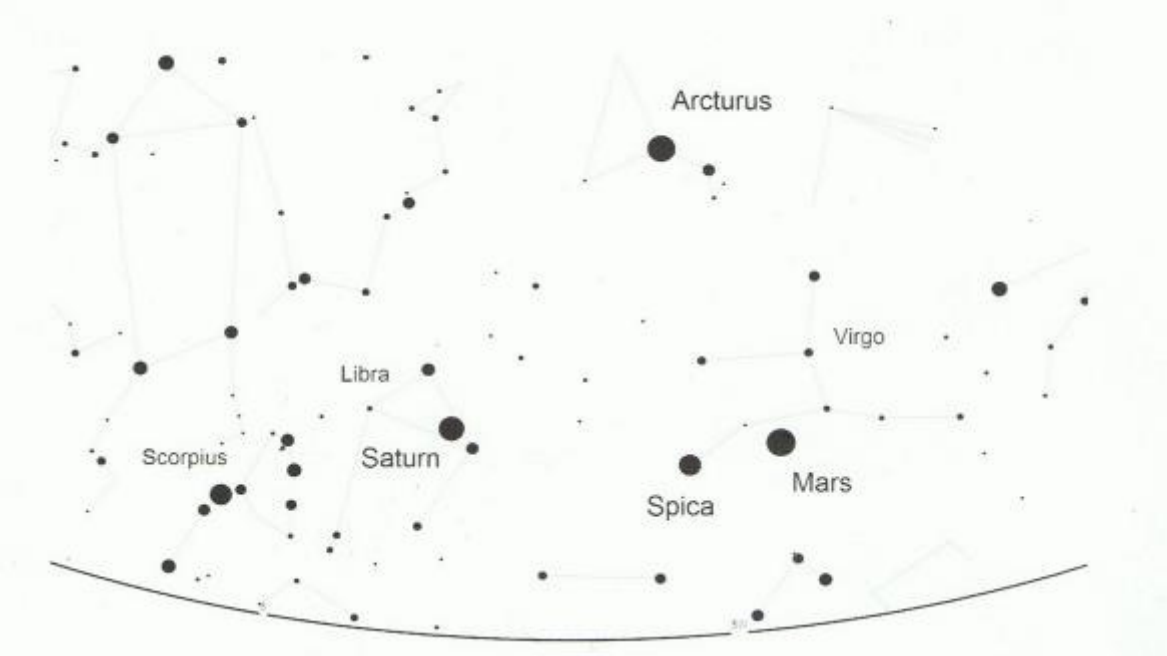


Figure1: View to south-southwest from Norwich at 11pm on June 21st 2014. Created using Cartes du Ciel 3.4.1 by Patrick Chevalley.

Though the two components of Spica are too close together to be seen separately in any regular telescope, when their combined light is spread out into its spectrum of colours using a spectrograph, they reveal themselves as two sets of dark absorption lines stamped on the bright rainbow sequence. Which colours are brightest, which dark lines appear and how dark they are depend on temperature in a way that can be modelled for the physical conditions expected in the gas at and near the light-emitting 'surface' layer of the star.

By computing model spectra for different temperatures and finding the combination that best matches the observed spectrum, we find Spica to have a brighter component, A, with an effective surface temperature of 24000 K and a dimmer component, B, with 19500 K. At such temperatures the spectrum becomes ever brighter toward the shorter-wavelength visible colours blue, indigo, violet, and beyond: whereas the 5800 K Sun radiates practically all its energy in visible light, Spica A radiates more than 80% of its energy in the ultra-violet. At its parallax distance of 80 parsecs, Spica A is already 2000 times as luminous as the Sun in visible light alone; 15000 times once its UV light is considered! Even Spica B is more than 1500 times as luminous as the Sun.

Such powerful stars have a dramatic effect on their surroundings. Spica is at the centre of a softly glowing nebula, like the Orion Nebula but much dimmer, stretching 8 degrees of sky in all directions, caused by its intense UV radiation ionizing (freeing electrons from) hydrogen atoms out to a distance of 12 parsecs. Close to Spica A this intense radiation transfers momentum to gas in the star's atmosphere, driving a wind that carries almost 1% of the star's entire mass away every million years at a final speed of 1300 km per second. This wind doesn't blow uniformly in all directions at all times, however, and is fast-moving and dense enough that when faster moving gas crashes into slower moving gas, shocks heat the gas up to about 1.3 million K, emitting around a thousand times more energy in x-rays than the Sun at solar maximum. Whereas in the Sun's atmosphere it is the hot x-ray emitting coronal gas that escapes to become the solar wind, in very hot stars it is the wind – a few times faster and carrying tens of millions times more gas than the solar wind – that is the source of the x-ray emitting hot gas.

Spica B is not much cooler than Spica A, but the winds of single stars with its effective temperature are already observed to be much less dense and the fraction of their total luminosity emitted as x-rays is at least ten times lower. We therefore expect Spica B to emit barely a hundredth of the x-ray emission of Spica A. There appears a quite abrupt dividing line between the Vega-like hot stars that have no mechanism for generating strong x-ray emission and the very hot stars like Spica A that generate strong x-ray emission in stellar winds.

If their masses are high enough, Spica A and B may have a much more profound impact on their surroundings by exploding as supernovae. Spica, like Capella and YY Geminorum, is one of those rare systems where we can determine the masses of the components accurately by measuring the movements of the two stars as they orbit one another. Some important characteristics of the orbit, such as the period and eccentricity, and the relative orbital speeds of the two stars, can be accurately obtained by taking a series of spectra and measuring the rhythmic Doppler shifts of the two sets of dark absorption lines (*see YY Gem in Cygnus,*

Spring 2014). But a full description of the orbit requires additional information from another technique, in Spica's case using interferometry (*see Altair in Cygnus, Autumn 2013*) to map the changing relative positions of the components to determine the apparent size of the orbit and its tilt to our line of sight (*see Capella in Cygnus, Winter 2012*).

Spica A and B are found to orbit each other in just 4.01 days, in a somewhat elliptical orbit with an average separation of 0.12 AU, less than an eighth the distance of the Earth from the Sun, with respective masses of approximately 10 and 7 times that of the Sun. The minimum mass required for a star to expire in a supernova explosion is thought to be between 8 and 10 times the mass of the Sun, so Spica B definitely won't but Spica A could. Indeed, Spica A is currently the closest high-mass star likely to explode as a supernova. You might then be interested to know that Spica A's luminosity, and its diameter, deduced from the interferometric observations, of more than 7 times that of the Sun, are both larger than expected for a star of Spica A's temperature, indicating that it has already begun to run out of hydrogen in its core ... Nevertheless, at the risk of sounding like Michael Fish in October 1987, there is no need to worry as stellar evolution models predict Spica A still has a few million years left yet and it'll be a few parsecs further away from us by then, too.

References:

'A study of alpha Virginis with an intensity interferometer', Herbison-Evans, D.; Hanbury Brown, R.; Davis, J.; Allen, L. R., 1971, Monthly Notices of the Royal Astronomical Society, 151, 161.

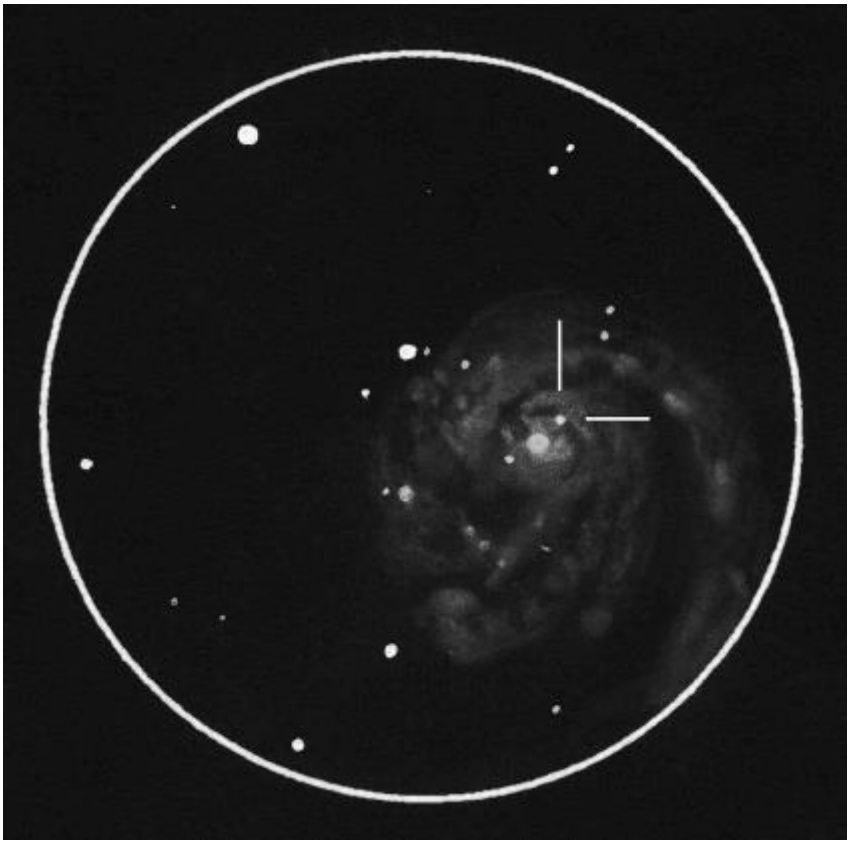
'X-ray emission from near-main-sequence B stars', Cassinelli, J. P., et al. 1994, The Astrophysical Journal, 421, 705 .

'Analysis of Spatial Structure of the Spica H II Region', Park, J.-W., et al., 2010, The Astrophysical Journal, 382, 1124.

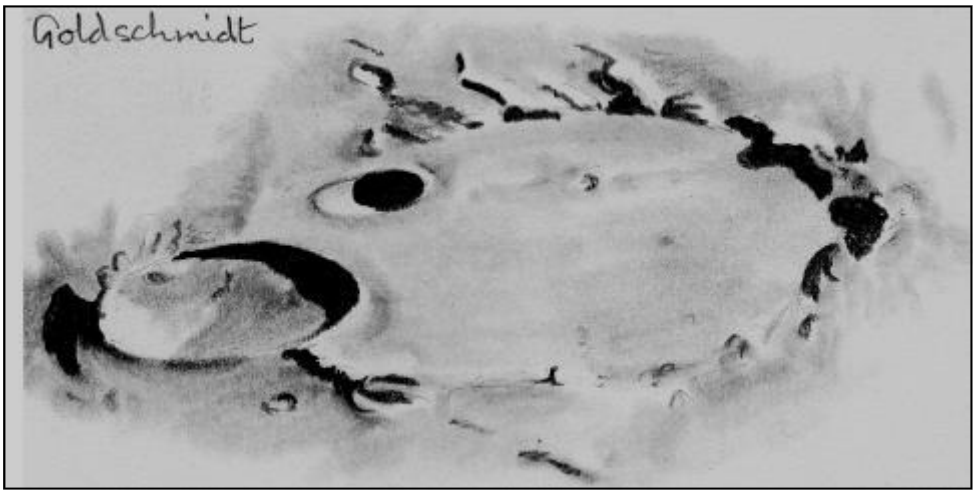
'Spectral modelling of the α Virginis (Spica) binary system', Palate, M., et al., 2013, Astronomy & Astrophysics, 556, 49.

Kevin Briggs

SKETCHPAD

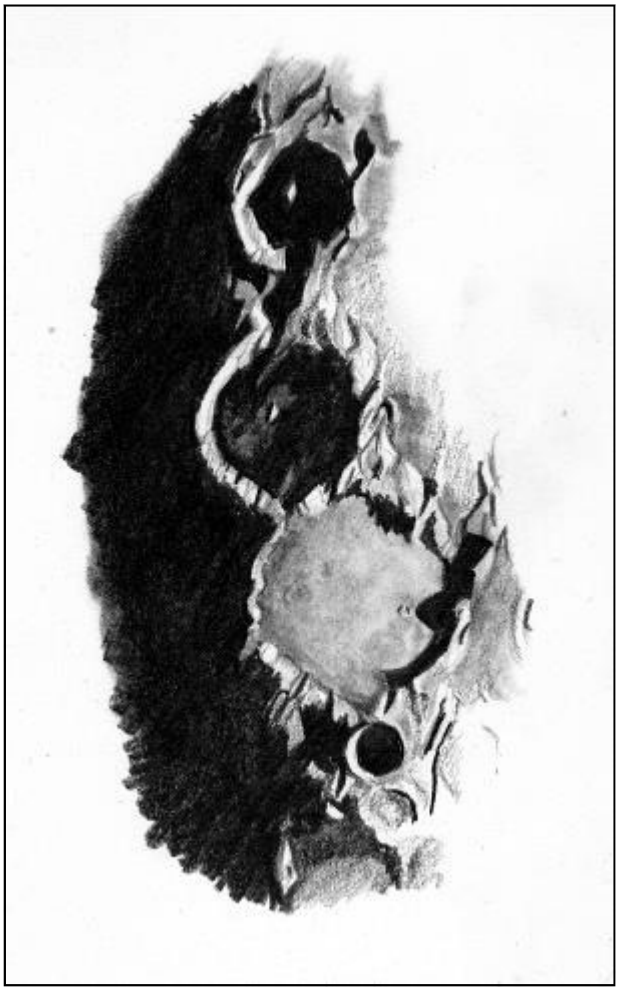


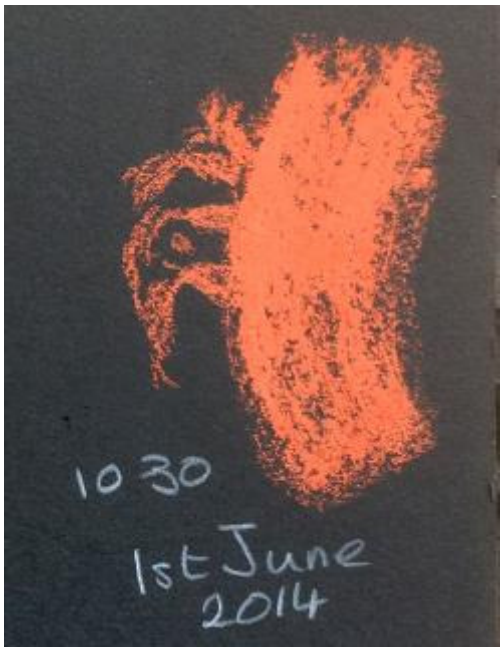
Dale Holt's drawing of M99, a spiral galaxy in Coma Berenices. The drawing was made on February 27th and shows the supernova SN20L.



The crater Goldschmidt lies to the north of the Mare Frigoris. The editor made this sketch on March 11th.

Right: The editor's pencil drawing shows the craters (top to bottom) Arzachel, Alphonsus, Ptolemaeus and Herschel.





Above: A drawing by Sue Napper of a prominence she observed with her Coronado PST.

Right: Dale Holt's water colour of Mars was made in late April using his 153mm Triplet F9 refractor with bino viewer and 15mm Televue panoptic eyepieces.

YURI'S DAY

So, after months of preparation and planning, Saturday 12th of April finally arrived – Yuri's Day.

Our glorious leader and Chairman had the foresight to ensure that the marquees and mess tents were erected on the Friday evening – thanks to all the willing volunteers and the volunteer'd who assisted. Don't think I've ever seen a Land Rover so laden down with kit, looked like a boy-racer had modded the suspension to create a low-rider!

Despite Yet Wha's careful planning, we had a curve ball or two thrown our way; the local box-shifter of astro and photography kit had pulled out at the last moment; we were fortunate that Neil from Green-Witch stepped in and arrived with his car filled with astro goodies including a Celestron CPC 800 that drew admiring glances.

NAS are the first astro society in the UK to stage this event, held every April 12th to celebrate the first man in Space – Yuri Gagarin; we were featured in prestigious magazines such as the events section of the Sky at Night Magazine and the Diss Mercury. Another first for us was to invite an outside caterer – it was great to see The Flying Chef on site selling Gourmet Hotdogs manned by the lovely Christine and her daughter. Safe to say the hot dogs were a huge hit with visitors and volunteers alike.

We had a number of interactive activities planned, ranging from a demonstration of Nuclear Fusion (yes, fusion), using marshmallows, a scale of the Universe activity, rocket decoration and making, as well as the massively popular Comet making activity using dry ice and Dave Balcombe's secret ingredient!

Once the rockets were made and decorated, the launch area was by the storage shed, the afternoon was punctuated with cries of 'ooh' and 'ahh' as the various rockets either reached low Earth Orbit or had an unplanned landing by onlookers who had strayed too close to the recovery site! The first rocket of the day was launched by the local MP Richard Bacon and his young son. Richard has an interest in astronomy, and was given a tour of the site while his young son enjoyed the activities.

The Sokol KV2 Space (really a Rescue Suit) was hugely popular, sadly too small for our chairman to fit inside, but two of our members were able to model the suit – pics attached, and Dave Balcome did sterling work in giving a talk aimed at the youngsters, who were also able to admire a portrait of Yuri painted by Dave along with a carefully crafted model of a Vostok Rocket built by Paul Brocklehurst.

We had a new speaker for the event too, Tatjana gave the introduction in Russian which was a great touch and added atmosphere to the talk.

In the later afternoon, the Sun finally helped out and we had a stack of young and old viewings through the solar telescopes.

Our main speaker for the day arrived with her daughter and CASSiE the UK space mascot – a knitted hedgehog that has been in low earth orbit via a helium balloon.

Vix Southgate (http://www.vixsouthgate.co.uk/yuri-gagarin/) is a Gagarin Expert and gave a well-researched talk and showed snippets from the newly released film. After the talk, the skies cleared and we were able to treat the visitors to some great views, including a specially planned (perhaps) pass by the ISS.

A great day, superb feedback from our visitors and hopefully a few new members / friends as a result.

Think a huge 'Well done' to all who volunteered and assisted on the day.

Poyekhali!

Chris Greenfield

THE DARK SIDE IS GROWING!

The Double Cluster in Perseus, NGC 869 &NGC 884, imaged by Shaun.

It seems that last year was a good year for me personally, what with having the honour of being short-listed for Astro Photographer of the Year 2013 (page 118 in case you'd forgotten!) and with my first ever public talk at the club. I can still remember the stress, the nights talking out loud in my shed in preparation. The neighbours give me a wide berth now, thinking I'm totally nuts!

Over the year up until now it seems there has been an explosion of interest in this dark art of mine, from new members and visitors to Seething . I'm personally very happy to see this happen and I think it gives the club in general a very good standing. It also seems to run hand in hand now with the visual observing side. There are some formidable visual observers, some long-standing and some relatively new to it. All of which just goes to show amateur astronomy is in pretty good shape.

The decision to hand out keys has helped open up the club's facilities to those keen to observe/image on nights other than club nights; in fact I think Tom is thinking of taking out a second mortgage on the imaging shed!

It doesn't seem that long ago that I was asking the same sort of questions that new members are asking now—about imaging and building the shed (Did I mention I had a shed? Can't remember!) But now the input has really grown with Mark Casto

committing to a five week course on capturing and processing, which I'm sure has helped many get off the ground and gain confidence.

Shaun's image of the Heart Nebula, IC1805.

For me ,I'm looking forward to the winter with its dark and (hopefully) clear nights in order to get back in the warm room, but also get out with the new camera with its full chip sensor (don't know if I've mentioned that around the club!) and see the night sky for real instead of on the laptop screen. Indeed August through to December is my favourite time of year for imaging, what with Cygnus, Cepheus and Monoceros, to name but a few out there, with their beautiful nebulae—an imager's delight! I can foresee dark rings under the eyes from many later-than-planned imaging sessions!

So this coming winter I think the club will be buzzing with activity and I'm sure many images will be forthcoming. Visual observing too will, I'm sure, be in full flow and those observers knowledge will be invaluable to us imagers, providing potential targets for us to image.

Clear skies!

Shaun Reynolds

Editor's note: I wish to assure new members especially that in referring to the 'Dark Side' Shaun is talking about imaging and <u>not</u> black magic. Rest assured that no cockerels were sacrificed before, during or after the writing of the above article.
Regarding the 'page 118' reference see Shaun—he'll be pleased to explain!

KEVIN'S LES GOBARDS DIARY

I've been increasingly observing with my second-hand Celestron C8, and I do enjoy the views it gives of the Moon and planets like Venus, Jupiter and Saturn, though discerning details on Mars involved a lot of wondering whether those slightly darker smudges and slightly lighter areas were artefacts of optics or optimism. The brightest galaxies, nebulae, planetary nebulae and especially globular clusters have also given me very pleasing images – once I could finally find the blessed things. Spending a whole evening failing to locate M81 or M82 is very frustrating (though I did get lucky the following night and actually see the supernova in M82) and I tend to resort to scanning around in hope till the sought after object, too faint to see with the 6x30 finder scope, slides into view of the 22mm eyepiece. It just takes so much time, with naked eye, finder and eyepiece views all having different orientations and the equatorial mount being somewhat unintuitive. I guess these are typical gripes of a beginner!

Then with much expectation, I had upgraded my eyepieces by buying two second-hand Hyperion eyepieces, 24 mm and 13 mm focal length, with the anticipation of wider fields and sharper views than offered by my 22 mm Celestron Silvertop Plössl and trio of Meade 40-degree field starter MAs. I was initially quite disappointed by the results. The Hyperions are much bigger eyepieces and a little unwieldy in the diagonal of the C8. The 13 mm didn't give much crisper views at 150x magnification – is it the seeing or the collimation of the scope? – and the larger field offered by the 24 mm didn't really blow me away either. Looking at the Moon revealed some flecks of black paint from the filter thread on the inside of the lower lens (most of which I could brush away, but still some remain). The compact 22 mm Silvertop remained my favourite eyepiece, though I'm very pleased by the compact 2.25x Hyperion Barlow that I only got for its bargain price, together with the 24 mm Hyperion, which gives enjoyable views in combination with the Silvertop.

So I was getting a little disillusioned. I was missing the ability to hop quickly from one object to another and frankly also regretting the inability to see the brightest open clusters in their full glory framed by dark non-cluster sky (but a glorious cluster for the C8 at 90x magnification: M67). So on this night I grabbed the small, easy-to-carry, point-and-look ETX-70 and confess I had a whale of a time. The Hyperions completely transformed the scope, making observing a more comfortable experience, and were much more stable in the port on top of the tube than they had been in the C8's diagonal. Clusters of pinpoint stars were framed by dark sky: M35, M36, M37, M38 using the 13 mm, even the Pleiades and Praesepe using the 24 mm. I even managed to find and see galaxies like M65 and M66 at higher magnification than 15x for the first time. It was very rewarding to discern their shapes with ease. So I can conclude that I'm a big fan of wide-field views and the Hyperions were not a complete waste of money (thank goodness).

In fact I've come to the conclusion that naked eye, binoculars, small telescope and larger telescope all have their place and if I reconcile myself to observing the things each is (a) best suited for and (b) realistically fit with my current level of observing experience and skill, I'll be a much happier observer!

Kevin Briggs

S.I.N. IN THE SUN

The weather couldn't have been better for this year's Science in Norwich event which was held in the Forum on Sunday 1st June. With June 'bustin' out all over', as the song goes, the public was out in force, enjoying the Sun, and those who came to the Forum saw that Sun in a different light—namely Hydrogen-alpha.

NAS was well represented at the event and our stall, which was better positioned than in previous years, received a constant stream of visitors and I must thank once again all those members who volunteered to be on hand to help out.

Of course, your beloved chairman wasn't there inside to help. Instead I set up my solar scope outside and for the first half of the day struggled on alone (and for once without my famous hat—something I later came to regret), giving the public what was for the majority of them their first view of solar prominences. Eventually Graham Sparrow dragged himself out of bed and came and set up his Coronado PST and some 15X70 binoculars that he'd fitted with some home-made Baader film filters.

It quickly became apparent that Graham had not thought this through properly because, even though the two instruments were close together, he couldn't be in two places at once. Luckily he'd brought his wife and she stepped in to help out. The white light view of the Sun was not impressive, with only three sunspots visible close to the limb, but the H-alpha view was a knockout with several prominences including a whopper that really had the wow factor.

Luckily Sue Napper was at home observing and sketching the same prominence and her drawing is shown here. You can see why folk of all ages were impressed and why so many kids said the view was 'cool' (not exactly an accurate description of a body that's about 15 million degrees Kelvin at its core, but we knew what they meant!).

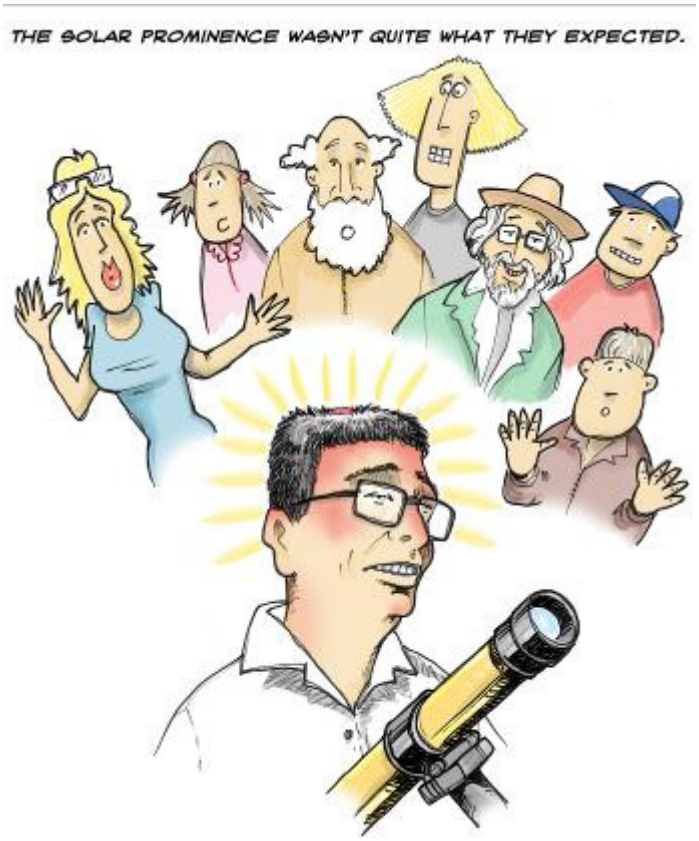
As I've already mentioned, I wasn't wearing my trademark hat but for most of the afternoon Graham, for a change, had a sort of bush hat perched on his head. This role reversal could be one of the reasons why I ended the day with mild sunburn to my scalp and Graham didn't!

Yes, Graham had remembered to

bring a hat but he'd forgotten to bring a stool and had set his scope up at a height more suitable for adults. I had had the foresight to bring a stool and what's more my scope tripod was much lower so kiddies, however small, had no trouble looking through my Coronado. Graham of course soon found a solution to the problem of how to get tiny tots up to eyepiece level—he pinched my stool! A (good-natured) tug-o'-war over the stool went on all of the afternoon.

Naturally as time went on the Sun's position in the sky altered as it made its progress to the west. This meant that we had to move the scopes several times during the course of the day, getting further and further from the building and making Tracy's trek with very welcome cups of tea longer as the afternoon wore on.

We had a wide variety of visitors of all ages and nationalities to the scopes, some were enthusiasts with previous knowledge of astronomy, most were complete novices, and it has to be mentioned that one or two had rather interesting ideas of their own. Thank you guys for sending the UFO bloke out to me, I'll do the same for you some day! I believe Graham had a creationist and a gentleman with a theory of how time travel could work. One thing we both noticed though was how really nice people were—everyone was really appreciative, which made our efforts (and the sunburn) worthwhile.



I look forward to next year's S.I.N. event. Maybe there'll be more members there with solar scopes and perhaps Graham will remember to bring a stool with him next time.

I certainly won't turn out without my hat!

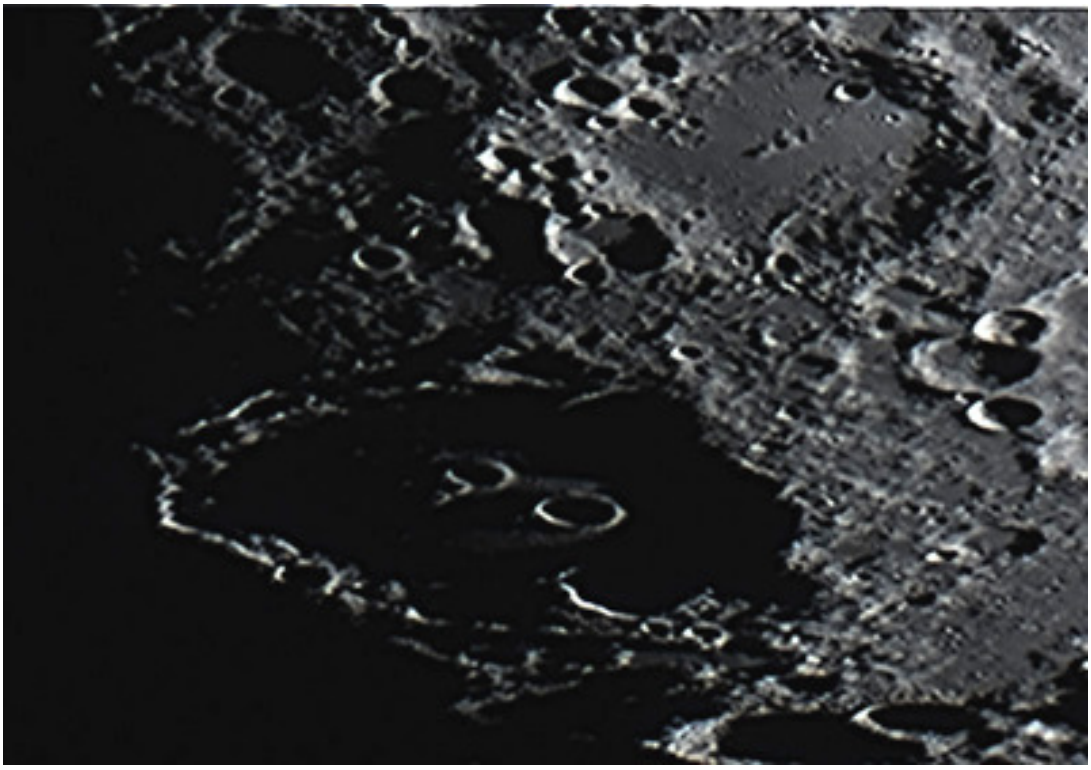
Clear skies.

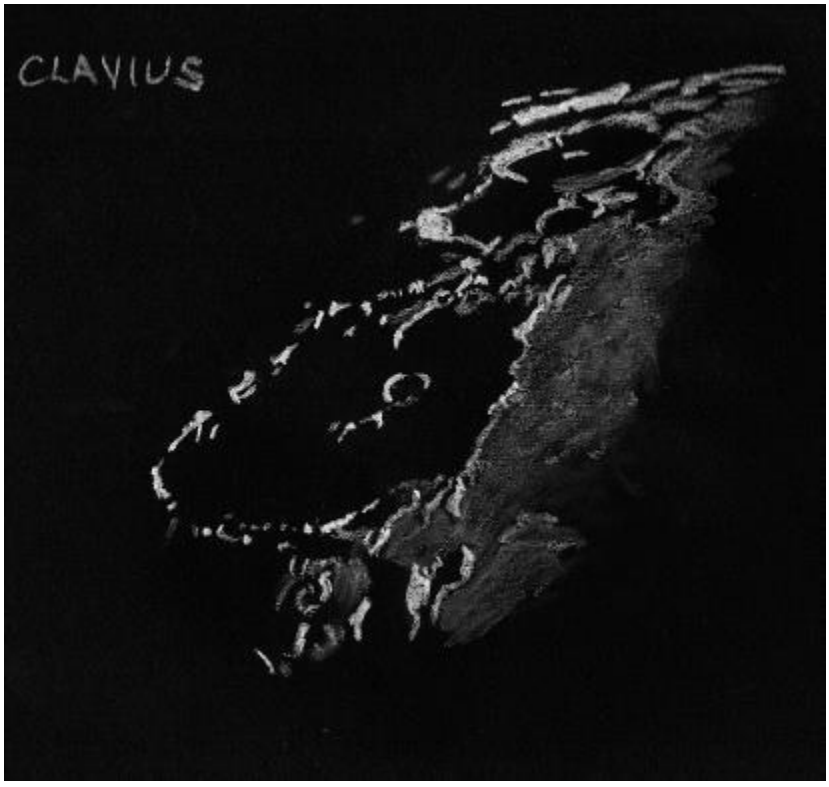
Article by Andy Gardiner (and a gentleman)

Cartoon by Mike Doddington.

Clavius in Pixel and Pencil.

Unbeknown to each other two NAS members were creating images of lunar crater Clavius on April 8th. Mark Turner used his camera a little later than Graham Sparrow made his drawing, using conte crayon on black paper.



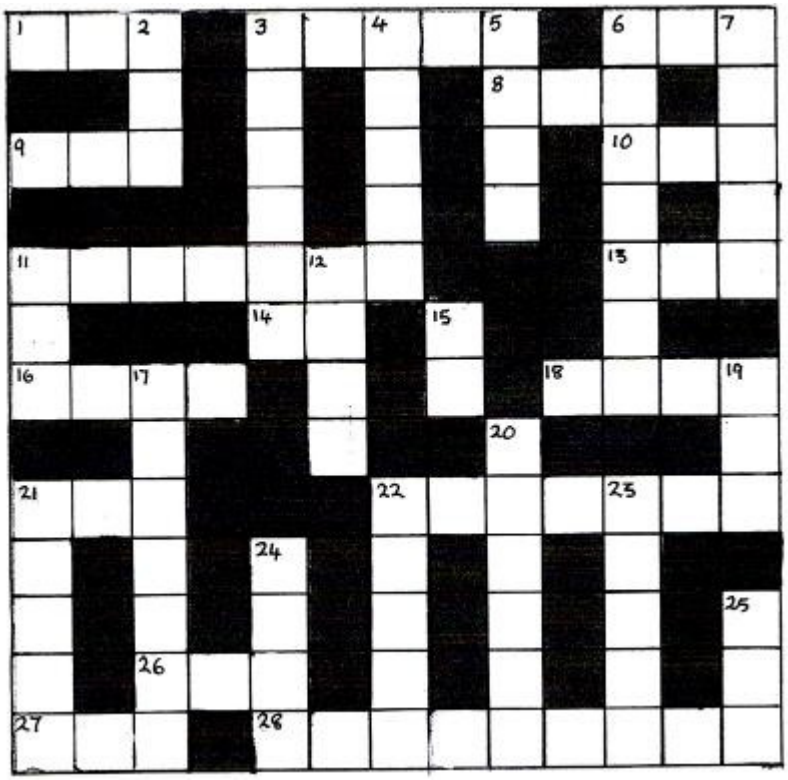


Clavius is a large and easily recognised crater in the southern uplands of the Moon.

With a diameter of 231km it is so large that the curvature of the Moon causes the centre of its floor to be higher than its walls. This means that at lunar sunrise or sunset features in the centre of the crater are illuminated while the eastern and western areas are still in shadow. Both the image and the drawing show this effect.

CROSSWORD

By Anon



Across

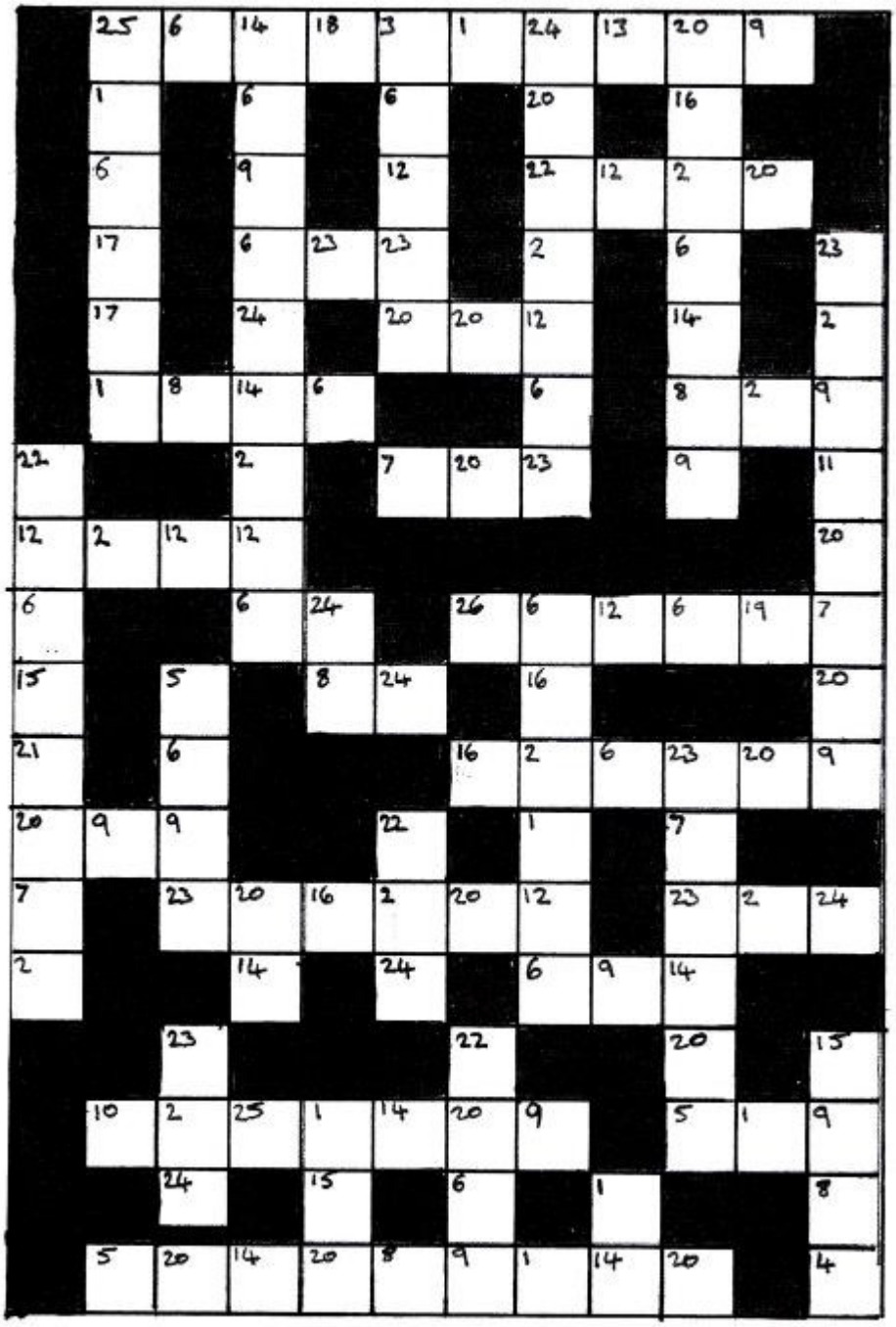
1. Our star (3)
3. Planum in straightforward English! (5)
6. Home to the triplet. (3)
8. Leonov made the first. (3)
9. 9th in Zodiac would have one. (3)
10. 21st letter of Greek alphabet. (3)
11. A comet has one. (3,4)
13. Active Galactic Nucleus in short. (3)
14. — variables, abbrev. (2)
16. SG in Ursa Major. (1,3)
18. — Orionis, also known as Rigel. (4)
21. ψ (3)
22. Famous observatory. (7)
26. Newton's telescope in short. (3)
27. Nothing to do with elite military force! Just abbreviation for a small space probe. (3)
28. Our hobby.(9)

Down

2. — Moon, a good time for DSO spotting. (3)
3. One of first 4 asteroids discovered, sounds fit for a king. (6)
4. UK satellite. (5)
5. — Earth objects could be dangerous. (4)
6. French mathematician who put forward theory on origin of Solar System. (7)
7. Home to M42 (5)
11. Interstellar medium—abbrev. (3)
12. Infrared Astronomical Satellite in short. (4)
15. 150 000 000 km (2)
17. Delta — , aka Mintaka. (7)
19. Earth's atmosphere (3)
20. Reflecting power of non-luminous body. (6)
21. Marsh on Moon. (5)
22. You could do this with your laser! (5)
23. Fra —. Lunar crater. (5)
24. — Cancri. Multiple star. (4)
25. Feature associated with craters such as Copernicus and Tycho. (3)

Answers in next issue of Cygnus.

CAROLINE'S CODEWORD



1	2	3	4	5	6	7	8	9	10	11	12	13
I							O					
14	15	16	17	18	19	20	21	22	23	24	25	26
										N		

Public Evenings

The dates of the autumn/winter public evenings are given below.

As yet there are few details regarding the speakers and none of the subjects of the talks are known at this stage. As soon as these are known they will appear on the website and in Cygnus.

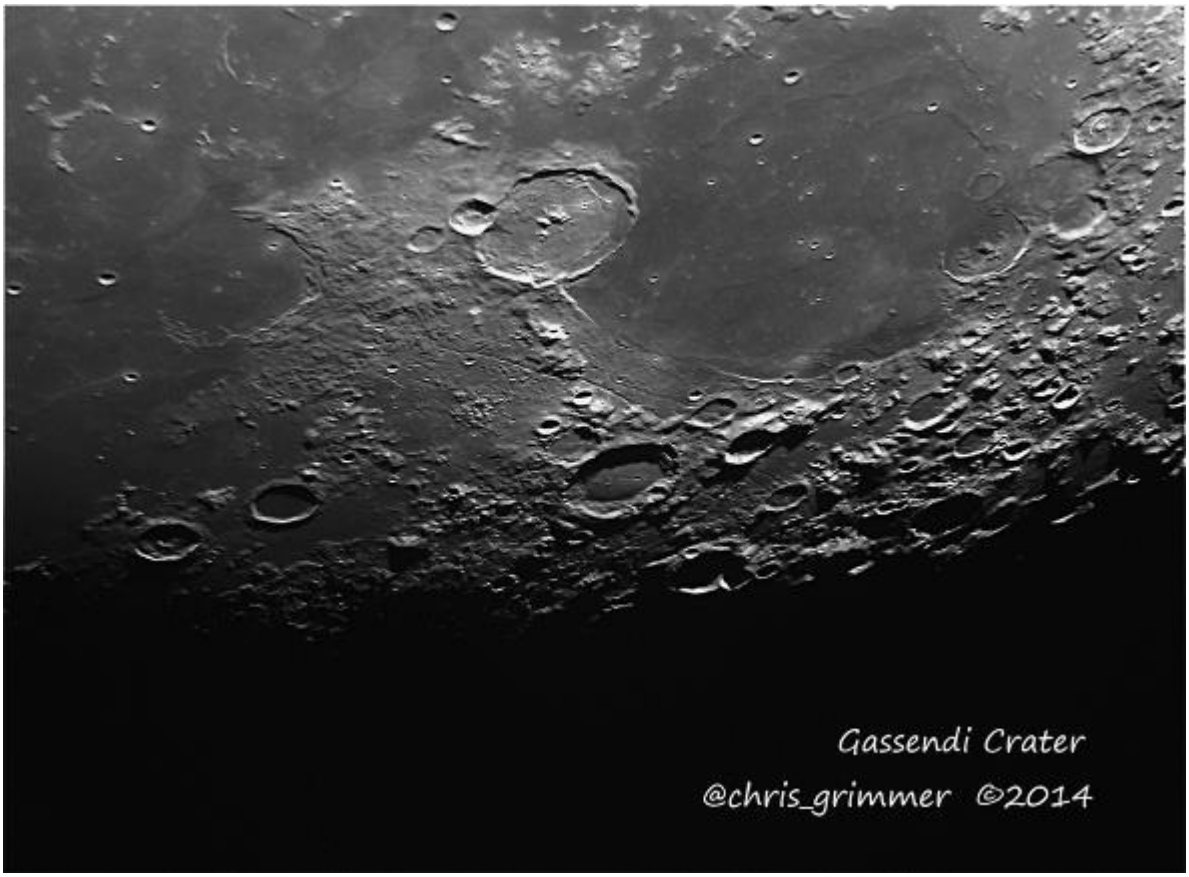
5th/6th September –Mark Thompson
3rd/4th October
31st October/1st November
28th/29th November
9th/10th January –Possible Star Gazing Live –Dave Balcombe
6th/7th February
6th/7th March
3rd/4th April

A couple of pics from Kelling. Above we see Paul Brocklehurst building his model of Vostok (see pages 14—15) and right is Sue Napper exhibiting signs of World Cup fever!

THE DEADLINE FOR COPY FOR THE NEXT ISSUE OF CYGNUS IS September 5th 2014

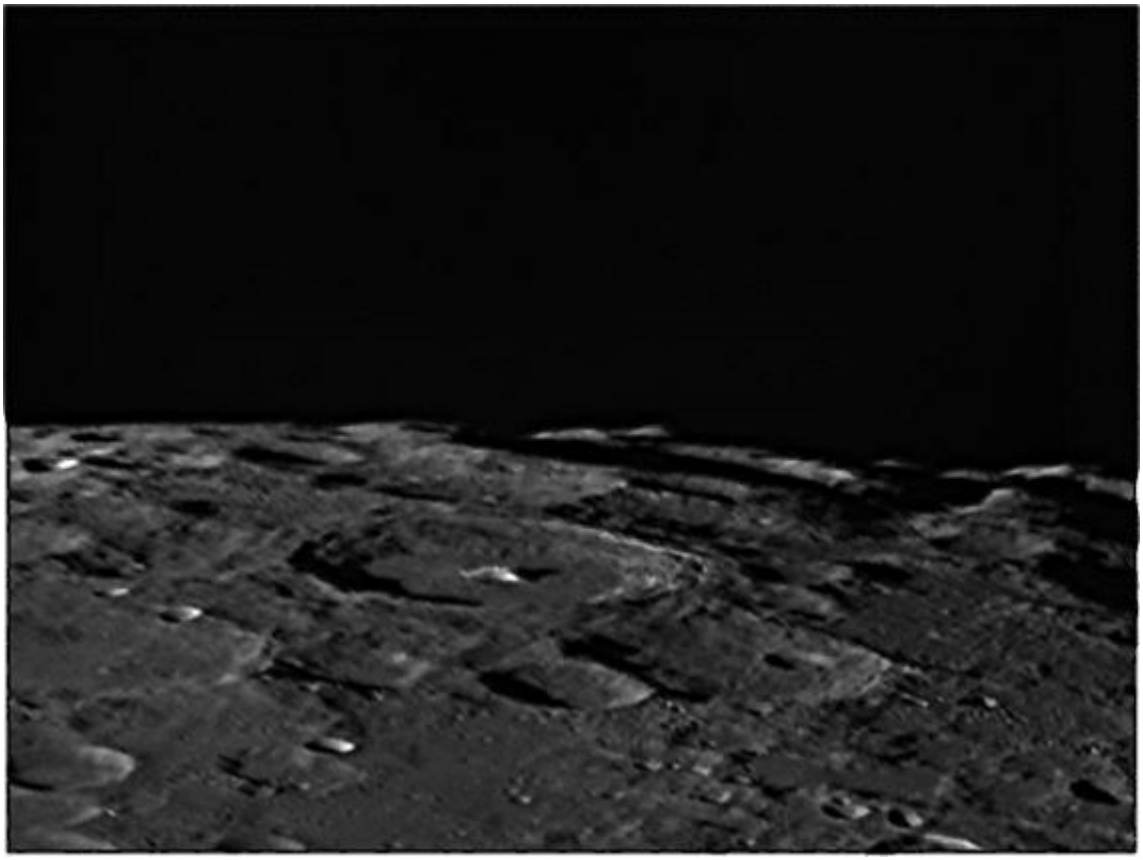
This is the very latest date by which articles should reach the editor (chairman take note!). Sooner than that would be much appreciated and would make the old chap smile!

BONUS PAGES

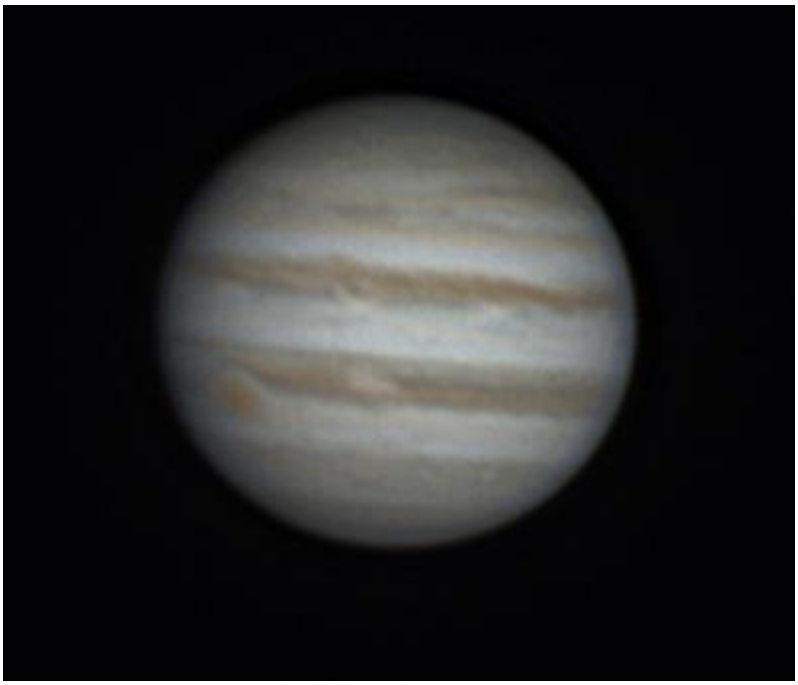


As well as Gassendi, Chris's image shows most of the Mare Humorum, including the lava-flooded crater Doppelmayer and Crater Vitello on the northern shore. To the left below Gassendi are Hansteen and Billy. The large crater immediately below Gassendi is the 84 km flooded crater Mersenius. The Mersenius Rille (230 km long) can be seen above this crater.

Left and above: Two images by Barrie Allsop, showing a double shadow



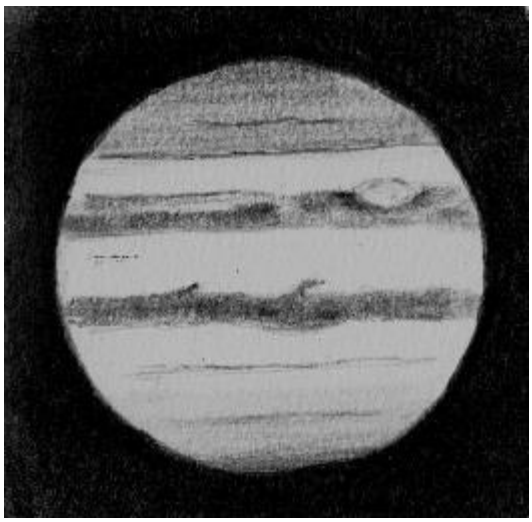
Mark Turner's image of the crater Moretus clearly shows its central peak and terraces. The large crater behind Moretus is Cysatus. In front of it are Short and Gruemberger.



With Jupiter well-placed in our skies earlier in the year several NAS members took the Opportunity to observe the planet and make images. This image is by Dave Cook

Above and right:

Lunar eclipse in Australia (showing an upright view of the Moon as seen down under). Photos taken by 'our man in Oz,' Barry Barfield. Thanks for these Bazza.

Below:

Jupiter again, this time drawn by the editor and imaged by Mark Turner.