

Next Meeting

Activity night: "Observing and imaging Saturn"

How to get the best views of the ringed planet, both through the eyepiece and the webcam

**Keith Mallalieu
& Ross Wilkinson**

3rd May 2011

Full Meeting List inside

BOLTON ASTRONOMICAL SOCIETY

would like to welcome the following new members:

Phil Taylor

Cliff Meredith

All members are welcome to suggest ideas for activities and events. If any member would like to give a talk on an astronomical topic or if any member would like to write an article for the newsletter then please do not hesitate to let a member of the committee know. Please email articles etc to the email address at the bottom of the page – remember that all articles and material must be original or copyright free.

Astronomy News

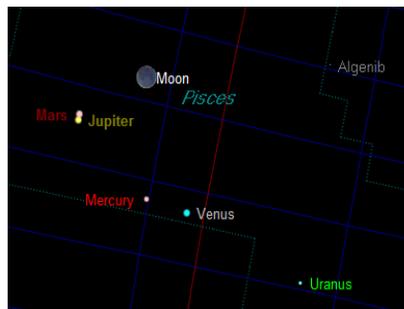
Some of the latest items of interest

SATURN AND PORRIMA IN CLOSE ENCOUNTER

Saturn is approaching the star Porrima in Virgo over the next few months - see later in this issue of the Newsletter for more details.

PLANETARY GROUPING

Don't miss the grouping of planets in the early morning before the sun rises. Look to the East to see this grouping during May. This is the view on 1st May.



BAS Competition

Name this Newsletter

Full details of the Newsletter naming competition will be announced soon – however you can start thinking about it now! Can you think of something original that differs from the usual names given to astro newsletters . A prize will be awarded.

In this Issue

Simple Astro-Imaging Techniques

Ross Wilkinson with the first part of a new series

Society Equipment

A list of equipment belonging to the BAS that can be borrowed by members from Dean Kos , the Equipment Coordinator.

Images from BAS Members

Images from Dean Kos, Gerald Bramall, T. Brandwood and Carl Stone

FROM THE ARCHIVES

A new feature taking us back in Astronomical History from Jean Brandwood

Crossword Number 6

And the solution to Crossword 5

May Objects of Interest

Two exciting observations to make this month

Featured Constellation

LYRA

*Please send magazine articles & contributions to the Editor
Len Adam.*

lenadam@sky.com

MEETINGS: Ladybridge Community Centre Beaumont Drive Bolton BL3 4RZ

Non-members invited to drop in to meetings which are held every other Tuesday evening at 7.30 p.m. £2 charge per meeting or £20 annual membership.

Go to <http://www.boltonastro.org/calendar> to find the next meeting. There are plenty of parking spaces at the centre.

FROM THE ARCHIVES

A look back into astronomical history by searching newspaper and magazine archives

From

Jean Brandwood



JUPITER AND SATURN.

These two planets now present an appearance which occurs only once in the space of about twenty years. It is their almost simultaneous opposition to the sun, that of Saturn happening on the 16th, and that of Jupiter on the 18th of this month, under the meridian of Paris. And this circumstance is, perhaps, still more worthy of observation.—I allude to the apparent retrogradation of these stars. In fact, viewed from the earth, they seem to retrograde in the heavens, that is to say, to move contrary to the order of the signs, or to advance from east to west; whilst viewed from the sun, they continue their direct progress, from west to east.

This singular phenomenon now so easily explained in the system of COPERNICUS, involved the ancient astronomers in an inextricable labyrinth. They were obliged to resort to epicycles, or to circles bearing upon other circles. This complexity in the celestial system induced ALFONSO X. King of Castile, a great amateur in astronomy, to observe jocularly, that “if he had been admitted to the creation of the world, he would have arranged certain things better than they had been done.”—
(From a Paris paper of Wednesday last.)

This article appeared in **The Morning Post, London, Monday October 22nd 1821** and probably caused some excitement amongst astronomers and enthusiasts at the time.

This occurrence of Jupiter and Saturn appearing close to one another is now known as a **Great Conjunction**. These occur every 18 to 20 years as a result of the combined 12 year orbital period of Jupiter around the Sun and Saturn’s 30 year orbital period. The last Great Conjunction took place on May 31st 2000. We have a while to wait for the next one in late December 2020!

A **Greatest Conjunction** is when Jupiter and Saturn appear close together and in opposition to the Sun. The “Star of Bethlehem”, thought to have appeared circa 7 BC, was said to have been a Greatest Conjunction. In fact some said it was “created” by an **occultation** (Saturn being hidden by Jupiter), with the 2 planets appearing to merge into a single object as seen from Earth. This is now disputed, as the minimum distance between Jupiter and Saturn in 7 BC was around 1 degree (twice the Moon’s diameter). The next occultation of Saturn by Jupiter is not for some time...7541! There is no obvious period for the occurrence of greatest conjunctions: the last ones were 1682, 1821, 1940 and 1981. The next one will be 2238/39. Yet another astronomical event we will all miss!

The “system of Copernicus” was the 16th century model of the solar system centred on the sun, with earth and other planets revolving around it. This was formulated by Nicolas Copernicus and replaced Ptolemy’s Earth centred theory which had been accepted since the 2nd century.

IMAGES FROM BAS MEMBERS

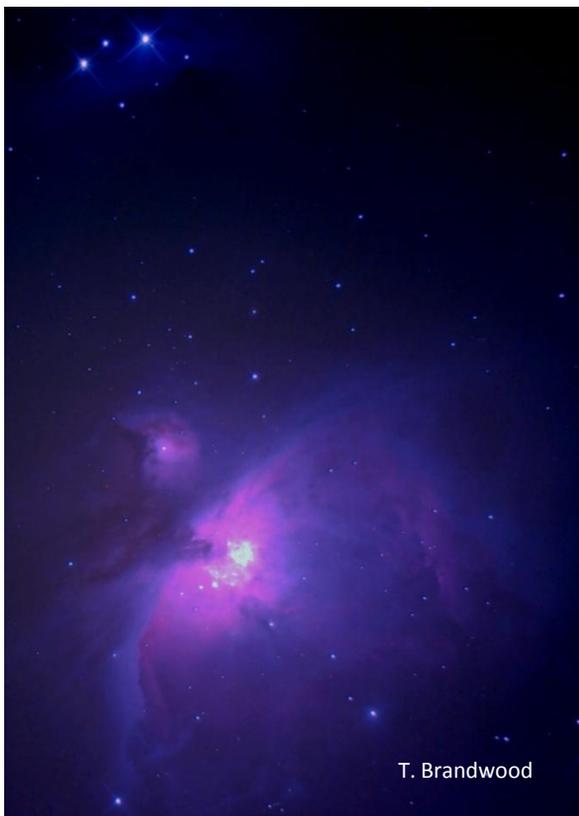


D. Kos

International Space Station

Dean Kos

Finally managed to capture the ISS this evening.....using webcam with its own lens to give wider field.....3sec exposures.



T. Brandwood

Orion Nebula M42

On the left is another attempt at M42, but I'm still using the same images, just new software:-) Using the trial of Nebulosity at first seemed great so, now this is using Nebulosity to stack them and bring out more detail than Deep Sky Stacker

T Brandwood



C. Stone

Saturn

Taken with a Celestron 11" and x2 Barlow lens

Carl Stone



T. Brandwood

Whirlpool Galaxy M51

T Brandwood

My first attempt at the Whirlpool Galaxy, I stacked 12 images and all done in Nebulosity, still probably much more to do with that program, just using the basics.



G. Bramall

Sun 22nd of April 31 view taken with a CANON350D and 25x320th of a sec exp. GB22 Apr 2011

Setting up for astro-imaging

Part 1

A Fixed Tripod

Even with just a camera mounted on a *simple photographic tripod*, it's still possible to get some pleasing images. If you take a series of exposures with a wide-angle lens, you can either simply add them to show the arc-shaped star-trails around the celestial pole, or *align-and-stack* them on the computer to compensate for the Earth's rotation to see the constellations, as illustrated in the *IRIS* tutorials:

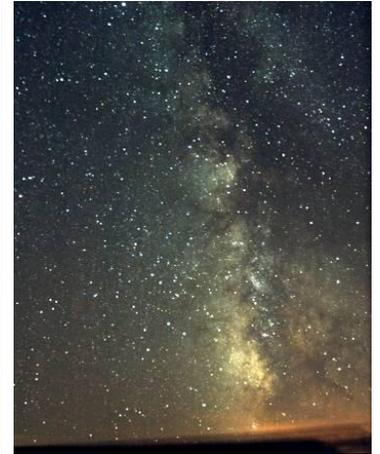
<http://www.astrosurf.com/buil/us/iris/iris.htm#tutorial>

If you're aiming to align and stack the images, keep the individual exposures short enough to avoid trailing. And a *light-pollution filter* is a useful accessory – particularly in Bolton!

In previous *Newsletters* we've looked at how digital cameras can be used for astro-imaging, but in this article **Ross Wilkinson** will cover some of the other hardware which is needed.



Simple addition of a series of images (from AstroSurf.com)



Stack of aligned images from the same series of pictures



Now what can be done with a *fixed* telescope? Well, the Earth's rotation means that any target will move quickly through the telescope's field-of-view, so we need to use very short (< 1-sec) exposures, and are therefore limited to *very bright objects* – such as the Moon or nearby planets.

You'll need to take a series of short-exposure images in rapid succession during the all-too-brief period whilst the target is in view, so an (unmodified) webcam is ideal for this. But if you do try a DSLR, beware that the *vibrations* from the flip-mirror and mechanical shutter can wobble the telescope and ruin your images!

If you can record twenty or more frames of the target area as it drifts through your field-of-view, then these can be aligned and stacked (using the *Registax* or *IRIS* programs) to produce a single sharp image, and their *Wavelet* filters can recover surprising latent detail.

Tracking mounts

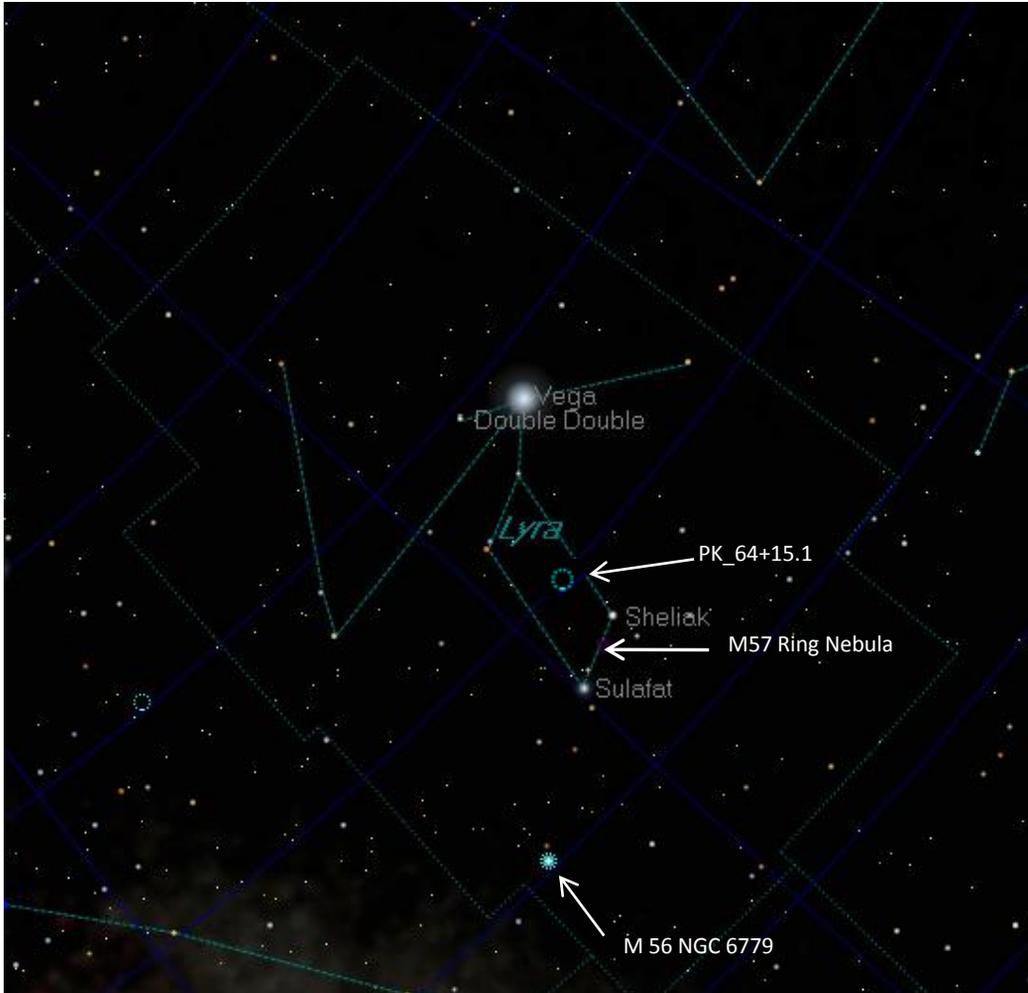
It's surprising what can be achieved with a static camera, but having some method of *tracking the Earth's rotation* opens up a wealth of new possibilities from deep-sky imaging to high-resolution planetary pictures. And the ability to automatically keep your target in view for many minutes at a time just makes imaging so much easier and more enjoyable!

The ideal set-up would be a sturdy polar-aligned equatorial mount, with a drive motor to synchronize it to the sidereal rotation – then you could use any combination of telescope and camera to tackle any imaging task. An *EQ-5* or similar with drive-motors and polar-scope should serve you well for many years.

But although *electronically-controlled alt-azimuth mounts* can keep your target in view for long periods, as they are not aligned to the celestial pole you'll see *field-rotation* trails on long-exposure images. However, if you keep your exposures brief enough to avoid the trails, the align-and-stack processing can remove this effect. But your long-exposures will always be limited with this type of mount. Meanwhile, in the next part we'll see how you can make your own simple lightweight tracking mount for a camera using "*Meccano* technology" and a few hand-tools!

Featured Constellation

LYRA

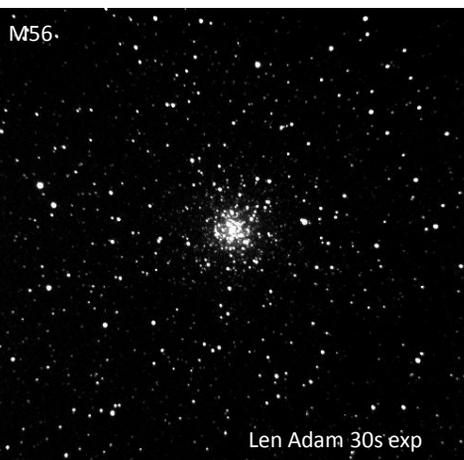
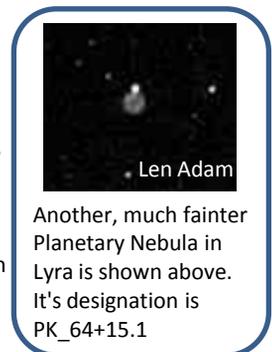


The Constellation of Lyra is a clearly recognisable constellation in the shape of a Harp with one of the “Summer Triangle” stars, Vega as a member. “The Sky” software gives its magnitude as 0.03 so it is a very bright star even in UK skies! The same software gives a distance for Vega as 25 Light Years or 7.75 parsecs so on the scale of our own Galaxy it is a near neighbour. By contrast, Lyra member “Sulafat” lies at a distance of 635 Light Years or 195 Parsecs and has an apparent magnitude of 3.25. Sheliak is slightly fainter than Sulafat at 3.5 but lies at an even greater distance of 881 Light Years or 270 parsecs. The “Double-Double” Epsilon Lyrae is a wide double (about 3.5 minutes separation) each component of which is a double star.



The Ring Nebula is a “must see” sight in Lyra that can be seen through a 3” telescope. It is a planetary nebula that has resulted towards the end of a star’s life as it used up all its Hydrogen in nuclear fusion and has ejected an emission nebula. It rather reflects the eventual fate of our own Sun in 5 billion years or so!

The Constellation of Lyra also contains a Globular Cluster that is distinguished by being a Messier Object M56 – also known as NGC 6779 – i.e. New General Catalogue 6779 – a catalogue initiated by the Herschels in the eighteenth century.



M56 is one of about 160 Globular Clusters that surround our Galaxy. Harlow Shapley discovered that there was not an even distribution of 100 Globular Clusters that he observed - as seen from Earth - whereas individual stars were evenly distributed from our viewpoint. He could see that the Globular Clusters were distributed in a spherical shape and proposed that the centre of this sphere would be the centre of our Galaxy which later proved to be true. He also showed that the overall magnitude of Globular Clusters depended directly upon their diameter – indicating that all of the stars in Globular Clusters were of the same type. (Except for two clusters whose magnitudes had been modified by interstellar dust as they were near the Milky Way.) Globular Clusters contain old stars and have compact cores that are about 3 Light Years in diameter.

Len Adam



May Objects of Interest

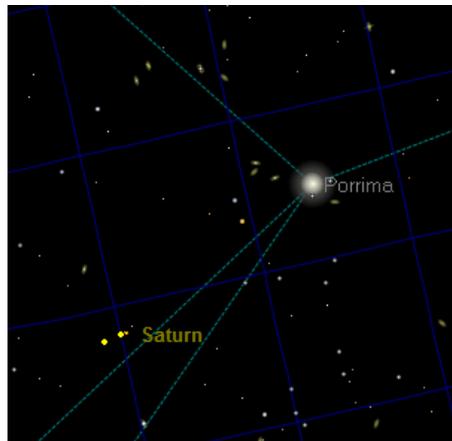
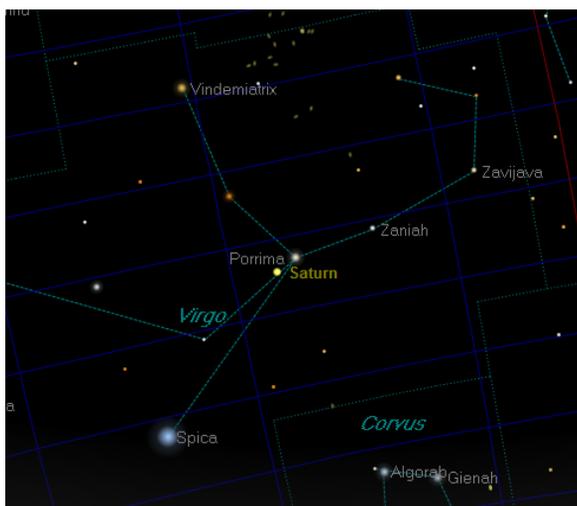
Two exciting observations that you can make this month
Objects are labelled as Naked Eye Objects (N), Binocular
Objects (B) or Telescopic (T).

Len Adam



1. SATURN (N)

Saturn is approaching the star Porrima in Virgo and will make a spectacular sight over the next few months.



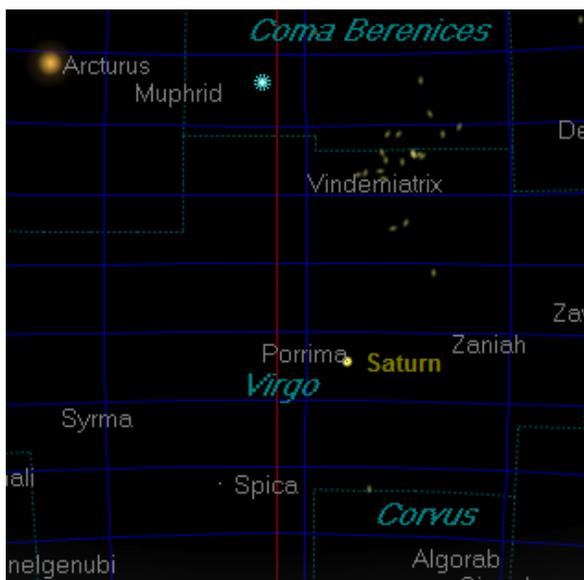
The charts above show the position of Saturn on May 1st. The planet approaches Porrima until early June and then starts to move away from the star. Porrima is a multiple star.

2. Globular Cluster NGC 5024 M53 (B) (T)

Can you spot this Globular Cluster in Binoculars? It is well located at the moment in that if you look to the South at about 11pm early in the month you may be able to spot it above Saturn on or close to the Meridian. If you locate Spica in the South and move up the Meridian past Saturn and beyond you could find it. It has a magnitude of 7.7 and a diameter of 13 minutes of arc – almost half the diameter of the full Moon – and is certainly not visible with the naked eye but binoculars or a small telescope should locate it. It will cross the Meridian 4 minutes earlier each night of course. On 1st May it has an altitude of around 55 degrees when crossing the Meridian. It is also 15 degrees West of Arcturus so there are plenty of signposts!



Len Adam



BAS Equipment Available for Loan

The Bolton Astronomical Society has a small range of equipment that can be borrowed by its adult members. It is important that members take all care to ensure that equipment is not damaged or lost and realise that when they sign the loan book they are accepting responsibility for the equipment and will be expected to replace any damaged or lost equipment. Please note that photographs are representative only and are not of the actual equipment at this stage.

Coronado Personal Solar Telescope	
Vixen Sphinx go-to mount	
Swift 10x50 binoculars	
Bresser 8-24x50mm solar zoom binoculars	
Boots 10x50 binoculars	
Green laser pointer	
6" Newtonian telescope (grey)	
6" Reflector telescope (silver)	

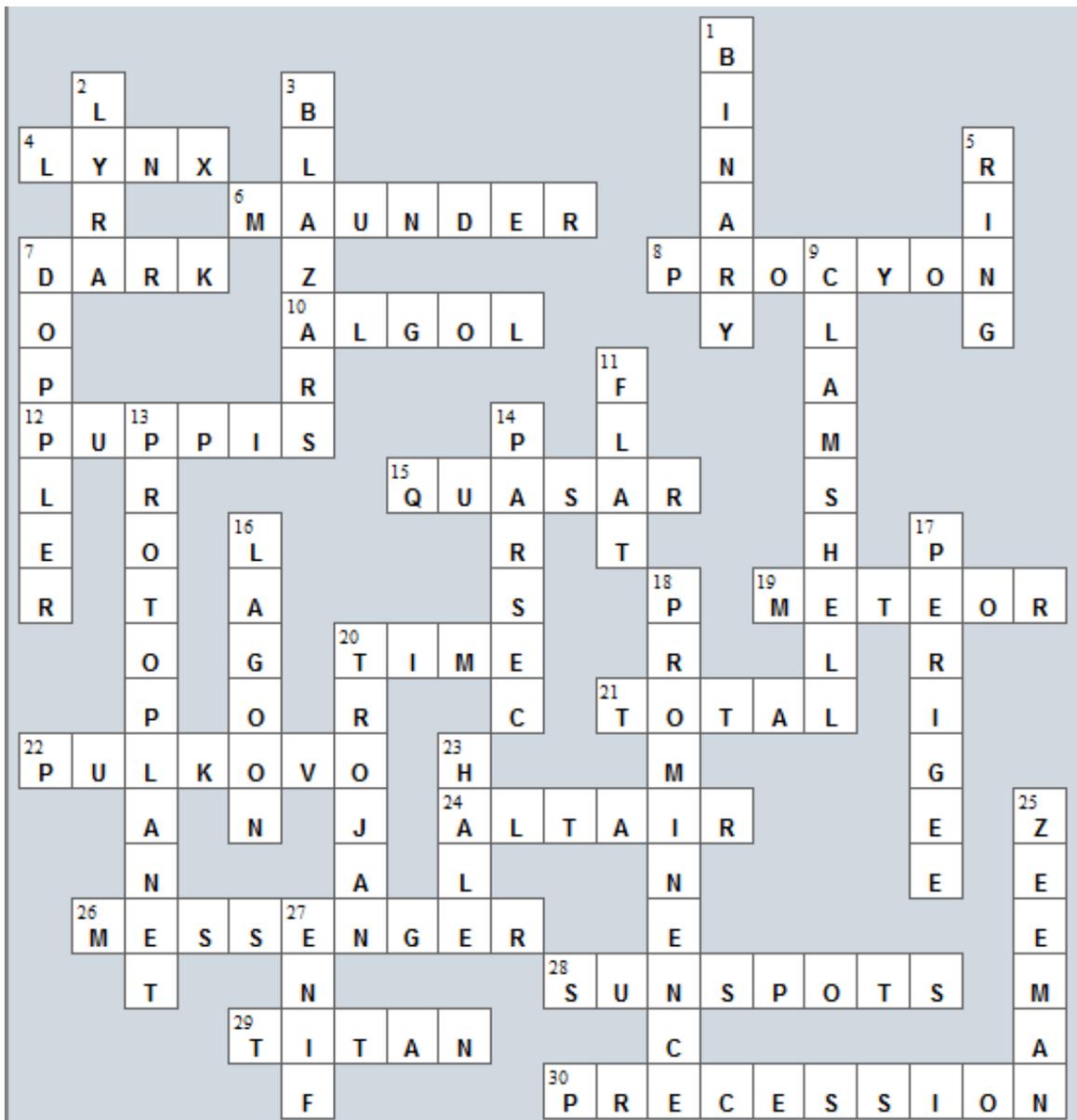
BAS Equipment Available for Loan Page 2

Laser Collimator	
Cheshire Eyepiece	
Webcam imaging kit 1	
Webcam imaging kit 2	
Hydrogen alpha filter	
Oxygen III filter	
UHC-S dual narrowband filter	
135mm lens for imaging	
Led lantern	

PREVIOUS NEWSLETTERS ARE AVAILABLE IN PDF FORMAT IN THE MEMBERS AREA OF THE BAS WEBSITE

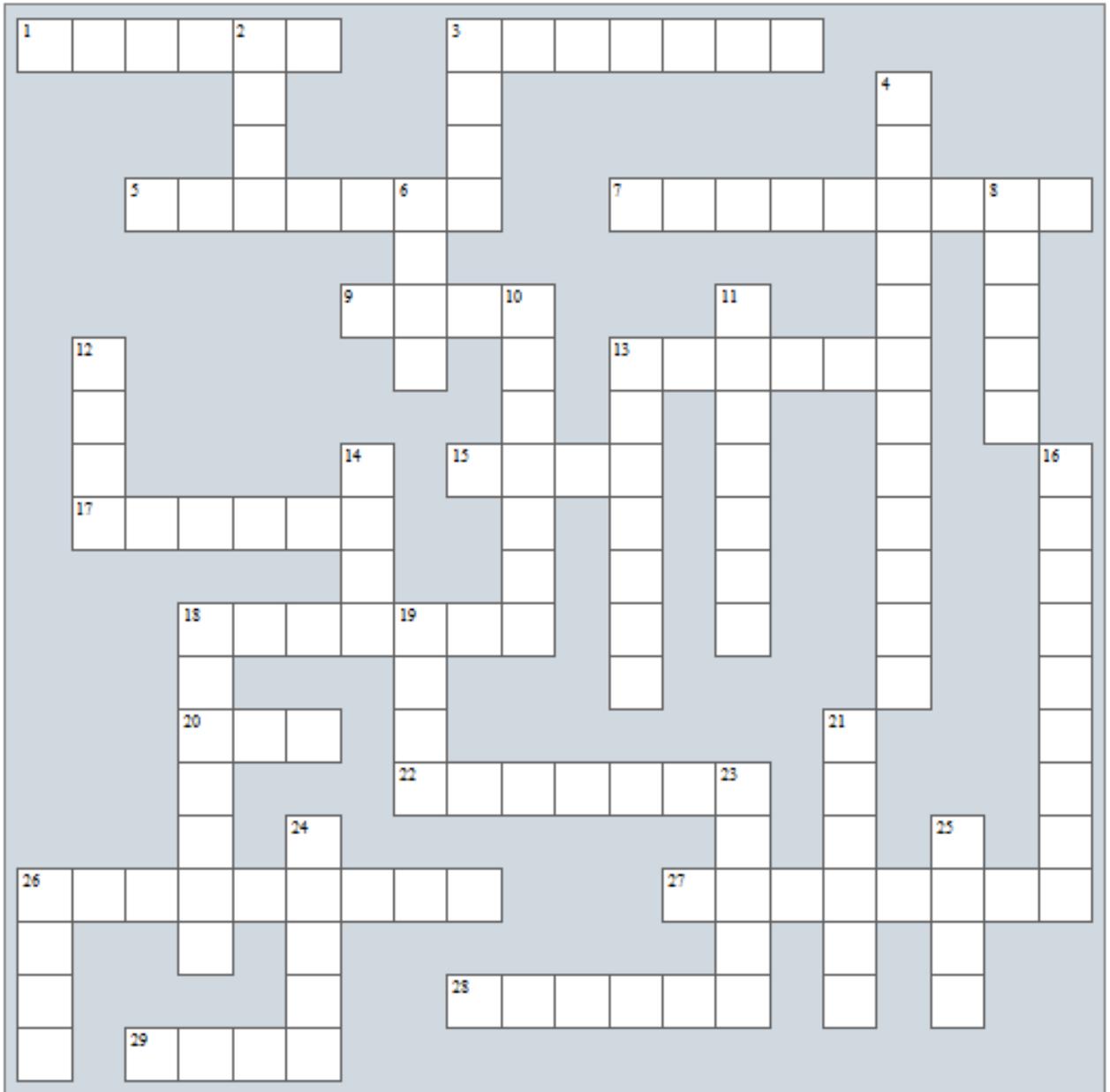
This includes the previous crossword so if you have not done that you may wish to print the previous issue and solve it before looking at the solution below

SOLUTION TO CROSSWORD 5



BAS CROSSWORD 6

Crossword 6



CROSSWORD CLUES

Across

1. Is this nebula is a good place to go swimming? (6)
3. Simply rearrange Venator to get this star (7)
5. This astronomer was on of the pair that detected the hiss from the Cosmic Microwave Background Radiation. (7)
7. PK_64+15.1 is this sort of nebula (9)
9. These massive particles are pathetic. (4)
13. Particles discussed by well spoken ducks? (6)
15. Bright star in this month's constellation (4)
17. Comet sounds like a Manchester Orchestra (6)
18. Your RA axis should very nearly point to this star (7)
20. These dwarves are the most common in our solar neighbourhood (3)
22. First observer to look at craters on the Moon (7)
26. The study of the Universe as a whole (9)
27. Patent Clerk and Scientist (8)
28. This nebula is named after a planet (6)
29. Magnitude difference for an object 100 times brighter than the other. (4)

Down

2. ET is this type of cluster - also known as NGC 457 (4)
3. Astronomer Royal (4)
4. Between the stars (12)
6. This star sounds like where you can find cash on a TV programme. (4)
8. First observer of spiral structure in Galaxies (5)
10. Birds blamed for Cosmic Microwave Background? (7)
11. Distance calculations use these standard light sources. (7)
12. This star sounds a bit like where you drink coffee. (4)
13. This type of physics describes interactions on the microscopic scale of elementary particles. (7)
14. This month's constellation (4)
16. Gives his name to the Microwave Anisotropic Probe (9)
18. Saturn is getting close to this multiple star this month. (7)
19. This object is always around in this month's constellation (4)
21. Unit of Distance (6)
23. Our local arm of the Galaxy (5)
24. This fiery nebula is not far from the horse head (5)
25. This universal force only has effect at nuclear and sub nuclear level. (4)
26. CDM in cosmological terms relates to this type of dark matter. (4)

Meetings Schedule May 2011 to August 2011

Meetings are held each month on Tuesday evenings, commencing at 7:30pm and concluding around 9pm.

Our main meeting programme runs from September to May, and features a mixture of formal lectures and informal "Activity Nights". Admission is free to members, and visitors are welcome at £2 per visit.

Over the summer we also get together on the first Tuesdays of June, July and August.

The programme of our future meetings is shown below, but may occasionally be subject to late changes, so *if you're travelling from some distance, please contact the BAS Committee by email to boltonastro@gmail.com to confirm before making your journey.*

There are 9 issues of the Society Newsletter per annum with a summer break in June, July and August

The Newsletter is an online PDF that can be downloaded and printed if required.

Please ask if you require a printed copy – there will be a small charge to cover the printing cost.

Date	Subject	Presented by
3rd May 2011	Activity night: "Observing and imaging Saturn" How to get the best views of the ringed planet, both through the eyepiece and the webcam	Keith Mallalieu & Ross Wilkinson Bolton AS
17th May 2011	Talk: "Probing the Core of Andromeda" How gravitational microlensing is helping us find out more about our next-door-neighbour the Andromeda Galaxy	Andy Newsam Liverpool John Moores University
7th Jun 2011	Activity night: "Here comes the Sun!" Solar viewing with our special <i>Hydrogen-alpha</i> 'scopes (clouds permitting!) plus Ross's tips on safe solar observing and imaging	BAS Committee
5th Jul 2011	Talk: "Astronomy in Bolton, 1894-1932" Peter has researched the Borough archives going back to the late 19th century...	Peter Miskw Bolton AS
2nd Aug 2011	Activity night: "Sun-struck?" Solar viewing with our special <i>Hydrogen-alpha</i> 'scopes (clouds permitting!) plus Ross's experiences of eclipses and transits - and underground observations!	BAS Committee



THIS NEWSLETTER NEEDS CONTENT FROM ITS MEMBERS

If you think you can produce content for the newsletter please have a go! We need:

Observations – no matter how brief – for example you may have followed the movement of the moons of Jupiter for a few hours and have some scanned sketches to illustrate your written observations. Remember dates times and equipment details are essential.

Images – no matter how basic or sophisticated – there is a place for them here.

Articles – you may want to enlighten us on an aspect of Astrophysics or some particular aspect of Astronomy that you know something about.

Equipment description – you may have built a simple – or complex – gadget for astronomy – or even a telescope! Write it up for the newsletter – no matter how long ago you did it – we have new members that will not have seen it.

Presentations – have you given a presentation that could be written up as an article – please consider doing that.

Observatories and Telescopes – Have you visited Jodrell Bank or Mount Palomar – and have photos – write the visit up as an article – or did you go to a Star Party – describe what you saw.

Send all content to lenadam@sky.com