

# THE BOLTON ASTRONOMER



The monthly journal of the Bolton Astronomical Society

# November 2012

ISSUE No. 18

**Next Meeting**  
**Researching Star Formation**

**David Eden**  
Liverpool John Moores  
University  
6th November 2012

**Wanted – images and articles**  
from members about their  
equipment setup  
Beginner's welcome  
Email the Editor  
lenadam@sky.com

## In this Issue

**Missed some issues of the Journal?**

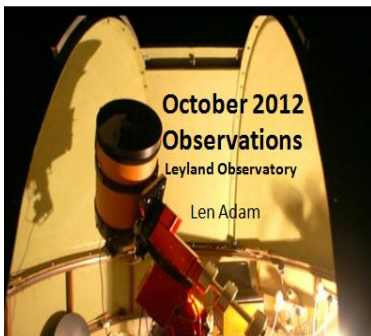


**Peter Miskiw the Society expert on the History of Astronomy in Bolton has uncovered more documentation about the History of the Society**



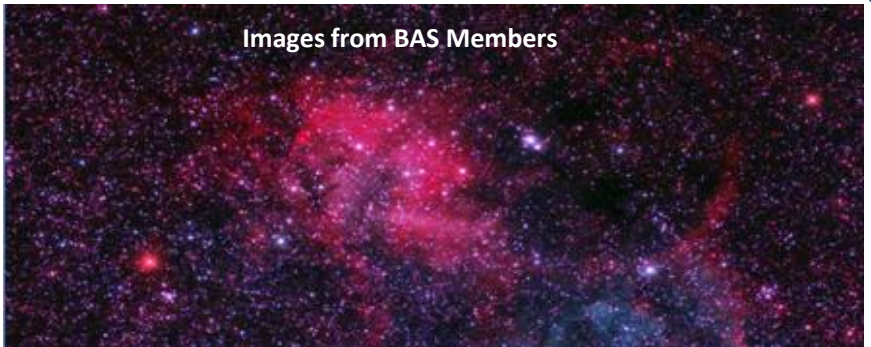
**Image Processing Secrets Part 8**

**David Ratledge**



**October 2012 Observations**  
Leyland Observatory  
Len Adam

**Images from BAS Members**



**November Objects of Interest**  
Hubblesite November Objects Video  
Len Adam



**Processing a Jupiter Image using Registax 5.1**  
Ross Wilkinson



**BAS Calendar**

Date	Subject	Presented by
16 Feb 2012	Members talk: attending a star party	Bob Combridge
23 Feb 2012	DoS 2011 and 2012 reports and club news	Bob Combridge
23 Feb 2012	Members talk: 'Changing and observing & imaging' Part of our research mission does what they've learned over the last year	Don Fox & Andy Gubbie
16 Mar 2012	Workshop: 'Building a home observatory'	Clareilly Carl Stone
16 Mar 2012	Carl Stone visit of the Bolton Astronomical Society in his observatory	Edna G. G.
23 Mar 2012	Guest speaker: 'Advances in astronomy through technology'	Prof. Ian Dobson
30 Mar 2012	Members talk: 'Telescope imaging'	Len Adam
30 Mar 2012	Workshop: 'Getting started with astronomical photography'	Bob Combridge
13 Apr 2012	Activity night: 'Observing & imaging Mars' getting the most out of the next opposition	Bob Wilkinsons & Jan Scott
13 Apr 2012	Guest speaker: 'Deep Sky Photography'	Prof. Paul Hogg
13 Apr 2012	Members talk: 'The Constellations, Part 1'	Clare Ratledge
13 Apr 2012	Members talk: 'The Constellations, Part 2'	Clare Ratledge
20 Apr 2012	Activity night: 'Observing the Sun in H-alpha light'	Bob Combridge
20 Apr 2012	Guest speaker: 'Telescope Mounts'	Robert Smith
20 Apr 2012	Members talk: 'Observing the Sun in H-alpha light using the H-alpha filter'	Janet Cook
20 Apr 2012	Activity night: 'Observing the Sun in H-alpha light using the H-alpha filter'	Janet Cook
20 Apr 2012	Activity night: 'Observing the Sun in H-alpha light using the H-alpha filter'	Janet Cook

**Please send magazine articles & contributions to the Editor**  
Len Adam.  
lenadam@sky.com

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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.co.uk/calendar> to find the next meeting. There are plenty of parking spaces at the centre.

**WHICH NORTH WEST AMATEUR ASTRONOMER LIVED HERE?  
AND WHY DO WE THINK THAT IT WAS MARIE CURIE'S FAULT THAT HE PROBABLY  
DIDN'T SPEAK AT THE SOCIETY MEETING IN 1914?**

SEE THE ARTICLE INSIDE BY PM AND LA



# Images from society members

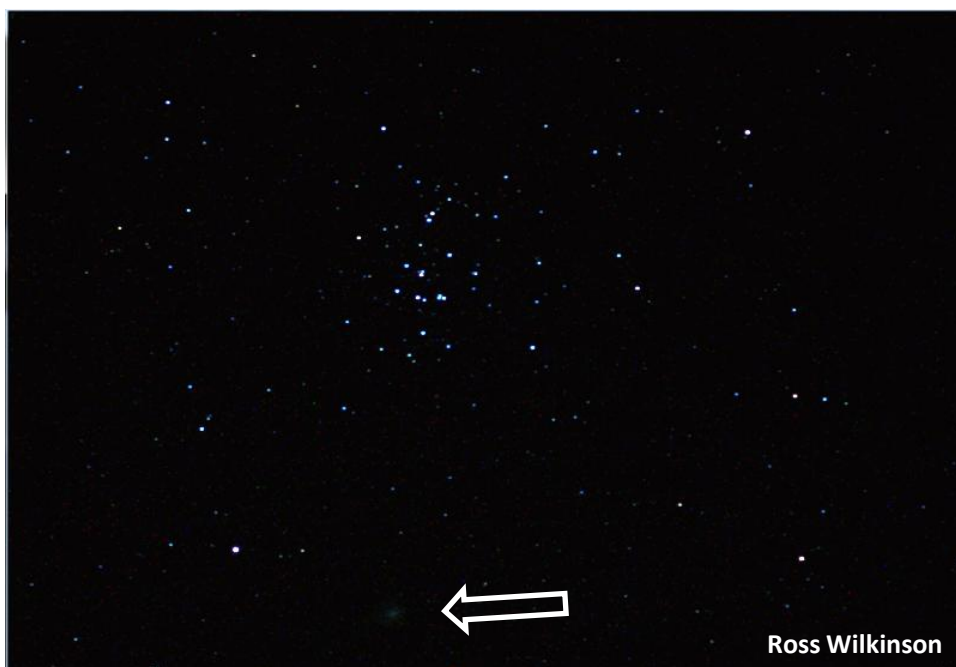


David Ratledge

## The Fetus Nebula, NGC 7008

One of the oddest looking planetary nebula around. The bright spot on the NNE edge is a low excitation knot known as Kohoutek 4-44. The weather did not cooperate and it took 4 nights to get enough signal for this interesting planetary nebula.

David R.



Ross Wilkinson

## Comet Lulin moving past The Beehive Cluster

I've just re-processed my data from Mar-2009 into this movie. Charles Messier would have been delighted with this - a comet moving past one of his Catalogued objects (M44)!



Dean Kos

**m45**

My latest attempt at m45, taken through £35 telescope, (70mm refractor)....and canon 1000d, 27x3min processed in iris and photoshop.....DK

**New Mount**

Eq6, Celestron 11" mounted on a 6.5ft pier



Carl Stone



Ross Wilkinson



**Comet 168P Hergenrother**

I switched to taking dark frames during the two periods when the clouds came over, hence the star trails appear as "three dashes"



L. Renshaw

#### Jupiter

Jupiter imaged on the 09th October 2012 at 0142. Although the sky was clear, seeing was poor and I struggled with this one. However I managed to get quite some detail. Visible in the image is the GRS, Oval BA and the Baby Red Spot. Belts on both the NEB and SEB are visible also. I used a Meade 3x TeleXtender and IR Filter to capture this image.



Gerald Bramall

#### North America Nebula (NGC 7000)

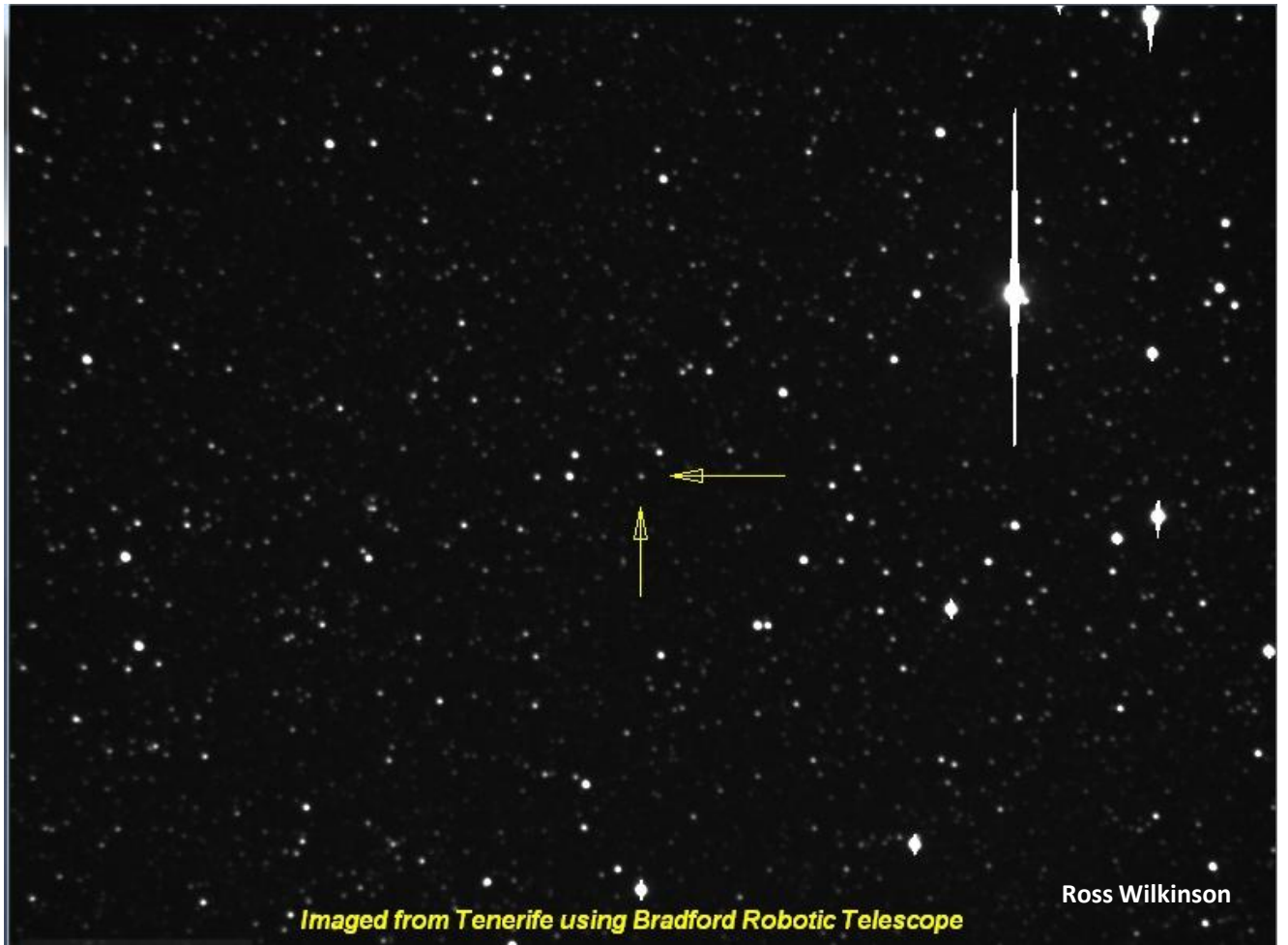
Taken on the 6th and 8th of October, 3Hrs H/A and 2Hrs UHC. GB



Ian Martin

**M81 & M82**

Captured with SW 150P, Canon 450D. Guided with PHD, ST80 and QHY5. 20 x 300s ISO400 & 30 x 300s ISO800 (taken Jan '12 & Sept '12 respectively) Stacked in DSS with PP in CSS. Colimation was not perfect in either instance. Need to work more on post processing. Same as my school reports - Could do better. IM



Ross Wilkinson

**Imaged from Tenerife using Bradford Robotic Telescope**

**This is an ex-planet!**

I've eventually found Pluto, on an image which I took with the BRT back in May. Pluto's position was confirmed by Cartes du Ciel, and there's nothing at that position in the DSS image of this area, so it must be a solar-system object passing through that part of the sky.

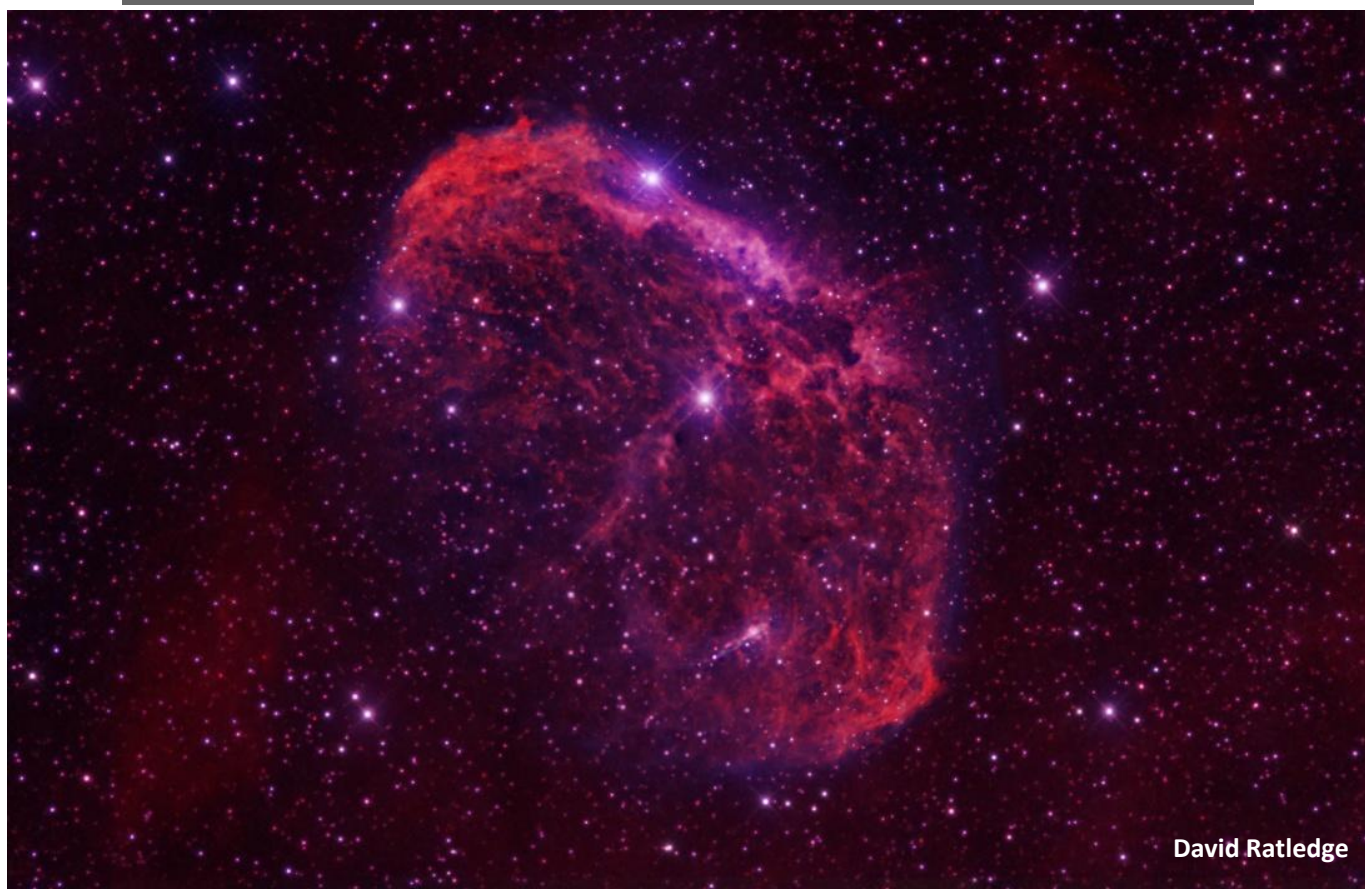


David Ratledge

#### Sharpless Sh2-132

Rarely imaged sharpless nebula which is a bit of a challenge for a DSLR camera or least the outer reaches are. Unusually for a Sharpless object this nebula has a strong OIII signal (blue-green) which came as a bit of a surprise.

David R.



David Ratledge

#### The Crescent Nebula, NGC 6888

Close-up of the nebula in H-alpha (3 hours) and OIII (3 hours). Central star is a Wolf-Rayet type and has formed the nebula by blowing off material.

David R.

# Image Processing Secrets – 8

## Shooting the Moon in Full Colour

David Ratledge

### Introduction

It probably comes as a surprise to discover that there is a point to shooting the Moon in colour. However, although the colours are there they are very weak – or more correctly, they are of low saturation. Our eyes just don't see those weak colours. Nevertheless, the colours are real and they can tell us much about the lunar geology. Digital photography makes the process of revealing the colours a relatively easy exercise. So if a full colour Moon appeals to you - read on.

### Step 1 – Shoot the Moon

The full Moon is the best time to try this technique. What is required is around 6 to 12 images of the Moon shot with a digital SLR camera in raw mode. The latter is important as this will increase the dynamic range, i.e. the number of tones in the image.



*Stacked raw images – little colour is evident*

Shooting the full Moon is relatively easy. Exposures are very fast so accurate telescope drives are not required. A focal length of around 1250mm is about optimum. Good focus is essential though so take your time to get the image as sharp as possible. Mirror lock-up is recommended when shooting.

### Step 2 - Pre-processing

No special processing is required – just align, then stack the images and save as a 16-bit file. IRIS or Registax will do this but IRIS has more features for cartography and is the one I would recommend. When you have finished admiring your image of the full Moon it is time to move on to the interesting part!

### Step 3 – Colour Boost

We need to boost those colours so our eyes can see them. This bit is important – we need to get the colour balance correct before we start. If the image has a colour cast at the start then increasing the colour saturation will just make it worse. If you have Photoshop then this software has a useful “Auto Colour” command which should get pretty close to a neutral colour balance. However, you will probably not get it exactly right initially so just accept that it will be a case of some trial and error.

Most graphics programmes will have a saturation command (look for hue and saturation) for boosting colour. Alternatively IRIS has a View>Saturation Adjustment – this is probably the easiest to start with. So using the Saturation Adjustment command boost the colour. If it turns the Moon red (or green or blue) then you didn't get the balance right initially. Adjust and try again.

You will probably need several applications of the Saturation Adjustment command. Aim for colours as I have shown them here - not because I am the expert but because mine have been processed to match published lunar geology maps. You should end up with the colours correct but with a useless noisy image.

### Step 4 – Getting Rid of the Noise

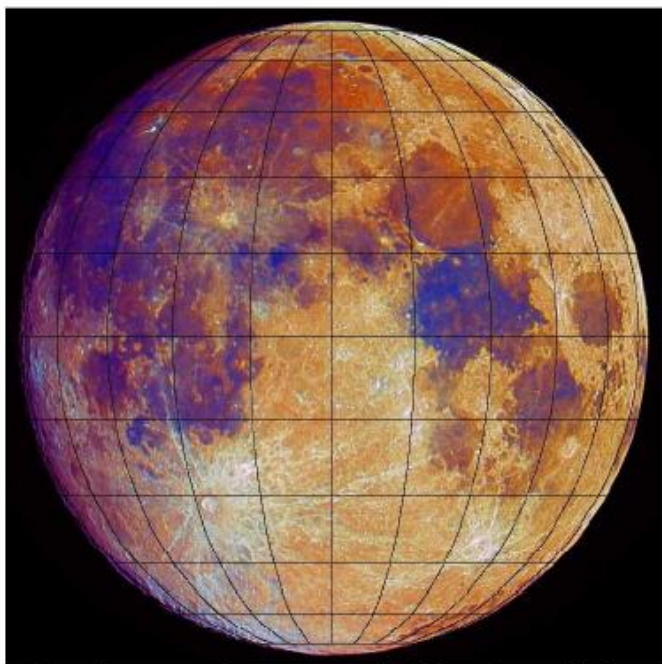
To get rid of the noise we need to combine our original colourless image of the Moon with our new colourful version. To do this we use the LRGB method. The original image becomes the L or luminance (convert it to mono). The colour version provides the R, G and B (Red, Green, and Blue). To do this split the colour version into its RGB components and recombine in IRIS using View>LRGB. Hopefully the noise will have gone. If not, try a Gaussian blur on the colour image – not too strong or the colour information will be reduced.

We should now have a colourful Moon free from noise. Admire it for a minute or two but we can do even more.

### Step 5 - Advanced Cartography

IRIS has more tricks up its sleeve with the GRID and MAP commands. First let's add a latitude and longitude grid to our image – looks a bit more high-tech now!





Colour image – noise gone and grid overlay added

If you wish to give GRID a try these were my parameters (T1.lst) for the grid overlay on the disk image.

```
0
0
90 0
1024 768 (size of image)
510 384 333 (X Y coords of centre & radius)
0.0
0
-180 180 -90 90
0
```

```
0
0
1
15
15
1
0
```

Note the last zero – there is an error in the IRIS tutorial and without this extra zero the command fails! It took me several months to fathom this!

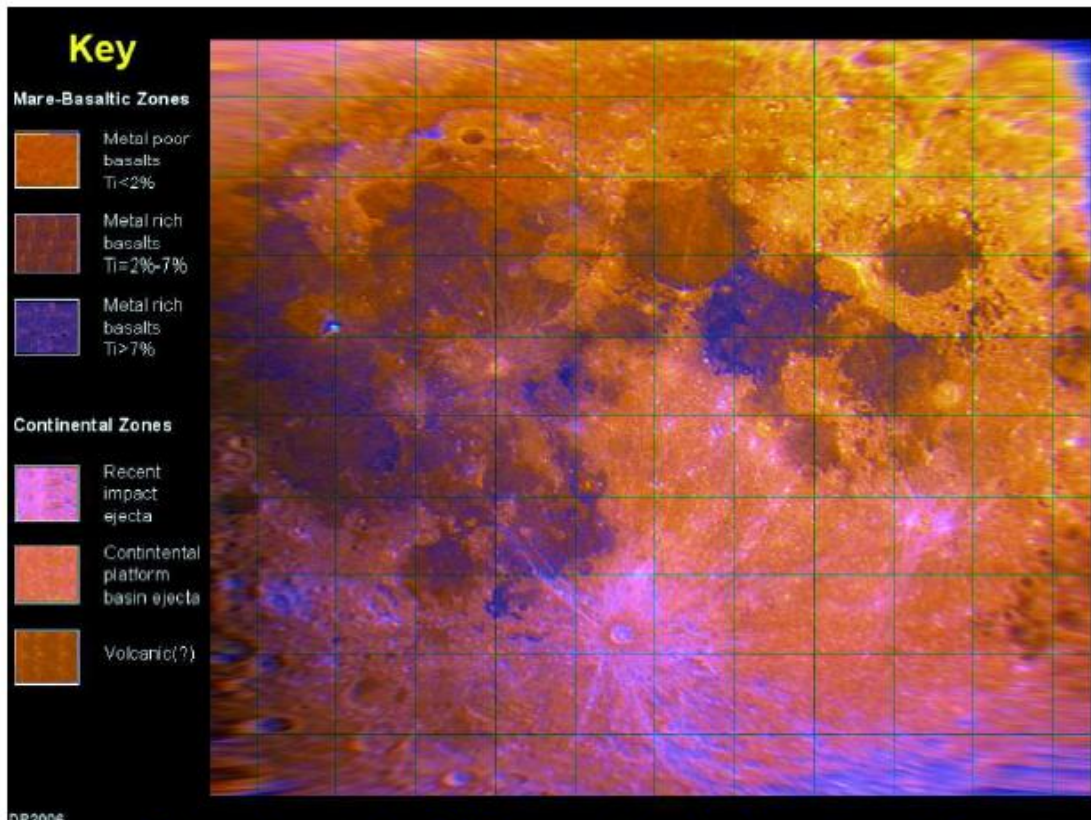
We can even change the map projection (see below) using the MAP command. These are pretty advanced commands in IRIS and take some mastering but the result is worth the effort.

Finally, remember those colours are real and actually mean something – they reveal the geology of the lunar surface. It is a good idea therefore to add a simple key to explain what the colours represent. The key I used was based on a lunar geology map published in Sky & Telescope Magazine many years ago.

### Conclusion

With a simple Digital SLR camera attached to our telescope we can reveal the Lunar geology in all its glory. So next full Moon, rather than complaining you cannot do any astronomy, why not try shooting the Moon in full colour!

Note this is a shortened version of my Astronomy Now magazine article "Shooting the Moon in Full Colour", April 2012.

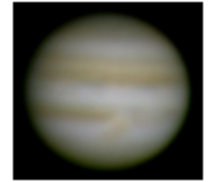


Cartographic projection (MAP command) and explanatory key added

# Processing a Jupiter image using RegiStax 5.1

Ross Wilkinson & Callum McDougall

Callum has only recently started planetary imaging, using a Philips webcam on the back of his Meade 10" SCT. But when I saw one of [his early posted results](#), I realised that he could be missing a lot of latent detail in the post-processing, so I suggested that he send me his raw image to experiment with. I could then list and explain the steps which I used – hopefully this will be useful to other readers too.

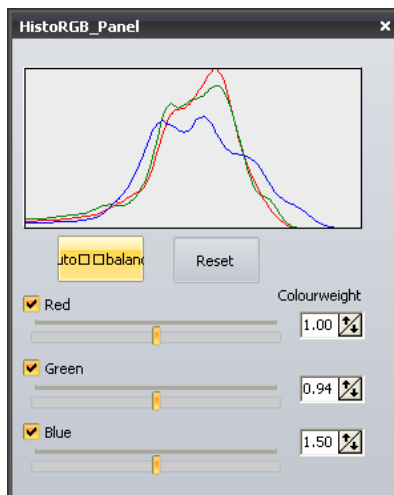
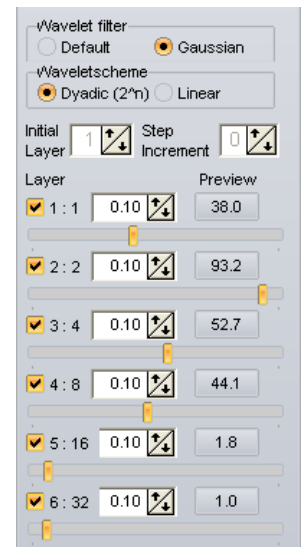


So having performed the *Align*, *Optimize* and *Stack* processes on his AVI file, he sent me the result as a TIFF image (an *uncompressed* 2MB still, rather than the original 500MB video file!) which I was able to import into *RegiStax 5.1* (or *IRIS*<sup>1</sup>).



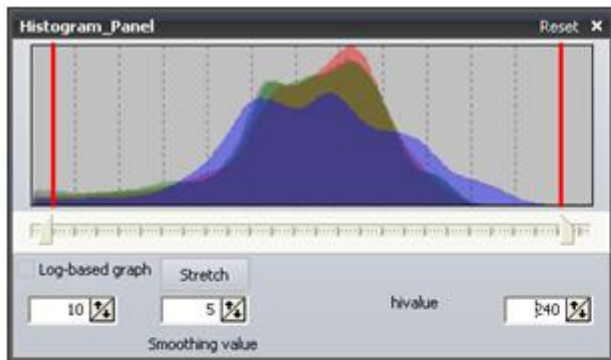
The first stage is to align the Red, Green & Blue fields which have been spread as a result dispersion in the Earth's atmosphere (this effect is much more marked when a planet is low in the sky and so its light is coming through a thicker wedge of air). *RegiStax* has an automatic feature to correct for this: *RGB Align*: simply draw a box (using *Define Area*) around the planet, press the *Estimate* button and wait a while! In this example, the Red field was shifted left and up (by 1 and 3 pixels respectively) and the Blue right and down (by 3 and 6 pixels).

Then the image can be sharpened using the amazing *Wavelet filters*. You don't need to understand the maths for this (*Fourier Transforms* and all that) – just appreciate that as the layer numbers increase you're regulating the detail of larger features in the image. For a large-scale image such as this (>250 pixels across), I find that the *Dyadic* filters are more useful than the *Linear* setting. Then it's a case of playing with the sliders to achieve the best result – but take care not to overdo it, or your planets will acquire a mottled or lumpy surface. This is a subjective process and the panel on the right shows the settings which I chose for this particular example.



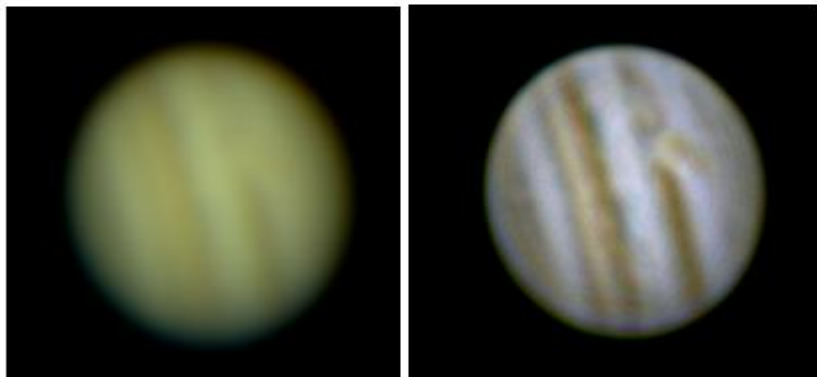
It's also worth playing with the *RGB Balance*: this can compensate for errors in the camera's white-balance when the video was recorded. In this case the *Auto-balance* button achieved realistic-looking colours (see left) but I sometimes find that I need to use the manual sliders or arrow-buttons instead.

<sup>1</sup> I did indeed try processing this image with *IRIS*, and got a very similar end-result, in about the same time!



The next step is to adjust the *Histogram* of the image to optimise the levels displayed on the screen. The numbers at the lower corners of this panel correspond to the black (minimum = 0) and white (maximum = 255) levels on the image. As Callum's example was correctly exposed, I didn't need to do much to this - I set the black-level at 10 and the white at 240 and pressed *Stretch*.

Once you're happy with the result, press the *Do All* button, and you'll then see a reminder of your original raw image and watch its transformation as the processing steps are applied:



Then, moving on to the *Final* page, *Set Centre of Rotation* at the centre of the disk and rotate the whole image so that North (or South, if you prefer) is at the top - I don't like to see my planets tilted over at a jaunty angle!

Then, moving on to the *Final* page, *Set Centre of Rotation* at the centre of the disk and rotate the whole image so that North (or South, if you prefer) is at the top - I don't like to see my planets tilted over at a jaunty angle!

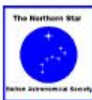
And in this case, I felt that *Resizing* the final image to 75% made it look clearer on the screen too:



I think that this is a pretty good result, especially given that the planet was quite low in the sky. Perhaps the focus was slightly out, but this is very difficult to get spot-on when operating at such a long focal-length, particularly if the "seeing" is not good.

**PREVIOUS ISSUES:** Following a number of queries from members about past issues of the Journal remember that any of these are downloadable from the member's section of the website. Some front page samples are below. Click on this page to go to the download page on the website. The Newsletters (including copies of this Journal) are in Library – Newsletters. You will need to log in.

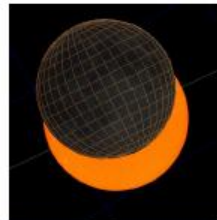
**BOLTON ASTRONOMICAL SOCIETY**  
NEWSLETTER No. 2  
January 2011



- From the BAS Web Gallery...1
- Next 2 meetings.....1
- Partial Eclipse.....1
- Scope for improvement.....2
- Orion the Hunter.....3
- It's all happening on 4 Jan.....4
- Crossword 1 Solution.....5
- Crossword 2.....6
- Crossword 2 Clues.....7
- Solar System Objects.....8

**PARTIAL SOLAR ECLIPSE ON 4<sup>TH</sup> JANUARY**

A partial solar eclipse will be visible from the UK on 4<sup>th</sup> January. The eclipse at maximum will appear as shown below.



Unfortunately the maximum occurs at around 08:14 and the sun will not rise until around 08:27 in Lancashire so only the latter part of the eclipse will be seen. Obviously it will require clear skies and an unobstructed view but if any observations are made at all by members – positive or negative – any reports of these will be welcome for inclusion into the next issue of the Newsletter.

Look out for the **Quadrantid Meteor Shower** 4<sup>th</sup> January 2011

**Stargazing Live**  
A series of events across the UK in January 2011  
<http://www.bbc.co.uk/programmes/b00wvrvf>

**Next 2 Meetings**

4<sup>th</sup> January 2011 7 p.m.  
**Supernova Hunting**  
Len Adam BAS

18<sup>th</sup> January 2011 7p.m.  
**Activity Night**  
"Show and tell" and "New Toys"  
BAS Members



Carl Stone Jupiter



The Moon T Brandwood

**IMAGES FROM THE BAS GALLERY**

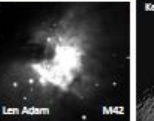
Find more like this on the BAS Website



Ross Wilkinson



Mike Scheffel Jupiter



Len Adam M42



Kevlin Maltafus Moon



David Ratledge Wizard Nebula

Please send magazine articles /contributions to Len Adam. lenadam@sky.com

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

**BOLTON ASTRONOMICAL SOCIETY**  
NEWSLETTER No. 3  
February 2011



**BAS Chairman David Ratledge looks back at 2010 and forward to 2011**



Firstly, may I wish all our members a happy and successful New Year. Hopefully we will get some good clear nights in 2011 although the recent ones at -15°C were a bit too cold for me. I used the excuse of it being too cold for the telescope to stay safe and warm in doors.  
Last year was quite a year for us with our move back (home) to Ladybridge from the TIC. The TIC was pretty depressing once Paul had left and Bolton Council took over. Julie, the centre manager, did her best but it was never the same – plus the huge hike in room costs – made the decision to move on inevitable.  
The move has also helped membership numbers. We must now be close to an all time high. It is also great to see families and younger members attending. You are very welcome. We have a new problem though – fitting everyone in!  
So far we have always managed it but it has been quite full on occasions. A great problem to have!  
As regards the format of meetings, the change to more activity evenings seems to have been popular. However, please pass on your comments, either to me or any committee member, as to what you would really like. If we need to cover something else let us know. Also if you can participate in the "show and tell" type meetings by all means do so. You don't have to be an expert – just someone interested in a particular topic. We will be pleased to hear from you.  
We are always on the look out for guest or member speakers. If you feel you give a talk, or know someone who could, again please let us know. The more that get involved the better. Go on give it a try!  
David Ratledge,  
Chairman of Bolton Astronomical Society

**Next Meeting**

"Digital imaging for beginners"  
How to get results with digital cameras and webcams  
BAS Members  
15<sup>th</sup> February 2011  
Full Meeting List inside

**In this Issue**

**Astro-Imaging with a Digital Camera**  
Ross Wilkinson with the first of his 3-part series.

**Images from the Web Gallery**  
Four superb images from David Ratledge and Ross Wilkinson

**Book Reviews**  
Two reviews in this issue of books by authors John Gribbin and Stephen Hawking

**February Objects of Interest**  
Six objects to view this month

**Featured Constellation**  
AURIGA

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**BOLTON ASTRONOMICAL SOCIETY**  
NEWSLETTER No. 4  
March 2011



**Next Meeting**

"Observing Artificial Satellites"  
Optical and radio observations, including the *International Space Station*  
Ross Wilkinson  
Bolton Astronomical Society  
Full Meeting List inside  
1<sup>st</sup> March 2011

**BOLTON ASTRONOMICAL SOCIETY**

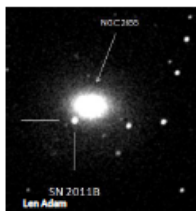
would like to welcome the following new members:

- John Brannan
- Stuart Edney and his son James
- Christine Taylor
- Shirley Holden
- Paul Barnes and his son Jack

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.

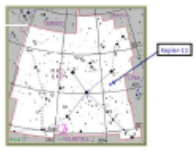
**Astronomy News**

Some of the latest items of interest



**Bright Supernova in NGC 2655**  
The second supernova discovery of the year is visible at magnitude 13 adjacent to the Galaxy NGC 2655 in Camelopardalis. It is a Type Ia supernova explosion in a binary star system.

**Cygnus & Kepler-11**



Potentially habitable planets have been discovered by NASA's Kepler mission. Five of the planets discovered are near Earth's size and lie in proximity to suns within the zone that would allow the existence of water on the surface of the planets. The stars corresponding to these planets are smaller and cooler than the Sun. Kepler also found a Sun like star (Kepler – 11) in Cygnus with six planets!

**In this Issue**

**Astro-Imaging with a Digital Camera**  
Ross Wilkinson with the second of his 3-part series.

**Imaging the Deep Sky**  
The first of a 2-part series from David Ratledge

**Book Review**  
A Review of "The 100 Best Astrophotography Targets" by Ruben Kier from David Ratledge.

**Images from BAS Members**  
Images from David Ratledge, Gerald Bramall and Len Adam

**Crossword Number 4**  
And the solution to Crossword 3

**March Objects of Interest**  
Six objects to view this month

**Featured Constellation**  
URSA MAJOR

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**BOLTON ASTRONOMICAL SOCIETY**  
NEWSLETTER No. 5  
April 2011



**Next Meeting**

"Monsieur Messier  
One man and his Catalogue"  
How the famous catalogue of "faint fuzzies" arose, and how we use it today  
Carl Stone and Ross Wilkinson  
Bolton Astronomical Society

5<sup>th</sup> April 2011

**BOLTON ASTRONOMICAL SOCIETY**

would like to welcome the following new members:

- Dean Kos
- William Humphreys
- John Mullineux
- David Cotton
- Antony Walmisley
- Derek Haworth

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**Astronomy News**

Some of the latest items of interest

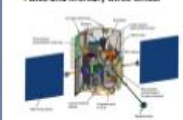
**NEW DISTANCE RECORD FOR GALAXY**

More distant galaxies are further back in time and so are nearer the Big Bang. Galaxy UG1-395462194 has been imaged by the Hubble Space Telescope at a distance of 33.2 billion light years.



**MESSENGER ARRIVES AT MERCURY**

The Messenger Spacecraft entered orbit around Mercury on March 18<sup>th</sup> 2011. It was launched on August 3<sup>rd</sup> 2004. It has flown past Earth once, Venus twice and Mercury three times.



MESSENGER has a highly elliptical orbit with a low point of 200 miles and a high point of 9000 miles.

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**Imaging the Deep Sky**  
The second half of a 2-part series from David Ratledge

**Society Library**  
Books available from the Society Library from our librarian Richard Newall

**Images from BAS Members**  
Images from David Ratledge, Gerald Bramall, Carl Stone and Len Adam

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**Featured Constellation**  
PERSEUS

Please send magazine articles /contributions to Len Adam. lenadam@sky.com

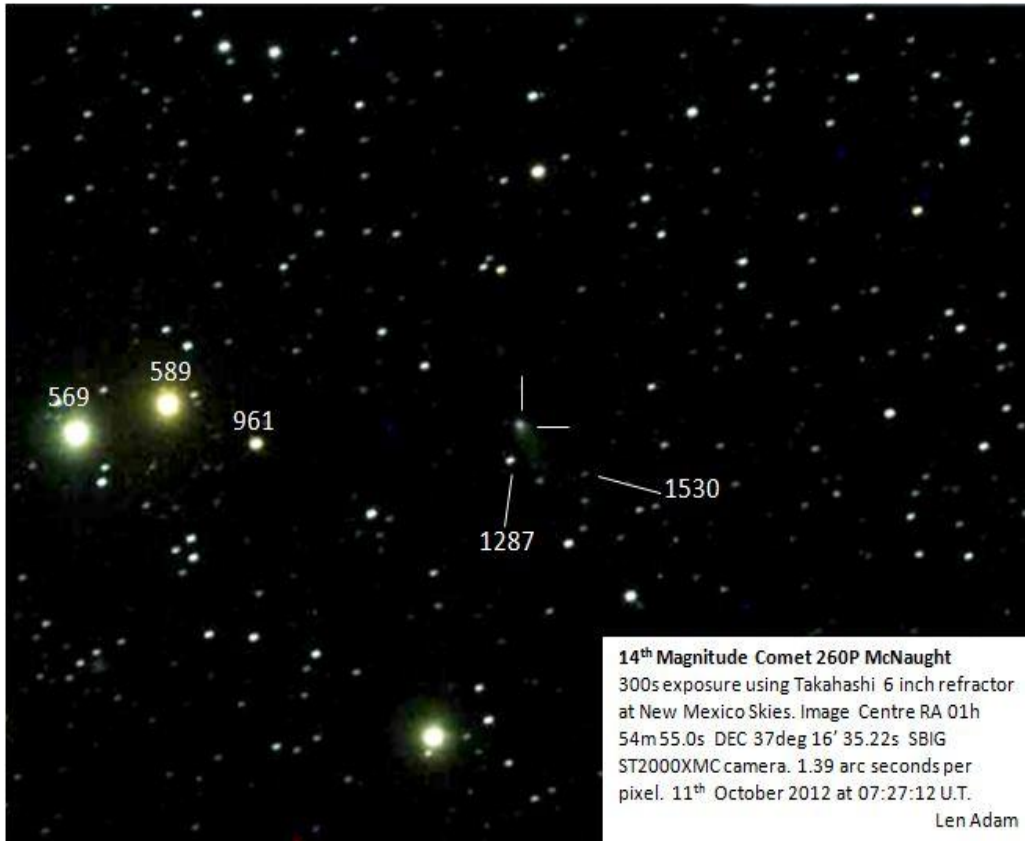
METINGS: Ladybridge Community Centre Beaumont Drive Bolton BL4 4RZ  
Non-members invited to drop in to meetings which are held every other Tuesday evening at 7.30 p.m. £2 charge per meeting or £20 annual membership.  
Go to <http://www.boltonastro.org.uk/calendar> to find the next meeting. There are plenty of parking spaces at the centre.



A sample of observations and comments from my personal log for last month . Similar content from any member of the BAS welcome for future Journals!  
 Len Adam ([Full log is here](#)). (44 PAGES)

Not a very good month in Lancashire for observing so having access to remote telescopes is an excellent alternative for some targets. However using a remote telescope for a supernova search would be expensive – for example imaging 200 galaxies at 30 seconds each – a typical night using my C14 under clear skies would take 100 minutes of time just for imaging and with a typical rate of \$1 per minute would cost \$100 per night – even if access for that length of time were possible. However using a remote telescope to check a suspect supernova is a different matter. Clearly you need to use a telescope where you can get a quick response otherwise it would be pointless. For objects such as Comets or Asteroids remote telescopes are extremely useful.

Thursday 11<sup>th</sup> October 2012  
 Comet 260P McNaught



As indicated by the P in its title this comet is a periodic comet. It has a period of 7 years.

One advantage of using a remote telescope is that you can acquire images at convenient times. I was able to get this image at 8.27 BST on Thursday morning 11<sup>th</sup> October. This telescope is part of the iTelescope.net organisation which allows you to directly control the telescope and receive immediate images – a fully automatic system.

**14<sup>th</sup> Magnitude Comet 260P McNaught**  
 300s exposure using Takahashi 6 inch refractor at New Mexico Skies. Image Centre RA 01h 54m 55.0s DEC 37deg 16' 35.22s SBIG ST2000XMC camera. 1.39 arc seconds per pixel. 11<sup>th</sup> October 2012 at 07:27:12 U.T.

Len Adam

The orbit of Comet 260P McNaught can be seen by visiting the Jet Propulsion Laboratory website page for this object that uses a Java Applet that allows you to set the date and see exactly where it is in relation to the solar system and the Earth. Set it to 11<sup>th</sup> October to correspond to the above image. You can see that the comet is just outside the orbit of Mars and is classified as a Jupiter family comet. When the image was taken it was at a distance of 0.59 A.U.

The website is <http://ssd.jpl.nasa.gov/sbdb.cgi?orb=1;sstr=260P>

# Saturday 13<sup>th</sup> October 2012

This turned out to be quite a busy day for astronomy for me.

## 0168P Comet Hergenrother.

Frustrated by cloudy skies I decided to use the iTelescope.net telescope network to image this comet which was discovered recently. The telescope I used was the same as above – a Takahashi TOA150 and the camera an SBIG ST2000XMC. This combination gives a field of view of 27.8 X 37.1 minutes of arc.



Two images of Comet Hergenrother were taken which clearly show the movement of the comet. The FITS data file below shows the Date and Time of exposure. (U.T.) for each image. Both exposures were 5 minutes. The position given in RA and DEC is the centre of the image.

Date (CCYY-MM-DD): 2012-10-13  
Time (HH:MM:SS.SSS): 06:12:42.000  
Instrument: SBIG ST-2K Color Dual CCD Camera  
Observer: Len Adam  
Telescope: ACP->iTelescope.Net T3 Tak TOA-150  
Object: 0168P  
Origin:  
Comment:

Right ascension: 23 53 37.49      Width (pixels): 1600  
Declination: +27 51 45.1      Height (pixels): 1200  
Exposure (seconds): 300.000      Bits per pixel: 16



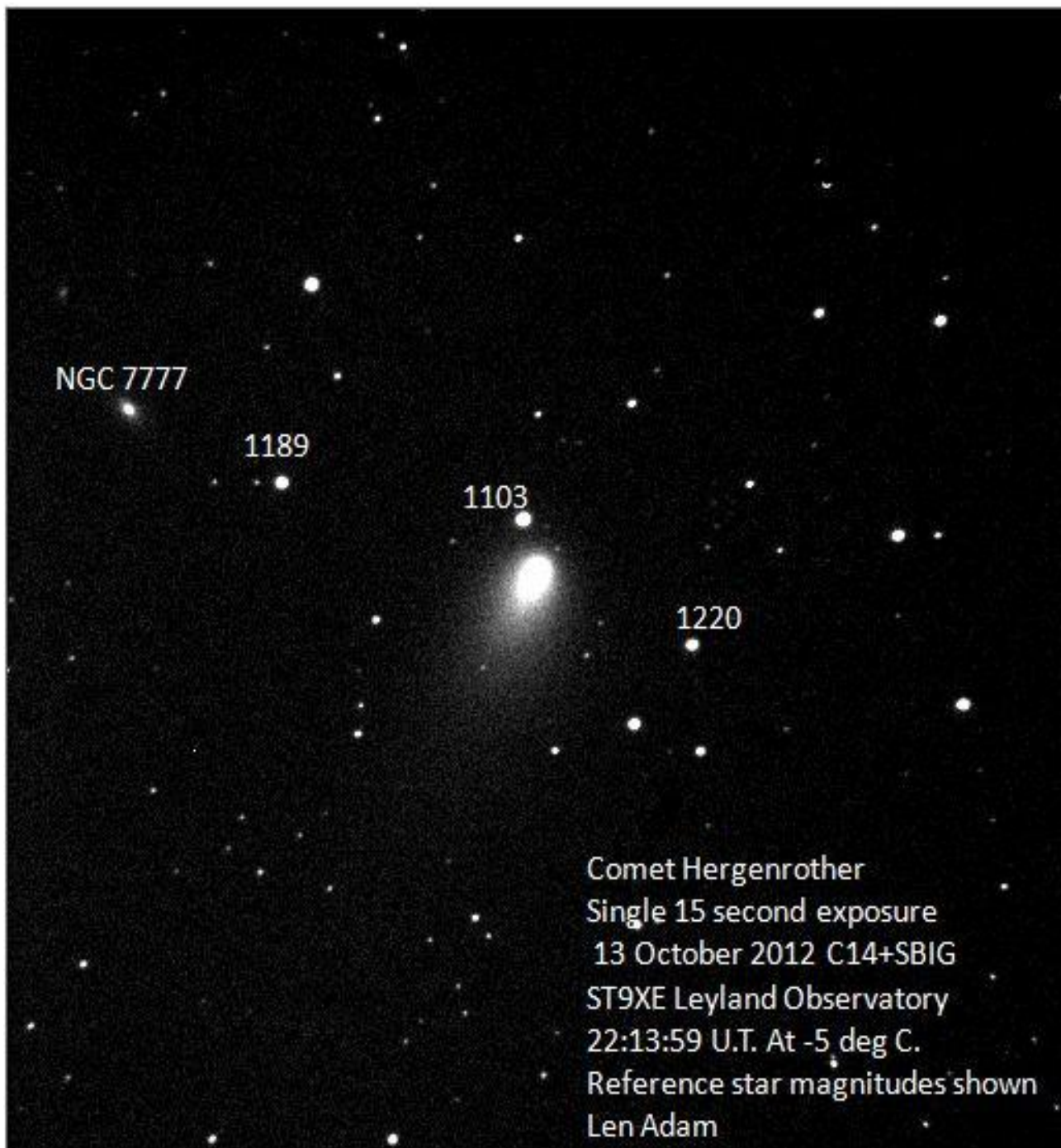
Date (CCYY-MM-DD): 2012-10-13  
Time (HH:MM:SS.SSS): 06:43:42.000  
Instrument: SBIG ST-2K Color Dual CCD Camera  
Observer: Len Adam  
Telescope: ACP->iTelescope.Net T3 Tak TOA-150  
Object: 0168P  
Origin:  
Comment:

Right ascension: 23 53 35.86      Width (pixels): 1600  
Declination: +27 52 30.1      Height (pixels): 1200  
Exposure (seconds): 300.000      Bits per pixel: 16

As can be seen from the FITS files images were taken 31 minutes apart giving an indication of the rate of movement of the comet. Using the Jet Propulsion Laboratory applet and setting the date to the 13<sup>th</sup> October 2012 gives its orbital position – just crossing the orbit of Mars and a distance of 1.42 Astronomical Units from the Sun.

[http://ssd.jpl.nasa.gov/sbdb.cgi?ID=c00168\\_0;orb=1;cov=0;log=0;cad=0#orb](http://ssd.jpl.nasa.gov/sbdb.cgi?ID=c00168_0;orb=1;cov=0;log=0;cad=0#orb)

Having taken the above images through the telescope New Mexico Takahashi refractor at New Mexico Skies on the morning of 13<sup>th</sup> October I was able to take a series of images from my observatory in Leyland during a clear (but moist) spell that night. One of these is shown below. This is a 15 second image using my C14 and SBIG ST9XE using an f/6.3 focal reducer giving an image size of 14.76 minutes of arc. Unlike the above images my CCD chip is square so the dimensions are the same on X and Y axes.



The galaxy NGC 7777 is shown on the image. This is a 13<sup>th</sup> magnitude lenticular galaxy with a Major axis of 1.2 minutes of arc. I came across a video in Flickr that caught the comet at the same time but is upside down in relation to mine. North is up in my image. It also shows the nearby galaxy.

<http://www.flickr.com/photos/cho-web/8084437139/>

To keep up with comets that are current go to this (really ) excellent website:

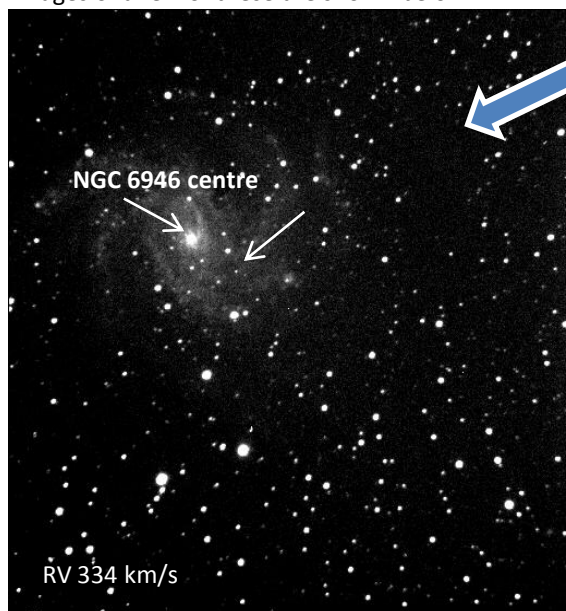
<http://cometchasing.skyhound.com/>

The website suggests comets to observe for telescopes of different apertures. Go to the [finder chart](#) for each comet.

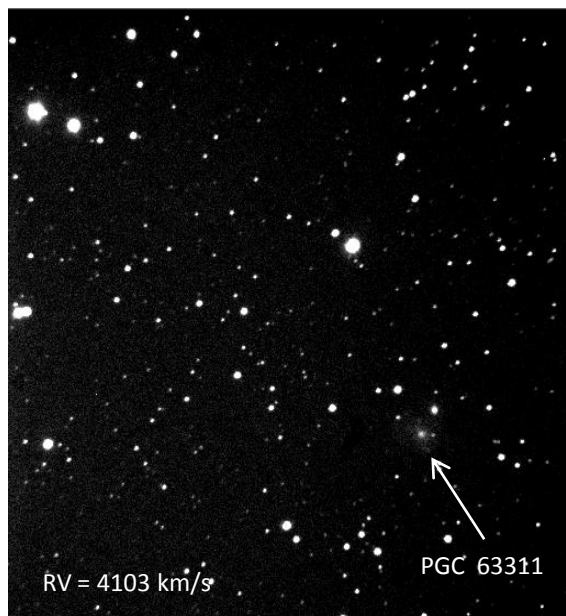
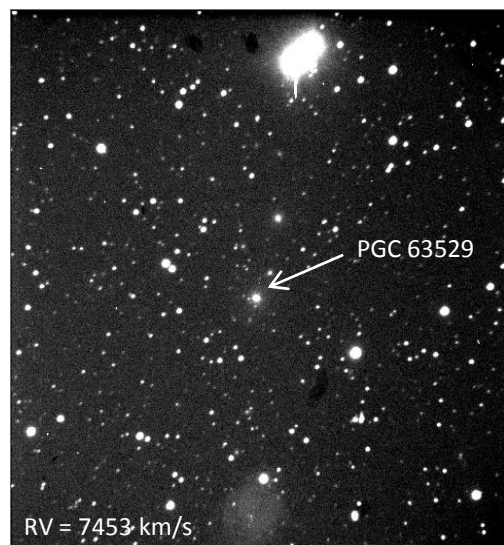
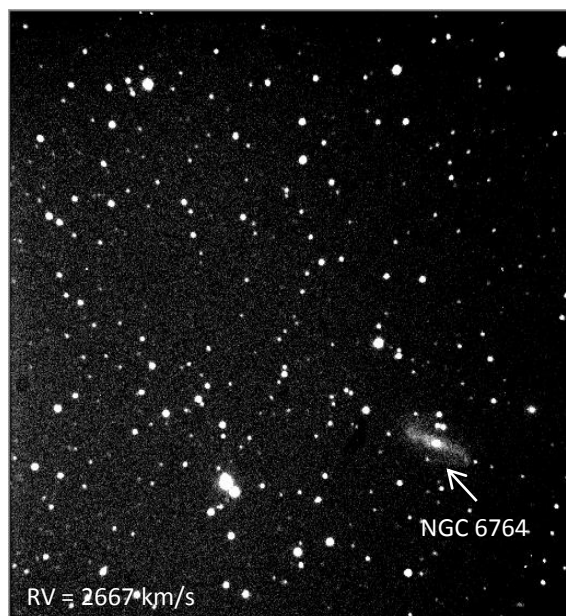
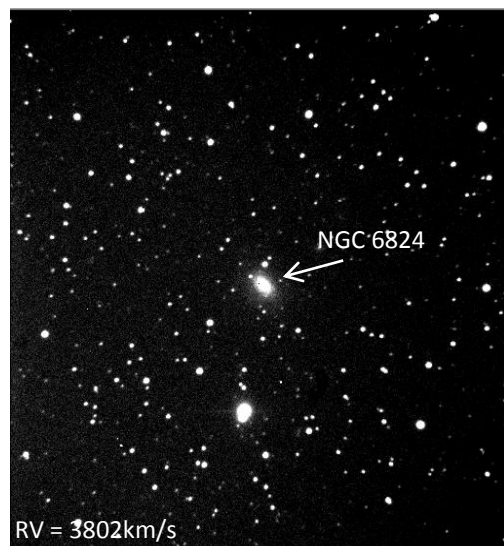
Having imaged the comet I turned my attention to a galaxy run to search for Supernovae. I decided to image galaxies in Cygnus as the constellation had cleared the massive oak tree to the South West of the observatory. I have a list of 42 appropriately selected galaxies in Cygnus as below. All images 30s C14+SBIG ST9XE.

1	NGC 6946
2	NGC 6764
3	PGC 63311
4	NGC 6824
5	PGC 63529
6	PGC 63766
7	NGC 6798
8	IC 4867
9	NGC 6801
10	PGC 63696
11	PGC 63664
12	PGC 63927
13	PGC 63514
14	NGC 6916
15	PGC 64026
16	PGC 67832
17	PGC 63552
18	PGC 63440
19	PGC 63424
20	PGC 63629
21	PGC 63345
22	IC 1301
23	PGC 63308
24	PGC 63794
25	PGC 63367
26	PGC 67712
27	PGC 67262
28	PGC 67265
29	PGC 67235
30	PGC 66592
31	PGC 66867
32	PGC 67246
33	PGC 67240
34	PGC 90392
35	IC 1303
36	IC 1392
37	PGC 66585
38	PGC 66281
39	PGC 67049
40	NGC 7013
41	NGC 7116
42	PGC 90392

Images of a few of these are shown below.



The “star” pointed at by the arrow on the right in NGC 6946 turned out to be a hot pixel . Note that South is UP in all these galaxy images. No SN found.

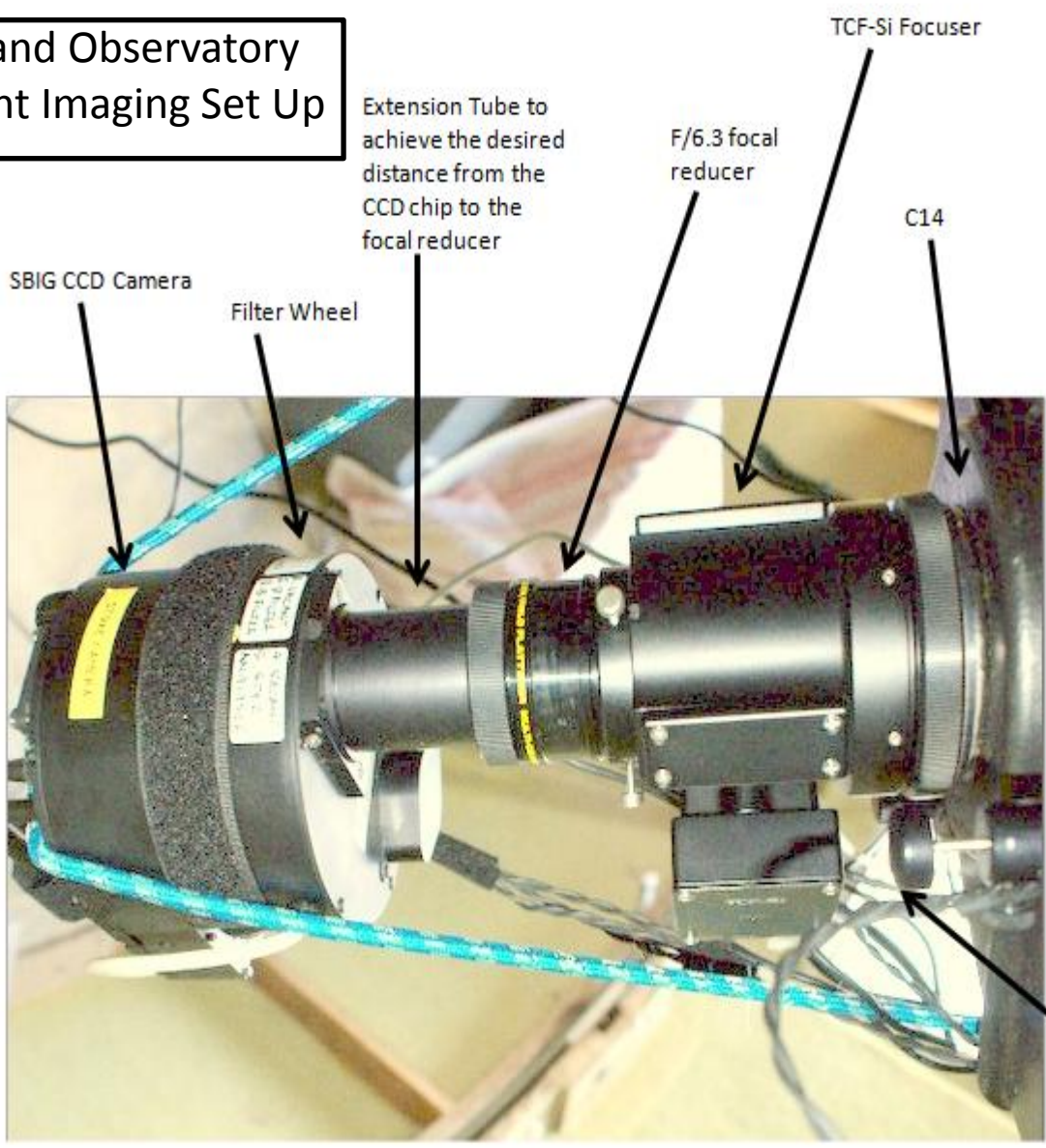


The recession Velocity of each galaxy is shown at bottom left . (From Principal Galaxy Catalogue) The larger the recession velocity the further away the galaxy is. To calculate the distance to each galaxy I simply divide the Recession Velocity by the Hubble Constant. (I assume this is 75 km/second per Megaparsec. ) 1 Megaparsec is 3.26 million Light Years to put it in more familiar terms. The Hubble Constant tells you how fast the Universe is expanding so if the Universe was expanding faster the Hubble Constant would be larger and the distance (for a particular recession velocity) would be less because the galaxy took less time to get there!

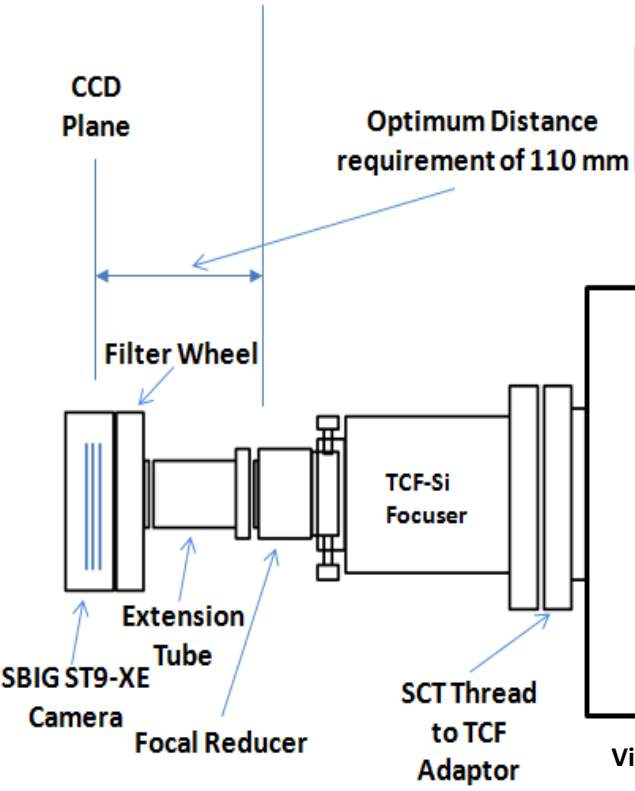
All of these images have a field of view of 14.75' X 14.75'. The setup that results in this FOV is shown on the next page.



# Leyland Observatory Current Imaging Set Up



Plane of base of reducer thread



The arrangement that is delivering a 14.75' X 14.75' image at Leyland Observatory is shown here.

**Celestron C14 OTA**



Visit my [website](#) to see the other activities last month

# A LETTER FROM THE SOCIETY SECRETARY

GEORGE ERNEST GRUNDY

IN DECEMBER 1913

More research from Peter Miskiw and Len Adam

Peter Miskiw the BAS expert on the history of astronomy in Bolton has provided a copy of letter dated 27<sup>th</sup> December 1913 relating to a potential speaker at a society meeting. The letter is addressed to the secretary of the Bolton Field Naturalists Society (Thomas K. Holden - not to be confused with the Holden telescope T.W. Holden) from the astronomy section secretary George E. Grundy, referring to a request to Thomas Thorp - a well known amateur astronomer and scientific and technical genius - to speak at a meeting on 23<sup>rd</sup> March 1914. We don't believe this event took place suspecting that Thorp was ill and that is why he did not reply - in fact he died on June 13<sup>th</sup> in 1914. (See the reason below).

37 Charles Bolden St  
Bolton  
Dec 27/13.

Dear Mr Bolden

I am sorry that I cannot forward the astronomical programme for our coming syllabus, I wrote to Mr T Thorpe of Whitefield ten days ago and enclosed a stamp for reply but have not received his reply yet. I asked him to oblige us with his lecture on March 23/14, also visit to his workshop



The letter was written by the astronomy section secretary George E. Grundy in this street (2012 streetview image) and below is the very house in the address! I don't know what the writer would have thought of the following:  
<http://www.theboltonnews.co.uk/news/8372388>.  
[Street is the star as film company comes to town/](http://www.theboltonnews.co.uk/news/8372388)



Reference is made to T. Thorp (There is not actually an "e" at the end) of Whitefield who also had a property (and observatory) in Prestatyn that I have managed to track down following the clues in the cutting sent by Peter and in the Wikipedia article about him. It is not one of the properties that Peter has pictures of but does have a dome in the roof. (See below) The property in Whitefield is evidently still there and I have tracked down what I think is the road but trees obscure the houses. (Streetview).

First of all though who was George Grundy. Read this extract from Peter:

The Society was blossoming, and the Astronomical Section, established in 1912, had developed to such a degree that a place was sought to be a site for its own observatory. Eventually a Mr. Hunt who owned a nursery at Markland Hill made available such a site at an annual charge of 5/- (25p) and allowed the Section to hold meetings in his potting shed at 1/- (5p) per night. Here a fine observatory was erected and the Museum Committee allowed the Section to borrow the Astronomical Telescope from Queen's Park. This telescope had been presented to the Museum by Councillor T. W. Holden and forms of agreement were drawn up, which the Society still possesses.

Hunt's Nurseries were later bought by George E. Grundy, secretary of the Astronomical Section, and are still in production (1986) and known as Grundy's Nurseries even though owned by Mr. John Hampson who showed the author the spot where the Observatory had been. He remembered it and, like many of our older members, George Grundy as well.

In these early days...

So it was George that bought Hunt's Nurseries later known as Grundy's Nurseries (see the last article on the Markland Hill Observatory) that was the society observatory site. This was quite a change for George – for the better I suspect – as his previous occupation was as a Stover in the Bleach Works. (Or is it Stoker?) (See 1911 Census extract below)

No.	Name	Sex	Age	Mar.	Prof.	Rel.	Occ.	Remarks
1	George Ernest Grundy	Head	27	Married	Stover			Bleach Works
2	Mary Grundy	Wife	31	Married	La.			

(To be filled up by, or on behalf of, the Head of Family or other person in occupation, or in charge, of this dwelling.)

Write below the Number of Rooms in this Dwelling (Kitchens, Tenant, or Apartment). Count the Kitchens as a room but do not count scullery, landing, lobby, closet, bathroom; nor warehouse, office, shop.

I declare that this Schedule is correctly filled up to the best of my knowledge and belief.

Signature: George Ernest Grundy

Postal Address: 37 Charles Holden St. 1321m

Now on to the potential speaker Thomas Thorp

Here is an article extract about him:

Thorp was a "scientific and mechanical genius" In pursuit of his childhood interest in astronomy, he developed considerable skills in the manufacture of optical glass and both reflector and refractor telescopes. He also created celluloid diffraction grating replicas, polarising solar eyepieces and prominence spectroscopes that were widely used, as well as objective prisms. His high resolution diffracting grating replicas were significant advances of the ideas developed by Henry Rowland, whilst his multi-slit spectroscope was the first to enable the showing of both celestial and terrestrial objects and has formed the basis for the present day spectrohelioscope. Father Aloysius Cortie, of Stonyhurst College, Lancashire, was one whom achieved good results from an example of the objective prisms. Eventually owning houses in Whitefield and also in Prestatyn, North Wales, he constructed observatories at each of these and favoured the 8 inches (200 mm) Cooke equatorial telescope for his own observations. This device was fitted with a photo-visual objective, a spectroscope and other attachments that enabled it to be used for photography.

Thorp's innovative design for celluloid diffraction grating replicas won him the Wilde Premium for Original Research in 1901, principally in recognition of his paper of 1899 entitled *Grating Films and their application to Colour Photography*. He was also recognised by awards from other bodies, including international exhibitions. His diffraction gratings were particularly noted in an obituary, which said that they made

... the study of spectroscopic astrophysics possible to so many lovers of the science. In addition to putting these on the market at a moderate price, he was most lavish in his generous distribution of them to professional and amateur workers throughout the world.

Prior to his developments, details of which he published but did not patent, interested people had to rely upon the photographic methods that had been proposed by Lord Rayleigh and Izarn. Thorp's "brilliant idea", announced in 1898 and improved thereafter through experimentation and the development of new materials, was to take "a cast of the ruled surface in a transparent medium [comprising] a thin solution of celluloid in amyl acetate." He described his method on numerous occasions, including a letter published in the 29 December 1905 edition of the *British Journal of Photography* (reproduced in *Popular Astronomy*, 1906). He emphasised the need for a dust-free environment and a uniform drying of the solution as well as asserting that his was the "first method of producing optically useful replicas of gratings and one which after all has not in my opinion been superseded." By 1900 he was able to apply his developments to colour photography and he went on to demonstrate to the British Astronomical Association a method for projecting natural colours that used "three replicas adjusted to diffract the proper colour sensations to the eye".

(2)

and Observatory the following dates for visit, Feb 7<sup>th</sup> or Feb 21<sup>st</sup>, Mr Shope can decide which. This is my little difficulty and I will forward you the reply at once when I receive same. Mr y Gibbs F.R.S., has promised to give our Society lantern lecture on Feb 16<sup>th</sup>. The subject he has chosen, ~~am~~ (amateur astronomers and their observations). Mr Gibbs wishes to catch the 9.30 train from Bolton. She visits of the public to the



This is Thomas Thorp with a British Astronomical Association group attending the solar eclipse in Algiers in 1900. Peter asks if anyone can fathom out what the equipment is in front of him. See later – I have solved it! (LA)

His obituary from the Royal Astronomical Society (elected 1902) is here and tells an amazing story.

<http://articles.adsabs.harvard.edu/full/gif/1915MNRAS..75..250./0000250.000.html>

**Rumour has it that he was unfortunate enough to meet Marie Curie who made a gift of some radium in a metal container to him – he used to keep it in his pocket! He died eventually of radiation poisoning at his home in Prestatyn!**



This is "Uplands" where Thomas Thorp died in 1914. The images are from Streetview.

There is another image and a brief article about him on this website.

[http://crimpy-degree.wix.com/harry-thomas#!\\_page-14](http://crimpy-degree.wix.com/harry-thomas#!_page-14)

In this it says that he also invented the coin operated gas meter and the colour camera....

Read all about him on Wikipedia:

[http://en.wikipedia.org/wiki/Thomas\\_Thorp\\_\(scientific\\_instrument\\_manufacturer\)](http://en.wikipedia.org/wiki/Thomas_Thorp_(scientific_instrument_manufacturer))

And here:

[http://en.wikipedia.org/wiki/File:Thomas\\_Thorp\\_in\\_Algers,\\_May\\_1900.png](http://en.wikipedia.org/wiki/File:Thomas_Thorp_in_Algers,_May_1900.png)



(3)

Observatory will be as follows,  
 First visit January 14<sup>th</sup> Wednesday  
 meet at Markland Hill Lane  
 Chorley new rd. bar steps 1-0.  
 at 7.30<sup>PM</sup>

---

2, visit, February 4<sup>th</sup> 14. meet  
 as above 7.30<sup>PM</sup>

3. Visit Feb 18<sup>th</sup>. meet as above

4. visit, ) March 11<sup>th</sup>. meet as above.

5. Visit March 25<sup>th</sup>. meet as above

These dates are for the

(4)

public. The use of the Observatory  
 for the Society. meetings and  
 Observations held every Saturday  
 whether clear or not.  
 nights for Observations, Tuesday  
 Thursday & Saturday, 7.30<sup>PM</sup>  
 to eight o'clock at Observatory.  
 I hope this is clear enough  
 Mr Holden, I was at Mr  
 W W Midgley's last Wednesday  
 I have bought a new microscope  
 from Watsons, Mr W Dewhurst  
 bought my other. in

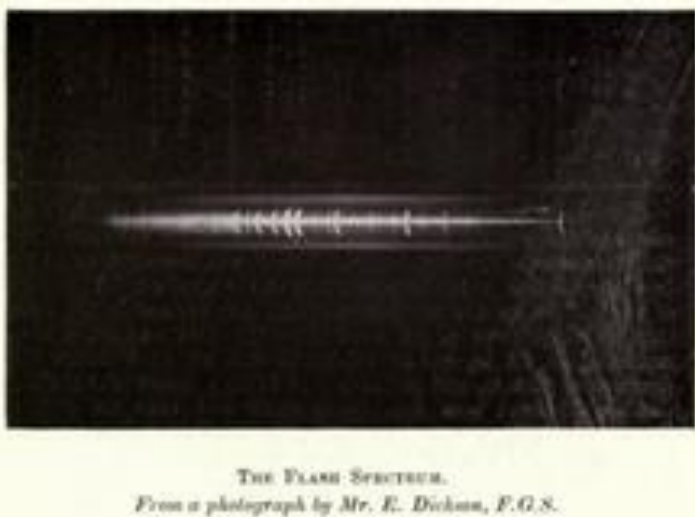
In researching Thorp further I discovered he was a Vice-President of Manchester Astronomical Society. In doing so I discovered that the society history describes exactly what I believe he was doing in the photograph in Algiers in 1900.

The link here describes it.

<http://www.mikeoates.org/mas/history/part1.htm#1892-1894>

“One novel application of his celluloid replica grating was the direct observation of the solar chromosphere during the total eclipse of 1900. By placing the grating in front of one object lens of a pair of binoculars and viewing the eclipsed sun by looking downwards through the instrument at the sun reflected in a silvered mirror, he was able to watch as the spectrum at the solar limb suddenly reversed as the hydrogen alpha line in the chromosphere flashed into view. This so-called flash spectrum is caused by ionised hydrogen in the solar chromosphere.”

In fact there is an image of a flash spectrum using this technique in the Wikipedia article! He attended another total eclipse in 1905 in Burgos in Spain where this relates to!



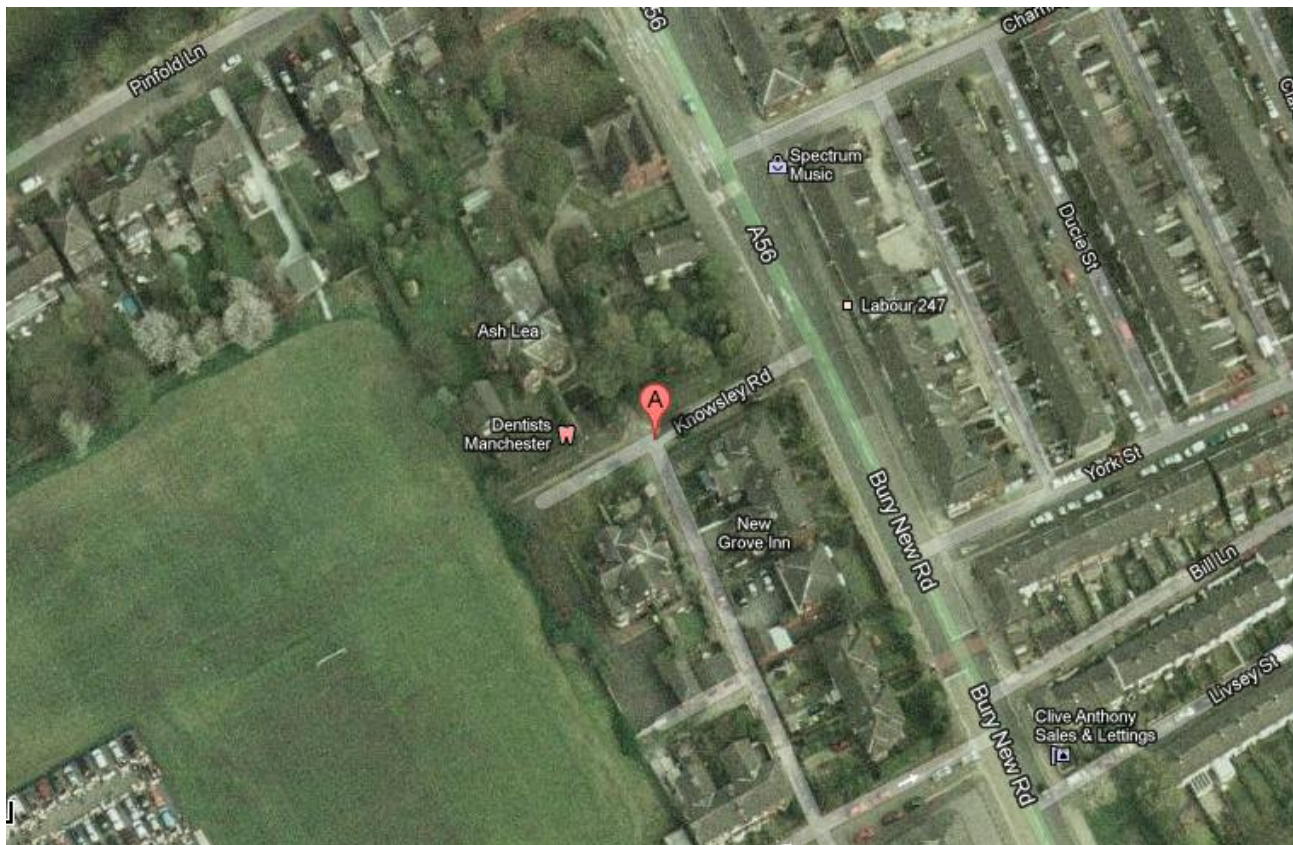
**From Wikipedia:** Thorp's Whitefield house was called *Moss Bank*, on Knowsley Street; and that in Prestatyn was *The Uplands*.<sup>[19][20]</sup> As of 2012<sup>[update]</sup> both still exist.

“Around 1883 [Thomas Thorp](#) established an engineering business in Victoria Lane, complete with an astronomical observatory on its roof for his own use. He invented the penny-in-the-slot gas meter” (Link below) Known as Narrow Lane at the time) [So could there be a third observatory?]

[http://en.wikipedia.org/wiki/Whitefield,\\_Greater\\_Manchester](http://en.wikipedia.org/wiki/Whitefield,_Greater_Manchester)

45	Knowsley Rd	1	Mary Smith	servant	0	27	John	100	100	100
			Thomas	Head	50					
			Margaret	Wife	50					
			William	Son	24					
			Elizabeth	Daughter	20					
			Arthur	Son	18					
			John	Servant	5					

The above census extract shows 3 sons with one called Franklin which corresponds to the Wikipedia reference so it is pretty certain that this is the correct address in Whitefield. ( It is Knowsley Road not Knowsley Street - The 45 is not the house number.) This could be the other house with an observatory but it can't be traced on street view. If anyone is passing could they try and spot a dome?



Finally there is another reference to a speaker in the letter – a Mr G. Gibbs. I think this is him in a Stonyhurst College report.

**xi.**

as last year; and the mean daily range of magnetic Declination (in minutes of arc) at 12.1. These are included in the following table for comparison with the corresponding *means* of the past five years:—

Year.....	1911	1912	1913	1914	1915	1916
Spot Area .....	0.33	0.22	0.04	0.82	4.51	4.52
Declination range	12.6	8.1	9.7	10.2	11.7	12.1

A new projection apparatus, designed and made by Mr. G. J. Gibbs, F.R.A.S., consisting of an aluminium collar and bicycle rods, was fitted to the equatorial during the year. It is found to be very light and rigid.

During the year, in the summer months, some very good and detailed drawings of the faculae were made by Mr. W. McKeon, a list of which follows. It would be an interesting study to compare them with spectroheliograms in hydrogen and calcium light obtained on the same dates. Applications for such records have quite recently been made.

**Can members find any other references to G. Gibbs?**

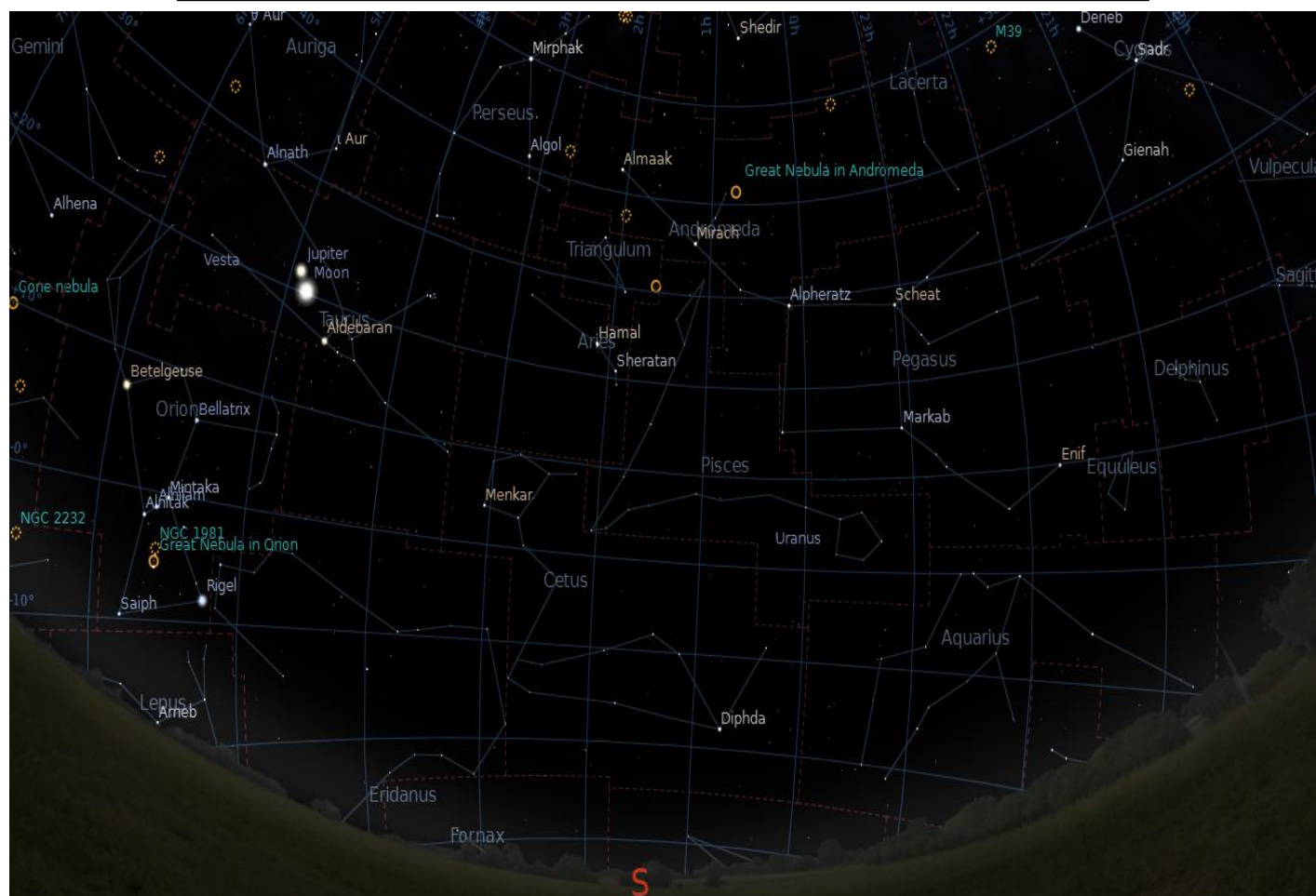
More to follow.



# November Objects of Interest 2012



STELLARIUM VIEW OF THE SOUTHERN SKY AT 10 P.M.ON 1<sup>ST</sup> NOVEMBER 2012



Click on the image above to see the Hubblesite video of the November 2012 Night sky.



## Meetings Schedule November 2012 to May 2013

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". Activity nights will be posted on the website so keep an eye on that for details.

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](mailto: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.*

Date	Subject	Presented by
6th Nov 2012	<b>Guest speaker: Researching Star Formation</b> As well as touching on theoretical understanding, Dave will present theories on how stars form from the molecular cloud. He will also present brand new results from Milky Way-scale surveys	<b>David Eden</b> Liverpool John Moores University
20th Nov 2012	<b>Members Talk: "Show and Tell"</b> Five Minutes! Have a recent purchase you want to brag about, or share some of your own astro-images with us? Then you have <b>five</b> minutes to show and tell everyone. Okay you can have <b>ten</b> if you need.	<b>BAS Committee</b> Bolton AS
4th Dec 2012	<b>Members Talk: "Star Parties 2012"</b> Update on the societies star party to Kelling Heath during Sept. 2012 and a members trip to the inaugural BSIA star party in Wales	<b>Carl Stone</b> Bolton AS
18th Dec 2012	<b>Christmas Party</b> End of season food, festivities and fun. Including Roy's popular Astro-Scrabble team game	<b>BAS Committee</b> Bolton AS
15th Jan 2013	<b>Workshops: "Telescopes"</b> No Presentations, no theoretical just pure practical. Here will we be showing how to use that telescope you purchased for Christmas.	<b>BAS Committee</b> Bolton AS
5th Feb 2013	<b>Members Talk: "Navigating the night sky"</b> Our panel of experts will be showing you how to navigate the night sky using a map, phone app or tablet device.	<b>Dean Kos &amp; Andy Martin</b> Bolton AS
19th Feb 2013	<b>Members Talk: "The Mobile setup"</b> How to image star trails but also what astronomy equipment take on holiday to make those holiday photos more memorable.	<b>Dave Walker</b> Bolton AS
5th March 2013	<b>Guest Speaker: "Moses Holden: 1777-1864"</b> In relation to the <a href="#">History of Astronomy in Bolton</a> a talk on Moses Holden. Astronomer, Evangelist, and much, much, more.	<b>Stephen Halliwell</b>
19th March 2013	<b>Members Talk: "Comets"</b> With Comet PanSTARRS getting brighter Ross will be showing how to find comets and even image them.	<b>Ross Wilkinson</b> Bolton AS
2nd April 2013	<b>Guest Speaker: "Show and Tell"</b> Five Minutes! Have a recent purchase you want to brag about, or share some of your own astro-images with us? Then you have <b>five</b> minutes to show and tell everyone. Okay you can have <b>ten</b> if you need.	<b>BAS Committee</b> Bolton AS
16th April 2013	<b>Members Talk: "My (Short) Career as Radio Astronomer"</b> Devling into physics, optics, space technology and radio astronomy, Rod will be taking about his career as a Radio Astronomer	<b>Rod Hine</b> Bradford Astronomy Society
7th May 2013	<b>Member Talk: "Observatories"</b> An update on the re-fit of the his observatory and offering some tips on how to build your own.	<b>Carl Stone</b> Bolton AS