

# Altair

Newsletter of the Croydon Astronomical Society



## February 2010 Issue

Hello and welcome to our eleventh edition of Altair

## Lectures these coming months

<b>Friday 5th February 2010</b>	We are having an ' <b>Ask an Astronomer</b> ' evening. Please submit your questions prior to the meeting by email to 'AskAnAstronomer@CroydonAstro.org.uk' or use the forms at the meeting. Questions are welcome on subjects from Telescopes to Cosmology.
<b>Friday 19th February 2010</b>	Tonight <b>John Axtell</b> from Guildford Astronomical Society will take a historic look at the space race when he speaks to us about ' <b>Sputnik in Context</b> '
<b>Friday 5th March 2010</b>	The Sun has been very quite recently but that has not stopped the research. Tonight <b>Dr. Lucie Green</b> from <b>MSSL / UCL</b> will tell us about the latest results from the <b>Japanese Hinode Solar mission</b> and how the UK is involved.
<b>Friday 19th March 2010</b>	Postponed from last term, tonight <b>Konrad Malin-Smith</b> will tell us all about the force that pervades the whole Universe – <b>Gravity</b> . It's the glue that holds the Universe together!

*All our lectures are held at the Royal Russell School, and start at 7.45pm*

## Norman Fisher Observatory, Kenley

The observatory will continue to be open on the Fridays, when not at the Royal Russell School (members), and Saturdays, throughout September. Usually we will open around 20:30 UT. Please telephone the observatory beforehand on 020 8668 9642.

During September we will continue our work maintenance within the observatory. This means that for the next three weeks, the Mead LX 200, will be out of action, due to scaffolding.

One other main job to be completed is to treat the wood of the clubhouse.

## Altair\_b

The society has an email discussion group. This allows us to relay information on events, or for members who have an astronomical problem to ask for help. Details can be found on our website on [www.croydonastro.org.uk](http://www.croydonastro.org.uk).

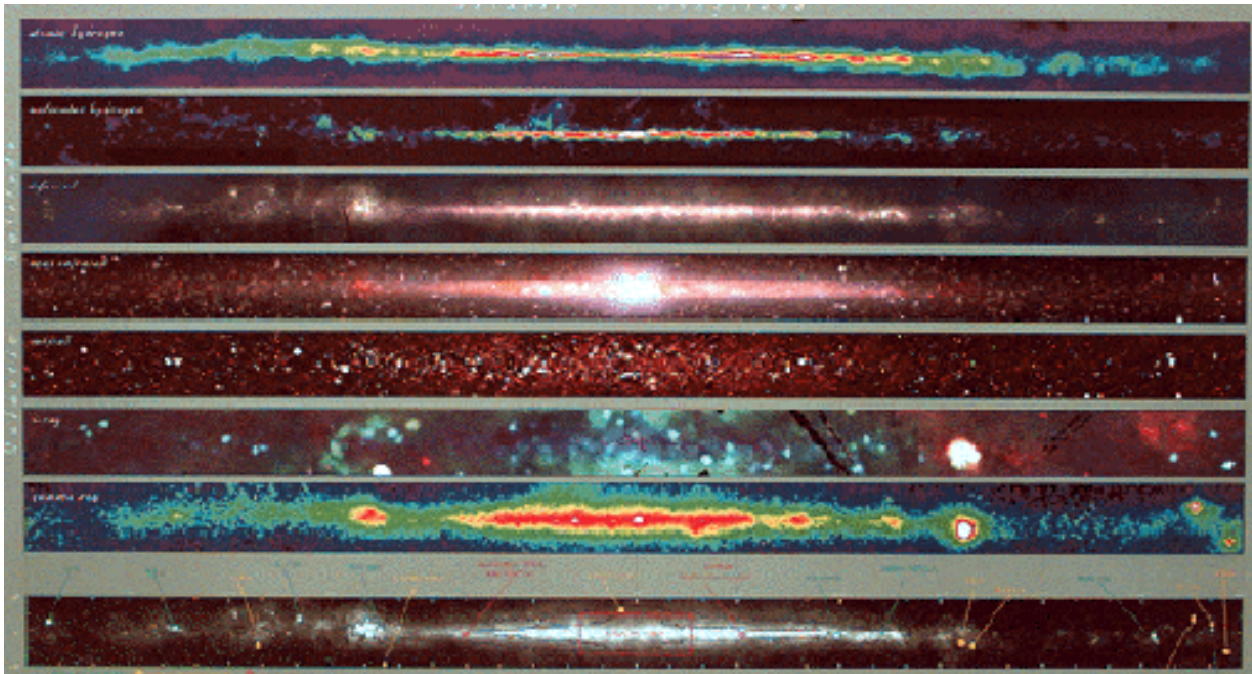
## Astro Bites – February 2010

An assortment of bite size astronomy by John Murrell

### The Universe at different wavelengths

To start this month's edition lets look at a website that allows us to get a deeper insight into how the universe appears at different wavelengths. In general the higher the energy the process emitting the photons the shorter is the wavelength. So very high energy events such as Supernovae emit Gamma Rays, less

Radio. A good place to explore the universe in different wavelengths is using a web tool called Chromoscope which can be found at <http://www.chromoscope.net/>. Operating the slider on the top right of the web page allows you to fade between the different wavelengths. The time taken for the next



energetic bodies such as stars emit visible radiation while the infra red to quote a recent WISE press release is the region of the dark, dusty & dim. In addition to showing how energetic a particular object is the sky is more transparent in some wavelengths than others. For instance our view of the centre of the Milky Way is obscured by dust in visible light, however this dust has much less effect on infra-red so we are able to see all the way to the centre of our Galaxy. The image shows the sky at wavelengths from Gamma Rays to

image to appear is very dependant on the speed of your Internet connection. Having loaded the image use the help link on the bottom left or press the 'h' key to see the help screen. There are single letter keys to jump to each wavelength. Also note the s for search key. This enables you to enter your favourite object and centre it on the screen. You can also download a copy to your computer where it will run faster and allow you to show it in places where there is no Internet connection.

John Murrell

### Binocular (and camera) mounts

If you use binoculars to view the sky you will find out that it is very difficult to hold them steady to get good views of an object. This particularly applies if they have a higher magnification. Having brought a pair of 15 x 70 mm binoculars I soon discovered that holding them steady was quite difficult. I initially tried mounting them on a lightweight photographic tripod but soon discovered two major problems. The first is that I could not get the binoculars high enough to view through the eye pieces, you need to have the binoculars above your standing head height so they are in the correct height when tilted upwards. The second was that the tripod was not very rigid – particularly with the centre column fully extended. I decided to research a higher more rigid tripod and decided to buy a Manfrotto 055PROB (this has been superseded by the 055XPROB but the specs are the same). This type of tripod is supplied without a head which you have to buy separately depending on what you intend to use it for. Needless to say the manufacturers do not include supporting binoculars in their applications so I was on my own. While I could have chosen a geared head I wanted to use it for photography as well so I decided on a three way head though the third axis is not useful for binoculars. After examining the available heads I decided that a 808RC4 was nearest to meeting my requirements. Having used this combination for a couple of years I can say I am very satisfied. The only problem I have found is that the head is described as having a front tilt of – 30 / +90 degrees. To my mind this indicates that the binoculars or camera should be able to be pointed at the zenith and 30 degrees below the horizon – more than adequate for astronomy. However the manufacturers seem to have a different interpretation and the head can be pointed vertically downwards and only 30 degrees above the Horizon. The solution to this is to put the Camera or binoculars on back to front as shown in the image. The only disadvantage of this is that the elevation handle is now on the wrong side and has to be used back to front. I found that I got used to it very quickly and now it seems almost natural and in some ways is easier as you are not in the way of the handle when you are trying to lock it while looking through the binoculars! The head has two angle scales both in azimuth and elevation. If you set the tripod up so the zero point on the azimuth scale is pointing due North this provides a good guide to find an object though the scale is not that easy to read in the dark. The elevation scale is rather small



but useable but I have a better solution for elevation measurement that I will cover another month. The tripod also has a built in bubble level so you can set it up vertically. The only remaining problem is how far you can bend your neck back to align with the binoculars at high elevations. I find that 60 degrees is about the limit and even this quickly gets quite uncomfortable. However for objects below this the view improves immensely over handholding. The tripod head has a quick release plate so you can buy an additional one for your camera and can swap from one to the other in less than a second.

The top image shows the complete tripod though it is not extended to its full height.

The lower image shows the tripod head in more detail. You can see the altitude scale and the azimuth scale just above the tripod column. Note the altitude handle facing the wrong way as discussed above.



If you want to see the tripod and see how this improves the view contact me and I will bring the tripod and binoculars either to the school or to Kenley.

John Murrell

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### How long will my battery last ?

Astronomers use batteries for a number of purposes but in this article I am going to concentrate on the battery packs we use to power our telescopes and dew heaters when we are not able to use a mains supply. There are only two real choices of battery for use with a telescope. The most popular are the sealed lead acid batteries that often are supplied in packs with leads to 'jump start' your car. The other alternative for larger capacities are the 'traction or semi-traction' lead acid batteries used for caravans and boats. These are a lot heavier. These are designed to be discharged to low levels without harm unlike car batteries that are designed to deliver a high current to start your car but not to be deeply discharged. (The guarantee for of a car battery normally exclude their use in applications where they will get deeply discharged such as powering a caravan).



The amount of time that a battery will power your equipment depends on a number of factors principally the capacity of the battery, the power consumption of the telescope and dew heater, how well the battery is charged and the temperature of the battery.

To calculate the time your battery should last you will need some basic understanding of electricity. The first thing to understand is electric current, this is measured in Amperes (normally shortened to A or Amps), this may also be shown as milliamps – a thousand milliamps make up one amp. So to convert from one to the other either multiply or divide by one thousand as appropriate. The best analogy for electric current is to think of a river – the electric current is similar to the amount of water that flows in a river. A milliamp current is like a small stream and a current of lots of amps is like the Thames.

The second concept you need to understand is what is voltage, this is like the difference in height of the bed of the river. River that has a great height difference will have a faster flow than a river of similar width that has little height difference. The symbol used for voltage is the letter V.

The final concept is that of electrical Power that is measured in Watts. This is obtained by multiplying the Voltage in a circuit in Volts by the current in Amps.

To find out how long our battery will last we first need to find out what the capacity of our battery is. If you are using a battery pack similar to those used to jump start cars they frequently quote a large number of amps on the front which is what they will deliver to start a car for a short period but we are interested in the capacity which will be shown as Ampere Hours or Ah. This may be shown on the label, in the instruction leaflet or else you may have to carefully open the unit to read what is on the battery. ( You need to take great care doing this as there is no 'off switch' on a battery and if the two terminals are accidentally connected they can deliver sufficient energy in a short time to melt wires and burn you or even start a fire ). The battery will always be rated at 12 Volts and normally have a capacity of either about 7 or 17 Ah. A caravan battery will normally have a capacity of 60 to 120 Ah.

Having found the capacity of the battery write it down you will need it later for the calculations.

The next piece of information is to find out how much power your telescope requires. You will need to hunt for this in the manual and maybe on the internet. If you have a simple drive without a goto there will normally only be a single figure quoted as the same power (current) is used all the time is tracking. With a goto telescope the power required will increase while the telescope is slewing to a new object and then decrease when it resumes it's tracking mode. You really need to find both figures, the slewing power may be quoted as a 'maximum' power. These will normally be shown in milliAmps

Having obtained these the next figure we require is the amount the Dew Heater uses (if you use one). This may be quoted either as a current in Amps or more likely a power in Watts. If the manufacturers quote a power in Watts divide this by the voltage (12 Volts) to give the current in Amps.

If you have any other accessories you use powered from the battery you need to find the power or current figures for these as well.

Having got the figures you need to estimate what fraction of an hour your telescope will be slewing and what proportion of the time you will be using your dew heater. If your Dew Heater has a variable power control use the setting of this as the proportion.

Now enter the figures in the following table, replacing those I have used as an example. The total consumption in milliAmpHours is obtained by multiplying the Consumption in mA by the proportion of time it is in use.

Equipment	Consumption (mA)	Proportion of time used	Total Consumption (mAh)
Telescope (tracking)	100	1	100
Telescope (slewing)	800	1/10	80
Dew Heater	2000	1/4	500
Total			680 mAh
Convert to AmpHours by dividing by 1000			0.68 Ah
Battery	Capacity (Ah)		
	7		
Calculate duration (divide battery capacity by total consumption)			$7 / 0.68 = 10.29$ Hours

The battery should last all night but it's capacity will be reduced if it is cold perhaps by 20 %. In addition you should note that the duration is very dependant on the fraction of time you use the dew heater. Increase the fraction of time you use it to  $\frac{1}{2}$  the time and recalculate the table above to see how long the battery then lasts.

The voltage from the battery falls as it discharges and as more current is drawn from it. As a result when the battery is nearly flat switching on the Dew Heater is likely to lower the voltage below the point where the telescope stops operating. If you have two batteries it is best to use one for the Dew Heater and keep the second for the telescope and any other low power devices. That way even if the battery powering the dew heater goes flat you will not have to realign the telescope.

The final factor is how well the battery is charged. The chargers typically supplied with the battery packs are of fairly low capacity and thus take a long time to fully charge the battery. For instance I have a 17 Ah battery pack from Maplin and this was supplied with a 400 mA charger. The time taken to charge the battery can be calculated by dividing the Battery Capacity (in Ah) by the charging current (also in A) thus my battery required  $17 \text{ Ah} / 0.4\text{A} = 42.5$  Hours to charge ! In practice charging is not 100% efficient and we need to multiply the time by 1.2 to give the predicted charge time thus  $42.5 \times 1.2 = 51$  Hours. Not much good if you used the scope last night and want to use it again tonight. The solution to this is to buy a battery charger with a greater capacity, this must be capable of stopping the charging process when the battery is fully charged otherwise the battery will be ruined. Charging of battery packs will be the subject of another article but before I go never use a car battery charger on a battery pack containing sealed lead acid batteries. The car charger will ruin your battery and it could even explode!

John Murrell

## Isle of Wight Star Party 2010

Following the success of the Isle of Wight Star parties in 2008 and 2009 the event is being repeated from Thursday 11<sup>th</sup> March to Monday 15<sup>th</sup> March 2010, these being the days around New Moon. The Star Party is held at the Brighstone Holiday Centre on the South coast of the Isle of Wight. This location has some of the darkest skies in the South of England particularly to the South where the nearest land is France some 60 miles away.

The main focus of the star party is on the observing nights but this is supported by activities during the day and also alternative evening activities if the weather does not cooperate. You need to take your own telescope or arrange to share one with other visitors.

There are three choices for accommodation on-site either camping in your own tent or accommodation in either Beach Huts or self-catering chalets. All these have the advantage that the observing site is outside your door. There are a very limited number of beach huts and chalets so you need to book as soon as possible. Alternatively there are a number of places offering bed and breakfast nearby though they will require you to drive to them. The Star Party provides a meeting room which provide somewhere to discuss astronomy as well as a room for 24 Hour tea and coffee. As you are likely to be staying up late special arrangements have been made for a late cooked breakfast to be provided.

You might think a holiday centre might be floodlit with inappropriate lighting but as the Star Party have sole use of the centre most of the lights are turned off and those that are

needed are replaced with red bulbs. Don't forget to bring your red torch and red headlight plus spare batteries as the site is a lot darker than Kenley.

You will need to take batteries to operate your telescope and the Dew Heater as there are only a few power connections. However the organisers provide a room where you can charge your batteries during the day as well as a place to store some equipment.

Beware that the site is exposed particularly to winds from the South, you are advised to take ground anchors and ropes to secure your scope if you are leaving it outside. The force from the wind on a covered telescope is sufficient to blow it over as a number of people discovered in 2008.

The Star Party is organised by The Vectis Astronomical Society and it is likely that a daytime trip will be made to their observatory to see the facilities.

In previous years the Star Party have organised special rates with Wight Link who operate Car Ferries to the Island from both Portsmouth and Lymington.

More information on the star party as well as images from previous events can be found on the link from the SAGAS website [www.SAGASonLine.org.uk](http://www.SAGASonLine.org.uk).

I attended the 2008 event and found it very enjoyable even though we had a limited amount of clear weather and some very strong winds.

Hope to see you there

John Murrell

## Royal Greenwich Observatory

Over the past several years, the RGO has been improving its facilities, to include more interactive experience to the observatory.

Ten years ago you had to pay to enter the observatory, however since improved funding, with grants from the National Lottery, facilities have improved.

One of the major projects at the observatory has been the building of the new planetarium; which is an improvement on the old one.



Several years ago the CAS visited the observatory for a tour, including a live show at the planetarium. Next to it, is the South Building, which used to hold the old planetarium. This has now houses the Weller Astronomy Galaxies. Here will find galleries of interactive machines, used in teaching people the glories of the universe, in plain English. This is perhaps is more designed for children, but is just as good for the adults.

Since the societies last visit, there have been some major developments to Flamsteed House, with the addition of the Time Galleries. These are called, "Time and Longitude" and "Time & Greenwich". Again they have installed some interactive equipment, but have totally re-arranged displays, for the better I believe.



There is plenty to see and do at the RGO. When you have finished there why not visit the National Maritime Museum. Both venues are free and there are good transport links with Croydon.



Paul Harper, Chairman Croydon AS

## Main Astronomical Events in February

More information and details can be found at:  
<http://www.popastro.com/spapop/skydiary.pdf>

If you take any images of these please send them to me at the email address below or hand a picture to me during a meeting, and we will publish it in Altair and/or our website.

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### Editor: Vivienne Marshall

If you would like to submit a picture or an article, please send by emailing me at: [cm003g3932@blueyonder.co.uk](mailto:cm003g3932@blueyonder.co.uk). Alternatively you can contact anyone on the committee (contact details on our web site: [www.croydonastro.org.uk](http://www.croydonastro.org.uk)) to forward to me.

I will welcome any comments you may have.