SOLSTICE

The newsletter of

Durham Astronomical Society

Durham Astronomical Society

December 2009

DAS ANOUNCEMENTS AND EVENTS

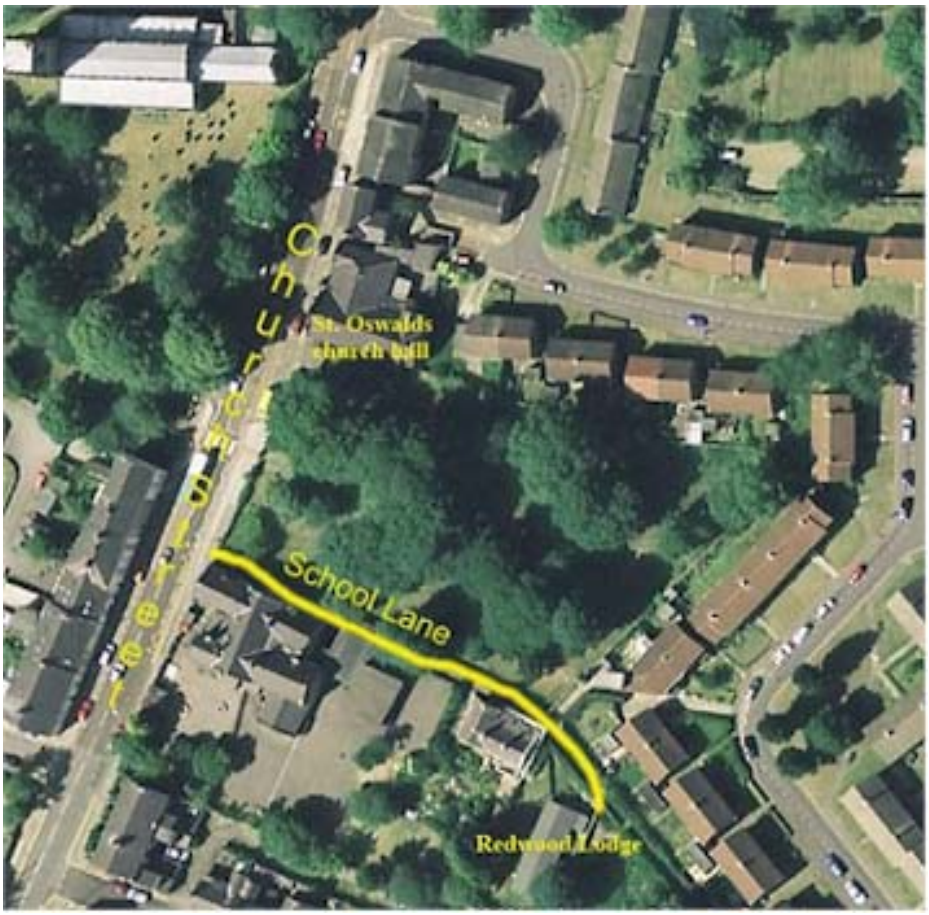
Last meeting : Friday 20th November 2009. Jűrgen Schmoll gave a talk about his new amateur observatory. There was a modest turnout but the talk was typically humorous and well received by members.

Next meeting : 15th January 2010. "Bringing the Universe down to Earth": a talk by Pete Edwards of Durham University about the Large Hadron Collider (LHC)

No December meeting! Please note: there is **no December meeting** as the third Friday in December falls too close to the festive period. As a result there will be no "Solstice" for January 2010 (I've tried to pack as much as possible into this month's!).

Society website address is: www.durhamastronomy.org

Note the meeting venue is **Redwood Lodge** on Church Street.



We would like to take this opportunity to wish our members a very merry Christmas and happy New Year 2010 (with clear skies!).

FORTHCOMING EVENTS:

The Geminids are coming!

There will be a free public evening at the Wynyard Planetarium on Monday 14th December for the Geminid meteor shower. The evening starts at 8 o'clock, no equipment needed just wrap up warm.

John and George will be demonstrating their new "All Sky Camera" which is hoped will capture real-time video of the meteorites.

Kielder Starcamps 2010:

Kielder Forest Spring Star Camp will take place from 10 - 14 March 2010. The event is being organised by Sunderland Astronomical Society and bookings are now being taken. Email lynnhenderson@blueyonder.co.uk.

The 8th Kielder Forest Autumn Star Camp will take place from 6 - 11 October 2010. Bookings open shortly.

For more information see http://www.richarddarn.demon.co.uk/starcamp/index.html.

ANOUNCEMENTS:

Galloway Forest Park

Members will be thrilled to hear that Galloway Forest Park has been awarded Dark Sky status, making it the first Dark Sky Park in the UK. The Park, near Newton Stewart in Dumfries and Galloway, is a two hour drive from Durham, making it quite accessible for our members.

Galloway Star Trails by Dave Thompson, June 2009

Your articles wanted!

Members are invited to submit their astronomy articles and pictures to Solstice. Please email your content to DASSolstice@yahoo.co.uk.

Monthly guide to the sky

Thanks again to Dave Eagles FRAS for letting us include his monthly sky calendar 'Eagle's Eye on the Sky' with Solstice. For more information, see Dave's website: http://www.eagleseye.co.uk.

WHAT'S NEW IN ASTRONOMY

Forest park given Dark Sky honour (BBC, 16/11/09)

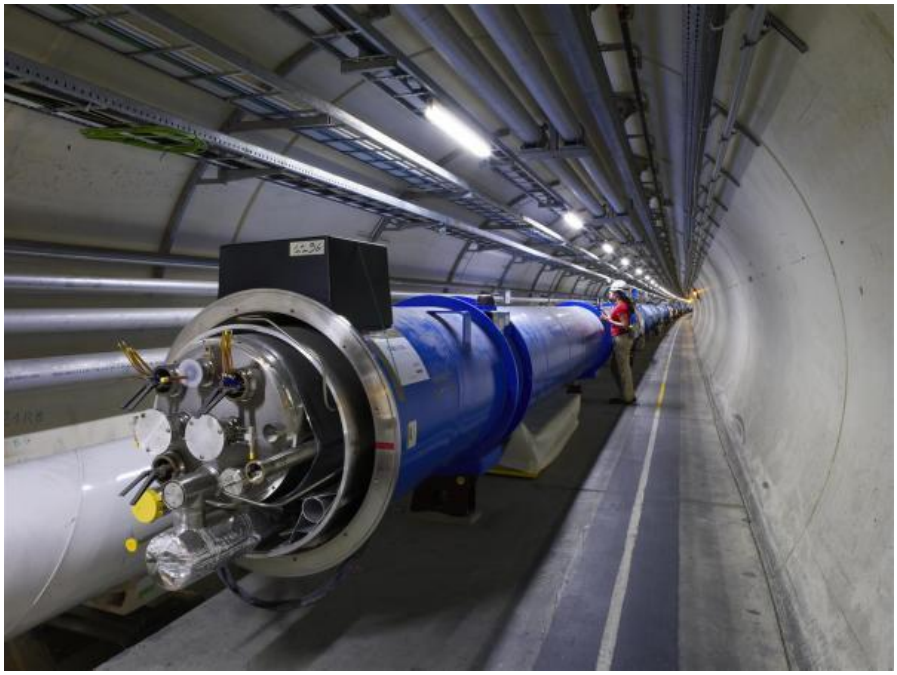
The award, announced by the International Dark Sky Association, confirmed Galloway as one of the best places for stargazing in the world.

Lighting experts were brought in to ensure the skies above the forest park were pitch black at night.

The organisers of Galloway's bid said they hoped the award would boost tourism in south west Scotland.

The final decision on the award was taken at the International Dark Sky Association (IDA) AGM in Phoenix, Arizona, over the weekend.

Read more…



First Collisions at the LHC (Universe Today 23/11/09)

Two beams circulated simultaneously inside the Large Hadron Collider for the first time today, allowing for the first proton-proton collisions to take place. "It's a great achievement to have come this far in so short a time," said CERN Director General Rolf Heuer. "But we need to keep a sense of perspective – there's still much to do before we can start the LHC physics program."

Read more…

BUILDING THE ALL SKY CAMERA

By John and George Gargett

We have been helping out at Wynyard Planetarium on nights of meteor showers for a few years now and decided to try making an all sky camera. Keith Johnson suggested we ask at Black and Decker for one of the large dome mirrors which hung over the gangway junctions. They gave us the mirror which is a 30 inch dome. We built a frame out of two by two timbers (see picture), the Mintron camera with a 6mm lens points down over the centre of the mirror. As the Leonids were clouded out we have not had a chance to try it yet. The Mintron camera has such a wide range of settings it should only be a matter of finding the setting that will work best for a meteor shower. The plan is to put the all sky camera in a dark field nearby and using video senders to project the image onto the planetarium dome.

A BEGINNER'S GUIDE TO WEBCAM IMAGING

By Keith Johnson

"Capture Settings"

This month's edition focuses on the camera settings. To enable me to set out this part of the tutorial correctly it was important to take screen images of the camera settings when I was actually imaging with the telescope and guess what? The seeing was terrible! However, this outlines a point that I have put across at the very beginning of these tutorials and will repeat once more.

No matter how good the focus, collimation, camera settings, if the seeing is poor then I am afraid you are going to achieve poor end results.

So, how do you set up the camera settings? Well it's a bit of a mixed bag really. To achieve the correct settings you must also have the telescope in focus, but how do you get the camera image into focus if the camera settings are not set correctly?

My answer to this would be to practice in the daytime on a distant building adjusting the focus then adjusting the shutter speed, then the focus. Gradually you will get the image of the building on the camera. Practice as often as possible is the key here! Once you are confident in using the telescope and camera together with the camera settings it's time to move onto imaging the planets and the Moon.

The very first thing you should do before you attach your camera to the telescope for any imaging session is align your finder scope so that the object being imaged is centred in the finder scope cross hairs as accurately as possible in comparison with the object centred in the eyepiece. Start off with an eyepiece which gives a nice wide field of view and adjust the finder accordingly, gradually increasing the magnification until you have the finder set as accurate as possible.

A few Tips:

- To help me seek out the planet I'm about to image capture I always set my camera to be over exposed. In doing this if you don't manage to have the planet on the CCD you may have instead one or two of the Moons so you will know you are somewhere near.

- To assist me in achieving good focus I always set the capture rate to 30 frames per second, this fast frame rate allows me to get an instant update on the screen to any adjustment I make on the focussing knob.

I always inform anyone starting out into web cam imaging to start off imaging the Moon. There are a number of reasons why I say the Moon and they are quite simply this – first of all it's big, in fact it's very big so you will find it much easier than trying to place a planet on the CCD chip. Secondly, it's very bright so you will probably see the Moon on the CCD camera chip albeit out of focus and with the incorrect camera settings.

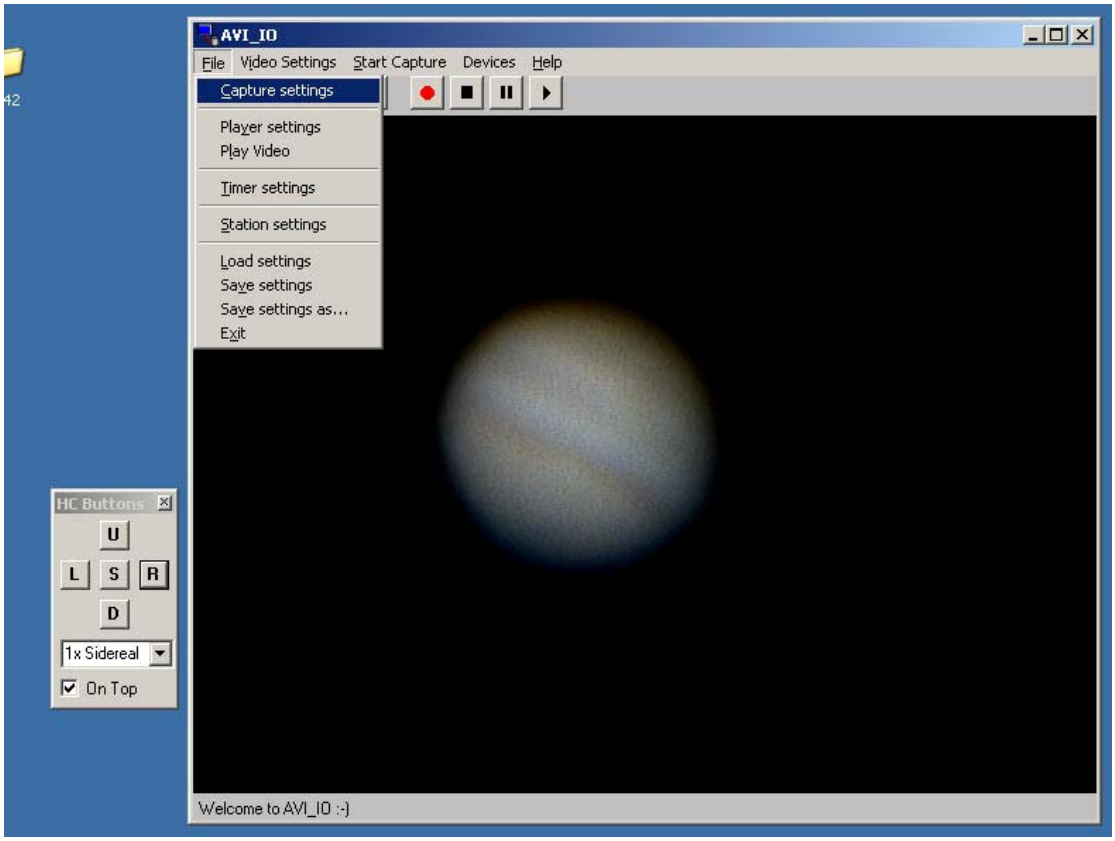
As the Toucam Pro web camera is the most popular imaging web camera I am going to assume that you are using a Philips Toucam Pro web camera thus the screen shots of the camera driver will be familiar to you, for those of you using the camera for the first time just simply go off these settings, they won't be exact but they will hopefully help get you somewhere near.

In this tutorial I am using the AVI – IO capture software, all capture software differs in appearance and some allow the user to do more than others, but the camera screen pages will be the same.

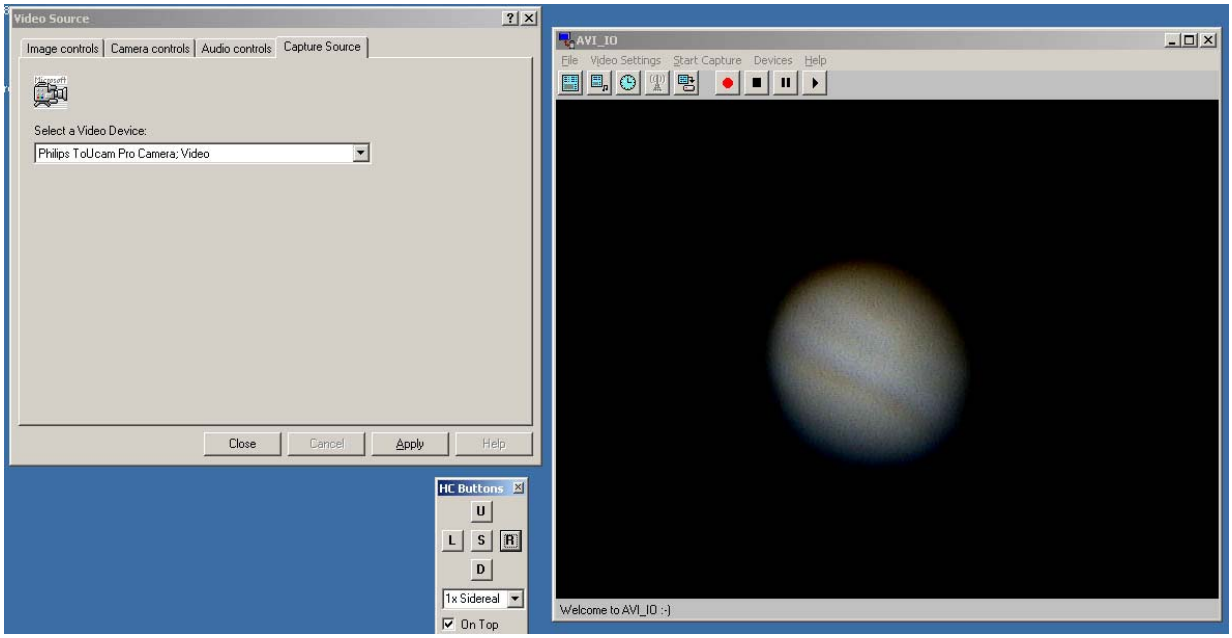
For this tutorial I used Jupiter for my capture session, thus these settings are different than they would be if I were capturing the Moon.

Capture Settings

Select "Video Settings" then choose "Capture Settings".

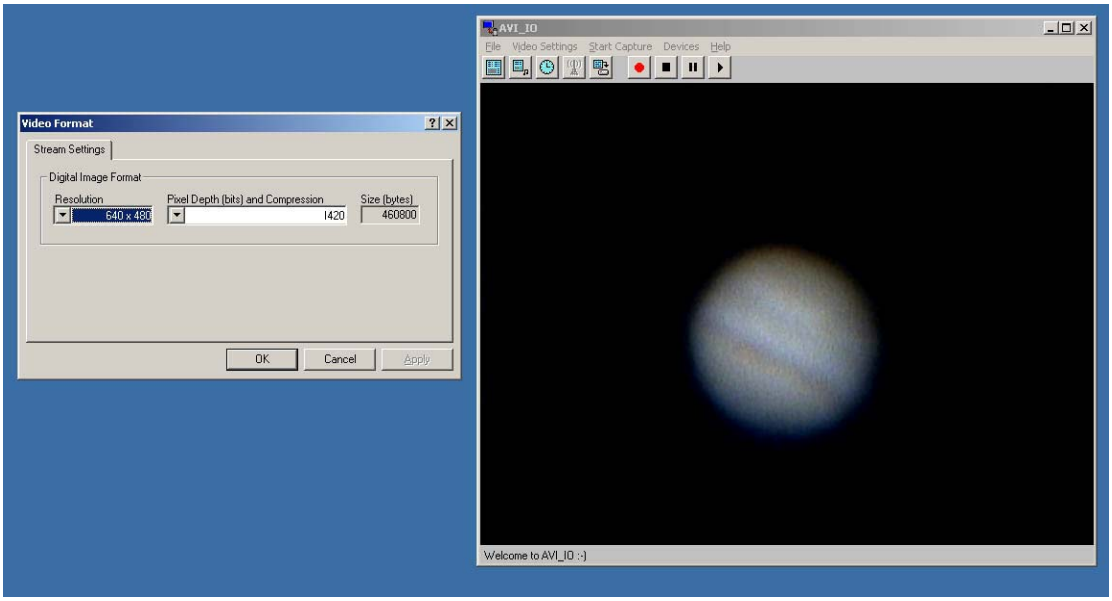


Connect the camera up to the computer and select you're favoured capture software, the capture software should detect the camera automatically once you have connected the camera but if it does not select "Capture Source" tab. And select the video device – in our case the Philips Toucam Pro Camera.
(See Below)



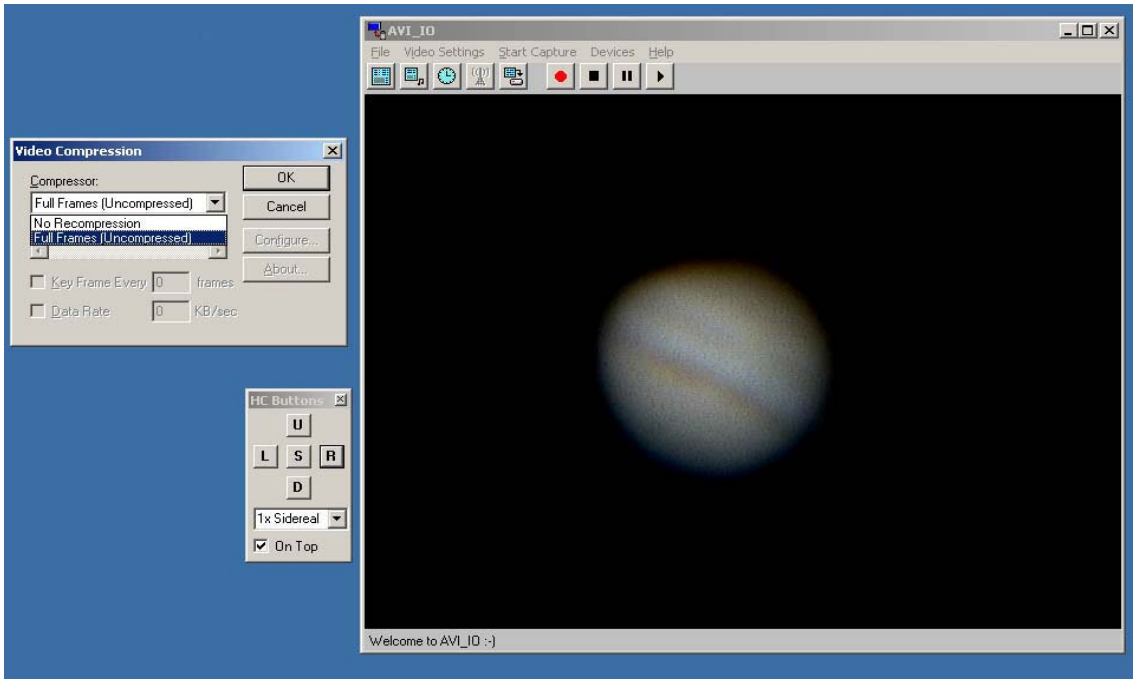
After the camera is selected click on Apply and Close.

Select the "Video Format" tab to display the Stream Settings, choose 640 x 480 (see below).



Once the format is selected click on OK.

Select the Video Compression tab and select "Full Frames (uncompressed)" This will enable us to capture more data resulting in a better final image then click on OK. (see below)



You may notice that within most of the screen shots a small box entitled "HC Buttons" can be seen. This is not part of the image capture settings but is in fact the Skymap Pro telescope control box that I use to control the movement of the telescope at the computer.

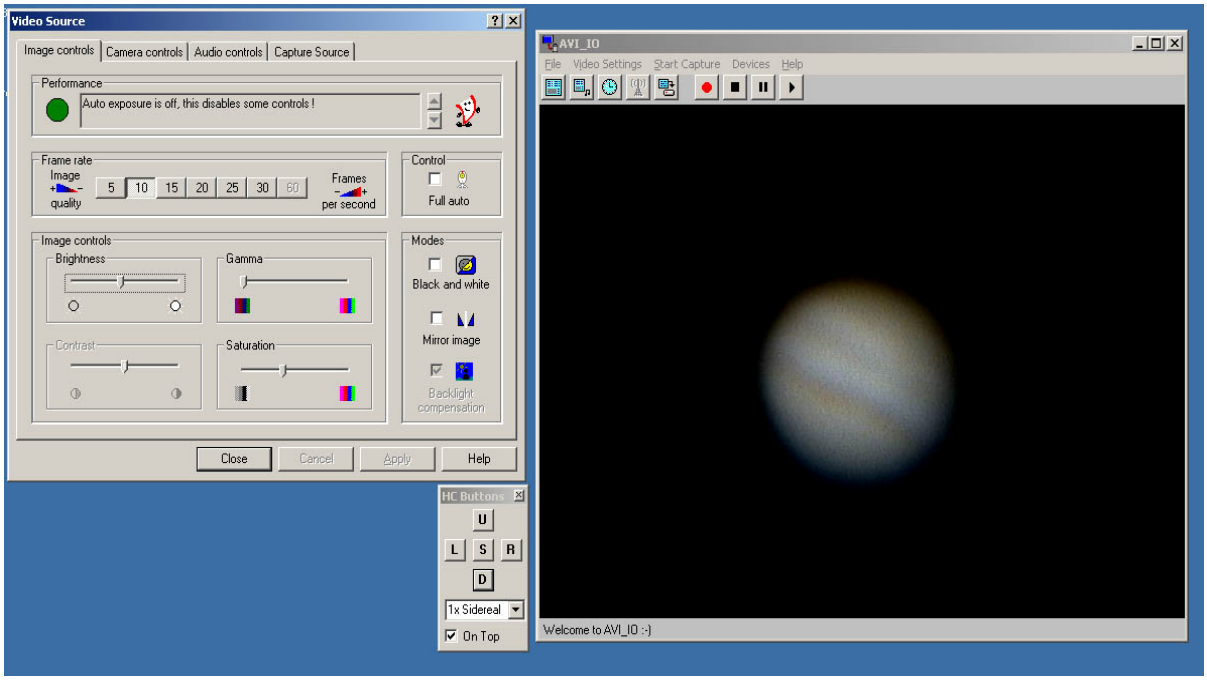
Image Control settings that are adjustable comprise of the following: Shutter Speed, Brightness, Gamma and Saturation.

Shutter Speed: Any higher than 10 frames per second will create compression, this will result in less data within the AVI thus resulting in a poorer quality image.

Brightness: I always have the slider control no more than in the middle position.

Gamma: Using the Gamma function will result in a washed out image, leave this slider to the far left.

Saturation: This can be increased after processing the image so I always leave this slightly below halfway.



As all Auto functions are disabled the Contrast function is not available, this does not interfere with our capture.
Leave the black and white box un-ticked unless you wish to capture in black and white mode.

Mirror Image may or may not be ticked.

Camera Controls

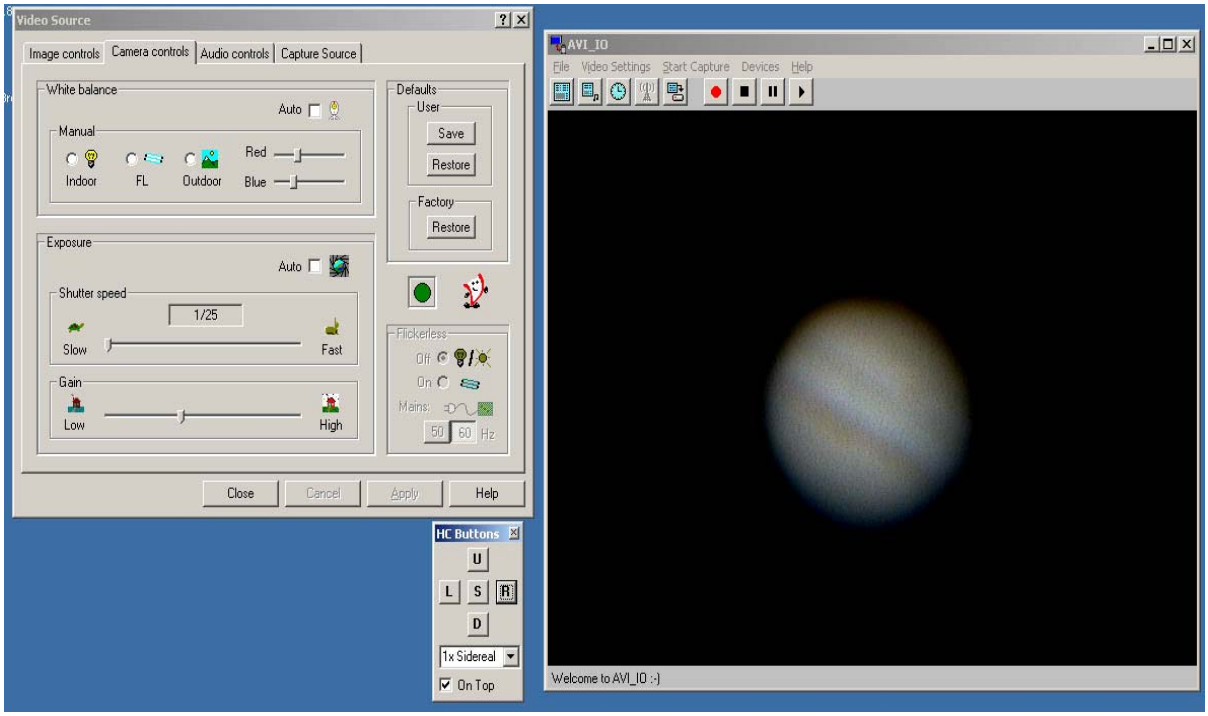
This tab comprises of the following: Shutter Speed, Gain, White Balance.

Shutter Speed

Whatever object you are about to image it is important that there is no over exposure on any part of the object, we first alter the shutter speed slider control so there is slight over exposure visible.

Gain

We then use the gain slider to reduce any over exposure. Always leave the Auto Exposure box un-ticked.



White Balance

Finally we need to set the correct white balance, leave the Indoor, FL, and outdoor boxes un-ticked but instead left click in the "Auto" white balance box.

After duration of about 30 to 45 seconds the white balance will have had time to re- adjust, left click the box once more to disable the auto white balance function.

Remember – These settings are only to act as a guide, depending on the object you are imaging and the telescope being used - most settings will have to be altered slightly.

Good luck, and I hope to see your efforts published in 'Solstice'!

Keith Johnson

THE GALLERY

Front page image: M45 Pleiades by Jűrgen Schmoll

Kielder Calvert Trust
2009 Sep 16
Canon 40 D modded
Skywatcher Newtonian 200/1000 + coma corrector, f/5.0, 1000 ISO 6 x 4 min
Tracking: EQ6 pro unguided
Stacked with dark subtraction, using DSS

NGC281 Pacman Nebula by Dave Thompson

I captured this image from my back garden in Medomsley using a Williams Optics Megrez 90 refractor, Starlight Xpress SXV-H9 CCD camera and Astronomik Narrow Band filters.

Sulphur II was mapped to red, Hydrogen alpha to green and Oxygen III to blue to create a colour image. A total of nine hours' data went into the final image.

M13 Hercules Cluster by Phil Sowerby

Captured at Kielder Autumn Starcamp 2009 using a Williams Optics Zenithstar 80 refractor and Canon EOS350D digital camera. The final image is a stack of six minute sub-exposures at ISO800.

Nebulosity in Orion by Dave Thompson

This was captured from my back garden in Medomsley using a modified Canon EOS20D digital camera and Leitz Telyt 180mm apo lens, on a Vixen GP mount (unguided). I used a range of exposures from 4 seconds to 180 seconds at ISO1600.

Milky Way and Jupiter by Jűrgen Schmoll

Kielder Calvert Trust
2009 Sep 15
Canon 40 D unmodded
EF-S 17-85mm @ 17mm, f/5.6, 1000 ISO
2 x 10 min
Tracking: Astrotrac TT 320
Stacked with dark subtraction, using DSS

Conjunction of Moon and Jupiter by George Gargett

300mm lens at f 5.6, 90th of a second 200iso

If you would like your pictures printed in the Solstice newsletter, please email them to DASSolstice@yahoo.co.uk with a short description. □

EAGLES EYE ON THE SKY

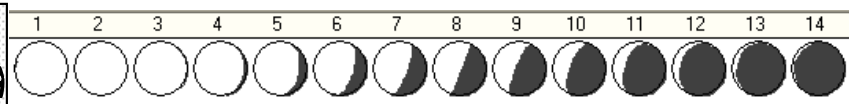
December 2009

YOUR MONTHLY GUIDE TO WHAT'S UP

Further details and graphics as well as up-to-date info can be found on my web page www.eagleseye.co.uk

Dave Eagle FRAS

All times GMT (UT).



THE MOON

2nd & 31st Full.
9th Last Qtr.
16th New.
24th 1st Qtr.

The Moon will be close to:

The Pleiades on the 1st and 28th.
Mars on the 7th.
Saturn on the 10th.
Mercury on the 18th.
Jupiter and Neptune on the 21st.

THIS MONTHS HIGHLIGHTS

Solstice - Winter Solstice occurs on the 21st of the month.

Mercury – May be seen in the evening twilight around half an hour after sunset during the second week of the month. Moon is close on the 18th when the planet is at greatest eastern elongation.

Venus – Still bright in the early morning twilight, but is sinking into the dawn fast. Close to Saturn on the 16th. .

Mars – Now rising at a reasonable time of night, visible close to the border of Leo and Cancer. It shows a very small disk with a slightly gibbous phase through a small scope, but things are improving fast.

Jupiter – Still very bright, but low down in the southern sky amongst the stars of Capricornus. Passes close to Neptune on the 20th when they are about half a degree apart.

Saturn – The ringed planet is now easily in the eastern sky before sunrise. Venus is close by on the 13th.

Uranus – Easily visible at magnitude +5.7 amongst the stars of Aquarius.

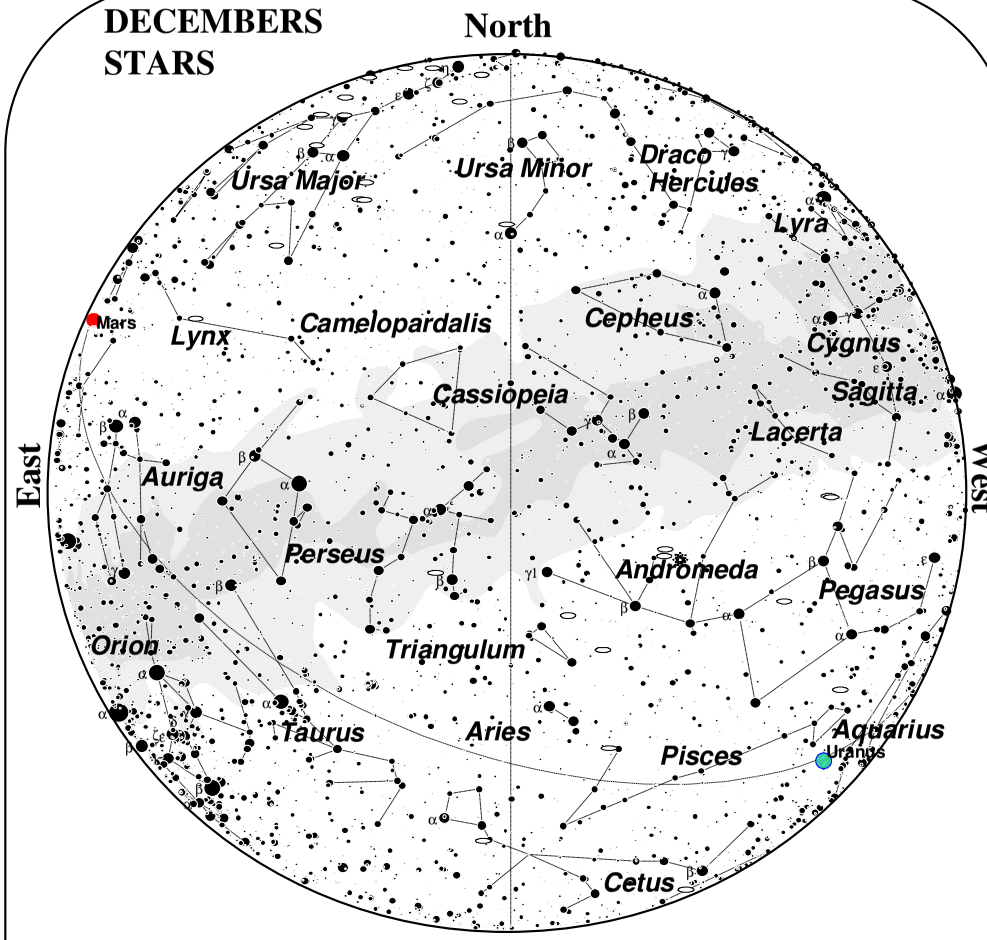
Neptune – Visible as a +7.9 magnitude object amongst the stars of Capricornus.

Geminids. – Meteor shower with an estimated rate of 120p/h. in the early hours of the 14th. Moon does not interfere.

Ursids. – An estimated rate of 10-15 meteors p/h on the night of the 22nd and 23rd. Moon sets fairly early.

Algol- This bright variable star fades from magnitude +2.1 to +3.4 at the following times: 4th 03:52, 7th0:41, 9th 21:30, 12th 18:19, 24th 05:36, 27th 02:25, 29th 23:15.

DECEMBERS STARS



This map shows whole sky at 21:00h on the 15th of the month. Cassiopeia lies directly overhead nestled in the northern part of the Milky Way, which also sweeps through Perseus. The area abounds with star fields and open star clusters, so is well worth sweeping with binoculars or rich field telescope. Low in the south, Cetus the whale swims across the sky. Lyra and the bright star Vega are getting lower in the western sky. Towards the eastern sky the bright star pair Castor and Pollux in Gemini and Procyon in Canis Minor can be seen rising.