An Introduction to astrophotography

Or

Iain's guide to getting extremely cold of a night..

What is Astrophotography?

- Photographing:
  - The Moon
  - Star Constellations
  - Planets
  - Eclipses
  - Meteors
  - Comets
  - Galaxies and Nebulae
  - Sky trails
  - The Sun

What Equipment do I need?

- To photograph the moon
  - Camera
  - Tripod
  - Any lens, the longer the focal length the larger the image, 400mm ideal
  - Remote control if possible

- To photograph star constellations, lunar eclipses, meteors, comets and sky trails as above but:
  - Wide angle lens maybe 28mm

What Equipment do I need?

- To photograph planets
  - A telescope of at least 4” diameter
  - T-mount to connect the camera to the telescope or
  - A suitable webcam that fits into the eyepiece barrel & a laptop
- To photograph the sun
  - DON’T unless you have a solar telescope
- To photograph solar eclipses
  - A small spotting scope and a big sheet of white card
- To photograph galaxies and nebulae
  - A motor driven mount on a tripod, very accurate polar alignment
  - A clear sky for several hours and warm clothing

Let's photograph the Moon

- The Moon is bright because it is reflecting sunlight
- So no long exposures are needed

Olympus E-620 400mm, f7, 1/200th sec ISO 200

Let’s photograph the Moon

- Here’s what the moon looks like at 38mm
- Olympus C50 38mm f4.8 1/8 sec ISO 80
- Shot was taken for silhouette effect not lunar detail

Let’s photograph the Moon

- Here is a lovely post-processed photo from John R, you will see more later. Canon 6D 300mm f5.6 1/800th ISO 100

Let’s photograph the Moon

- What have you noticed?
  - All the images were to some extent out of focus
  - Why?
  - It is very difficult to get your AF to get a good lock on to the moon or other celestial objects.
  - Manual focus is needed but difficult
  - Shake will affect hand held photos

Let's photograph the Moon

- Use a tripod
- Focus using live view if you have it with the magnifier
- Pick a bright star and focus to smallest image
- Don't touch the focussing, just rotate back to the moon
- Use a 2 or better 10 second delay on the shutter
- Even better if you have a remote control
- Take a range of exposures, digital images are free

Let’s photograph the Moon

- What can go wrong?
  - Weather – astronomers allow for 20 good seeing nights per year
  - Even very faint cloud will reduce definition
  - Cold – can get excellent “seeing” but image can scintillate
  - High angle of moon at times of the year can mean being on hands and knees
  - Not checking results before finishing can mean a wasted evening
  - Summer evenings mean late nights and sub-optimal images

Let's photograph the Moon

- What should my set up be?
  - Set your ISO to 200 or less that way you will have the best image
  - Set your speed to 1/200th second or thereabouts.
  - Set your aperture to f8 or f16 if you can
  - Set your zoom as high as possible – 400mm works well.

Let's photograph the Moon

- A good starting point for a full(ish) moon is then:
  - 400mm zoom, 1/200th second, f8, ISO 200
  - Experiment, speed first then aperture and lastly ISO
  - Look at the result and don't be afraid to take lots of images
  - Every sky is different and so is the moon's luminance
  - Don't forget - take time focussing and use timer delay

Let's photograph the Moon

- Best pictures are of partial moons – here is a very new moon

Let’s photograph the Moon

- The old moon in the young moon’s arms with Venus

Let's photograph the Moon

- Or with a 2000mm lens with 200mm front lens (f10)

Let’s photograph the Moon

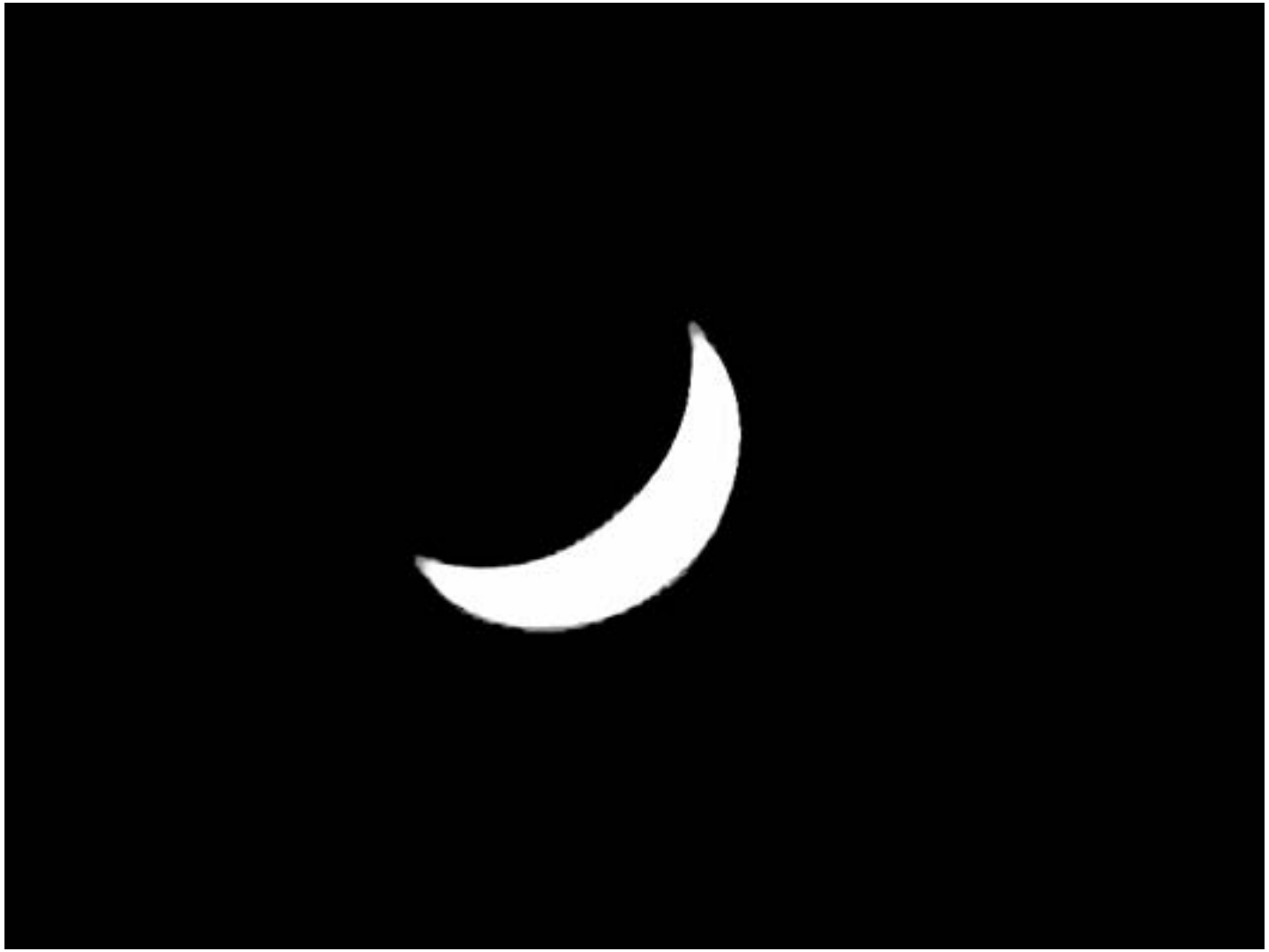
The Plough through naked eye – the Plough through a camera

Comet with Meteor

Jupiter

Saturn

Venus



The Andromeda Galaxy

The Transit of Venus in 2004

And not forgetting the important bit→

Be comfortable!

Remember your:

- Woolly hat
- Ear Muffs
- Scarf
- Winter Anorak
- Fleece
- Thermal underwear
- Fingerless gloves
- Waterproof trousers
- Thermal socks
- Stout boots
- Hand warmers
- Hip flask