



Simple Astrophotography (using a digital camera)

How to do it and what to use!

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FIRST OF ALL, YOU DON'T NEED THIS!!



Types

- * Tripod / bean bag mounted.
- * Tracking mounted with lens (Barn door, piggyback on telescope or automated tracker).
- * Afocal imaging with lens through a telescope eyepiece.
- * Prime focus imaging with direct fixing to telescope viewfinder. (Not being covered tonight!)

Simple Bean Bag Rest

Use with self timer
(Astrophotography doesn't
need to be complicated!)



Tripod / bean bag mounted

- * Can be done with any camera that allows an exposure time of at least 1 second and the ability to select a high ISO speed.
- * Suitable for exposures of up to 30 seconds with a wide angle lens.
- * Any exposure over 30 seconds will require tracking
- * Longer exposures ok for star trail pictures.

- * Use the highest ISO setting and widest aperture (smallest number), available.
- * Best if you include something in the foreground to give a sense of scale.
- * Try using the flash or a torch on long exposures to “paint” the foreground.
- * Best results if done when there is still some twilight in the sky.

- ★ Use self timer or shutter remote to prevent camera shake.
- ★ If possible use the incandescent bulb light setting to help prevent an orange cast from light pollution.

Photographs From Simple Tripod and Fuji S8000fd Bridge Camera

Jupiter & Moons

0.62 sec / f6.3 / ISO1600 / 84mm (486mm equivalent)



ORION CONSTELLATION

1 sec / f8 / ISO 800 / 84mm (486mm equivalent)



Orion constellation with Fuji S8000fd bridge camera

4 seconds / f3.2 / ISO 1600 / 4.7mm



Night sky at Kelling with Canon 1100d DSLR

30 SECONDS / F3.5 / ISO 3200 / 18MM



Picture taken by moonlight with a DSLR sitting on a bean bag

18 Seconds / f5.6 / ISO800





Moon and Venus taken with dslr on a fixed tripod





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D. Murten 2015



Star Trails



© 2006 Jerry Lodriguss

© 2006 Jerry Lodriguss

Star trail photos can be

- ★ Stitched from many short exposures, try 30 seconds, 50 to 100 exposures. This ensures dark sky / foreground can be “painted” on one frame / bad frames are easier to edit / there is less noise and grain / battery failure can be dealt with. Don’t use long exposure noise reduction though as it will introduce gaps.
- ★ One long exposure. Doesn’t need special software or a fast computer.

Tracking mounted using camera lens

| Types | Pros/Cons |
|--|---|
| <ul style="list-style-type: none">* Barn door tracker, manual or automated* Piggyback on equatorially mounted auto tracking telescope* Automated tracker (astrotrack/vixen polarie/etc.) | <ul style="list-style-type: none">* Cheap, simple / needs to be constantly adjusted* Good for long exposures, can be left running / Needs expensive tracking tripod* Simple, compact, can be left running / Expensive |

Barn Door (Scotch) mount

- * Easy to self construct.
- * OK for at least 5 minute exposures with a wide angle lens, shorter with a telephoto.
- * Needs to be polar aligned.
- * Usually worked by hand but can be automated if you wish.
- * Needs to be constantly adjusted to follow the stars by turning a screw thread.
- * Remote shutter release required.

Typical Barn Door Mount



Remote Shutter Release & Timer



Milky Way & ISS taken using a Barn Door Tracker and Canon 1100d DSLR camera

★ 240 sec / f4 / ISO 400 / 18mm



Andromeda Galaxy & milky way taken with Barn Door tracker and Canon 1100d DSLR camera



Piggyback on telescope

- * Needs to have equatorial motorised tripod/mount.
- * Suitable for very long exposures.
- * Can be used with a Goto mount.
- * Easy to align with object you wish to photograph.
- * Can be used with telephoto lens.
- * Exposures can be left running or completely automated using a pc.
- * Remote timer or computer controlled.

Typical Piggy Back set ups.



Other examples of piggy back photography

Canon 60Da camera and 70-300mm lens

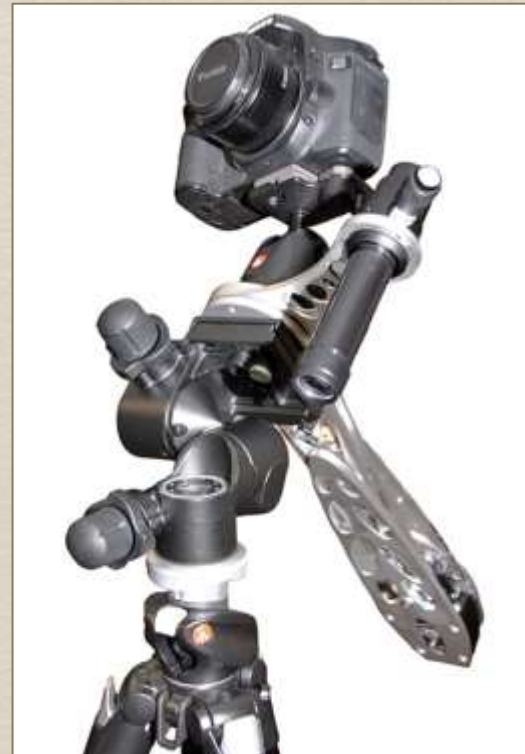


Automated Trackers

Vixen Polaris



Astrotrack



Examples of tracker photography



Afocal Imaging through a telescope eyepiece

- * Needs a suitable bracket.
- * Can be done with any type of camera or iphone.
- * Suitable for pictures of the moon and brighter planets using an alt/az mount or Dob.
- * Can be awkward to align camera with eyepiece.
- * Self timer or remote shutter release should be used to prevent camera shake.

Typical reflector Afocal setup



Refractor with I-Phone adaptor



Pictures taken with a Fuji S8000fd bridge camera and 8" Dobsonian telescope

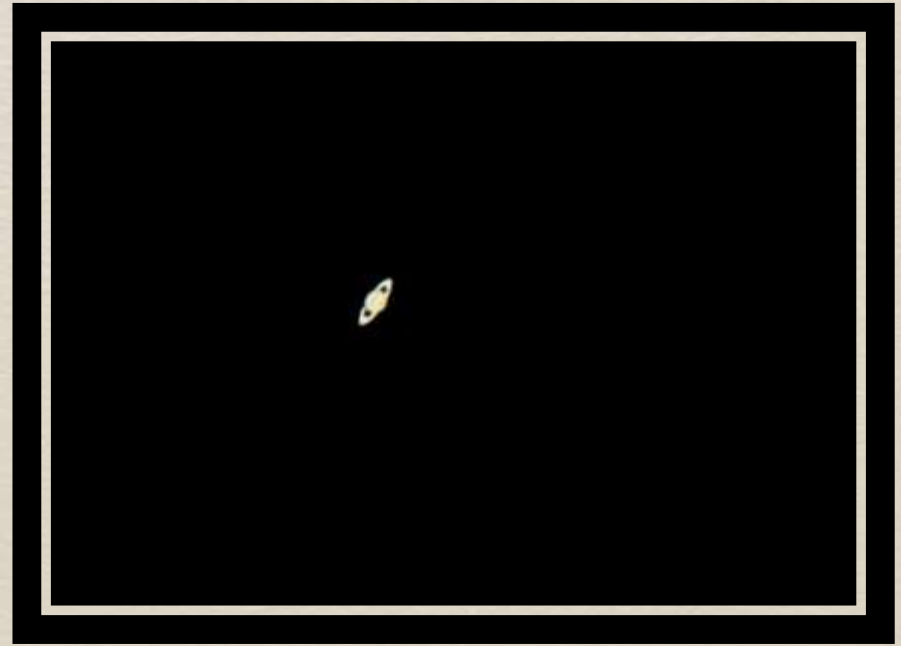
The Moon

1/40 sec / f4.5 / ISO 800 / 78mm



Saturn

1/10 sec / ISO 800



Recommended websites

- * Ukastroimaging.co.uk/forums
- * East Anglian Astrophotographers Facebook group
- * Photography-on-the-net/forum (large sections on astrophotography).
- * Astronomyforum.net/astro-imaging-forum/
- * Allens-stuff.com

REMEMBER

- * Above all, get out there and try it. Whatever your camera, you can take some great pictures and it isn't as hard as you think.