

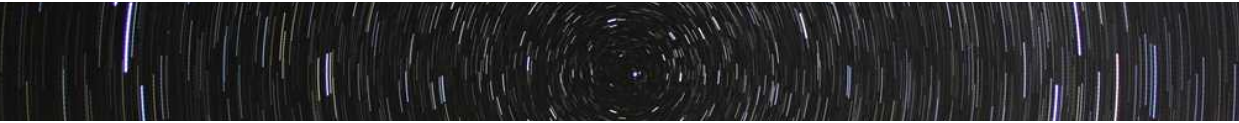
Astrophotography *for beginners*

*at the
Royal Observatory, Greenwich*



Course Tutor: Dr Darren Baskill

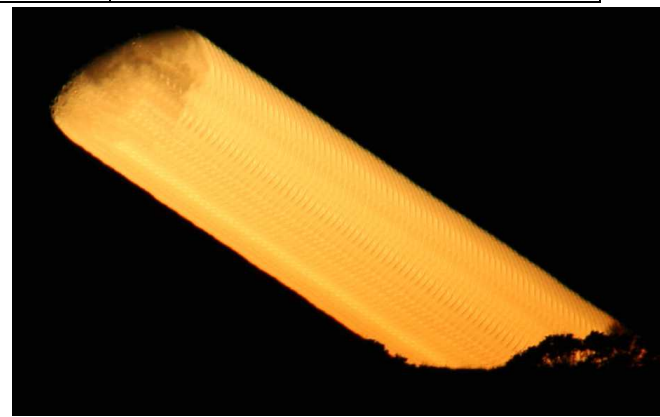
Overview



- Astrophotography is possible with any camera: mobile phones, compacts or (the most suitable) digital SLR camera's.
- If you have access to a telescope, use an adapter or eyepiece mount.
- Exposure times, ISO, f-number – digital camera's allow you to experiment with all of these on the fly.

<i>Increasing...</i>	<i>Advantage</i>	<i>Disadvantage</i>
Exposure time	Collect more light (makes fainter objects clearer)	Need accurate & strong tripod/mount to avoid shake/drift
ISO sensitivity	Signal is amplified (makes fainter objects brighter/clearer)	Increases noise on image
F-number	Easier to focus (leading to a sharper image)	Decreases amount of light getting through, so fainter detail is lost
Quality	Higher quality images	Larger file size, so fewer images can be stored on memory card

- The Sun and Moon can make for dramatic photographs, even with compact camera's...
- ...but take care not to damage your eyes or camera when photographing the Sun. Use filters or a solar telescope, or risk blindness.
- Plan Sun/Moon rise/set photo's using Stellarium and an OS map



Foreground objects are important for all astrophotography!

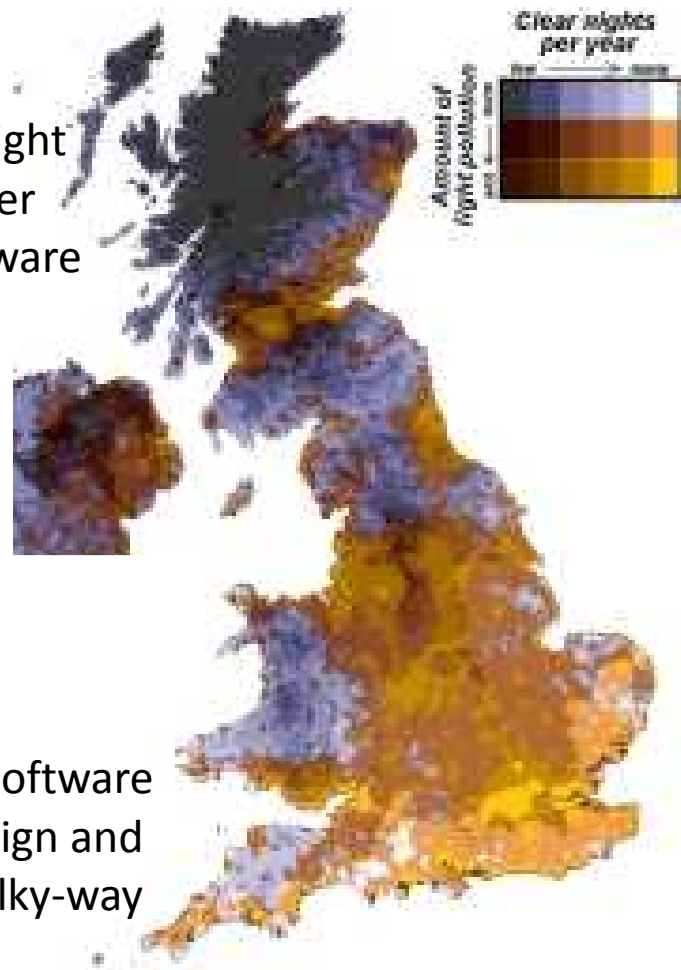
- *Dark skies are vital for starry astrophotography: so go somewhere dark!*

- If you are using a telescope to image a bright object (e.g. Sun, Moon or planets), consider taking a video and using the Registax software

- With photographs of stars, you should calibrate your images by subtracting at least a dark frame, and stack multiple images to bring out details in the Milky-Way (best viewed in summer without the Moon present)

- The free Deep Sky Stacker and StarTrails software can both subtract dark frames; DSS can align and stack images to bring out details in the Milky-way

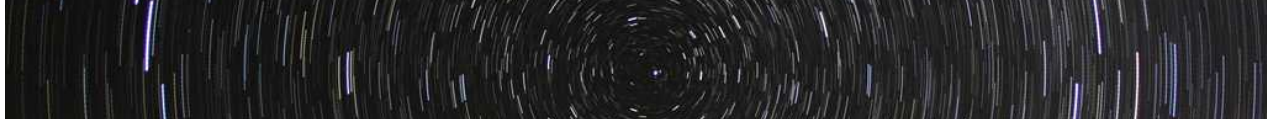
- Free software such as IrfanView and Gimp can help improve the final images, allowing you to change brightness, contrast, saturation, gamma correction and colour balance – the latter being useful for reducing the impact of light pollution



- For zoom lens/telescopic photo's, the lens/telescope must track the object you are looking at .

- The fainter the target, the longer the exposure time required, and so more accurate (and expensive!) mounts are required

Next steps



- Practice! And think of lots of ideas, especially with foreground objects
- Join a local astronomical society to learn and share expertise & equipment
- If you don't already have one, consider getting a DSLR – more control leads to better photo's
- Look for inspiration online:
 - SpaceWeather.com
 - Our Flickr APOTY group, and many others
 - NASA's APOD
- Get outside and practice!
- Enter our *Astronomy Photographer of the Year* competition!

