

SUSSEX ASTRONOMY CENTRE

Prime Focus Astrophotography

The "prime focus" of a telescope or camera lens is simply the camera mounted at the primary focal plane without any extra positive or negative auxiliary lenses, camera lenses or eyepieces in between the optics of the main scope and the camera.

The camera lens is removed from the camera body and the telescope functions as the camera lens. *To attach your camera you will need a 'T' ring & eyepiece adapter.*

Prime focus photography is challenging because the long focal length of the telescope magnifies the image so much compared to a normal camera lens. It also magnifies any problems with polar alignment, or tracking that the mount may have. Focus is also critical for prime focus photography because unlike many camera lenses that stop at the infinity focus, telescope will focus through the infinity point.

To archive correct infinity focus a *Hartman mask* will help. This is a lens cap with three holes evenly placed. You will see three stars, focus until you have one star & you are now correctly at infinity focus. Do not forget to remove mask before taking your astro photos.



**Piggyback 50mm lens, 1x magnification
Constellation of Orion**

**Prime focus 1,000mm scope, 20x magnification
M42, The Orion Nebula**

The Maths: The magnification of the telescope with the camera mounted directly to it can be determined by dividing the focal length of the telescope by 50. For example, a 2,000mm focal length telescope would yield 40x magnification compared to a normal 50mm camera lens. If using a digital SLR (i.e. Canon 300/350/400D) The chip gives 1.6x so $2000/50 \times 1.6 = 64x$ magnification.

Tips: A good quality 2x Barlow lens will double the focal length of you telescope. Filters can be fitted to enhance detail. Photos can be stacked using Registax to improve resolution and remove grain. All photos can be improved using a photo-editing program. Star clusters, lunar & nebular can produce good results. I do not recommend trying to image planets; a web-cam will produce better results.

Information Sheet

www.sussex-astronomy-centre.co.uk