

Astronomical Photography

Photography is used in nearly every aspect of astronomy and in its simpler forms need not involve the use of very complicated or expensive equipment. Any type of camera which allows a time exposure may be used on a rigid tripod or other support to obtain photographs of star fields. An exposure of 15–20 seconds on film of 200 ASA, with a standard 50mm lens, at about $f/1.8$, will show stars down to about the naked-eye limit. Such photographs are interesting in their own right, but even though the star images will be trailed on all but the shortest exposures, due to the Earth's rotation, they may still be used for some purposes such as variable star work.

Long trailed exposures are also quite commonly used in work on meteors, or in fireball patrols. Here the main consideration is the recording of the fast-moving objects, and as long as the star patterns are recognizable, so that the meteoroid's path may be determined, trailing is of little consequence. The amount of trailing will, of course, depend upon three factors: the length of the exposure, the focal length of the lens being used, and the declination of the area being photographed, motion being least at the celestial poles and most at the equator.

The next degree of sophistication is the simple driven mount. There are numerous forms which this can take, some very simply constructed. The actual

drive may be of many kinds, ranging from those where the observer turns a handle at a suitable rate – not as difficult as it may first seem – to those with a full electrical drive. All driven mounts must be properly aligned with the celestial pole, and this is all the more important for long photographic exposure with telescopes. With the comparatively short focal lengths of lenses used on cameras alone it is not quite so critical. Some very spectacular photographs of the Milky Way have been obtained with driven cameras, but a lot of specific work may also be undertaken. The lenses which some amateurs already have for everyday photography with single-lens reflex cameras can be especially suitable for particular studies. The 135mm lens, for example, the commonest telephoto lens, conveniently covers a nova search area (page 56–7) and is therefore the standard equipment for this work.

The use of aerial cameras and lenses (usually from ex-government sources) and similar equipment may be regarded as the next stage of complexity. These cover wide fields at fairly wide apertures – up to as much as 150mm diameter. Some of the military designs may require modification or filters for astronomical work, but this sort of equipment is generally excellent for wide-field cometary and minor planet work (pages 148–151). This type of

This photograph of the centre of the Milky Way in the direction of Sagittarius was taken by R. McNaught using high-speed Ektachrome film (160 ASA) and a 30-minute exposure, with a 35mm camera mounted on a driven and guided telescope.

