Buying Tips for Digital Compact Cameras and Accessories

If you are planning to purchase a compact camera to take astrophotos, you should consider a few things before the actual purchase. A wide variety of designs are available, and not all cameras are equally suited to this purpose.

Tips for the Purchase of the Camera

With compact cameras, in particular, you find a vast range of offerings. The main advertising argument is usually the number of pixels of the camera sensor (see pages 11-12). If you are using good optics respectively, more pixels means that you can get larger prints from your images without individual pixels becoming visible (i.e., noise). However, compared to digital single lens reflex (DSLR) cameras, compact cameras have very small sensors with very small pixels, and thus display more noise. Therefore, photos taken with a compact camera are never as good as photos taken with a DSLR. For astrophotography though, it is an advantage if your compact camera includes the following features:

Ability to Switch Off Autofocus

When you try to take pictures with your compact camera through a telescope, you will notice that autofocus systems generally fail when it comes to astronomical motifs.

Digital compact camera with pivoting display.

LCD/TFT Displays

Taking pictures through the telescope disables the optical viewfinder of the compact camera if it is not an SLR camera. The only way to check your image in this case is the liquid crystal display (LCD) or thin film transistor (TFT) display on the camera back, with which you can judge the field of view and the focus. A rotating and pivoting display that allows a comfortable viewing position even if the camera is oriented vertically upwards is very useful. The display is also important in order to check the exposure and the exact focus after you have taken the image. A zoom function with which you can enlarge parts of the image is also convenient.

Connector Socket for a Remote Control Release

When mounting the compact camera to a telescope it is not advisable to release the shutter by pressing the shutter release button on the camera body as camera shake would be an almost inevitable consequence. A

Connector sockets for remote control releases of different compact cameras.

Camera display showing manual settings.

remote control release is a more elegant and almost contact-free solution. Not all camera models have an available remote control release, and not all cameras have a connector socket. A possible solution would be the self-timer, however in the long run, working with this is rather cumbersome.

Ability to Switch Off the Flash

Nearly every digital compact camera comes equipped with a built-in flash. For astrophotos, it is crucial that you have the option to switch off the flash.

Manual Exposure Setting

Not only the autofocus, but also the automatic exposure is usually pushed to its limits when shooting astronomical scenes. Ideally, you can manually set the exposure time, as well as the aperture. The maximum exposure time should be as long as possible (minimum 16 sec). Still, with many camera models you will only be able to perform manual exposure compensation. This allows you to correct the value calculated by the automatic mode by either overexposing or underexposing. Adjustment steps of plus/minus two should be the minimum.

Filter Thread

A filter thread on the lens front of a compact camera makes for simple mounting to a telescope. If you intend to do this, you should pay attention to the inclusion of a filter thread.

Fixed Lens

When operating the camera on the telescope with the afocal method, it is convenient if the lens does not change its length, neither when zooming nor when focusing. In both instances, this means that the effect is achieved by adjusting lenses in the interior of the objective. If this is not the case,

you need to take care that the protruding camera lens does not hit the lens of the telescope's eyepiece.

Reliable Power Supply

Astrophotography, with its long exposure times, can quickly drain a camera's batteries. Take note of how long a camera model works with its in-camera battery, and whether it can be connected to an external power supply.

Built-In Noise Reduction

A camera with built-in noise reduction for time exposures can be helpful, especially for beginners.

Although you can achieve the same result later during image processing with the generation of "dark frames" (see page 118), it is more comfortable to work with the existing camera feature if it is available.

Storage of Exposure Data

It is useful, though not mandatory, that the camera store exposure date and time, as well as technical data, such as shutter speed, aperture, and ISO speed as part of the image file. Given the option, you should choose a camera with the ability to save images as RAW or TIF files as opposed to the JPG format.

Small Front Lens

With a small front lens you decrease the risk that pictures taken through a telescope suffer from vignetting, i.e., they have dark, shaded corners.

Useful Accessories for Your Compact Camera

For astrophotography some accessories are useful that are not usually supplied with the camera.

Remote Controller

A remote controller is desirable for vibration-free shutter release of the camera. A cable release acquired from the camera's manufacturer would be ideal. A wireless remote control, which works with infrared or radio signals, can also be used for astrophotography, but could cause problems in practice depending on low temperatures and the orientation of the camera.

Photo Tripod

For pictures of constellations or dawn scenes, a tripod is an essential piece of equipment to avoid blurry images due to camera shake. If you do not want to burden yourself with a bulky tripod, in most cases, a table top tripod or small clamp will be sufficient (see figure below and page 75 bottom-right). However, this restricts the selection of your photo location because you always need free space or an object on which the clamp is attached.

Ball Head/Clamp for Mounting on the Telescope

For photos in which the camera needs to be mounted piggyback on the telescope, a fixture is required (see page 75). Some telescopes include a screw with a photo thread on top of the tube clamp specifically for this purpose. However, you should not attach your camera directly onto this screw, because then you have no adjustability and are very restricted in regard to your angle of view. Instead, get a ball head mount that can be attached to the screw and onto which you mount your camera.

Thus, you can turn the camera independently from the telescope to ensure that the telescope tube is not showing in the picture. Alternatively, you can screw a clamp onto the counterweight bar of the telescope mount, but during longer exposures this only works if the bar does not turn while the telescope is moved on the declination axis.

Camera with clamp and ball head on the counterweight bar of a telescope.

Connection Adapter for the Telescope

For photography through the telescope, astronomy shops offer special accessories. If your camera has a filter thread, you only need to find the corresponding adapter to fit your filter thread (see figure, page 22, center and right). Without a filter thread, the best solution would be to inquire in photo shops if a filter attachment adapter is available for your camera model. With an adapter you can retrofit your camera with a filter thread. If this is not feasible, you need to employ a cumbersome and not very stable bracket, which uses the tripod thread and adjustability in all directions to lock the camera into position (see figure, page 22).

UV/IR Blocking Filter

The lens of a compact camera is usually only corrected for the visible light. This means that ultraviolet (UV) and infrared (IR) light, with respectively shorter and longer wavelengths than visible light, reaches the camera sensor as well, and thus creates blurred, superimposed ghost images. You can

Mounting of a camera without filter thread.

Telescope mounting of a camera with filter thread. Accessories at right.

Clockwise from bottom left: adapter ring, adapter, eyepiece, eyepiece holder, casing (bottom right).

counteract this by integrating a UV/IR blocking filter into the optical path. You can, for example, attach such a filter to the filter thread of the eyepiece.

Taking Astrophotos with a Digital Compact Camera

Now, you can get your digital compact camera ready and aim it at the sky: on a tripod, mounted on a tracked telescope, or through the eyepiece of a telescope.

Photos With a Tripod or Piggyback

The compact camera mounted on a tripod and outfitted with a remote controller is the equipment for images of pretty dawn scenes and constellations. In the box on the right you will find suggestions for taking your first exposures using a tripod.

If you mount your camera piggyback on a telescope that is tracking the rotation of the sky, you can take longer exposures of celestial areas. Make sure that you have a stable mounting allowing you to expose for a few minutes.

Freehand Snapshot Through the Telescope

For the occasional snapshot of the Sun or the Moon, it is sufficient to handhold the camera behind the telescope's eyepiece, using the camera's display as a viewfinder. But be careful: Never take pictures of the Sun without