



ASTROPHOTOGRAPHY
CAMERAS ARE
DESIGNED TO REVEAL
WHAT OUR EYES
CANNOT SEE

ASTROPHOTOGRAPHY CAMERA TYPES

While all dedicated astronomy cameras perform the same basic task—recording light collected by your telescope—not all cameras are designed for the same type of astrophotography. Some are optimised for long exposures of faint galaxies and nebulae, while others are designed to record hundreds of images every second when photographing the Moon, planets or the Sun. Modern astronomy cameras are also available with either colour or monochrome sensors, allowing photographers to choose between simplicity and maximum performance.

BUYING GUIDE #7

This buying guide explains the different types of dedicated astrophotography camera available to help you choose an imaging system that matches your interests.



MORE TIME IMAGING,
LESS TIME PROCESSING

ONE-SHOT COLOUR CAMERAS

One-Shot Colour (OSC) cameras are fitted with a colour sensor containing a microscopic Bayer matrix. This allows every exposure to record a full-colour image, making them the simplest and most convenient option for astrophotography. Because colour information is collected in a single exposure, OSC cameras require relatively little additional equipment and a straightforward imaging workflow. They are available as both deep-sky and planetary cameras.

STRENGTHS.

- Simple to operate
- Full-colour images from a single exposure
- Minimal additional equipment required
- Straightforward image processing
- Available in a wide range of sensor sizes

LIMITATIONS

- Lower sensitivity than comparable monochrome cameras
- Slightly reduced resolution due to the Bayer matrix
- Less suited to specialised narrowband imaging

WHICH SHOULD YOU CHOOSE? If you're beginning astrophotography, a One-Shot Colour camera offers the easiest path to producing attractive astronomical images. Their simplicity and versatility make them an excellent choice for general-purpose imaging.



UNLOCK THE FULL
POTENTIAL OF YOUR
TELESCOPE

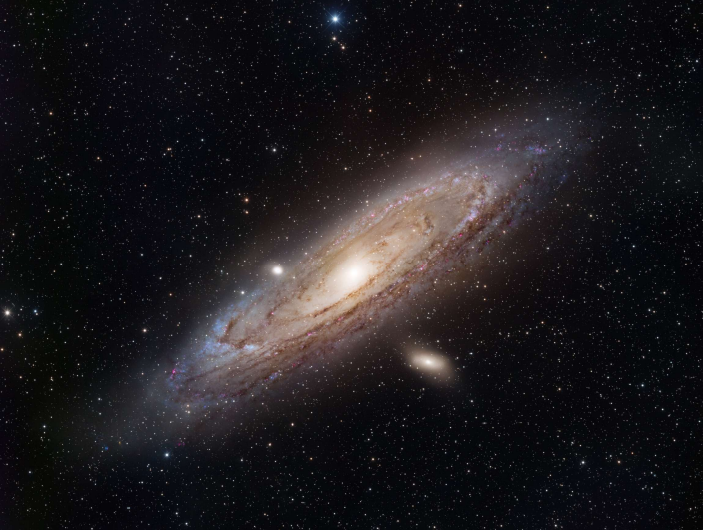
MONOCHROME CAMERAS

At first glance, it may seem surprising that many experienced astrophotographers choose a camera that cannot produce a colour image on its own. The reason lies in the way many astronomical objects emit light.

Emission nebulae do not radiate all colours of visible light equally. Instead, they emit most of their light at specific wavelengths associated with their constituent elements such as hydrogen, oxygen and sulphur. By capturing these wavelengths separately using dedicated filters, a mono camera records each signal before they are combined to create a final colour image during processing.

This approach offers two important advantages. Firstly, every pixel contributes to recording the selected wavelength, making the camera more sensitive. Secondly, isolating individual wavelengths increases image contrast by rejecting much of the unwanted background light caused by light pollution and moonlight. The result is improved visibility of faint nebular detail and greater flexibility when processing the final image.

Mono cameras are not without limitations. Firstly, the user requires additional filters which can be expensive, and in most cases, an electronic filter wheel for automation. Longer total image acquisition time, as more exposures are required to produce a colour image.



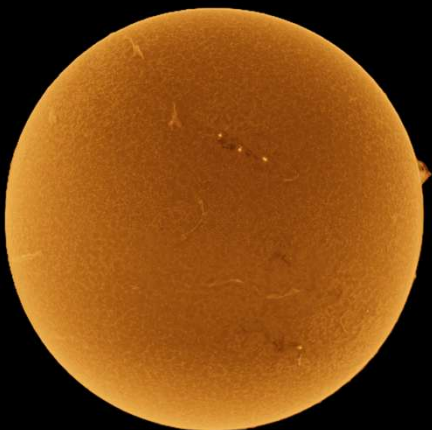
SPECIALISED ASTRONOMY CAMERAS

While astronomy cameras share many common features, manufacturers often optimise different models for specific types of astronomical imaging.

DEEP-SKY CAMERAS. Designed for photographing faint objects such as nebulae, and galaxies. Most incorporate thermoelectric cooling to reduce thermal noise during long exposures and are available with larger sensors to capture wider fields of view. Whether colour or monochrome, deep-sky cameras prioritise low noise, high sensitivity and consistent performance during extended imaging sessions.

PLANETARY CAMERAS. Optimised for photographing bright solar system objects including the Moon. Rather than taking long exposures, they record hundreds of images every second using relatively small sensors and high-speed USB interfaces. Specialised software selects the sharpest individual frames before combining them into a single highly detailed image, a technique known as lucky imaging.

SOLAR CAMERAS. Optimised for high-resolution solar imaging. High frame rates are essential for freezing atmospheric turbulence, while some models incorporate global shutter sensors that minimise image distortion caused by rapidly changing seeing conditions. Used with dedicated solar telescopes or certified solar filters, these cameras are capable of revealing remarkable detail in sunspots, prominences, filaments and the dynamic structure of the Sun's atmosphere.





ONE CAMERA.
MULTI-USE POTENTIAL.



GUIDE CAMERAS

Many planetary cameras also make excellent guide cameras. Their high sensitivity, low read noise, and fast frame rates make them ideal for tracking guide stars and sending precise corrections to the mount. While both color and monochrome cameras can be used for guiding, monochrome cameras are generally preferred because they detect fainter guide stars and provide more reliable guiding performance.

Guide cameras are typically used in one of two ways:

GUIDE SCOPE. A small telescope mounted alongside the main imaging telescope. This is the simplest and most popular solution, especially for beginners and short-to-medium focal lengths.

OFF-AXIS GUIDER (OAG). A prism picks off a small portion of the light from the main telescope and directs it to the guide camera. This eliminates differential flexure and is the preferred choice for long focal length telescopes and demanding imaging setups.

Whether using a guide scope or an off-axis guider, a sensitive monochrome guide camera is one of the best investments for achieving consistently sharp long-exposure images.

ABOUT NSO

Our Vision

We envision a world where anyone with an interest in astronomy can begin their journey with confidence and enjoy rewarding first light experiences. Where choosing equipment is exciting rather than overwhelming, expert guidance is always within reach, and every astronomer has a trusted partner throughout their journey under the stars.

Our Commitment

We believe our responsibility doesn't end with a sale. We are committed to supporting our customers throughout their astronomy journey.

- Expert Guidance
- Carefully Selected Stock
- Accessible Value
- Long-Term Partnership

