

OVERALL GUIDE PAGES

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BEGINNERS GUIDE TO THE NIGHT SKY

<https://www.digitalcameraworld.com/tutorials/the-beginners-guide-to-photographing-the-night-sky>

Although you can use any camera that allows you to adjust the ISO, aperture and shutter speed, a compact with a one-inch sensor or a DSLR will yield the best results – and this is very much the case if you want to capture the Milky Way.

Since you'll need to keep the camera as still as possible to take long exposures, a sturdy tripod is a must. A remote shutter-release cable is also helpful, though most cameras can be set to shoot on a two- or ten-second delay.

Another must-have is torch with a red light mode, which will help preserve your night vision (it's also worth lowering the brightness on the LCD screen to prevent a blinding glare). However, the art of night photography is as much about knowing how to manipulate your camera by touch and feel rather than by sight. An easy (and warm) way to practice is to switch off the lights at home and see if you can set your camera up in the dark.

Remember to also prepare yourself for the night by wrapping up warmly and taking a hot drink if necessary.

Once you're in a dark, moonless place at the right time, think about composition. It's often overlooked by night-sky photographers, but it's just as critical as it is for any landscape image.

Look for something interesting or unexpected to place in the foreground, such as a church, a tree, vehicle or a lake (the latter might even reflect star-light). It can be useful to arrive somewhere before dusk to scout-out some locations to try, then wait until at least an hour after sunset.

The trick to successfully photographing the night sky is to let as much light in as possible from as much sky as you can. That means using the fastest, widest lens you can. A 10-22mm lens (or thereabouts) with an aperture of f/4 is OK, but most night-sky photographers will use a lens that reaches f/2.8 or lower.

First, set the camera to manual mode. Now focus the lens on infinity, ensuring that autofocus is deactivated. This will keep the stars sharp, though finding the exact dial position on your lens that maximises sharpness will be a matter of trial and error.

Set the white balance to tungsten or daylight (though remember that you can change this in post-processing), and tell your camera to record in Raw plus JPEG formats.

With your camera on a tripod and pointing upwards towards a clear patch of sky, try these settings for your first shot: an aperture of f/2.8, ISO 800, and a 25sec shutter speed. Zoom into the resulting image on the LCD screen to see if the stars are sharp, and nudge the focus dial if necessary. Keep checking this; even if you get the focus spot-on, it's too easy to nudge it accidentally while moving the camera, so check and re-check it.

Leave the aperture and exposure as they are (30 seconds tends to blur the stars because of Earth's rotation), and start to experiment with ISO 1600, ISO 3200 and even higher if your camera can reach higher ISOs (and there's zero artificial light around). If there is a streetlight or security light on somewhere nearby, using a higher ISO will introduce a lot of noise.

STAR TRAILS

If you want circles, you must point your camera at Polaris, the North Star. Earth's axis points to Polaris, so all stars in the northern hemisphere appear to rotate around it. You could just point your camera towards the north, but if you want circles around, say, a church spire, [you can easily find Polaris](#) by using the stars of the easily recognisable constellation The Plough/Big Dipper.

The easiest and cleanest way is to take a series of 30-second exposures and stack them using free software. Expose for 30 seconds as a test shot, and once you're happy with the image – particularly the focus and composition – just repeat it 100 times! Put the camera in continuous shooting mode and come back in 40 minutes.

When you get home, download [StarStaX](#) to a laptop, drag in the images, and in a few minutes it will compile a beautiful star trail. If the finished image contains dotted lines, they're airline tail lights, so remove individual frames and restart the process.

If you get really into star trails, it can be helpful to go out on a night shoot with two cameras capable of night sky shots. So, next time you're out you can set up a compact on a small tripod pointing north that can shoot frames for a star trail while you use a DSLR on a bigger tripod for that Milky Way shot nearby. However, for night sky photography all you really need is a camera with manual control, a warm coat and clear skies.

PHOTOGRAPH THE MOON

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The equipment you'll need is the same as for landscape photography: a DSLR, mirrorless or bridge camera on a sturdy tripod, and either a wide-angle or any regular telephoto lens, such as one with a 70-300mm focal range. A remote shutter-release cable will also be useful so you don't introduce vibrations, although you can also use the timer in your camera.

Although you can autofocus on the Moon as it rises, or as it becomes visible just before sunset, it's a good idea to focus manually. With your lens set to manual focus, set the the focusing ring to infinity. It takes some practice since most cameras can focus beyond infinity, and finding the exact point that works for your lens takes trial and error.

Take some test shots and zoom in on the result on your camera's LCD screen to see which one works best. Don't skip this step; only once you've done it correctly will your Moon photos be reliably sharp.

HOW TO EXPOSE FOR THE MOON

Don't overexpose the Moon – it's much brighter than you probably expect. However, it does depend on whether you're just photographing the Moon, or whether you also want a foreground.

To get a great Moon shot and little else, set your camera to ISO 100 or ISO 200 and the aperture to between f/5.6 and f/11, and adjust your shutter speed to between 1/125sec and 1/250sec. The exact settings will vary depending on your camera and the brightness of the Moon, which depends on its exact phase, but these base settings will get you started.

Some photographers will tell you to always photograph a Full Moon, but that's an amateurish mistake. Not only is the Full Moon's glare a real challenge to overcome, but a perfectly Full Moon is also visually uninteresting. It's a cliché.

Instead, go for other phases of the Moon when you can see a line between the light and dark sides. This is called the terminator line, which is when the craters on the Moon throw shadows, particularly near its South Pole. You can see this most nights, but perhaps the most precious kind of Moon is visible only on the few days on either side of New Moon. At this time, you'll also see a waxing or waning Crescent Moon close to the horizon, and it comes with the bonus of Earthshine.

Although 50% of the Moon is constantly being illuminated by the Sun, there are a few days each month when the Earth gets involved – and it's a beautiful event to capture.

Earthshine is a dull glow to the unlit area of the Moon that's the result of sunlight reflecting off Earth's surface and on to the lunar surface. Its subtle and mesmerising, and easy to capture if you time it right. Set up for the first (or, more likely, the second) sunset after New Moon. Using a lens with as long a focal length lens as possible, and with your camera on a tripod, dial in a sensitivity of ISO 400, an aperture of f/2.8 (or as low as your lens will go), and open the shutter for between one and four seconds.

To anyone with a trained eye, most composites look like what they are: fakes. There is one exception; [moonstacks](#), a lunar time-lapse, in which you take several photos of the moon as it moves through the sky, and then use Photoshop to composite them into a single image.

READ MORE: [HOW TO CREATE A MOONSTACK](#)

CREATE A MOONSTACK

<https://www.digitalcameraworld.com/tutorials/how-to-create-a-moonstack>

LANDSCAPES BY THE LIGHT OF THE MOON

<https://www.digitalcameraworld.com/features/moonlighting>

1. TAKE A TEST SHOT

Set your highest ISO, such as ISO6400, and a wide aperture, like f/4. Under the full moon this should result in an exposure of no more than a few seconds. It'll be horribly noisy, but it means we can come up with an exposure without waiting around for ages.

2. CHECK THE EXPOSURE

Look at the test shot and histogram to check the exposure. While you're at it, zoom in to check focus. If you're happy, make note of your exposure settings. Now you can lower the ISO for better image quality and narrow the aperture for greater depth of field.

3. LOWER THE ISO

For each stop of ISO that we alter, we need to double the shutter length. Taking ISO6400 down to ISO400 is a difference of 4 stops, so 2 secs becomes 32 secs. We could go lower, perhaps to ISO100, but consider whether the extra quality is worth waiting around for.

4. CALCULATE THE EQUIVALENT

Our initial aperture of f/4 doesn't provide enough depth of field, so we closed up 4 stops to f/16. Now 32 secs becomes 8 mins 32 secs (an exposure calculator app, like [PhotoPills](#), helps work it out). Set Bulb mode and use your cable release to lock open the shutter.

HOW TO PHOTOGRAPH ISS

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