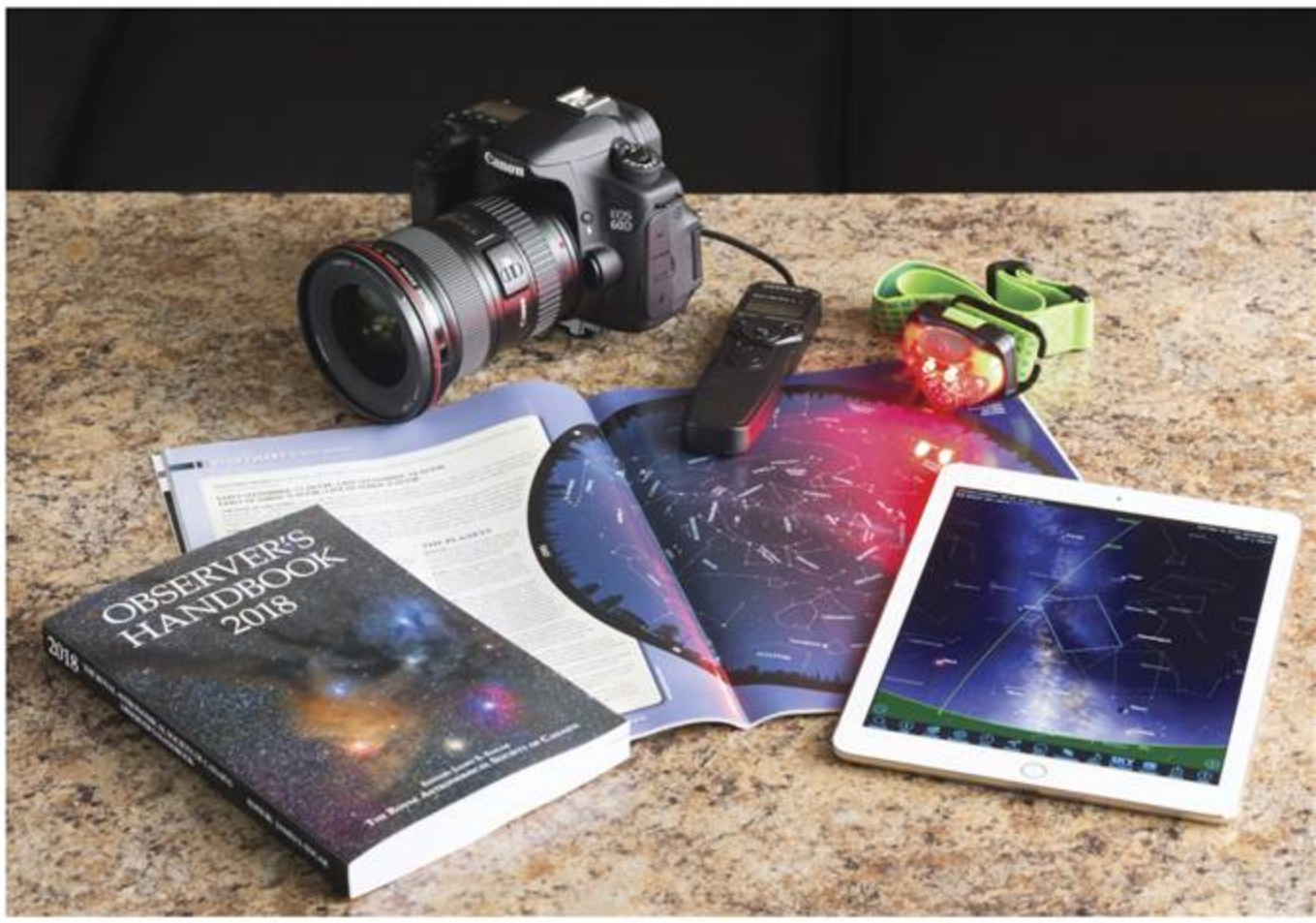
Text and photography by TONY PUERZER

PLANNING YOUR ASTROPHOTO SESSIONS

Preparing for the worst instead of hoping for the best is the surest way to get great shots

THE HISTORY of professional sports is filled with many "lucky shot" stories. But chalking up these events to good fortune ignores the years of practice athletes put into honing their skills. I've noticed the same thing with my photography—the better prepared I am, the luckier I seem to get!

Autumn is my favourite time of year to be an astrophotographer. Shorter days and longer nights mean less time waiting for darkness. In the early evening, the very best of the summer's deep-sky objects are still on display and the majestic arch of the Milky Way swings into perfect position for dramatic wide-field portraits. If you're willing to stay up late (or rise early), the predawn offers a tantalizing preview of the winter constellations minus the bone-chilling temperatures. But even in early autumn, clear nights can be infrequent, and you don't want to be caught unprepared when one comes along.



TOOLS OF THE TRADE Proper planning significantly improves your chances of taking a great image. In addition to your camera gear, the most essential item is a red-lens LED headlamp (and spare batteries). For advance planning, the author relies on the reference sources shown here: the RASC *Observer's Handbook*, this magazine's all-sky map and Celestial Calendar listing and SkySafari planetarium software.

KNOW YOUR SKY

A helpful first step for an at-a-glance overview of what's currently visible is to flip to the centre of this magazine to review the main star chart. The Celestial Calendar section opposite the star chart lists the Moon's phases—and knowing what our nearest neighbour is up to is crucial. Each month offers a brief Moon-free window around the new Moon. This is the best time to try to photograph faint targets. When the Moon does come around, don't despair; you can still take memorable astrophotos. A Harvest or Hunter's Moon set against indigo twilight can add drama to a carefully timed landscape photo. And if you're interested in capturing planetary conjunctions, check out Alan Dyer's excellent Exploring the Night Sky column (page 26) to see what's in store in the coming weeks. For longer-term planning, the RASC *Observer's Handbook* is indispensable.

A clear, dark sky is the one essential ingredient for creating great long-exposure astrophotos. If you're fortunate enough to live in a rural location, the perfect spot to set up your tripod could be as near as your backyard. For city dwellers, though, a drive of an hour or more might be necessary to escape the scourge of light pollution. Before I load the car, I check the weather forecast. In particular, I go on-line and visit the Clear Sky Chart (www.clearsky.com/csk) to review the cloud cover and transparency predictions for my destination.

If you're travelling to a location for the first time, plan to arrive well before sunset. This will give you ample time to scout around for the perfect spot to set up your gear. Mobile phone apps, like Night Sky for iOS or SkyView for Android, include a handy "augmented reality" feature that allows you to overlay a graphical representation of the heavens onto a live video image of your daytime landscape. This can be valuable for composing wide-field photographs, since you can check in advance how the constellations will be positioned with respect to your surroundings throughout the night.

For narrow-field imaging, I rely on desktop planetarium software to plan the framing of my pictures. The computer program displays a rectangular frame scaled to match the field of view produced by a specific

LATE-SEASON MILKY WAY Autumn is the author's favourite season for astrophotography. In this self-portrait, he's setting up a 300mm lens for a night of shooting at the Amphitrite Point Lighthouse in Ucluelet, British Columbia. He used a Canon EOS 6D DSLR camera set to ISO 1600 for this 30-second exposure made with a 15mm fish-eye lens at f/2.8.

WINTER PREVIEW The autumn predawn sky offers a tantalizing preview of the winter constellations minus the chilly temperatures. On this particular morning, a thin layer of ground fog rolled in just before sunrise, obscuring the rising stars in Orion and coating the camera lens with dew. For this 30-second exposure, the author used a Canon EOS 6D DSLR at ISO 3200 and a 15mm fish-eye lens working at f/2.8.

MOON, MARS AND VENUS Conjunctions of the Moon and bright planets often present excellent photo opportunities when long-exposure, deep-sky photography is out of the question. Make your shot while the sky still has some colour, and position your camera to include an interesting foreground. The author used a 300mm f/4 telephoto lens with his Canon EOS 70D DSLR camera (set to ISO 3200) for this ¼-second exposure showing (from top to bottom) the Moon, Mars and Venus.

camera and lens combination. This helps me figure out which lens I'll need to frame a given target. SkySafari is my go-to application; however, most premium software packages offer this basic feature. I also use the frame overlay to plan multishot mosaics that I stitch together in postprocessing. (I gave a detailed description of this technique on page 16 of the May/June 2018 issue.)

Planetarium software shows the start and end times for astronomical twilight as well as the exact moment your desired deep-sky object crosses the local meridian. This is important because the best time to image any celestial treasure is when it's highest and therefore being photographed through the thinnest cross section of atmosphere. Also, an object on the meridian is usually positioned farthest from any horizon glow.

All this planning can be done well in advance and offers a fun way to spend a cloudy or moonlit evening.

PACKING UP IS HARD TO DO

Knowing what, where and when you're going to shoot is obviously important, but so is remembering to bring everything you'll need. Draw up a packing list, and get into the habit of storing everything in the same bags each time. This vastly reduces the chance of forgetting to bring along a critical item—or leaving something valuable behind when you're done. At the end of an imaging session, it may still be dark; you'll probably be tired and prone to making mistakes. That's why it's always wise to take a second look around your observing site before driving away. Of course, leaving an expensive lens behind on a remote mountaintop is something I'd *never* do. (But if you happen to find a nice Canon lens at such a location, I hope you enjoy taking photos with it as much as I did.)

And don't forget to include those little extras that can make or break a trip. Two items I always pack are a red-lens LED headlamp (makes setting up and tearing down so much easier) and a spare set of batteries. I also like to bring along several pocket hand warmers. I use a thick elastic band to attach one or two to the side of a lens. The gentle heat they produce is enough to keep the front lens element free of dew for several hours—an essential tactic on damp autumn evenings. And a snack or a thermos drink is a sensible idea too. Simple sustenance will go a long way toward ensuring that the photographer stays reasonably sharp.

Finally, the most important advice I can offer is to be 100 percent familiar with your gear. Before heading off to a remote location, set up everything at home and do some test shots. The worst approach is to buy a new piece of equipment (or software) on the eve of a big outing. Standing in the dark in an unfamiliar environment is not the time to discover you don't know how to set the controls on your brand-new camera or intervalometer. It's much better to sort out these details at home, where you can Google your way out of any problem.

Planning ahead isn't infallible, but it's your best bet for trouble-free imaging. With sufficient preparation, you'll nab your share of "lucky" shots. ✦

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