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“If you visit your location during daylight hours, you can mark out potential shooting spots beforehand, making it easier to get set up when you return”

» surrounding environment. “There isn’t one particular type of location that you can’t shoot for night photography,” agrees Richard. “I would recommend Las Vegas because we have the glimmering lights of the Strip and a hundred miles away some of the darkest nights in the world. The most inspiring location I’ve visited so far is Nelson’s Landing.”

Composing your shots effectively may prove a little tricky if you can’t see much, so it pays to take a powerful torch and plenty of spare batteries. Also, if you take the time to visit your location during daylight hours, you can mark out potential shooting spots beforehand, making it easier to get set up when you return under the cover of darkness. Richard adds: “The main thing you need to look for is a subject to place in the foreground: something to start you off and lead you into the rest of the image. Also, make sure there is context to the image. You can’t just point your camera up at the sky. The foreground is the most important because that is where your eye goes first.

Composition can be difficult to control because you can’t change things once you’re there, you can only reposition yourself. Also, try to capture the sense of place. Shooting wide (using a wide-angle lens) can give you this sense of place: with night photography, I shoot everything wide-angle: 14mm-24mm. Try to get as much of the scene in the image as you can.”

Richard’s atmospheric images of abandoned buildings and structures in the areas neighbouring the bright lights of the Las Vegas Strip are indicative of the level of impact it’s possible to work into these sorts of shots. He continues: “In Nevada there are several abandoned mining towns and boomtowns from the 1900s. I spend a lot of time researching what people have shot during the day and then go out to see what it looks like at night. I’m the only person who has shot many of these ghost towns after dark.” Richard’s principles can effectively apply to anywhere in the world: you just have to do a bit of legwork.

While there is scope to manipulate your night shots on the computer once you’re home, Richard prefers to perfect his compositions in-camera: “I don’t manipulate any of my images. The effects have to do with scene selection and the brightness of the moon. Everything is done in camera, with available light and handheld light and flashes.”

Along with experimenting with different light sources and man-made objects and structures, Richard dabbles in the art of photographing the night sky, and last year he took a trip 60 miles outside of Las Vegas to photograph Perseid’s meteor shower. He continues: “Just after midnight there were long fireball-like streaks shooting across the dark Nevada sky. I shot with three separate cameras pointing in all different directions with an average exposure between 3 to 13 minutes. Depending on the brightness of the streaks the amount of light that will register on your camera’s sensor will vary, so shoot on a wider aperture (2.8 to 5.6) and bump up your ISO to about 200 or 400 and just shoot a lot.”

Dennis Mammana has been a published photographer of images of the night sky for over 40 years and is an invited member of TWAN (The World at Night), an international team of the most highly acclaimed night sky photographers on the planet (www.twanight.org), making him a real expert on the



subject. In spite of this, he makes a living pursuing a variety of interests, and so doesn’t class himself strictly as a professional photographer. He explains: “I’ve never completely turned professional in photography because much of my work consists of writing and lecturing. While I do sell and publish many of my images, the best I’ve been able to achieve is ‘semi-pro’ status. Doing only photography as a business – let alone filling such a small niche as sky photography – would be incredibly difficult and I admire anyone who can pull this off successfully!”

While this area of photography may not be the most lucrative, it’s certainly fascinating, and it’s possible to get some incredible results, even without specialist equipment. Dennis continues: “I shoot with Canon gear. Years ago, while shooting film, I worked with Minolta and Nikon and, for a while, I experimented with medium-format Hasselblads and even a 4 x 5. I soon realised that the fastest lenses on the market come from Canon, and these are what I need to create quality images under extremely low light levels. So today I work primarily with a Canon EOS 20D, and my workhorse lenses are a 14mm f2.8L and a 24mm f1.4L. Not only do these include more sky in my images, they have a very good depth of field, especially the 14mm lens. Even wide open, its depth of field is nearly infinite!”

I’ve concluded that digital is the very best way to do sky photography – if for no other reason than the learning curve is much easier to climb because of the instant results. Rarely do I use anything more advanced than a camera, wide-angle lens and tripod. This stuns people who see my photos, but it’s all that’s necessary if one has the celestial knowledge to anticipate what’s going to happen and how it’s going to proceed.”

Dennis was inspired to take up night photography at a young age: “It was the mid-1960s and I was a youngster who was becoming fascinated by the night sky. I soon realised that finding words to communicate the beauty and mystery of this celestial display was difficult. I remember reading such

▲ LIGHT SHOW

An incredible combination of traffic light trails and Mother Nature’s own light display combine to produce a powerful and awe-inspiring shot

Shot details: Canon EOS 20D at 14mm and f5, 30sec, ISO 100

"Trying to compose and focus an image in darkness is probably the biggest problem. I have no magic solutions to this challenge"

▶ magazines as *Sky & Telescope*, which often featured beautiful photos of the night sky. I thought "I can do that!", so I saved some money from odd jobs and bought myself a used Kodak Vigilant Junior Six-20 camera and tripod, and set out to shoot the sky. Not long afterwards I built a basement darkroom in which to do my photographic work. It was pretty basic, of course, but it allowed me to experiment with black-and-white processing and printing, and opened up an entirely new universe for me."

Although photographing the night sky doesn't have to be rocket science, you do still need to do some research to ensure you go home with the best possible results. "Many of my photos are carefully planned – or at least visualised – beforehand," Dennis explains. "As an astronomer I've always worked under the paradigm that the clearest, darkest sky was best, but as a sky photographer I've found that clouds, moonlight, etc are some of my best friends."

To plan out shots I often use planetarium software – my favourite is *StarryNight* (www.starrynightstore.com/stniso.html); this often allows me to plot out an event within my camera's field of view, watch its motion and compose the image long before I get out in the field. Of course, one must have some knowledge of the workings of the sky before this becomes an efficient process.

Those who've come to night sky photography from amateur astronomy often try to avoid areas with city lights, and will only work on nights with no moonlight in rural areas that are completely dark. In my way of thinking, that's a huge mistake – some of my best sky photos have come from inside major cities! In fact, I rarely shoot under a completely dark sky. In my opinion, a sky shot without ambient light of some sort is nothing but highlights (stars) and shadows (everything else). I prefer using moonlight since this adds middle tones in a very

natural way and makes the photo. The amount of moonlight needed depends on the subject, foreground and exposures necessary to get the shot. I also like water; the reflections that it produces can be magical under the subdued light of the stars or the moon."

As Dennis has mentioned, the main problem you're likely to encounter is achieving sharp focus, which – in the dark – can be a bit hit and miss: "Trying to compose and focus an image in darkness is probably the biggest problem to solve. I have no magic solutions to this challenge; each situation is different. However, if the moon is up I'll usually focus on that and then, making sure that the lens is set on manual focus, tape the Focus ring down so it can't move. If the moon's not up I try to focus on something at infinity during daytime and hope for the best after dark. Often I'll set up the camera in the approximate position I think I'll need, take a photo and look carefully at the LCD image. If the composition needs to be changed, I'll move the camera slightly and reshoot. Going through a series of steps like this will often get me the shot I'm looking for."

One natural phenomenon that never ceases to attract photographers is the Aurora Borealis, or 'Northern Lights'. Dennis has succeeded in capturing some truly stunning images of this natural light display, and has more than a few tips to share on the topic: "While you can occasionally see the aurora from southerly latitudes (see some of my shots from the deserts of Southern California, USA), it is most prominently visible from northerly locations – around 60-70 degrees north latitude – which means going to such locations as Alaska, Iceland and Norway directly under the 'auroral oval'. It also waxes and wanes with the 11-year solar cycle; we're now coming out of 'solar minimum' and, within the next year, the auroral intensity will begin to increase dramatically, so I'm looking forward to getting back to these northerly locations early next year."

Taking a photo of the aurora is easy. Taking a good photo, however, is hard. It requires being in the right place at the right time, knowing how to anticipate its movement, and estimating the correct lens, aperture and exposure. It is this process that I spend a great deal of time on during my public tours to Iceland and Alaska, and I'm proud to say that many of our participants wind up taking some beautiful images. The lights are somewhat predictable, and I've put together a one-page tutorial on how to do this for more southerly locations: www.dennismammana.com/skyinfo/gazingtips/auroras.htm.

Dennis prefers to take a more measured approach when composing his shots: "It's important for me to combine the celestial with the terrestria – to provide the viewer with a sense of perspective and inter-relationship between our world and others. This means that selecting an interesting foreground is profoundly important; sometimes this isn't possible, but when it is, it can make all the difference."

Many who photograph the sky are content with capturing the celestial activity. This can certainly be quite a challenge – depending on what it is – but it's just not enough for me. I must be able to create a strong image out of it. In fact, ▶▶

NATURE'S CANVAS (AURORA OVER MOONLIT MOUNTAINS)

"When the sun blasts charged material in our direction, some falls into our atmosphere creating the aurora borealis – marvelous works of art as well as wonders of science. Here, splashes of colour from the aurora borealis along with wispy cirrus clouds fill the sky over the moonlit mountains south of Fairbanks, Alaska on the night of March 23, 2002. On the lower left appears the Pleiades star cluster and, more toward the center, a glint of sunlight off an Iridium satellite. On the right, a jet contrail appears. It was a truly spectacular night, with display after display from dusk to dawn"

Shot details: Canon F1 with Canon 24mm f1.4L lens at 24mm and f2, 12sec, ISO 400

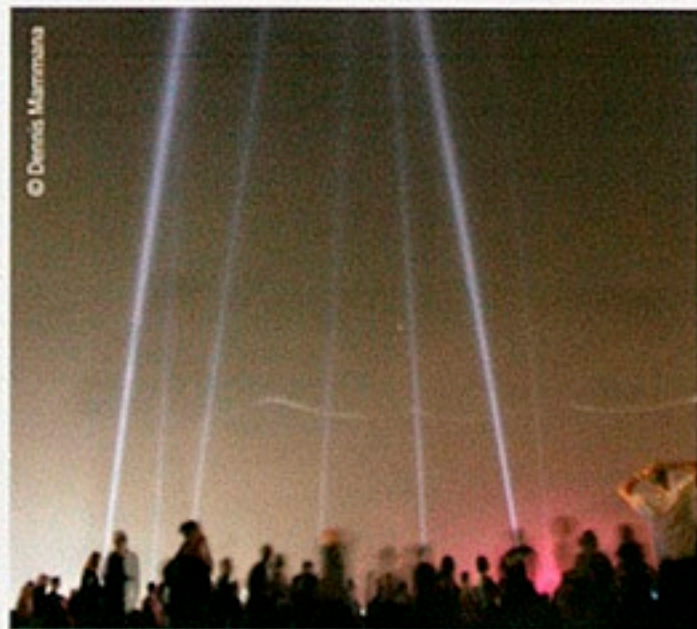
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LUNAR CORONA ▶▶

"Though the waxing gibbous moon is overexposed, the beautiful and colourful lunar corona shines through the cirrus clouds around it. It's produced by the diffraction of light by tiny cloud droplets or sometimes small ice crystals. The bright 'star' to the left of the moon is the planet Jupiter, while the two fainter stars to its right are the 'twin' stars of the constellation Gemini: Pollux and Castor. More info about lunar coronas is available at www.sundog.dara.co.uk/droplets/corona.htm"

Shot details: Canon G2 with 7mm FL lens at f2, 3.2 second exposure (ISO unknown). Shot from the parking lot at the Alaska Pipeline Fox visitor centre at mile 89.4 Steese north of Fairbanks, AK during the early morning hours of March 14, 2003.

Terrain from a four-second exposure and car taillights is blended with a 3.2-second exposure of the sky



COACHELLA FESTIVAL ▶

"Spotlights shoot into the night sky and festival goers look on as Depeche Mode performs a set at the Coachella Valley Music and Arts Festival, Saturday, April 29, 2006"

Shot details: Sony DSC-R1 at 14mm and f4, ISO 400

Low light



© Dennis Mammama



EXPERT ADVICE

DENNIS MAMMANA

Web: www.dennismammama.com

"I began young. In fact, this year marks the 40th anniversary of my first published sky photo. It was the 12 April 1968, and somehow my father had arranged for me to shoot that night's total lunar eclipse with our town's newspaper photographer. Despite listening patiently to my advice about eclipse shooting techniques, the photographer chose not to believe some dorky 16-year-old and went merrily about his business. Later that night we developed our film and - well, to cut a long story short - my shots appeared in the next evening's newspaper and his didn't!"

My formal education is in astronomy and, while I've taken a few non-credit classes in photography and digital image processing over the years, I've actually taught more of these than I've taken. Just about everything I know came from reading books and magazines (including *Digital Photographer*), and through trial and error.

I offer popular classes and workshops in sky photography, but also lead public tours around the world to view and photograph remarkable celestial events such as total solar eclipses and the aurora borealis. You can check out some of these upcoming cosmic adventures at www.dennismammama.com/tours/upcoming.htm

1 LEARN TO SEE IN THE DARK

It sounds crazy, but once you try to focus and compose an image at night you realise how remarkable good night sky photos are!

2 TAPE DOWN ANYTHING ON YOUR CAMERA THAT CAN POSSIBLY MOVE

Most people figure they don't need to do this because they're careful not to move anything, but things will move! Use gaffer tape so you don't leave a sticky residue behind.

3 EXPERIMENT

Don't hesitate to set up a shot if there are city lights, moonlight, airplane trails, people or anything else you think could disrupt a photo. You might be pleasantly surprised by the results.

4 FORGET USING AUTOMATIC SETTINGS

Forget using automatic settings: Night sky photography requires you to use your camera in all its manual modes. Learn them and you'll become a much better photographer overall.

5 MOST IMPORTANTLY

If you can see it, you can photograph it. Night sky photography takes a bit more knowledge and skill than most people have, but it's not brain surgery. You can do it!



Dennis Mammana's tips for stunning star trail images

To get you started, if all you have is your camera and a tripod, you can create inspirational images of star trails, created by the rotation of the earth. Dennis explains: "Star trails are – at the same time – one of the easiest and most difficult of celestial subjects. This illustrates my rule of thumb that it's easy to take sky photos, but difficult to take good sky photos."

Set a camera on a tripod, focus on infinity and open the aperture pretty wide, and take an exposure of many minutes or hours in length. The way the star trails appear depends on the direction the camera is aimed. To get concentric circles, aim toward the North Star. To get straight trails, aim in the opposite direction.

With digital, long exposures just aren't possible without getting lots of noise. There is free software that makes it possible to assemble star trails from a series of short exposures (www.startrails.de). For some of my shots, I use hundreds of 30-second exposures. I recommend capturing these with an intervalometer, lest your shutter finger becomes worn away!"

►► there have been times when I've actually not photographed interesting celestial events because I knew the final product just wouldn't be very good.

The most inspiring celestial activity to photograph has to be both the aurora borealis and total eclipses of the sun. Shooting here in the Desert Southwest (US) is almost tailor-made for capturing the grandeur of the heavens. Weather and lighting can be quite dramatic, as any daytime desert photographer knows, but at night it can be magical."

It's a misconception that taking photos of the night sky always necessitates expensive equipment and telescopes. Sometimes it's preferable – and more interesting – to keep your feet firmly on the ground, as Dennis describes: "I'm careful to make a distinction between astrophotography and sky photography. Shooting close-up photos of astronomical subjects is the realm of 'astrophotography', and for this one must have tremendous time, patience, knowledge, money and some heavy-duty hardware – especially a perfectly-tracking telescope. This is fun to do but, quite frankly, if you've seen one photo of the Andromeda Galaxy, you've pretty much seen them all. To photograph larger celestial sights – haloes, constellations, the Milky Way, or a crescent moon nuzzled up against the brilliant planet Venus – requires nothing more than the most basic of

“To photograph larger celestial sights – haloes, constellations, the Milky Way or a crescent moon – requires nothing more than the most basic of gear”



◀ SOUTHERN HEMISPHERE STARS

“Few places on Earth can match the beauty and serenity of Lake Benanee”

Shot details: Canon F1 with Canon 24mm f1.4L lens at f2 and 15sec, Kodak Ektachrome E-200. Scanned using Nikon SUPER COOLSCAN 4000 ED

▲ MOON OVER LUXOR

“Moon Over Luxor”: “At dusk on the evening of March 31, 2006, the thin crescent moon hovered over these massive columns at the spectacular Temple of Luxor in Egypt. To witness this sight that has appeared every month since the days of the great ruler Rameses II thirty-two centuries ago was a remarkable experience that no photo could ever truly capture.”

Shot details: Canon EOS 20D at 32mm and f8, 4sec, ISO 100

gear. This is what I call ‘sky photography,’ and every single one of these images is unique. No one can ever duplicate your effort exactly.”

One of the most popular photographic subjects for a nighttime sky photographer has to be the phases of a lunar eclipse. Dennis has created some incredible compositions recording such events, and was happy to share his knowledge on the subject: “When trying to capture a sequence like this on a single piece of film, you have to plan out the movement of the

11 years – the length of the solar cycle the northern lights wax and wane for

moon across the sky, the movement of the earth’s shadow across the moon, the changing brightness of the moon during the night (this depends on the phase of the eclipse as well as its elevation above the horizon), the proper exposures for each image, the field of view necessary to capture the entire sequence, etc – this can be quite a challenge. With digital photography, however, it’s still a challenge, but you can assemble the final sequence with Photoshop or another image-processing program. The trick, however, is to keep the image accurate by making sure the movements, colours and exposures are correct.

I will often use my StarryNight software to plot out an eclipse and then use it to make a Photoshop layer so I can assemble the final sequence properly, with the correct sizes, spacings, angles, etc. As an astronomer I just cannot in good conscience publish an image that isn’t accurate. If you’re going to put a sequence, panorama or mosaic together – and the sky provides some wonderful wide-field opportunities to do this – be sure to take a few minutes to do it accurately.”

The night holds an incredible variety of photographic opportunities. We’ve only touched upon a few here, but hopefully they’ve whetted your appetite, inspiring you to venture out, give your eyes time to adjust and capture the beauty that lingers in the darkness.