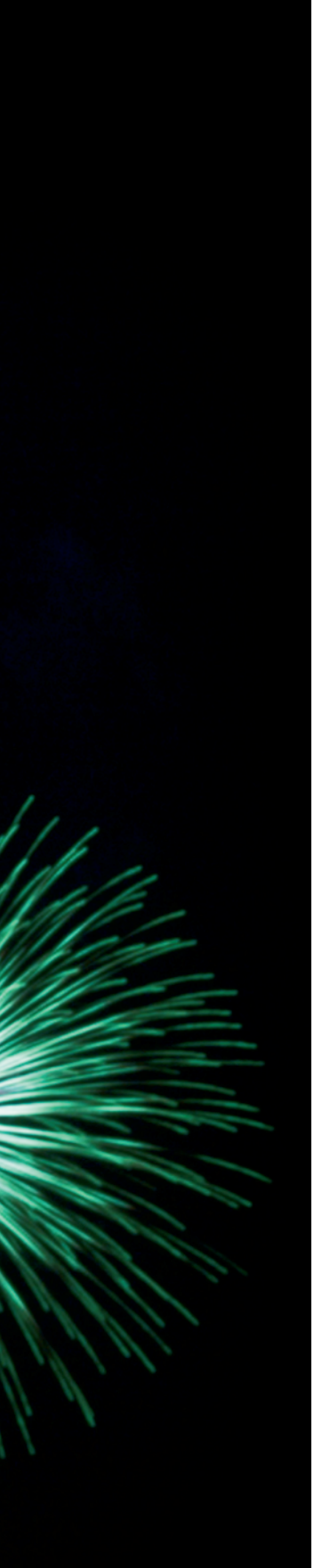


CHAPTER 1

NIGHT AND LOW-LIGHT PHOTOGRAPHY OVERVIEW

Photographing at night is challenging because there is usually less light available, and the less light available, the harder it is to get a proper exposure. This also applies to low-light situations such as shooting indoor events or sports, or even the kids just playing in the living room. The basics of photography don't change when the sun goes down or the action moves inside, but the tradeoffs become much more noticeable.

The lack of light means that you have fewer choices for the settings that you can use to create a photograph, and the challenges of getting the image to look exactly the way you want increase. When it comes to getting the proper exposure, there are only three controls that can be changed: the shutter speed, the aperture, and the ISO. Controlling these settings to get the shot you want in reduced lighting conditions is key. At times faster shutter speeds are needed to freeze movement, and at other times slower shutter speeds are needed to show the full movement. There are times when a wide aperture is needed to allow as much light in as possible, and other times a smaller aperture is needed to create a deep depth of field.

For example, in Figure 1-1, taken from a ferry dock at Coronado Island with the San Diego city lights in the background, I needed to use a setting that exposed the sky and the background, but I also wanted a deep depth of field. I started with a low ISO (100) to keep the digital noise to a minimum, and then set the aperture to f/10, which gave me the depth of field I wanted. Then I set the shutter speed long enough to get the exposure I wanted. Because the shutter speed was 2.5 seconds, I made sure the camera was properly locked down in a tripod and used a cable release. I then corrected the color by adjusting the white balance in postproduction.

SHOOTING CHALLENGES

If you believe the advertisements on television and in magazines, photography is easy: Just point the camera at the subject and press the button. No worries about the amount of light or the movement of the subjects or any of the camera settings. I don't blame the camera manufacturers for making it all look so easy; their job is to sell cameras, not to make sure you get the best results from the camera. Many of the situations they depict — shooting in a crowded, dimly lit restaurant or capturing a touchdown pass using the built-in flash — are not going to yield nicely lit photos because those are both examples of difficult lighting situations.

LACK OF LIGHT

Lack of light is easily the biggest challenge, not only with night and low-light photography, but with most photography.

Many times this lack of light can be frustrating to newer photographers — they see a great scene, whip out the camera, and take the photo, only to look at the LCD on the back of the camera and see an image that is blurry; so they turn on the flash and the results are even worse. This frustration often results in missed photos because the next time a low-light photo-op presents itself, they just leave the camera in the bag. For example, I live in San Diego and spend a fair amount

ABOUT THIS PHOTO *The San Diego skyline in the distance with the ferry dock in the midground and the rocky shore in the foreground taken right after the sun had set. Taken at 2.5 seconds, f/10, and ISO 100.*

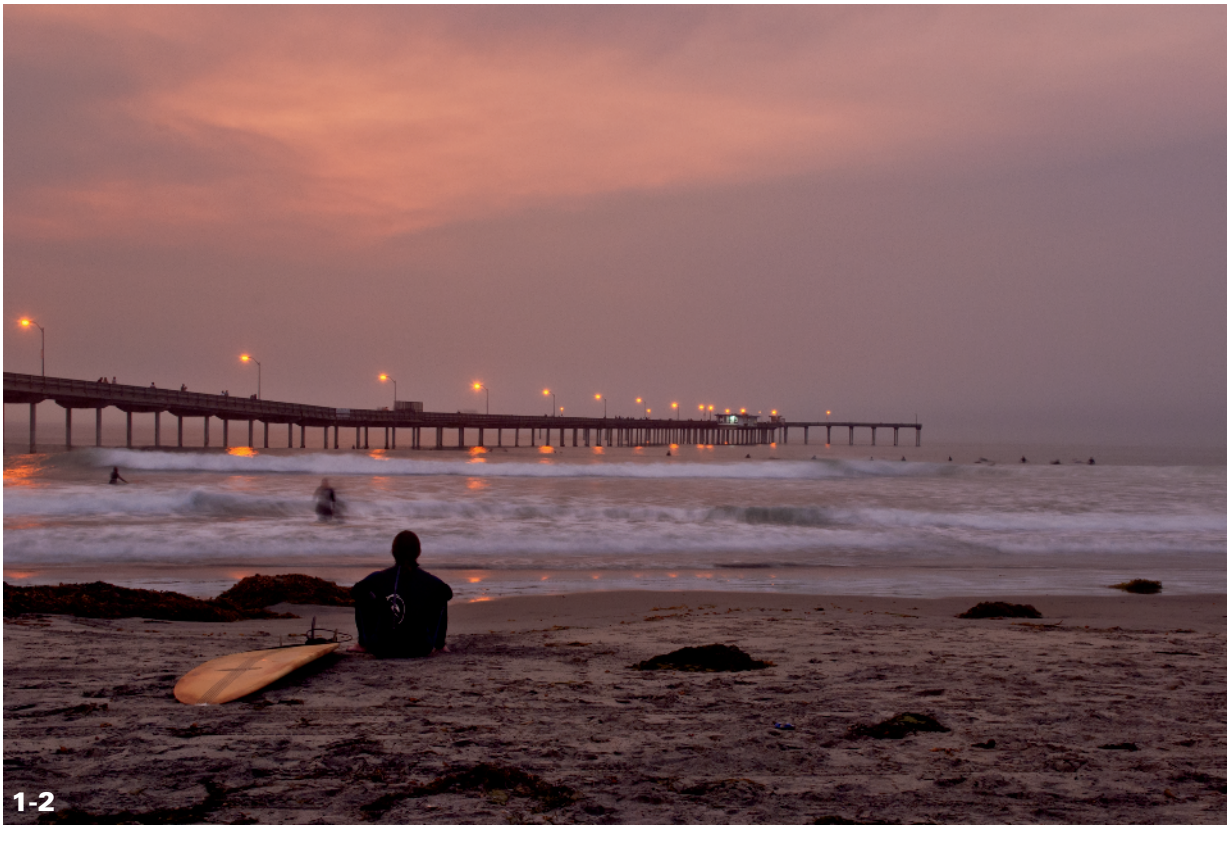
of time photographing the beautiful sunsets here, and it never fails to amaze me when I see someone standing with a camera at the water's edge trying to capture the sunset with the pop-up flash turned on. I know that when they get home, they will be disappointed because there is no way that the image will come out as they envisioned.

The solution is to understand how the camera works and which of the settings needs to be adjusted. Many times, the shutter speed needs to be increased, allowing the shutter to remain open for longer, and at the same time the camera needs to be supported so that it doesn't move during the exposure. The surfer sitting on the beach in

Figure 1-2 was photographed using a shutter speed of 1.3 seconds, which allowed enough light to reach the sensor to make a proper exposure. The camera was set on the sea wall to make sure it didn't move during the exposure, and luckily, the surfer didn't move either.

FREEZING ACTION

The only way to freeze action is to use a shutter speed high enough that in the time the shutter is open the subject doesn't move. That is not to say the subject has stopped and is waiting for you, but instead the sliver of time the shutter moves out of the way and allows light to reach the sensor is short enough that the subject looks frozen in place. The shutter speed needed depends on the subject being photographed. For example, a person walking is a lot slower than a horse running, so the shutter speed needed to freeze a horse mid-run is shorter than the shutter speed needed to freeze a man walking. The faster the action, the less time the shutter can be open before the subject starts to blur. The problem with low-light scenes is that with the small amount of light available, using a high shutter speed means that you have to either increase the ISO or open the aperture up as wide as possible — and in most cases, you have to do both. For example, when I photographed the Lipizzaner Stallions, shown in Figure 1-3, I made



ABOUT THIS PHOTO *The surfer was sitting on the beach watching the waves right after sunset. I didn't know if he had just come out of the water or was waiting to go in. Taken at 1.3 seconds, f/10, and ISO 100.*

1-3

ABOUT THIS PHOTO *The Lipizzaner Stallions are amazing horses to see and to photograph. To make sure I froze the movement of the horse rearing up, I used a fast shutter speed. Taken at 1/320 second, f/4.0, and ISO 1000.*

sure I was using a shutter speed fast enough to capture the action of the horse rearing up. To do this, I needed to use the lowest aperture available to me — in this case, f/4.0 — and I needed to push the ISO up to 1000 so that the exposure would be correct at the 1/320-second shutter speed.

x-ref

There is a lot more on freezing the action covered in Chapter 5 and Chapter 6.

When it comes to using shorter shutter speeds to freeze the action in low light, one of the other exposure settings needs to change — either the aperture needs to be made larger or the ISO has to be increased. The higher ISO values can cause other problems, however, the biggest of which is the introduction of digital noise.

DIGITAL NOISE

Digital noise is the catchall term for a range of problems that appear in images, especially those taken at high ISOs or when leaving the camera shutter open for a long time. This topic is mentioned so much in later chapters because many images taken at night or in low light require either a high ISO or a slow shutter speed, which creates digital noise in these images. Digital noise

can look like little spots of unwanted color, especially in areas that should have a smooth tone. It can also look grainy when viewed at a distance, and subjects can even look slightly out of focus if the noise is very high in the critical areas of your subject.

On the positive side, for new photographers and especially for those just getting into night and low-light photography, the camera manufacturers, as well as the software developers who create noise reduction algorithms, have really made improvements. The images produced today have far less noise than images produced a few years ago in the same conditions because cameras can now shoot at much higher ISO values and still get relatively noise-free images. And those images that need a bit of help can be fixed in postproduction or using in-camera noise reduction (if your camera offers that feature). For example, the image in Figure 1-4 was photographed at ISO 400 in 2005, and even at that relatively low ISO the noise is really obvious, especially in the shirt and skin tones.

LIGHT

There are really only two types of light in photography: the light that is already in the scene, often called available light, and the light the photographer adds to the scene. Both of these types of light can be used to create great images, and many people will argue about which is better. I believe that the type of light that you use is dependent on the subject and the shooting conditions. It would be great to always have the option of using extra light by adding a flash where needed, but at times that isn't possible.

ABOUT THIS PHOTO *The photograph of guitarist Mark Karan backstage was shot using available light, so the ISO was pushed to 400 and the shutter speed was dropped to the lowest speed I could successfully handhold without motion blur. Taken at 1/20 second, f/3.5, and ISO 400.*

USING AVAILABLE LIGHT

The available light in a scene can be from multiple sources and can be used to create great images if you use it to your full advantage. This can mean just waiting until the light is in the right position, as when shooting a concert by timing the movement of the spotlight, or leaving the

shutter open for a longer time to allow the light to fully illuminate your subject, as with long exposure landscapes. At times, photographing in low-light situations can come with rules that prohibit using an extra light, such as photographing in some wedding venues or photographing some sporting events at night or inside. There are also some locations where it isn't very practical to set up extra lights or where the use of those lights will change the look of the photograph too much. Take the bridge pictured in Figure 1-5, where the light sources are all actually attached to the bridge and the light reflected in the water helps to illuminate the underside of the bridge. I took this image with the light that was already there in the scene.

Many times, the key to getting great images when shooting in available light is to watch for a few minutes and see how the light is affecting your surroundings. When you can see what the light is actually affecting, you can do a better job of capturing it. For events, such as concerts and weddings, this could be as simple as showing up a little early and watching the area and how it is illuminated. For static scenes like the bridge in

1-5

ABOUT THIS PHOTO *When I took this photograph of the Ingraham Street Bridge late at night, I was limited by the light available from the bridge and needed to use a long shutter speed to capture it all. Taken at 33 seconds, f/20, and ISO 200.*

Figure 1-5, I stood and watched for a few minutes to see what the light would do before picking the spot for the photographs.

Using available light is covered in many sections of this book including using the window light to take portraits in Chapter 4, weddings, concerts, and other events in Chapter 5, and sports in Chapter 6. Chapters 7, 8, and 10 also discuss the use of available light in the creation of images.

ADDING LIGHT

One solution when faced with photographing in a low-light situation is to add a bit of light to the scene. This could involve just turning on a nearby light or adding an off-camera flash unit or two. The results are best when the new light works with the scene and doesn't try to overpower it. Take the photograph in Figure 1-6, for example. It was taken outdoors right after the sun had set. The added light from the camera-left position helped to make this a better image. Had there been no light added, the model would have been in too low of a light to shoot at these settings and the light would have looked too even and flat.

Adding light to a portrait is not as easy as it sounds because the flash units are usually very small bright lights that create hard light from the camera's position. This can cause your images to look unflattering.

1-6

ABOUT THIS PHOTO *Photographing Sam outside after the sun had set, I added an off-camera flash from the left to add light and definition to his face. The flash was fired using a radio triggering system that fires the flash when the shutter release button is pressed. Taken at 1/60 second, f/6.3, and ISO 200.*

WHAT GEAR IS IMPORTANT

There are a lot of accessories available for your camera. Walk into any good camera store or visit a big online retailer and you will see bags, cases, flashes, cords, cables, straps, remotes, timers, tripods, tripod heads, filters, filter holders…well, you get the idea. Many of these are not necessary for photographing at night or in low light, but there are a couple accessories that you will want to invest in. The most important of these is a good camera support, followed closely by a cable release or remote. Even with all the advances in camera technology, image stabilized lenses, and high ISO capability, making sure that the camera doesn't move — especially when using longer shutter speeds — is really important, and using a cable release or remote means that you don't have to touch the camera once it has been set up.

CAMERA SUPPORTS

One way to get a proper exposure when shooting in low light is to let the shutter stay open long enough for enough light to reach the sensor. However, when the shutter is open, anything that moves appears blurred in your shot, and if the camera moves, then everything is blurred. The way to counteract this is to make sure that the camera is locked into position and can't move, which means you need a tripod or at least a monopod.

Tripods have a long history, and even with the newer models that are made with space-age materials, the basics are the same. The tripod has three legs that extend downward from a center point creating a stable platform; the camera is attached either to the tripod itself or to a tripod head that allows the position of the camera to be adjusted. All cameras made today either have a threaded tripod mounting hole on the underside of the camera, so the camera can either screw directly onto the tripod or the tripod head, or they can have a mounting plate attached to make putting it on or taking it off the tripod easier. Once the camera is firmly attached to the tripod, it is held firmly in place and won't move during the exposure. Having the camera locked into the tripod also allows you to take multiple photographs of the exact same scene without changing the composition. This is important for HDR photography, capturing star trails, light-painting, and especially time-lapse photography.

You can find much more on tripods and gear in Chapter 3. For more on Star trails and time-lapse photography, go to Chapter 7, where all the techniques require the camera to be held steady during the exposure, and Chapter 9, where a tripod is needed for light painting.

The choice of a tripod is a personal one because tripods come in all sizes, materials, weights, and prices. However, the most important factor is choosing a tripod that can support your camera and lens. If the tripod is too light, or the camera and lens are too heavy, then the tripod will not be rock steady, which defeats the purpose. There is another bonus to using a tripod—the time it takes to set up the photograph and make sure the composition and exposure settings are just right. This little bit of extra time makes you think about the photograph more than when you just bring the camera up to your eye and press the button. When it is impossible to use a tripod, either due to the shooting location or because it's against the rules such as when photographing concerts, using a monopod in these cases can help you get better results that just handholding the camera and lens. This is especially true when you are using any of the longer, heavier lenses.

CAMERA AND FAST GLASS

There have been a great many advances made in camera technology. For example, cameras are able to capture usable images in less light than ever before, you can now shoot at higher ISO settings with excellent results, and consumer-level cameras have better ISO capabilities than professional models of just a few years ago. When you combine the advances of the ISO capability with the improved in-camera noise reduction and processing, the results are amazing. There have also been advances in the auto focusing and camera metering systems, making it easier to get proper exposures and in-focus images in a wide variety of situations.

For photography where you need to freeze the action in low light, consider a camera with high-ISO capability combined with a lens that has a very wide maximum aperture like f/1.4 or f/2.8, for

example. Look at the photographers working on the sidelines of a sporting event, especially under the lights at night, or the photographer in the photo pit of a concert, or a wedding photographer in a dimly lit church; the one thing that they all have in common is the types of lenses they are using. Known as fast glass, these lenses allow the maximum amount of light to reach the sensor in the shortest time; this enables you to use faster shutter speeds, which freeze the action. One problem with using wide apertures is that the photographer has very little control over the depth of field. For example, a large majority of my concert images are taken at f/2.8 or wider, which offers a very shallow depth of field. The photo of Anthrax lead guitarist Scott Ian in Figure 1-7 was shot using fast glass and a high ISO so that the shutter speed would freeze the action under the stage lighting.

SHUTTER-TRIGGERING DEVICES

Many times, just having your camera locked into a tripod isn't enough to get razor-sharp images. When you press the shutter release button on the camera with your finger, you can set off small vibrations in the camera that can cause slight blurring. This is why a shutter release cable is a great idea for long exposures. In Figure 1-8, I used a cable release so that I could watch the fireworks and trigger the camera at the right moments without actually touching the camera.

ABOUT THIS PHOTO *Scott Ian is the rhythm guitar player for the band Anthrax and was captured here in concert at a high enough shutter speed to make sure he was not blurred. That meant a combination of a wide aperture and a high ISO. Taken at 1/500 second, f/2.8, and ISO 1250.*

note

You can also get remotes for many different camera brands that allow for wireless triggering of the camera shutter release without having to touch the camera.

It is possible to use the self-timer to trigger the shutter release, but you are limited to the maximum shutter speed of the camera (usually 30 seconds or less) and you have to think ahead because the shutter will trip 2 to 10 seconds after you press the button.

There are two good reasons to get an advanced shutter release: to be able to lock the shutter open for extended periods using the camera's Bulb mode, and to set up interval shooting like that used for time-lapse photography.

1-8

ABOUT THIS PHOTO *I used a cable release to capture these fireworks. I started the exposure as the rockets flew skyward, and stopped it at the end of the explosion. Taken at 6.5 second, f/22, and ISO 200*

POSTPRODUCTION SOFTWARE

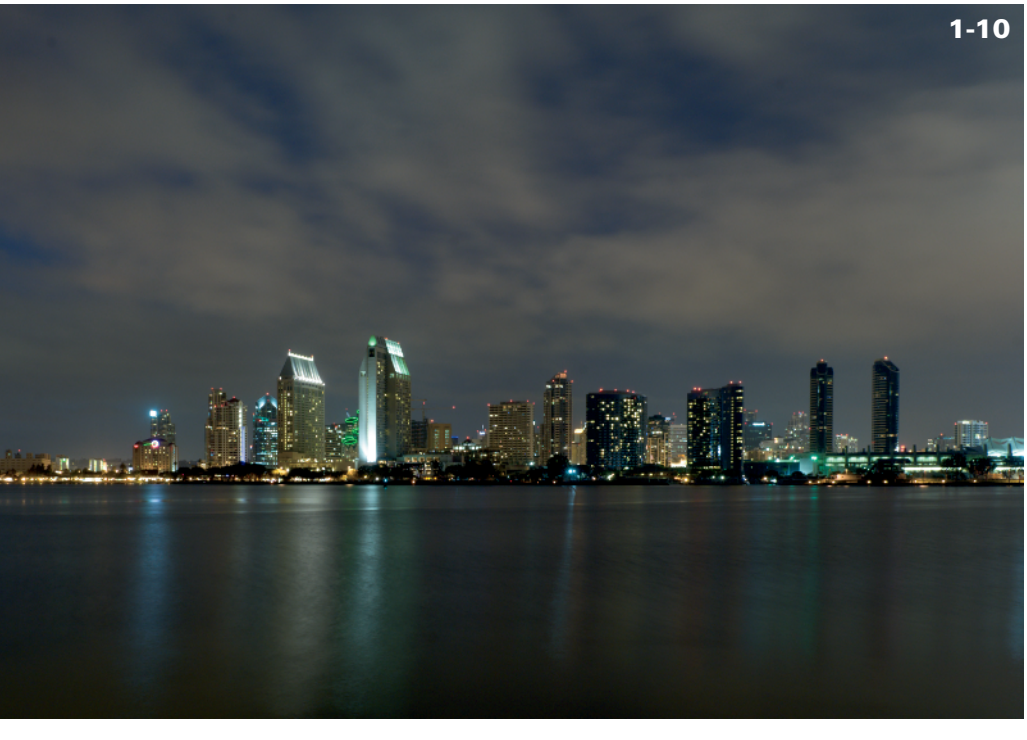
Everyone has heard of Adobe Photoshop, and many people think that it is the magic answer to every photograph. While photo-editing software can do amazing things, it is always best to get the image as close to what you want in the camera. While this isn't a Photoshop or image-editing software book, there are some important things that you can do in postproduction to make your life easier and to get the most out of your images.

Three of the most important adjustments you can make when editing photographs taken in low light and night conditions have to do with reducing the noise in your images, correcting the white balance which controls how the colors in your image are rendered, and adjusting the exposure.

- **Noise reduction.** Because of improvements in noise reduction in image-editing software, an image taken at night or in low light can have a significant amount of the digital noise removed while keeping the sharpness of the image. These advances make it possible to shoot in lower light, use higher ISOs, or keep the shutter open for much longer than ever before and still get a good shot.
- **White balance.** When you take a photograph, the color of the light that illuminates the subject can cause the image to look wrong — to have a colorcast. You can usually solve this colorcast by picking the right white balance setting in the camera, but you can also change or adjust the white balance in postproduction, especially if you photograph using the RAW image file type. Take Figures 1-9 and 1-10; these are of the same image but the white balance has been changed. When I took the original photo, I had the white balance set for fluorescent, which gave the image an interesting look but wasn't accurate to the scene.
- **Exposure.** Every image-editing software program has tools for adjusting the exposure of your images, from slightly increasing the overall brightness and revealing details in the highlights that could otherwise be too bright to increasing the brightness and revealing the details hidden in the shadow areas that otherwise could be too dark. It is possible to adjust both so that the details in the dark areas and the light areas are both visible.

ABOUT THIS PHOTO

The San Diego city skyline photographed from Coronado Island. Taken at 15 seconds, f/10, and ISO 200 using the fluorescent white balance.



ABOUT THIS PHOTO

The San Diego city skyline photographed from Coronado Island. Taken at 15 seconds, f/10, and ISO 200 with a custom white balance set in postproduction.

There are many image-editing software packages on the market, but you don't have to spend a lot of money. Much of the post-processing of the images for this book was done using Adobe Photoshop Lightroom, the Adobe Camera Raw module of Adobe Photoshop and Photoshop Elements. The full version of Adobe Photoshop Lightroom retails for $299.00 but can be found on sale often for less. Abode Photoshop Elements can be bought for $79.00.

CHOOSING YOUR SUBJECTS

What to photograph can be a tough question. For weddings, it's easy; just follow the bride around. For concerts, it's also easy; just follow the spotlight around. But what about other subjects? What good subjects are available to you that lend themselves to night and low-light photography? Since the earliest cave drawings, people have been depicting other people in their art, and photography is no different. Night photography, in particular, offers some really exciting subjects that you just can't photograph during the day. The dark night sky makes a perfect canvas for light trail photography, be it the blending of the car lights as they stream past your camera or the great fireworks displays that have been wowing crowds for years. The stunning vistas as the sun sets (or rises) and paints the sky with color are great to photograph. There are nighttime sporting events and concerts or the kids playing outside that are all great subjects. You can also create time-lapse photographs that show the changing night sky. If you are at a loss for a subject, just point the camera skyward and see what the night sky has to offer.

PEOPLE

I have a theory that the people who don't like to have their photo taken have never had a good photo taken of them. I believe this is because the person taking the photo didn't understand light and how it can make or break an image. This is especially true when the light gets low and a photographer starts to use a flash or tries to compensate in some other way. Many times, just using a simple external flash with the head aimed up or over the subject so that the light bounces down instead of blasting straight forward produces a much more flattering image. For the photo in Figure 1-11, the flash was aimed up ay the ceiling where it bounced down creating a simple portrait of the young Giants fan.

1-11

ABOUT THIS PHOTO *Photographing inside, I adjusted the flash on my camera to point up over the head of the subject at the ceiling, which was white and slightly angled; this created a nice soft light that was pleasing to the eye. Taken at 1/250 second, f/5.0, and ISO 200.*

PLACES

In addition to photographing people, photographing places can be fun and also challenging as the sun goes down. The best part of using a building as a model is that it never moves and never complains, and you can go back and photograph it as often as you want. The look of building exteriors and interiors changes as the light changes. And, during the evening and night, moonlight and artificial light start to illuminate the building, creating interesting textures, shadows, and even patterns that may not be visible during daylight hours.

Photographing at night can also bring out colors not seen during the day because the color of the light often changes as the types of light illuminating the scene change. This can make a room that may appear drab and boring in the daytime look really exciting at night.

EVENTS

I photograph a lot of events. It is the type of photography that I do the most and that I have been doing the longest. The main types of events that I photograph are concerts, and these can range from small, dark clubs to big arena shows. But the one thing that stays consistent is that the lighting is never as bright as I would like it to be. That makes concert photography one of the hardest types to master: There is rarely enough light to freeze the musicians, you are not usually allowed to add any light by using a flash, the light changes from moment to moment, and you usually have to get permission to photograph a concert in the first place. As you can see from Figure 1-12, the concert light can be all over the place, and while it may look bright to you in the photos, it sure doesn't to my camera. I needed to use the slowest shutter speed possible and still freeze the action, which in this case was 1/100 second. However, that also meant that I needed to use the widest aperture my lens offered (f/2.8) and I had to push the ISO up to 1000 to get the proper exposure. I was able to grab the shot, and within seconds, the lights had changed again.

But when it comes to shooting in low light, there are many other events besides concerts. Often, wedding photographers have to deal with low light at the ceremony, especially if it is being held indoors in a house of worship, where it may be against the rules to use a flash. Receptions are often low-light situations as well, with a lot of action and different types of lighting in the same room, so wedding photographers need to be able to shoot in a variety of lighting conditions.

Another type of event that has lower available light than you would expect is a sporting event held indoors or at night. Because the goal in shooting sporting events is to freeze the action and that action is moving fast, higher shutter speeds are needed. To get those high shutter speeds, you either need a lot of light or you need to raise the ISO and open the lens up wide. While those Friday night lights might seem very bright on television, you need to increase the ISO and open the lens up as wide as possible because they are not bright enough to allow for action-freezing shutter speeds at low ISO and small apertures.

THE NIGHT SKY

Go outside any night of the year and look up. Chances are it will look different than the night before. It might not be very different, but because it is impossible to get the exact same weather patterns with the exact same moon at the exact same

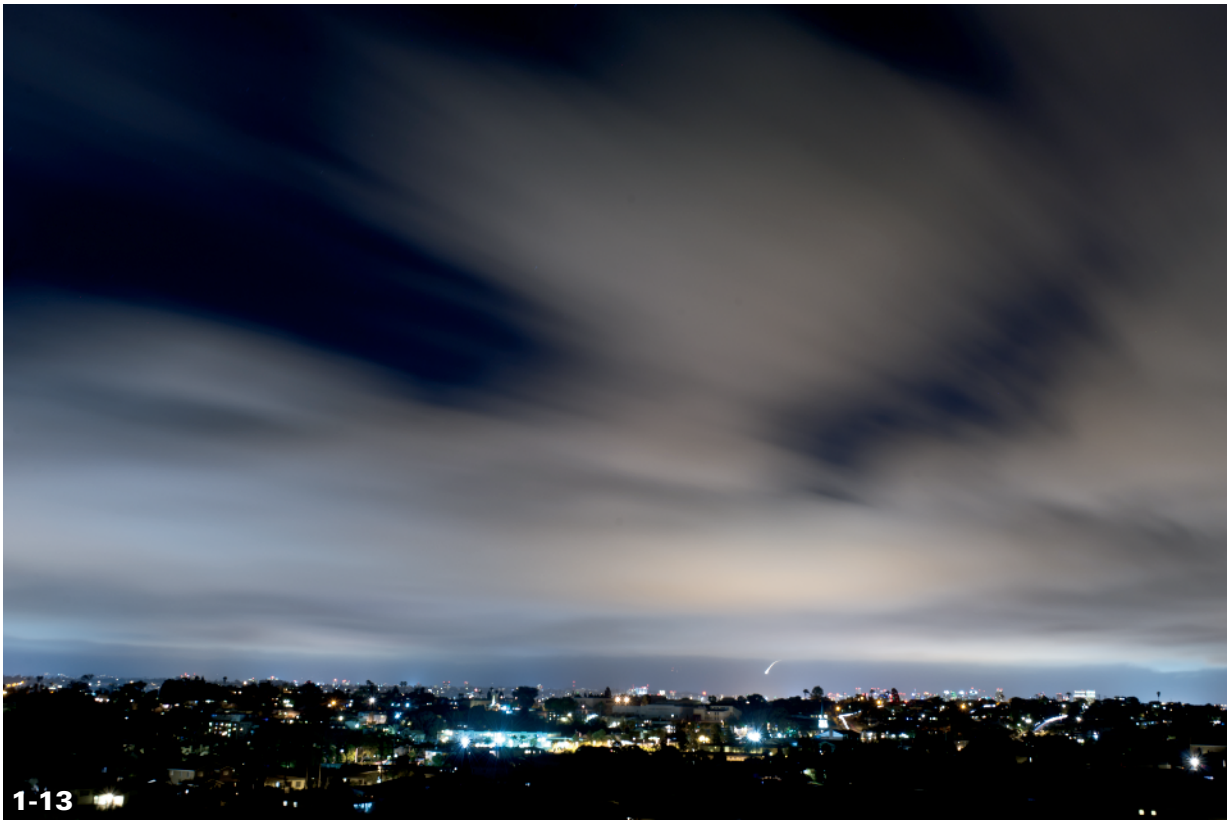
1-12

ABOUT THIS PHOTO *The lights beam down on the stage, illuminating the individual band members. Shot at 1/100 second, f/2.8, and ISO 1000.*

time, it is different. This means that every night you have a new opportunity to make a new image of the same beautiful subject.

Now there are subjects that you can photograph specifically as part of the night sky, including the golden glow of sunrises and sunsets, star trails, and even fireworks displays, but it is important not to forget that the night sky itself can make a great subject. For example, the night sky in Figure 1-13 had these darker clouds that I wanted to capture as they moved across the sky. So I used a long shutter speed — in this case, 55 seconds — which allowed the clouds to have some movement and made them a nice, soft counterpoint to the hard lights from the city.

Photographs of the night sky or objects in the night sky usually need longer shutter speeds to allow enough light to reach the sensor and give you a proper exposure. This means you need to get out the tripod and cable release to help eliminate camera shake during those long exposure times. But in the end, the extra steps are really worth it.



ABOUT THIS PHOTO *The same night sky I have photographed many times before, but it is always different. Taken at 55 seconds, f/10, and ISO 100.*

CITY LIGHTS AND LANDSCAPES

When you think of landscape photography, you probably think about photographing at the first light of the day and as the sun sets. While this is a great time to photograph, you can often get great images even after the sun has set. The landscape can take on an entirely different look, depending on the amount of illumination and the length of time you leave the shutter open.

Shooting landscapes at night takes patience and a sense of adventure. That is also true when shooting urban landscapes where the subject is often lit mainly by city lights. You must be willing to try a fair amount of experimentation because it is nearly impossible to read the light accurately in these types of scenes, so you have to try different shutter speed, aperture, and ISO combinations to get results you are satisfied with. For example, consider that long shutter speeds can render a scene in a way that you can never see with the human eye because the camera can take an extended capture and compress it down to a single moment. Items that are moving can virtually disappear from the image, and any light that is moving can be rendered as a trail instead of a point. All these factors combine to make night and low-light photography a really adventurous form of image creation.

Assignment

Capture the same scene during the day and then at night

The assignment for this chapter is to capture an interesting scene during the day and then the same scene at night. You should really look to see what the differences in the lighting and mood are. When you are done, post your resulting images to the website to share with other readers.

The two images here were taken in Balboa Park in San Diego 90 minutes apart. The image on the left, taken at 1/80 second, f/6.3, and ISO 200, shows the reflecting pool and the Prado building in the background. The second image is the same scene but taken at 1 second, f/5, and ISO 200. As you can plainly see, the colors in the image are completely different because the main source of illumination is different.

During the 90 minutes between the two images, the sun set and the electric lights inside the buildings became the main light source. You can tell that there are at least two different types of light in the scene because some of the light is green and some is orange. There are also the last traces of color in the sky, adding a nice blue hue to the sky. If you look closely at the image on the left, many of the lights are already turned on but they are no match for the sun's power so they don't necessarily add to the illumination in the photograph. Look for lights like this when photographing during the day because it usually means that the building will be illuminated at night.

Remember to visit www.pwassignments.com after you complete the assignment and share your favorite photo! It's a community of enthusiastic photographers and a great place to view what other readers have created. You can also post comments and read encouraging suggestions and feedback.