



THE FINE ART OF

PAINTING WITH LIGHT

By Ben Willmore

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INTRODUCTION

I first got interested in photography back when I was in high school in the early 1980's. After learning the basics, I started to experiment with all sorts of special techniques. I did everything from painting liquid emulsion onto egg shells and then printing black & white images onto the fragile surface, to inserting mirrors into a scene to fake out the viewer by making them think something impossible was happening. Out of all the creative techniques I experimented with back at that time, only one has remained a cornerstone of my contemporary photography technique – light painting.

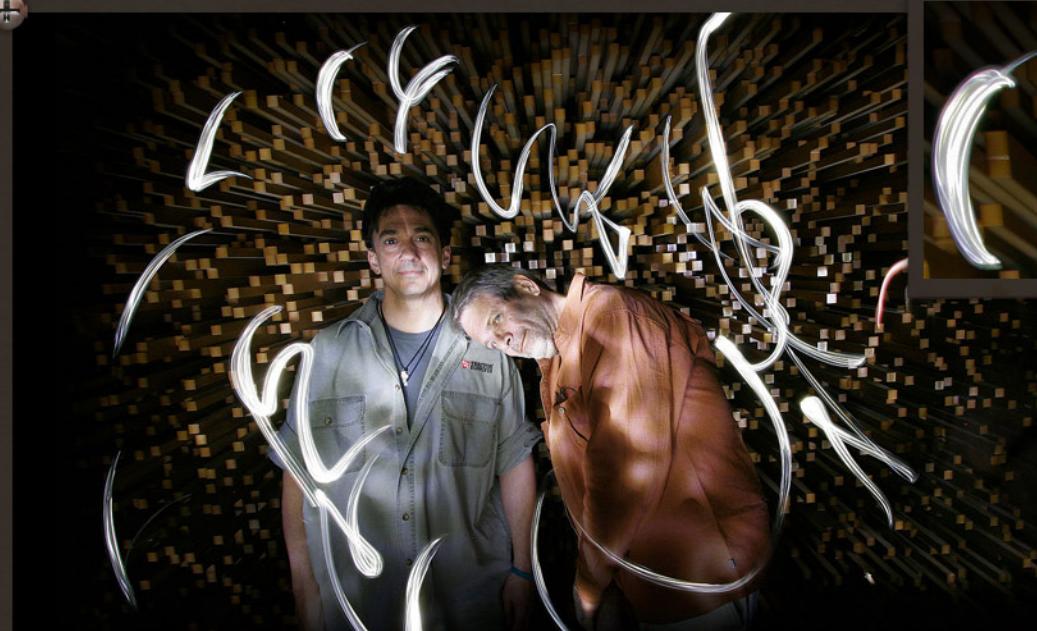
I can vividly remember the first time I ever painted light onto a subject. It was in my parents' living room where I had talked my brother into sitting motionless on the sofa while I ran around him with a flashlight outlining him with light. I recall being amazed at how the flashlight created a pure white streak when it reflected off the living room window behind the sofa. That instantly got my brain thinking of what I could do if I were to point the flashlight at the camera instead of the subject. It sent me down the road to more creative light painting techniques. To this day, I get excited any time I have the opportunity to create a new light painting.

For the longest time, I created light paintings using a camping head lamp that I always kept in my camera bag. It's the same kind of light source that many



A photo of me during a night shoot in the ghost town of Bodie.

photographers use to illuminate their path during pre-dawn hikes to a location to shoot sunrise. Then one day, I was asked to create a light painting when I did not have my camera gear available. That meant I ended up using someone else's camera, a found flashlight and other gear that was foreign to me. After processing that shoot, I noticed that the white streaks produced by pointing the flashlight directly into the camera had a much more painterly, brushstroke-like look. After inspecting the flashlight, I saw that it had



A flashlight with multiple bulbs can result in a painterly effect.

three LED bulbs instead of one. That's when I started to experiment with light sources and began amassing a large collection of flashlights and other light-emitting devices.

I started teaching light painting techniques to photographers about a decade ago. Once you start teaching, you end up being asked all sorts of questions that you otherwise wouldn't have thought about. In the process of learning the answers, I further expanded my light painting knowledge. In prepping for this e-book, I also ended up purchasing all sorts of flashlights and accessories in an attempt to give you the

best information available. My hope is to give you the knowledge I've acquired from decades of shooting, so you don't have to spend too much time experimenting before you can tackle most light painting jobs.

To this day, I see light painting as my most creative photography outlet and, at the same time, the realm that I can learn and experiment with the most. The opportunity to come up with new and exciting light painting techniques feels endless to me.

-Ben Willmore
September, 2011

A scene lit with ambient light.



*The same scene
light painted.*



THE CONCEPT

Start from nothing

Most light paintings start with nothing ... no ambient light, that is. That means a 30-second exposure would produce a black frame with no discernible detail, which is not unlike what you'd get if you left the lens cap in place.

Capture all the light

Light is the one thing that is essential to any photograph and in this case, 100% of the light will be supplied by a household flashlight. To a human observer, the process might look similar to a searchlight scanning a scene. But to the camera, the light will act more like water coming out of a garden hose onto a dry desert; the camera will soak up the light and produce a trail that reflects the full path the light took as it passed over the scene. And, just like with water, the longer one lingers with the flashlight (or garden hose), the more the light will build up to produce a brighter result.

A circle of light, where the flashlight is aimed at one spot and doesn't move.

A trail of light, where the flashlight is moved as if it were scanning a surface.

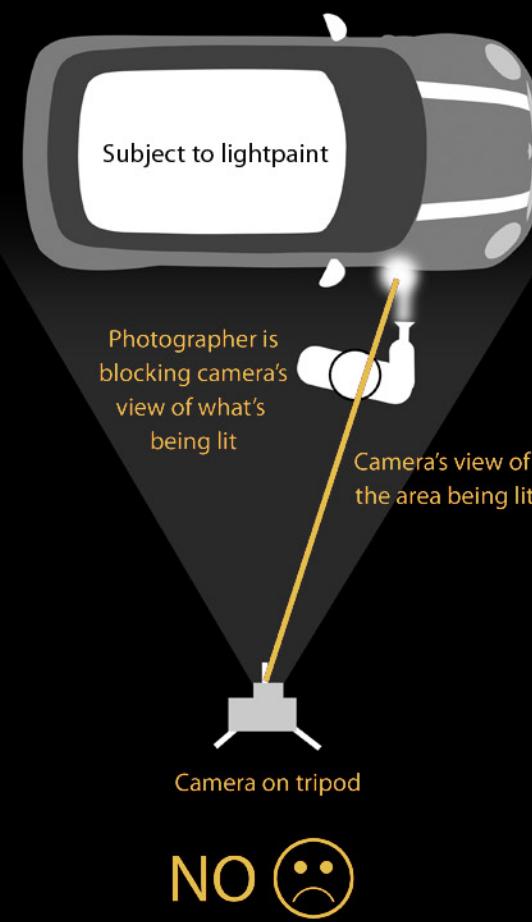
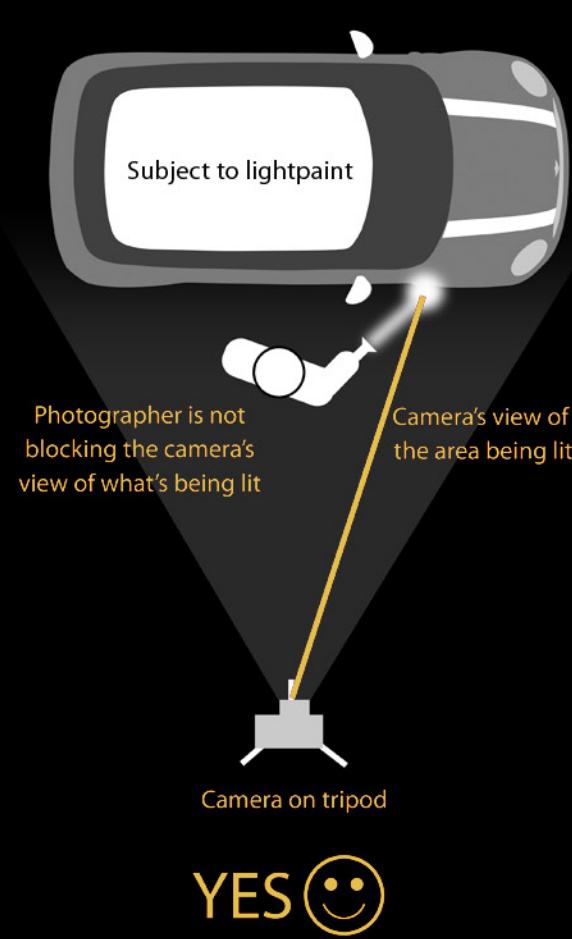
Trail of light

Only that which is lit is captured

When working in a dark environment, a camera will only capture areas that are lit by the flashlight. That means the photographer is free to walk anywhere in the scene and will not appear in the final image as long as care is used to make sure the light of the flashlight is never cast onto the photographer. The photographer also must be careful to never stand directly between the camera's line of sight and the area that is being lit.

Light trumps subject & composition

Your eye is naturally drawn to the brightest area of a scene. With light painting, you are in full control of what in the scene will be light, dark, or lit at all. This means you have much more control over where someone's eye will be drawn than with any other type of photography. How you light the scene will have more influence on your viewer's impression than the subject you choose or how the image and scene are composed. Light painting can transform an otherwise boring scene into a piece of art.



LIGHT PAINTING STYLES

Before we get into the details of how to produce a light painting, let's look at what kind of results we can look forward to.

There is a vast variety of styles that have emerged in the field of light painting. You can produce everything from a traditional evenly-lit result to one where the only subject is the light itself.

In this e-book, I'll start with the absolute basics and

then slowly progress into more intermediate and advanced ideas.

My style is very painterly, where you can see each paint stroke. You can also produce images that look like "normal" photographs that simply vary the lighting more or have solid black backgrounds.

Here are a few examples that show how varied of a result you can end up with.



With the surroundings being lit by the light of the full moon, areas that would otherwise be in the shade were lit using flashlights and colored gels. The headlights were even lit up using a small penlight-style flashlight.

The overly soft quality of the light in this image is not all that different from what can be produced using a softbox and studio lighting. What makes it obvious that this isn't traditionally lit is the solid black background. Lighting the subject with a flashlight allowed for much more control than would be possible using traditional lighting.



Selective lighting is a common theme in light paintings. In this case, the background was lit while the human subject was not present. Multi-image compositing allowed the final image to be created without forcing the subject to be present while most of the work was done.

Pointing the flashlight toward the camera and tracing various elements on this trailer produced solid streaks of light.



A moving subject with a moving flashlight can contribute to a very creative result.



YOUR FIRST LIGHT PAINTING: SETUP

The concept and process of light painting can feel mysterious if all you do is read about it. It's best to just jump in and create a few light paintings so you can get a feeling for the process before you read about more intermediate and advanced ideas.

The only gear you'll need for your first light painting is a digital camera that offers manual exposure settings and a flashlight. Here's how I'd go about capturing your first image:

1. Use manual mode

Switch your camera over to Manual mode, set the aperture setting to f/11, set the shutter speed to 30 seconds, and use the default ISO setting (100 for most cameras, 200 for some Nikons).

2. Find a dark environment

Find a dark area where you'd either need a flashlight to see your way, or where your eyes would take multiple minutes to adjust in order to produce good night vision.

3. Start with a simple subject

Choose an otherwise unexciting subject like an ordinary chair, table or wine bottle. This should be something that has no moving parts, is no larger than a tabletop and can stay stationary for hours on end. The idea is to let the light make the image special and to get comfortable lighting something familiar before you get too fancy with your subject matter.



4. Steady camera

Your camera will need to remain in the same position for at least 30 seconds, which means that you'll need to find a surface to support it (chair, table, counter top for example), or ideally, use a tripod.

5. Frame the subject

Adjust the angle of the camera to frame your subject while using the light of a flashlight to illuminate the scene. This can take some practice, so don't expect an award-winning result on your first try. Switch your lens over to manual focus mode, shine the flashlight on the most important part of your subject and then adjust focus. Manual focus mode is essential when light painting, otherwise your camera will hunt for focus in the dark and prevent you from starting an exposure.

YOUR FIRST LIGHT PAINTING : SHOOTING

Now that all your gear is set up and ready, with flashlight in hand, press the shutter release button to start an exposure and consider the following when creating your first light painting:

Get in close

Move in close to your subject. The smaller the subject, the closer you'll need to be to get a painterly look. For tabletop-sized subjects, I usually hold the flashlight between six inches and two feet away from the subject.

Don't block the camera's view

Try to avoid blocking the camera's view of the subject by keeping your body off to the left or right side of the subject.

Paint away

Turn on the flashlight while it's pointed at the subject and scan over the entire subject as if you were using a water hose to get the entire object wet. Try *not* to light the object evenly. Instead, spend a little more time allowing the light to fall on areas where you'd like the viewer to look first. The flashlight-to-subject distance has a big influence on how long you need to keep the light on a particular area. Move very fast if the flashlight is six inches away and spend more time lighting areas if you're a few feet away.

Wait for shutter to close

You don't have to spend the full length of the 30-second exposure lighting the subject. If you feel you've lit what needs to be lit, then turn off the flashlight and wait for the sound of the shutter closing before you

turn on any other light sources. If the shutter closes before you're done lighting the subject, then paint faster on your next exposure.

Only light subject

When painting light onto the subject try to avoid pointing the flashlight toward the camera or yourself.

Review results

After you've completed your first exposure, review the resulting image using the screen on the back of your digital camera. Don't expect your first try to produce a masterpiece. It will most likely be way too bright or dark.

Adjust settings

If your results were too dark, change the ISO setting on your camera to a higher setting (somewhere between 200 and 400), and/or change your aperture setting to f/8 to allow more light into the lens. If you were finished painting before the shutter closed, then you also have the option to paint over areas for a longer period of time to allow the light to build up. If your results were too bright, then either 1) paint much faster next time, or 2) change the aperture setting to a higher value.

Fail until success

Do a second exposure after adjusting your camera settings or your technique and repeat the process until the brightness of the result is acceptable. It can easily take six or seven tries before you get your first success. Just keep in mind that it will get easier once you have more experience.





Shot with ambient light.



Light painted far from subject.



Light painted close to subject.

LIGHT-TO-SUBJECT DISTANCE

There are vastly different light painting styles to choose from. If you were to ask three different photographers to shoot the same subject with identical framing, you'd find that all three would produce dramatically different results. One of the main differences in technique is how far the flashlight is held away from the subject.

As you move your flashlight closer to the subject (six inches away for instance), you'll see that three things change: 1) It will be easier to see exactly

where each paint stroke was done since the beam of the flashlight will only cover a small area. This will produce a much more uneven appearance compared to painting from a greater distance. 2) The amount of light being delivered is greater, which will force you to paint much faster to prevent areas from being blown out to solid white. You can also either use a lower ISO setting, or use a higher aperture setting to compensate for the intensity of the light. 3) You'll end up with a much faster fall-off of light, which will produce a harder-edged appearance.

As you move the flashlight farther away from the subject (two feet away for instance), you'll notice three things changing:

- 1) It will be more difficult to see exactly where you painted because the flashlight will cover such a wide area. It will be difficult to isolate objects without using a snoot or other light focusing aid (talked about later in this e-book) to concentrate the light.
- 2) As you move further away, the amount of light falling on the subject will decrease. If you double the distance from flashlight to subject, that will cause only 1/4 of the light to fall on the subject. Tripling the distance will deliver 1/9th the light and quadrupling it will deliver only 1/16th the light. If you want to know more about this, do a Google search for "inverse square law." To compensate for this, you'll most likely have to increase your camera's ISO setting to make it more sensitive to light and/or paint slower to allow the light to build up.

3) Moving the flashlight away from the subject will produce a much softer light quality where the light slowly fades out on the edge instead of stopping abruptly.

I've found that multi-bulb flashlights used at close proximity to the subject will produce a hybrid look where the edge of the light has a soft fall off (similar to a single bulb light used a few feet away), but can be used to more selectively light the subject by being at a close range. I typically use a flashlight that features at least a dozen bulbs when going for this look.



Painting from a few feet away produces a soft result where it is difficult to tell exactly where the flashlight was pointed during the exposure.



Painting from only a few inches away from the subject makes it easy to see your paint strokes.



Camera set to bulb mode



Cable release



Pen light



Wireless trigger

INTERMEDIATE SHOOTING SETUP

You don't have to spend a lot of money to get started with light painting. Your existing camera and a household flashlight are fine for your first few creations. If you're like me, you'll want to start to refine your setup to create a more ideal configuration. Here are some things to consider:

1. A stable tripod is essential for anyone serious about light painting. It's also crucial when creating complex multi-exposure composites as we'll discuss later in this e-book.
2. When using 30-second exposures, consider using your camera's self timer to give yourself time to walk away from the camera and get close to your subject.
3. To release yourself from the limitations of a 30-second exposure, you should learn how to access Bulb mode on your camera. In that mode, the length of the exposure is determined by how long you hold down the shutter button. On most cameras, you'll have to set your exposure to Manual mode and then decrease the shutter speed until you go one click beyond the 30-second limit that most cameras have. That should change the shutter speed to "B" for bulb mode. Other cameras will feature a B mode in the same area where you switch between Aperture Priority, Shutter Priority and Manual modes.

4. A cable release with a lock feature allows you to press the shutter button and then slide a lever to lock it down. That, combined with Bulb mode, will allow you to walk away from the camera, light paint and then return and release the shutter without an assistant.

5. Try leaving a tiny penlight-style flashlight at the base of your tripod pointed away from the scene that you are shooting. That makes it much easier to find your tripod in the dark and operate your cable release without bumping the camera.

6. A voice-activated shutter release: someone at the camera operating your cable release as you yell "Open" and "Close" as a substitute for pressing the button yourself.

7. If you don't want to rely on an assistant and don't want to walk to and from the camera over and over, then consider replacing your cable release with a wireless trigger. You just have to make sure you get one that supports bulb mode. That way, you can press and release the shutter from multiple yards away. I found mine by performing a search on Amazon.com that included my camera model and the words "wireless trigger" and then read the reviews to see which model reviewers had the fewest complaints about.

LIGHT GRAFFITI

Just as a can of spray paint will leave a thin trail of paint when used on a wall at close range, a flashlight will leave a thin-lined streak of light when moved while pointing in the direction of the camera. This technique results in an effect I like to call light graffiti.

Here are a few things to consider when pointing your flashlight toward the camera:

- Light graffiti is best produced with dimmer flashlights and your aperture setting will most likely need to be increased to prevent the graffiti from blowing out to solid white.
- If the flashlight ever gets pointed directly into the lens of the camera, glare will result. To avoid glare, keep the flashlight angled a little to the right, left, above or below the lens of the camera. If the result is too dim, angle the flashlight so the beam is closer to being pointed at the camera.
- A single-bulb flashlight will produce a solid line, while a multi-bulb flashlight will produce more of a painterly stroke that looks almost like it was created using the bristles of a brush. Varying the angle and slightly rotating the flashlight while you paint will produce the most painterly results. Note: If the flashlight has more than about six bulbs, then the individual strokes from each bulb will start to combine into a





wider single stroke reminiscent of a single-bulb flashlight.

- A blinking light source will produce dashed lines. The on and off timing will determine the length of the line and gaps.
- A color-cycling flashlight is a nice way to create lines that contain a rainbow of colors.
- Any light source can be used, so don't limit yourself to a flashlight. I've used sparklers, Christmas tree lights, glow slicks, light sabers and more.
- A cheap squeeze-to-light key chain light is a nice source for creating thin-lined light graffiti.



A color-cycling flashlight was used to produce the multicolored lines at the bottom of this image.



Sparklers as a light source.



Xmas tree lights as a light source.

GETTING FANCY

If you've had a chance to try light painting a few times and you're starting to get the general feeling for how things work, then it might be time to start to refine your equipment and technique. Here are a few ideas that you might find useful:



Colored gels

One way to make a light painting more interesting is to incorporate colors that were not in the original scene by shifting the color of the light that leaves your flashlight. The simplest way of doing that is to hold a colored gel over the end of the flashlight. These are the same gels that theatre companies use to change the color of stage lighting and can be acquired by ordering them from a company such as B&H Photo on the Internet, or looking up "theatrical supply" in the Yellow Pages.

You should be able to acquire a sample pack for either free or a very low cost, since it's just like a paint company giving you free swatch samples of what their product will produce when you visit your local hardware store.

Multi-color led

Colored gels might be inexpensive, but they're not always the most convenient way to add color to an image. Gels tend to get overly wrinkly, can occasionally crack and tear, aren't always easy to keep attached to a flashlight and can easily fly away in the wind if you're not careful. Plus, it's not always fun trying to find the red gel out of a pocket full of a dozen colors. I frequently use LED flashlights that have bulbs of more than one color. Pressing one button might produce red light, another green and a third blue. I found the one I use on clearance at a local RadioShack store. You might be able to find a similar flashlight by searching Google for "multi-color flashlight" or "RGB flashlight."



I've also experimented with RGB flashlights that automatically change color over time. You can Google "color-cycling flashlight" or penlight, since they're often hard to find. Pressing the button on these devices usually cycles through multiple modes that control how fast the flashlight changes color. I find this to be an interesting choice when creating light graffiti since it can produce a multicolored line.



Cinefoil™

Almost all flashlights produce a relatively consistent round beam of light, which can become easily recognizable in light paintings that were lit from up close. You can easily distort the shape of the light by creating a temporary snoot made out of a dull black tinfoil that's called Cinefoil. Cinefoil can be acquired at the same places that I mentioned for acquiring colored gels.

I usually attach the Cinefoil to the barrel of the flashlight with black gaffer's tape, although any type of tape can be used. Once it's attached and extends an inch or more beyond the front of the flashlight, you can deform the end of the foil to change the shape of the light that's leaving the flashlight and produce much more interesting results than what is possible with a bare flashlight.

Blinking

Some flashlights offer a setting that causes the light to blink. I first found this when using the kind of head lamp that is designed for night hiking. I found that pressing the button cycled through three modes: 1) low power, 2) high power, 3) blinking. A blinking light will produce dashed lines when light painting or creating

light graffiti. The speed at which you paint and the duration of the flashes will determine the length of each line.

Kleenex®

If you find the light that leaves your flashlight to be too harsh and uneven, you can diffuse the light by holding a facial tissue in front of the light.



An example of the result of a blinking light source.



An example of a light-painted image using xmas tree lights.



A simple thick light graffiti with a fire-like background. This was accomplished using glow sticks on a string.

ADVANCED IDEAS

There is so much room for experimentation with light painting that I've never stopped trying new things. Here are a few ideas that might push you into more advanced territory. Just keep in mind that we're just scratching the surface here, so you should try to convince your brain to constantly come up with new light painting ideas.

X-mas tree lights

A string of Christmas tree lights that are in motion will produce a large number of interesting, semi-random lines when moved in a scene. I often use this behind a subject to create a unique background.

By doing it behind the subject, the subject should block the camera's view of the lights and appear as a silhouette. This will allow you to use more traditional light painting techniques to light the subject after you've created the interesting background.

Glow sticks

Traditional "snap, shake and glow" chemical glow sticks as well as modern electronic glow sticks can be used to create different-looking light graffiti. Moving the glow stick using a smooth, curvy motion while keeping it parallel to the camera lens will produce nice, overly-thick light graffiti.

Attaching the same glow stick to a string and spinning it in a circle while allowing the string to wrap around your arm with each rotation should produce a spiral of light. Violently yanking the same string at a shorter length in random directions will produce an almost fire-like result.

Light sabers

You can take the glow stick idea to an extreme by experimenting with electronic *Star Wars*-like light sabers. Using a long, white light saber gives you enough surface area to tape various colored gels to the light source to produce multi-colored light. You might also want to try pointing the tip of the light saber toward the camera and then varying the position of the handle end to produce a bright dot (from the tip remaining near the same location during the entire exposure) with darker lines surrounding it (from the rest of the saber moving).

Steel wool on a string

I've seen a lot of light paintings that incorporate sparks flying in every direction. You can see many examples at <http://tinyurl.com/steelwoollightpaint>. That look is often created by attaching steel wool to a string, igniting it and then spinning it via the string. I'd only suggest this technique for those who want to be on the cutting edge and are not prone to accidents or injury since it's very easy to get hurt when combustible metal is being

flung around your body. With safety goggles on, here are the details to get you started:

Steel wool comes in various grades, from coarse to super fine, where 0000 is super fine, 000 is extra fine, 00 is very fine, 0 is fine, 1 is medium, 2 is medium coarse and 3 is coarse. The first four grades can be used for light painting.

Since you'll be working with hot flaming metal, make sure your surroundings are not combustible. Concrete, brick and water are not bad choices. Be sure to wear eye protection since a single stray piece of molten metal hitting your eye could blind you. Prep your steel wool by cinching a bundle in the middle with some wire, let the wire extend at least an inch away from the bundle and then attach the free end of the wire to a length of string. Practice swinging the string up and down to produce a large circle.

Once you feel confident that you know you're ready, ignite the steel wool with a lighter (you can hold a 9-volt battery to the metal as an odd alternative method for starting it ablaze). It's also a good idea to protect your lens with a UV filter.



FLASH

An alternative to using flashlights is to light a scene using a speedlight-style flash that you would usually place on the hot shoe of your camera. To use the flash for light painting, you'll want to take it off the camera, set it to manual mode so you can control its power and then use the test button to manually trigger the flash.

As with any light painting, your first few exposures will be test shots to see if the power of the flash is too high or low to produce an acceptable exposure.

Most of the time, when shooting with flash, you'll need to be positioned outside of the camera's frame of view so the light spilling out of the edge and side of the flash is not recorded in the exposure. When I need to stand within the frame, I'll be sure to shield the edge of the flash unit using a black glove or similar flag.

I very frequently use colored gels to change the color of the light coming out of the flash. The gel sample packs that I mentioned earlier in this e-book usually contain gels that are almost perfectly sized to cover the front of a speedlight-style flash.

Since the light from a flash can cover a huge area, some people find it difficult to visualize what their results might look like when viewing the unlit scene. Since I mainly use flash outdoors and there is usually some hint of natural light in the scene, I allow my eyes to adjust to the darkness and then make sure I have them closed when I fire off the flash so I don't lose my night vision. The main thing I keep in mind is that the flash can only light areas that are visible from the position of the flash. After all, the light can't bend around corners. Be careful, though, because it can reflect off some surfaces.



View from position that the car was lit with red light.



Lit from left side of frame from a position where the opposite side of grille was not visible.



View from position that the car was lit with blue light.



Lit from right side of frame. Any light hitting the opposite side of grille is reflected off side of headlight.



Ambient exposure to show you what the scene looks like without any lightpainting.



Two exposures shown above combined using Lighten mode.

Let's say you're lighting a car and you want the left half of the front of the car to be lit with red light and the right side with blue light. To accomplish that, I'd walk beyond the left edge of the car until I'm outside of the camera's frame of view. I'd then look at the car and reposition myself until I find a spot where I can see the whole left front of the car, but cannot see any of the right front of the car. That means that I might end up at a 45° angle from the front of the car and just a foot or two in front of the car off to the left side. When I get to the desired position, I'd hold a red gel in front of the flash, place my finger on the test fire button, point the flash in the same direction I was looking a few minutes ago, close my eyes and then fire off the flash. After doing that, I can walk across the front of the car to the right side and repeat the process with a blue gel when I can only see the right side of the front of the car.



Final image after adding the interior and headlight exposures.

Keep in mind that you don't have to limit yourself to a single light source. You can always light the main parts of a subject with flash and then move in close and use

a flashlight to light smaller areas. In this case, I lit the interior using white light, which reflected off the maroonish-purple interior fabric to create the colorful interior. I also

lit the headlights by tracing around them with a small keychain-style LED as I detail in one of the examples in the second section of this book.

MULTIPLE EXPOSURE COMPOSITES

Light painting is one of those techniques where you can choose to keep things as simple as possible or take things to an extreme by making complex multi-exposure composites. I tend to lean toward the latter as I find it offers me much more control and versatility. The negative aspects of this are that it takes up much more hard drive space and lengthens my digital processing time when compared to shooting single-shot images. Just in case you're interested in getting more complex, here are some of the advantages (we'll cover the specifics of how these are done later in this e-book.):

- 1) By capturing multiple exposures you will be able to create multiple versions of the same scene using different combinations of exposures without having to reshoot anything.
- 2) When creating light graffiti using light sources that do not have an on/off button (a sparkler, for example), you can produce disconnected lines by closing the shutter and reopening it when you'd like to continue a line.
- 3) You'll be able to more easily edit your composite image to fix mistakes, adjust colors and more.
- 4) You have the ability to lessen the affect of ambient light pollution. To do this, combine your exposures using the Lighten blending mode instead of Screen. This will make it seem as if everything was shot in a single exposure.
- 5) More experimentation can be done without sacrificing the final image since any layer can be discarded, masked, retouched or edited without it permanently being incorporated into the image.

The first step to creating a multi-shot composite is to capture the exposures you plan to combine. You have three choices for how to start and stop each exposure. Here they are, presented in my order of preference:

1) Using a radio-based remote trigger to open and close the shutter while the camera is in Bulb mode. This allows the most versatility since you have precise control over when the exposure starts and stops and you don't need any assistants in order to be successful.

2) A voice-activated shutter release, otherwise known as an assistant with cable release in hand, to whom you yell "open" and "close" to indicate when you'd like the exposure to be started or stopped. I find that there is often a slight pause between when I yell and when the action actually happens, which means you have to be a bit more careful with your timing. The main advantage to this technique is that you'll also have someone at the camera that can report back to you after they see the results of your light painting. That's when they might reveal that the result is too bright, too dark, or that you missed an area.



Here is a composite image I shot of an abandoned Airstream trailer in the parking lot of the Baghdad Cafe. The individual exposures can be seen on the next page.

3) You can get away with using next to no gear by using the two-second self timer and a 30-second exposure. This can be rather frustrating when you finish painting and have to wait for the exposure to finish and also can cause a lot more ambient light pollution to be captured.

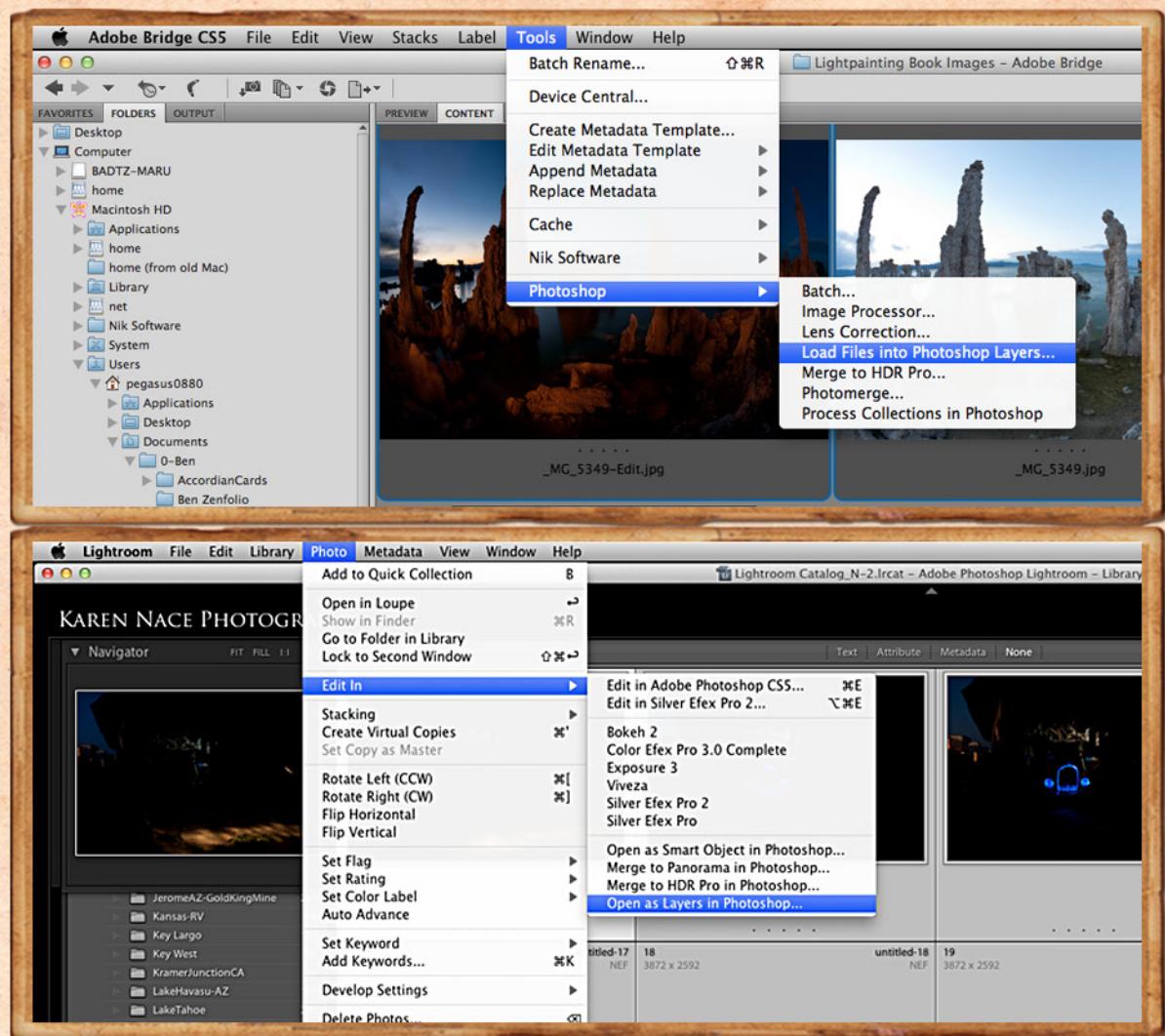
Here are a few example shots from a shoot in the parking lot of the Baghdad Cafe where I located an abandoned Air-stream trailer. The final composite can be seen on the previous page.



PHOTOSHOP COMPOSITES

After you have captured multiple exposures, the next step is to composite the results into a single image. Here are the essential steps needed to produce a composite:

- 1) Start in either Adobe Bridge (which ships with Photoshop and is automatically installed when you install Photoshop) or Adobe Lightroom. Click on the first image in the series, hold the Shift key and then click on the last image in the series to get them all selected. If there are any individual exposures that you'd rather not use, hold the Command key (Mac), or Ctrl key (Win) and click on them to deselect individual images.
- 2) With the images still selected, choose either **Tools > Photoshop > Load Files into Photoshop Layers** from within Bridge, or **Photo > Edit In > Open As Layers in Photoshop** from within Lightroom. This will create one Photoshop file where each image is on its own layer.
- 3) Once all your images have been loaded into a single Photoshop document, click on the top-most layer's name to make it active and then change the pop-up menu that's found at the top of the Layers panel to **Lighten**. Next, click



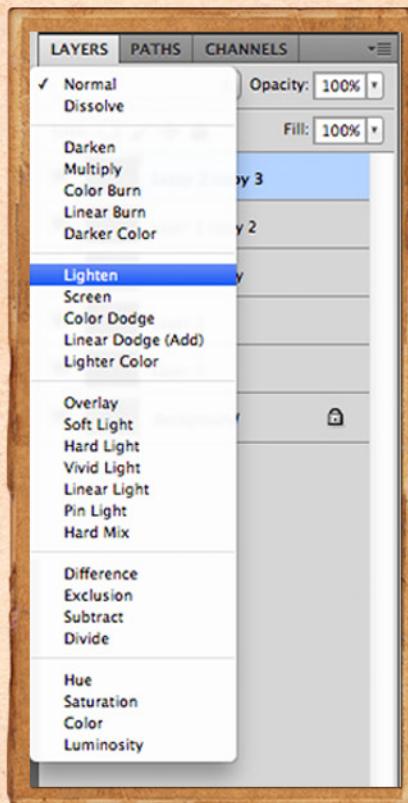
on the underlying layer's name to make it active and then, once again, change the pop-up menu to **Lighten**. That menu is known as the Blending Mode menu, by the way, and you want to change the

mode for all of the layers you are combining. So, repeat the process (click underlying layer, choose **Lighten** mode) until you've gone through all the layers.

4) Note: The bottom-most layer doesn't

have to be changed (although it wouldn't harm the image) because that menu controls how the active layer will interact with the underlying layers and there's nothing below the bottom layer.

That's all that's necessary to combine multiple exposures into a single image, but you may find that you'd like to refine your results using some of the following ideas:



- You can click on the eyeball icon for each layer to toggle its visibility. Only keep the layers that help produce a successful image and leave any less-than-ideal layers hidden.

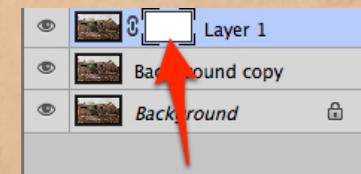
- Use the Eraser tool or a layer mask (see right) to hide portions of a layer if you find that any area isn't helping to produce a successful image. That might include areas where stray light was reflected off something shiny when you were lighting something in another area, or unintentional light graffiti that was caused by having the side of the flashlight visible to the camera.

- Adjust the Opacity setting at the top of the layers panel for any layers that look to be too bright overall.

- If any layer appears to be too dark, then make that layer active and change the blending mode from **Lighten** to **Screen**. In screen mode, you can also duplicate a layer to double its effect on the end result and then lower the opacity of the duplicate if you didn't need the result to be twice as bright.

HOW TO USE A LAYER MASK

Clicking the Layer Mask icon, which looks like a circle inside a rectangle, will cause a layer mask to be added to the active layer.



Brackets indicate the layer mask is active

Once you've added a mask, either the layer or the mask can be edited with any painting, retouching or adjustment features. You can tell if the mask or layer is active by inspecting the corners of their thumbnails in the Layers panel. The active item will display doubled-up corners. Clicking on either the layer or the mask thumbnail will change which is active.

A white mask will leave the layer untouched and will be the same as having no mask active. Adding black to a mask will cause areas of the layer to become hidden. Painting with shades of gray, or painting with black at a lower opacity, will cause the layer to partially show up.

You can directly view the contents of the mask by Option-clicking (Mac), or Alt-clicking (Win) on the mask thumbnail image in the Layers panel. Shift-clicking on the mask will temporarily disable it. You can also move a mask between layers by clicking on a mask and dragging it to another layer. Hold Option (Mac), or Alt (Win) to drag a copy of the mask.

SCREEN MODE VS. LIGHTEN MODE

When compositing a multi-exposure image, you have the choice of using either **Lighten** or **Screen** mode. It's useful to know the difference:

Lighten mode compares the brightness of each layer and only uses whichever layer is the brightest in each area of the image.

Screen mode, on the other hand, will add the light from one layer to the light of the underlying layer and therefore add up the light from all layers. This will produce a brighter result wherever an area has been lit in multiple exposures, but will have no effect on areas that are lit in only one exposure.

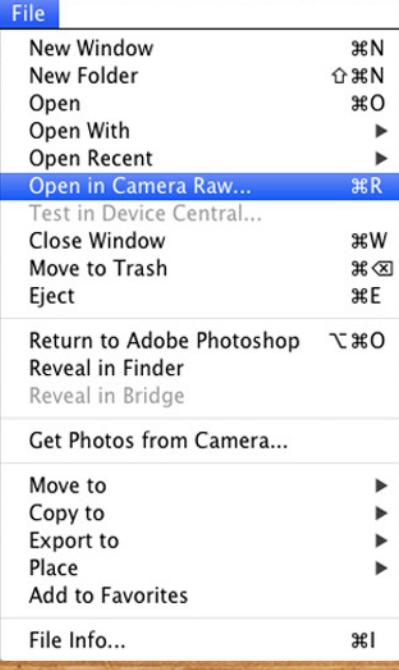
I prefer to use **Lighten** mode for the majority of images that I composite because it allows me to minimize the effect of light pollution from light sources that I cannot control such as street lights. Ten thirty-second exposures combined in **Lighten** mode would cause the look of a street light to be the same as a single thirty second exposure. **Screen** mode would add all the light from all ten exposures and end up with a result that is 10x as bright!



In the image above, six exposures have been combined using Lighten mode. Lighten mode only uses a single exposure in any given area... whichever is lightest. So, either the yellow or the green exposure was used below the window, but never both. That caused the area to remain dark compared to what Screen would produce. For the same reason, the wall on the right is dark. After all, only a tiny amount of light fell on it in each exposure.



A street light caused the wall on the right to be illuminated with a tiny amount of light in each exposure. It was such a small amount of light that it was not noticeable in any single exposure. When multiple exposures were combined in Screen mode, the light from all those exposures were added up, which made the wall easier to see. The area below the window is also brighter since the green and yellow light is being added together.



DIGITAL REFINEMENTS

We were just scratching the surface on what's possible with digital composites in the last example. Here are some additional ideas that you might find to be helpful if you want to further refine your images:

Before combining the images, consider adjusting them individually or as a group using Adobe Camera Raw (ACR) or Lightroom. To do this from within Bridge, select the images and then choose **File > Open in Camera Raw**. The images will appear as thumbnails on the left side of the ACR window. You can click on individual images and adjust them one at a time, or click the **Select All** button at the top of the thumbnail list and then adjust them as a group. In Lightroom, select the images from within the Library Module, click on the Develop Module and then inspect the **Auto Sync** setting found near the lower right of the window. If the **Auto Sync** setting is on (it looks like a tiny light switch), then any changes you make to the adjustment sliders will affect all the images that are selected. If Auto Sync is turned off, then you'll only affect the image you

are currently viewing. To switch which image you're viewing, choose another image from the filmstrip of thumbnails that is usually available at the bottom of your screen (if it's not visible, then click the triangle that is at the center bottom of your screen to toggle its visibility).

Here are the adjustments that I find are most useful when adjusting images using ACR or Lightroom:

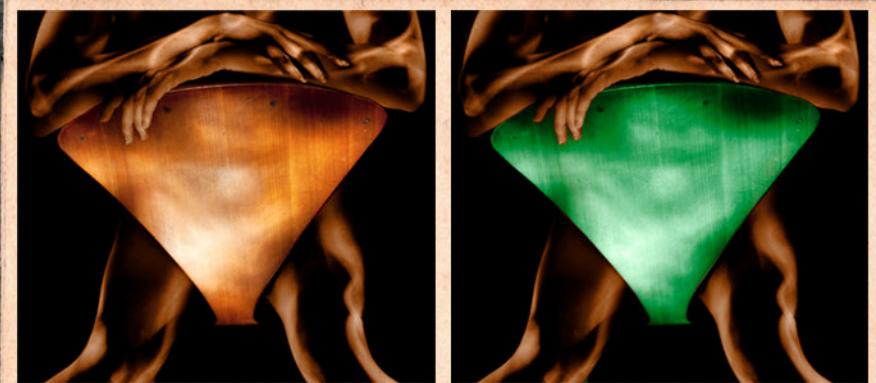
The **Temperature** and **Tint** settings (collectively known as White Balance) are great for shifting the color of the light that was produced by a flashlight. You'll find that traditional incandescent flashlights produce overly warm light that you'll sometimes have to lessen by moving the Temperature slider toward the left. If you shot with an LED flashlight, on the other hand, you'll find that the light has a cool blueish tone. To correct for that, move the Temperature slider to the right until the light looks either neutral or just a little bit warm.

Lowering the **Exposure** setting can help recover a little detail in areas that might have been blown out to solid white. There





The three frames above are snippets from an image made with sparklers. The image on the left has a clarity setting of -25. The center image is set to 0 and the image on the right is set to 25.



In the above image, I added color to the chair in Photoshop. The version on the left is before the color change and the image on the right is after the color change.

is a definite limit to the effectiveness of this slider, but it can be a real lifesaver.

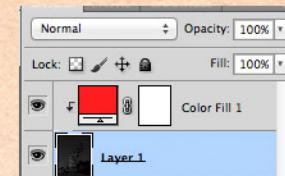
The **Brightness** slider (in CS5) or the **Highlights** slider (in CS6) can be useful to boost the brightness of areas that were not lit as much as they should have been. Also, try increasing the **Exposure** as well.

Increasing the **Clarity** setting can cause close-painted areas, light graffiti, and especially sparkler-painted areas to become better defined and sharp-looking.

Once you've combined multiple exposures into a single Photoshop file, consider using the following ideas to further refine your image:

You can add color to an area that was painted using white light to simulate the look that you would have gotten by painting through a colored gel. To accomplish this, start by making the desired layer active by clicking on its name. Next, click on the half black and half white circle icon that appears at the bottom of the layers panel and choose **Solid Color**. That should cause a color picker dialog box to appear. Choose a bright and vivid version of the color you'd like to use and then click OK to dismiss the color

picker. Now, with the newly-created solid color layer still active, change the blending mode menu at the top of the Layers panel to **Color Burn** and then adjust the Opacity setting at the top of the layers panel to around 40%. Finally, to limit the change to a single layer, hold the **Option** key (Mac), or **Alt** key (Win) and click on the horizontal line that separates the newly created solid color layer from the underlying layer. You'll know everything worked out if you see a small, down-pointing arrow appear to the right of the eyeball icon for the solid color layer. Keep in mind that you can always lower the opacity of the solid color layer if the color is too intense.



The above technique is useful when an area was painted using white light. If you instead have a layer where colored light was used and you'd like to shift the color, then do all the steps mentioned in the previous technique, but use **Color** mode instead of **Color Burn** and leave the Opacity setting at 100%.

Another method for changing the color of light used for a particular exposure is to choose **Image > Adjustments > Hue/Saturation** and adjust the **Hue** slider.

PIMPING YOUR GEAR

You might find that an unmodified flashlight works just fine for the majority of scenes that you light paint. I used the same unmodified camping head lamp for many years before I started to experiment with different light sources and methods for modifying the output of various flashlights. Here are some ideas to consider that might help you produce more interesting results:

Gaffer's tape for comfort

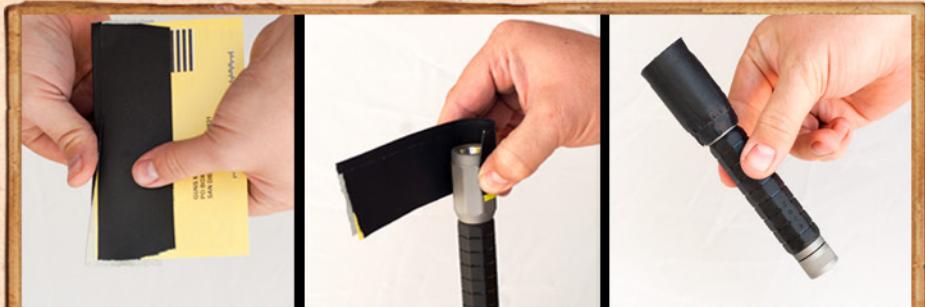


Many of my flashlights have been covered from head to toe with black gaffer's tape. That makes a cold flashlight a lot easier to hold when working with bare hands. It also prevents light from reflecting off the surface of the flashlight. In addition to the shooting benefits, it also becomes a nice dispenser of tape that I might find useful to hold gels in place. Just make sure you don't seal over so much of the flashlight that it becomes difficult to change batteries, focus the beam, or turn it on and off.

Snoots

It's not uncommon to have light sneak out of the edge of your flashlight and appear as either glare or unintended light graffiti. That happens any time you light a subject from the side with your flashlight pointed at a 45-90 angle from the subject ... the camera just gets a peek at the front of the flashlight and records it in your exposure. To prevent that, we can recess the front of the flashlight in a non-reflective tube that is often referred to as a snoot.

To make a snoot, start with a semi-flexible piece of thick paper or thin cardboard like the stuff your flashlight might have been mounted to in its original packaging. If you don't have that, then just grab one of those subscription cards that fall out of magazines when you flip the pages. Here's how I'd transform that card into a snoot:



Above, a home-made snoot is made using a card and some gaffer's tape.

- 1.) Run a piece of gaffer's tape along the top edge of the card trying to keep it from going beyond the top of the card.
- 2.) Flip the card over and run a second length of gaffer's tape along the same edge allowing the top to extend about a quarter of an inch beyond the edge of the card.
- 3.) Fold over the protruding part of the tape so that it covers the edge of the card and overlaps the tape that you applied to the opposite side of the card.
- 4.) Wrap the card around the bulb-end of your flashlight to create a cylinder that fits snugly around the flashlight. Slide it about 1/2 inch beyond the front of the flashlight. Using scissors, cut the card to make it short enough that it only covers the front-most barrel of the flashlight and does not extend onto the main body of the flashlight. Leave 1/4 to 1/2 inch of space before the card would hit the main barrel.
- 5.) Wrap the card around the flashlight using gaffer's tape to create a tightly-fitting snoot and extend the tape beyond the card so that it overlaps the flashlight surface enough to securely attach the snoot to the flashlight. Make sure the entire length of the card is covered with tape so that it does not have the potential of reflecting light if any falls on it.

Also consider creating a snoot out of Cinefoil on one flashlight so that you can create a non-round beam.

SHOOTING PEOPLE

Light painting human subjects can be fun and entertaining, but also will present you with some challenges. Keep the following points in mind when shooting people:

- Any movement in the subject will produce a blurry image. For that reason, I try to prep my subject mentally for the shoot I'm about to begin. If you just tell them to be still, they'll often not move much, but it will be enough that the results of multiple exposures will not line up when they are composited. I usually tell them to be "like a statue" and show them the results from a shoot where an area ended up being blurry.
- Telling someone to hold as still as a statue can cause them to have an unnatural expression on their face. I try to tell them to look in a particular direction (occasionally placing a tiny red penlight somewhere as a reference) and to think of something specific. I might say "keep your glance on that red light and act as if you're surprised to see a good friend walk by." That gives them something to focus on in the dark and helps produce a more natural looking result.
- I always light people's faces before lighting any other area of the scene. I find that their expression is freshest at the beginning

and slowly transforms into an evil, robot-looking unnatural look as time goes by. It's much better for them to have odd expressions when you're lighting their feet instead of their head.

- Warn your subject that you'll have to somewhat blind them with the flashlight in order to produce a good image. If you don't tell them ahead of time, you might find them squinting, changing their expression, or turning their head away from you when you point your flashlight toward their head. When painting, realize that you might get a better facial expression if you avoid direct hits with their eyes. Paint around the face, while trying to avoid pointing the flashlight directly into their eyes.
- I usually paint light across people's face from a distance of 1-1.5 feet away. That will produce a much softer and even light than the results you'd get from painting six inches away, which is what I might be using for the rest of their body. I used to paint faces from the same distance that I lit the rest of their body, but found that all too often I'd end up with dark areas in the face from me being too careful not to blind my subject. Lighting them from farther away evens out the light and I find that it avoids poorly-lit faces.
- Even if you've told them to hold still like a statue, they will still need to breathe, which will cause motion in their stomach area. I've been successful in mentioning this and then just saying "don't breathe" as I get my flashlight near their midsection. If they've been pre-prepped, then they'll know they can start to breath again once I've done painting light into that area.
- For a more painterly and unique look, I often paint light onto the subject from about 3-6 inches away. When doing so, you can portray your subject in a more idealized fashion by tracing the outline of their body and veering a little off course when you encounter undesirable bulges in their torso. That might mean painting an inch or two "inside the lines" when you pass by their waste. You'd be amazed at how much some people appreciate that kind of thoughtfulness.





An example of an unevenly lit face due to painting from a close distance.



A close-lit face for more of a creative effect.



An evenly-lit face with more of a painterly body accomplished by varying the distance.



This face ended up being blurry because the subject moved.

If you're new to light painting, you might feel unnatural standing within the camera's frame of view. Just realize that the only thing that will show up in your image is what you point your flashlight at. If you never point it toward your body, then you're only concern should be to make sure your body is not blocking the camera's view of the exact area you are currently painting light onto. That means that there is no need to try to hide behind your subject, or avoid

blocking the camera's overall view. Feel free to stand right in front of the subject when you're lighting their arm and then move a little bit off to the side when you light their face, chest and stomach. You can pass over to the opposite side of them and then light their opposite arm. Just be careful where you're pointing the flashlight at the moment you pass from one side to the other; either cup it with your hand to cut off the light, or simply be conscious of what

you're lighting and how your body blocking the camera's view might affect the image.

Finally, don't let any of these ideas cause you stress when shooting. You can mess up on 3/4 of these concepts and still end up with an awesome result. I'd say the two most important concepts would be to have them hold as still as a statue and to light their face from at least 12 inches away.

COMPLEX SHOTS WITH PEOPLE

I find that it's really impractical to expect my subject to hold still for more than about two and a half minutes. If I try to go longer than that, they seem to start to relax their posture without realizing they're doing it. Also, I often spend a great deal of time lighting complex backgrounds and they're going to get overly bored if I make them stand still for the entire time I'm working the scene. To avoid problems, I often light the background in separate exposures either before or after the subject enters the room and later composite them into the background. The following is what goes through my head when I'm creating a complex shot that involves people.

The order in which I shoot the subject and background will often be determined by when the subject is available. Here are a few examples:

- In the instance of the wine makers shot (below), they directed me to the shooting location and then wanted me to finish so they could get back to work. For that reason, I lit



them first using a few exposures, turned on the lights and let them leave. Then I turned the lights back off and spent a half hour creating exposures of the background.

- When shooting the owner of a recording studio (above), he gave me a tour of his facilities and then left me to decide where to shoot. I picked the wall where they display all the award-winning albums that have been recorded in his studio. Once I found the location that I like, I had a friend stand in for the owner while I was framing the shot, I spent a good half hour lighting the albums, turned on the lights and had the owner enter the scene (being overly careful to make sure nobody went near my tripod). I turned the lights back off and took a few shots of him before sending him on his way.

The total amount of time the owner was in the room was maybe three minutes.

The general concept is to light the background while the subject is absent, light the subject, then mask the background exposures to make sure they don't overlap the subject. Let's take a look at how the compositing work changes when the subject was not present at the time the background was lit:

The general technique for compositing starts off the same as any other image, loading the images into layers into Photoshop and combining them using the **Lighten** blending mode. Once that's done, we need to start to deviate from the previous technique.

Move all the layers that contain the subject to the top of the layers stack and then click on the eyeball icons for those layers to temporarily hide them.

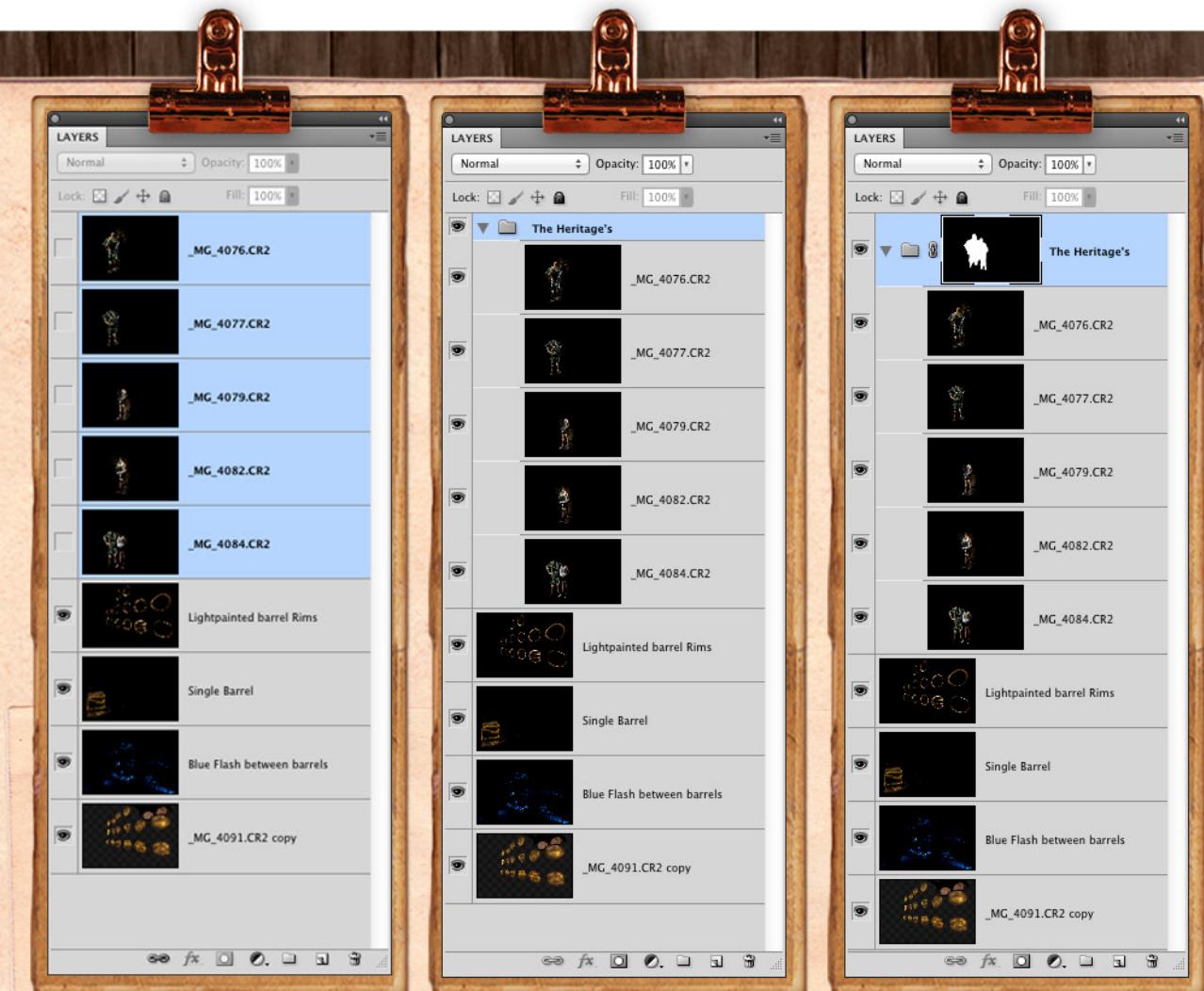
Refine the images that make up the background (masking, lowering opacity, retouching, etc) until you're generally happy with the overall look (knowing that you can make further changes at any time).



We next need to group all the layers that make up the subject so that we can easily mask them as a whole. Those are the layers that should currently have their eyeballs turned off and therefore be hidden. To select those layers, click on the name of the top-most layer to make it active and then hold the Shift key and click on the name of the bottom-most layer that contains the subject. Next, hold the Shift key and click on the folder icon that's found at the bottom of the layers panel to move the selected layers into a group (if you didn't hold Shift, you'd get an empty folder).

Now, click on the triangle icon that appears to the left of the name of the newly created folder to view its contents. Click on the eyeball icons for each of the layers that appear inside the folder to make them visible.

Now let's get the layers that are inside the folder to be treated as separate from the underlying image so that they obscure our view of what's underneath instead of blending with those exposures. To accomplish that, click on the name of the folder that contains the subject layers to make it active and then change the blending mode pop-up menu at the top of the layers panel from **Pass Through** to **Normal**. That will cause the enclosed layers to combine with one another in **Lighten** mode (since that's what each of those layers are individually set to) and then it will take the result and combine it with the background in **Normal**



Left: Hidden layers selected. Center: Layers placed in folder and set to normal mode. Right: A mask painted to reveal the underlying layers.

mode, which will obscure your view of those underlying layers.

Now, all we have to do is add a mask to hide some parts of the subject layers to allow the background to show through. Start by clicking on the layer mask icon (circle inside a rectangle icon) at the bottom of

the layers panel to add a layer mask to the active folder. Finally, choose the brush tool, set your foreground color to black and paint over areas of the image where you'd like your light painted background to show through. You only have to be overly precise with your painting when you get up close to the edge of the subject.

CONSIDER THE MOON

Let's talk for a moment about shooting outdoors at night. There are two very special times that you should consider and it all has to do with the moon. When the moon is full (which happens once a month), you can use it to light the surrounding landscape and substitute for the sun as a bright object in the sky. When there is zero moon, then it's a good time to capture the stars in their full glory, especially the Milky Way. Let's take a look at what you should consider when thinking about the moon.

- There are about five days per month when the moon is full enough to provide enough light to illuminate a scene. Two days before a full moon, the day of the full moon and two days after are a perfect time to do long exposures (around ISO 200, f/8, 2.5 minutes) that allow the moonlight to fill in the surroundings and make it look as if it were daylight.
- During a full moon, look for areas that will be in the shade. Those are the places where you have the opportunity to light paint while the moonlight provides the surroundings.
- Consider including the moon in your composition where it ends up looking like the noon day sun as a white glowing object in the sky. Just be careful because

any exposure longer than 30 seconds can cause the moon to be a blur, which can be acceptable as long as it's small in the scene.

- Try to avoid areas that have a lot of light pollution from streetlights or other man-made light sources so that you have total control over the scene.
- The day before, the day of and the day after the new moon is a perfect time to attempt to capture a star-filled sky. Since stars are rather faint, you'll have to start with settings such as ISO 1600, f/2.8, 30 seconds. Make sure that you focus your lens on infinity (∞). It's overly important that you find an area away from city lights to shoot if you'd like the Milky Way to be visible. Anything longer than 30 seconds will produce short lines instead of points where the stars should be since they are always in motion.
- After taking a star exposure, feel free to change your ISO setting back to 100, stop down to f/11 and do bulb mode shots to light paint any foreground elements that you might want to include in a multi-exposure composite image. Using those camera settings should cause the stars to be very dim if they show up at all, which makes for easier compositing.

- Do a Google search for **Moon Phase Calendar**, or download the iPhone app **MoonPhase** to figure out which times of month are best for taking advantage of the moon.



LIGHT PAINTING KIT

I find it useful to have a small light painting kit in my camera bag that holds the essential equipment for light painting. I thought I'd just pop open my lighting kit, show you its contents and describe why I use each item found inside. I'd suggest you create a similar kit so you're always ready to light paint at short notice. Don't feel you need to have the exact same gear ... this is more of an overall setup and you can substitute any similar gear.

Keychain LEDs

I have multiple versions of this light. One puts out red light, one green, one blue, and one white. With these lights, you can either pinch them for momentary use or flip a switch to have them stay on. I often place this tiny light at the base of my tripod pointed away from the scene. That makes it easier for me to locate my tripod in the dark without bumping it.



Flashlight with flexible stalk

This flashlight allows me to get into tight areas (like the grills of cars) and also allows me to paint close to objects that are above my head. I used it to light the picture frames on the image of the owner of a recording studio.

Colored Gels

I use a variety of Roscolux colored gels that I store in a wallet that's made by ThinkTankPhoto.com. I try to keep multiple copies of the same color since it's really easy to lose one or have it become too crinkly from use. The wallet allows me to separate the gels into warm and cool colors, which makes them easier to sort through.

Electronic glow sticks

These are a less than essential item, but can be used to create very thick light graffiti or to create a fire-like background.

LED 4-color flashlight

I bought this one at RadioShack on clearance. One button puts out red light, another green, another blue and the fourth button gives me white light. I love using this as an alternative to gels or for light graffiti.

Inova Bolt FLASHLIGHT

This flashlight is well built, is bright for its size and can either be used in a constant-on capability (by tightening the rear cap), or in a momentary-on capability by loosening the rear cap. I just wish it was rechargeable so I didn't have to keep a stock of batteries on hand.

Three-bulb LED

I use this flashlight when I want to create light graffiti that has a painterly appearance. The multiple bulbs give me what looks like a brush stroke instead of a solid line.

Duracel Daylite flashlight

This is another good flashlight that puts out a consistent beam. Rotating the front of the unit changes the width of the beam. I don't use it as much as the Inova Bolt just because it doesn't have the momentary on/off feature that I like so much and therefore I use this as more of a backup light source.

Simple semi-transparent bag

I store most of the items described on this page in a semi-transparent zippered bag that I purchased from <http://www.Think-TankPhoto.com>. It's known as the Cable Management 10. A big zip-lock bag would work almost as well.

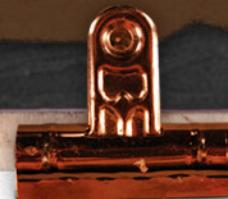
Lanyard

A lanyard is a good tool for creating orbs and is convenient because it fits into a small bag. However, I do prefer to use a dog leash because it's longer and easier to create nice orbs with.

EL Wire

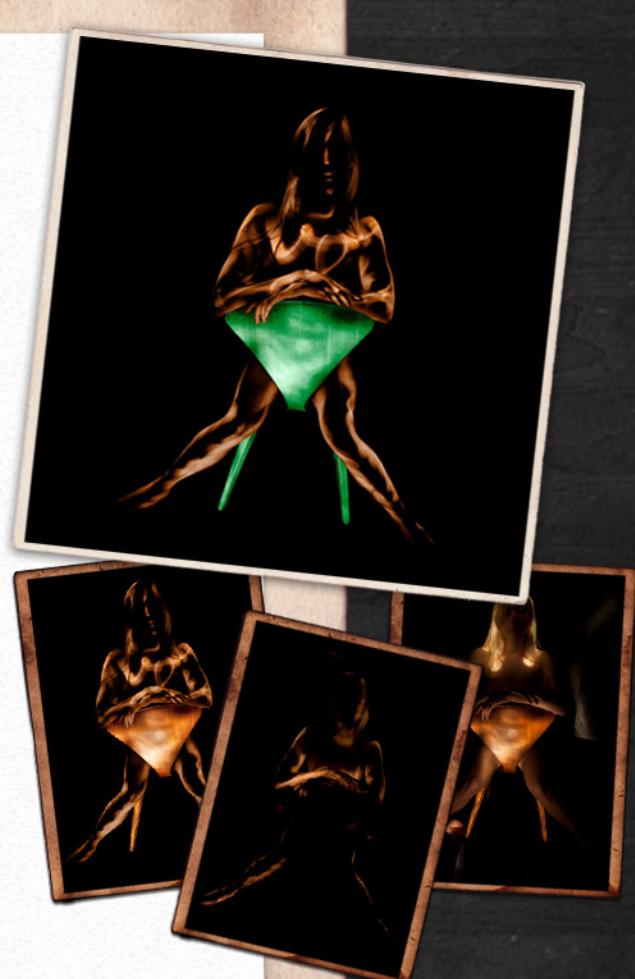
EL Wire, also known as electroluminescent wire, is a great way to simulate fire, water and other abstract effects. It comes in various colors and you only need a single battery pack because you can disconnect one color and connect another. Because of this, it doesn't take up much space.

EXAMPLES



In the first half of this e-book, we explored the general techniques that are essential to create a successful light painting; what tools to use, how to think while shooting and how to begin processing the images on the computer.

In the next section, you're going to see several real-world examples. I'll show you the final image and then detail what was unique about how that image was produced. Basically, I'm going to let you into my head, so to speak, so you get an idea of what my thought process was in each light painting scenario. You'll learn how I tackled certain obstacles, and what I did to make each image unique.







HOW IT WAS DONE:

This is a composite of seven exposures taken of a model named Alex. I decided to go for a different look and achieved it by using a black tin-foil product known as Cinefoil. Here are some details from the shoot:

- The green color on the chair was added in Photoshop by creating a new layer on the top of the image, setting the Blending mode pop-up menu at the top of the Layers panel to **Color** and then painting with green in the areas I desired.

- None of the individual exposures were good enough to define the model from the single shot. I layered the exposures and masked each one to only keep the areas that I thought looked good.

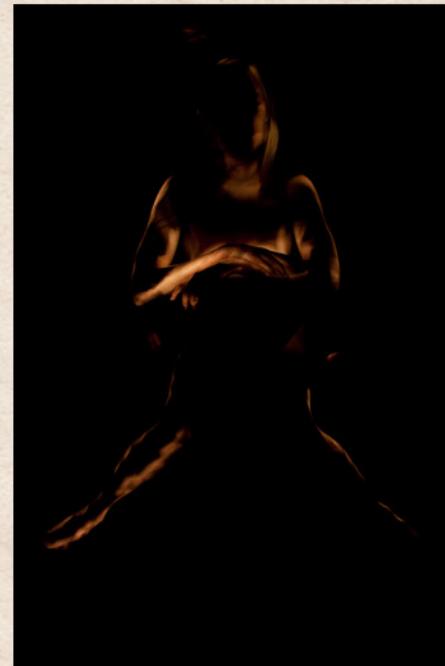
- The Cinefoil was used to create a snoot that could be easily distorted so that the shape of the light leaving the flashlight was not round. I then painted light onto the model's legs using a fast up/down flicking of my wrist almost like I was flicking wet paint onto a wall from a paintbrush.



Here's what the image looked like before I changed the color of the chair to green.



One of the individual exposures that helps define the legs.



Another exposure that wasn't good on its own, but was masked to help fill in areas that needed more light.



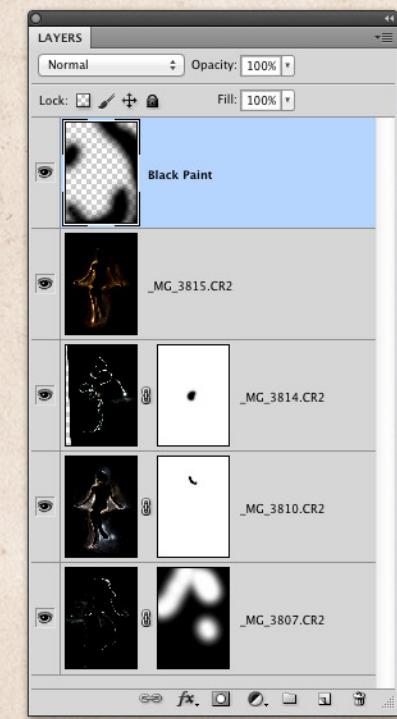
The chair exposure all by itself. I had to mask out the model in the final composite.



HOW IT WAS DONE:

This image is a composite of four exposures. In this case, I wanted to experiment to see if I could show the subject of the photograph without actually adding much light to the subject. Here's a rundown of my thinking in creating this image:

- This is a nude model sitting on a sofa that was covered with an ordinary wrinkly white bed sheet.
- In two of the exposures, I attempted to light the edge of where the body touched the sheet. In one, I had the flashlight pointed toward the sheet and in the second, toward the body where it touched the sheet.
- The other two exposures were where I somewhat haphazardly traced the outline of the model while pointing the flashlight toward the camera and randomly rotated my wrist so the width of the resulting light graffiti would not be consistent.
- By combining the four exposures and masking out any areas I did not like, I was able to produce an image that I thought was satisfactory.
- As a final touch, I created a new layer on top of the layers stack and painted with black to darken any areas of the sheet that were extending too close to the edge of the frame. I like to keep the edge of the frame clean, if possible, so there are few distractions to pull the eye away from the subject.







FAR LEFT: This is what the image looked like when the compositing was complete. Multiple curves, hue/saturation and color balance adjustments were performed to transform the image into the final version. Compare to the post-adjustment inset photo.

DIRECTLY LEFT: Layers view before adjustment layers were added.

HOW IT WAS DONE:

In this image, our model, Batel, asked me to take a photo of her along with a set of red wings that she used to wear as a kid and she had fond memories of. Batel is a yogi and decided that she wanted to incorporate a related pose, so I adjusted the position of the wings until everything looked pretty symmetrical. Here are a few details about how the image came together:

- This is a composite of four exposures. In one, I lit Batel from a distance of around 1.25 feet to produce a soft quality of light.

For the second exposure, I lit the subject from a close distance to get more of a painterly look. In the third exposure, I attempted to backlight the semi-transparent wings by lighting them from underneath. In the final exposure, I lit only the edges of Batel's body right where it touched the bear skin rug she was laying on.

- In compositing this image, I used all of the soft-lit exposure and then masked the closely lit and back-lit wings exposures so they only showed up where the wings were.

- Finally, I used the edge exposure to add a little highlight to the edge of Batel's legs and to allow her right ear and neck show up.
- To finish the compositing routine, I added a layer on top of the layers stack and painted with black wherever there was any stray light falling on the background.
- Once the compositing was complete, I brightened the image, made it more colorful and fine-tuned the color.



HOW IT WAS DONE:

When a friend's daughter showed me her drum set, I asked if she'd like to get a very unique photograph of her taken playing the drums. Melissa was concerned that her drum room setup wasn't quite the right environment for creating an image she could be proud of. But with a little encouragement and the promise that I'd incorporate sparklers into the image, she decided to go along. Here are some details about what made this shoot unique:

- This image is a composite of no fewer than 22 exposures. That might make this sound like it took hours to create, but the shooting time from start to finish was only nine

minutes. Compositing all those images took about 35 minutes, which made this a manageable task.

- It only took five exposures to produce the most important parts of the image. The additional exposures allowed me to add accents to the drums and other areas. I had a friend at the camera with a cable release in his hand while I was yelling "Open" and then "Close" to tell him what to do with the shutter. In one shot, I might paint light onto the top of one drum. In the next I'd light the side of the same drum, while in the next I might light the stand that was holding up the drum. Having them as separate exposures allowed me the

most versatility when compositing the image.

- When I shot this, Melissa was only seated during the sparkler exposures and then one flashlight exposure that lit her. She was holding still the entire time to make sure she wouldn't turn out blurry. I told her she could relax and didn't have to hold still anymore as I started to create the flashlight exposures for her drums since I wasn't going to light the area where she was seated.
- I did four exposures with sparklers. One that covered most of the scene and then three more for areas that were not easy to access (for example, the area where her dresser almost touched the drum set).



Example of a flashlight-painted exposure that lit just a portion of the equipment.



Here's what the room looked like when shot with ambient light.



Here is the image with only five exposures. The extra 17 exposures are used as accents.





The sky exposure.



First car sparkler painting.



I also made a version that included a self portrait.

HOW IT WAS DONE:

This image is a composite of eight exposures. They were shot with a 17-40mm lens at 33mm, f/13 and ISO 100. Here's the story behind the image:

- The subject is Cadillac Ranch in Amarillo, TX. This location features ten Cadillac cars from the 1950's buried nose first into the ground in the middle of a cow pasture.
- I lit the cars using the same kind of sparklers you find for sale in the U.S. around the 4th of July. I buy them on the 5th of July for almost nothing and stock up for all the light painting I might do that year.
- After opening the shutter in Bulb mode, I walked behind the first car and lit a sparkler. I then walked out in front of the car and attempted to trace its outline while moving my hand back and forth to create a squiggy line. I was not able to reach the top of the car, so I jumped near the middle of the car to get a high stroke. I didn't show up in the exposure because I kept the sparkler at an arm's length away from my body.
- The first sparkler only lasted long enough to be able to light the front-most car, so I returned to my camera, finished the first exposure and then started a second. I did this because the sun was about to come up and the sky would have ended up being too bright if I left the shut-

ter open long enough to paint all the cars. On the second exposure I lit the second car.

- In subsequent exposures, I lit two cars with a single sparkler because I realized that I only needed to paint the left half of each car since the right side would be obstructed by the car in front of it.
- After painting all the cars, I took a final exposure to capture the look of the sky right before the sun rose. I ended up masking that exposure so that it's only visible in the sky area.



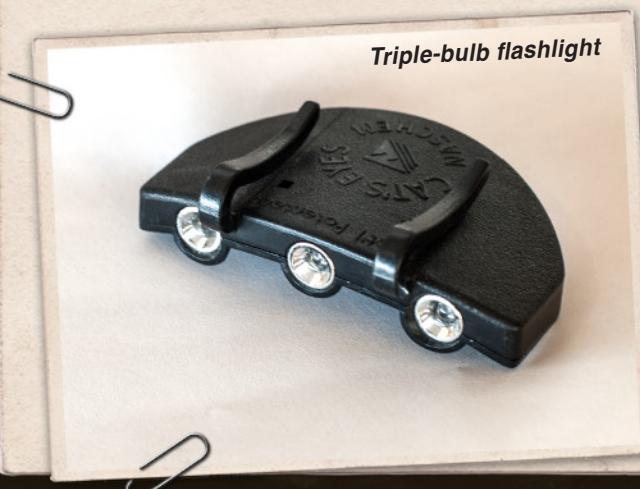
Earlier in the night I light painted the same scene using flashlights. Here's a composite of that along with the sparkler version.



HOW IT WAS DONE:

This image is a composite of 31 separate exposures! I just kept shooting until I ran out of ideas and then combined the images until I got something that I thought was interesting. You can see a video that shows the original exposures and the composite coming together at <http://YouTube.com/BenWillmore>. Here are some details about the image:

- Chris and Cherie, from Technomadia.com, are shown standing in front of the trailer they used to live in (they now live in a vintage bus). They were only standing in that position while they were being lit. The rest of the time they were relaxing as I painted their trailer. That meant that I had to mask the exposure of Chris and Cherie so that it would end up as the top layer in the composite.
- The triple white lines were created using a three-bulb flashlight that is designed to be clipped to the bill of a baseball cap.



- When refining this image in Photoshop, I shifted the color of the vent that appears to the right of center on the trailer. The vent was originally made from two exposures. One that used blue light for the main paint of the grill and a second that used white light to trace its edge. I shifted both exposures toward an orange color so that less attention was drawn to that area. I explain how the color shifts are done on page 29.



A single exposure of Chris and Cherie was masked to cover up the underlying light painting.



Original look of the grill.

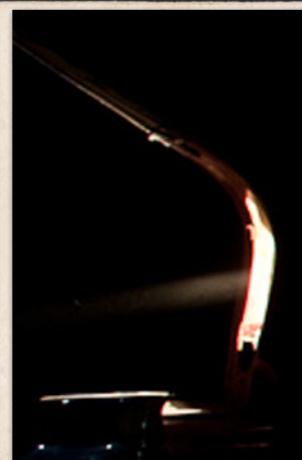


Result of shifting color toward orange.





Result of placing a Flashlight in the far taillight pointing out.



Result of throwing sand at the tail light during the exposure.

LEFT: Base exposure of 2.2 minutes lit solely by the full moon.

HOW IT WAS DONE:

This image is a composite of 13 exposures, all of which were shot at ISO 200 and f/8 at 17mm. All of the exposures were taken using Bulb mode and the length of each varied from 4 seconds to over two minutes. Here are some of the unique things I did to make this image different:

- With a full moon overhead, I took a 2.2 minute exposure, which produced the base exposure where the overall background and

surroundings were visible. I did not calculate that exposure. I simply got a feeling for how much time it took after shooting other compositions in the same environment. The camera settings I used (ISO 200 and f/8), gives me a hint that I was impatient, since I more commonly shoot at ISO 100 and f/11, which would have caused me to need an 8.8-minute exposure.

- The flame-like exhaust emanating from the

taillights of the car was created by placing a flashlight inside the car pointing out of the area where the taillight glass would usually be. I then threw sand at the taillights during the exposure to let the beam of light become visible.

- The uniquely-shaped shadow on the side of the car was created by shooting light through the bush that appears on the right edge of the image.





100% of the full moonlight exposure is included in this shot.



A shot detailing the taillight exposure.

HOW IT WAS DONE:

This image is a six-exposure composite shot with settings of 19mm, f/8 and ISO 200. Here are some of the things that make this image unique:

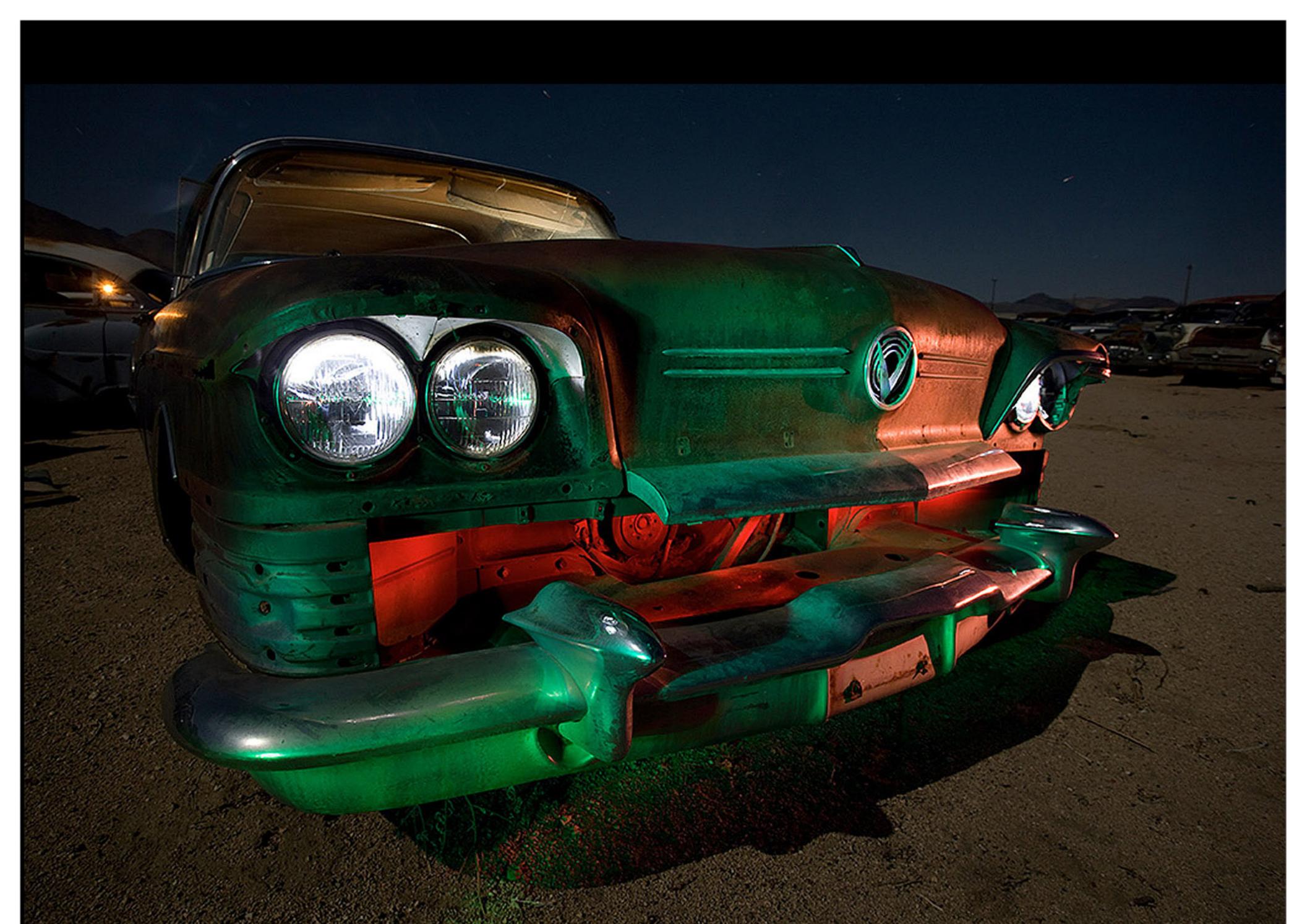
- Although shot under a full moon, I decided not to use the exposure that allowed the background to look like daylight because I liked the over-spray of green light that fell onto the ground and thought that looked out of place on such a bright background.
- Being a car in a junk yard, I was unable to get the owner to turn on the taillights. I manually lit the taillights using a tiny pen-light (the kind you might have on your key chain). I created a snoot out of gaffer's tape to make the exposed bulb look re-

cessed, wore a black glove to prevent light from over-spilling onto my hand and then traced around the edge of the taillight with the flashlight pointed toward the center of the taillight. When the flashlight was on the left side of the taillight, it was illuminating the right side and vice versa when I made my way around to the other side of the bulb. It sounds complex and difficult, but it's really simple once you give it a try.

- I didn't like that the red light from the taillights ended up being reflected onto the bumper and trunk lock. To prevent that, I masked the taillight exposure and painted with black over those areas to remove the reflection.



Here is a different version, with taillight reflections showing on the bumper.



I got bored when shooting the moonlight exposure and couldn't help but light the interior and headlights while waiting.



Red light exposure of grille area.



Green and orange light exposure.



Green light exposure. I ended up masking this layer to only use the light falling on the lower bumper area.



HOW IT WAS DONE:

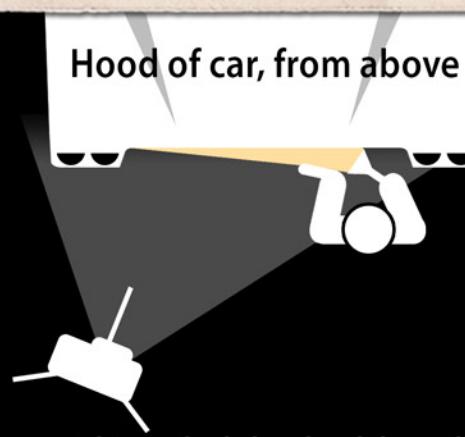
This image is a four-shot composite. It was shot under a full moon and the four shots consisted of: 1) a two-minute moonlight exposure, which included the headlights, 2) red light in grille area, 3) green light painted from camera left and orange light from camera right, 4) green light from bottom and camera left. Here are some of the unique techniques I used to produce it:

- The headlights were lit using a tiny penlight snooted with gaffer's tape. I traced around the outer edge of the headlight while wearing a black glove. When the flashlight was at the top of the headlight, light was being directed around the headlight's reflector and back out the bottom of the headlight. My hand never shows up since it was at the top of the headlight when the camera was capturing the light coming

out the bottom of the headlight, which means it was always in darkness. This is a technique that is hard to understand without trying it yourself. Just try to keep the majority of your hand out of the way and only let your fingertips get near the glass of the headlight.

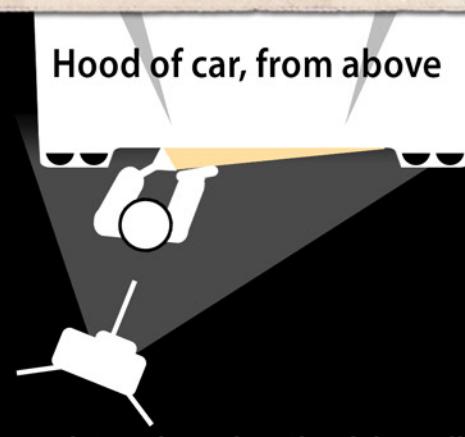
- The red light that appears where the grille of the car would usually be was done as a separate exposure. I was blatantly standing in front of the camera near where the end of the bumper appears on the left side of the photo when I lit the right side of the grill. I then turned off the flashlight, moved to the right side of the scene and lit the left side of the grill area. I had to wear black gloves and use my hand to block the bright front of the flashlight from being in view to the camera.

Hood of car, from above



Lighting the left side of the grille

Hood of car, from above



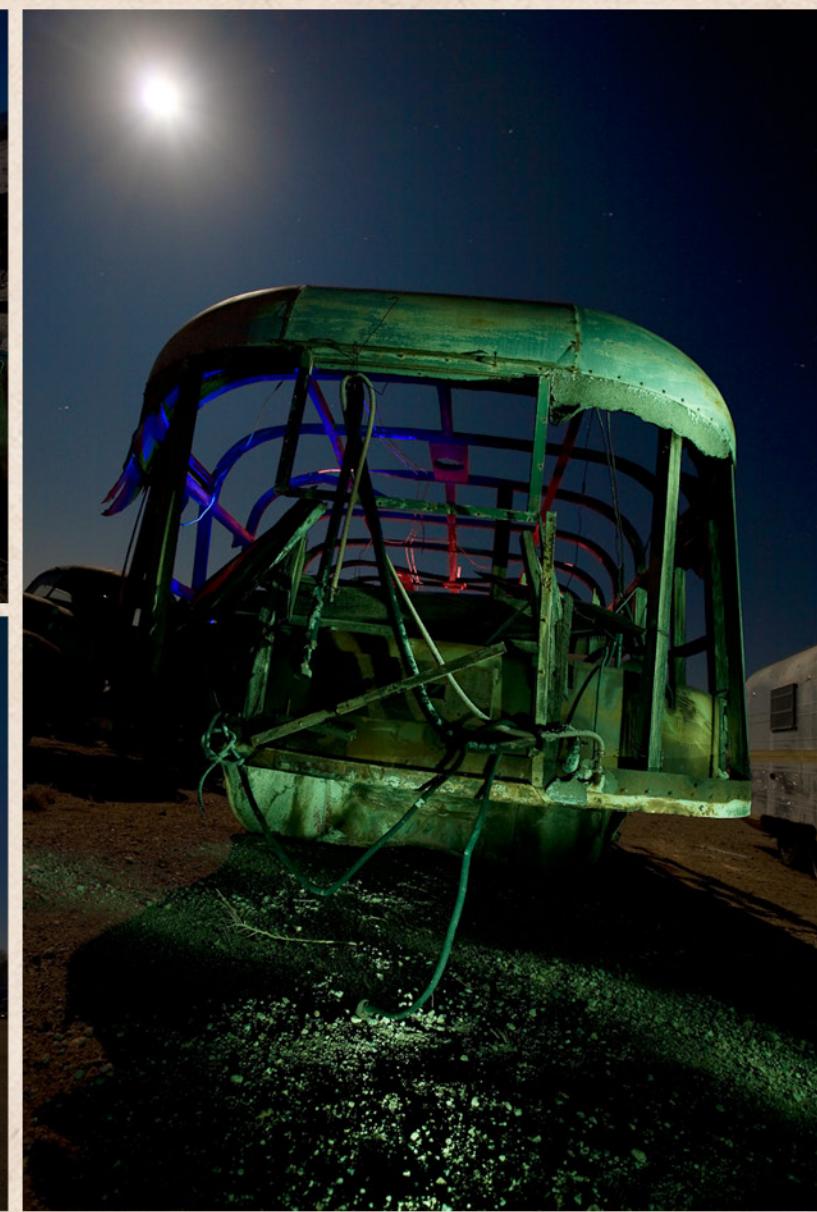
Lighting the right side of the grille

Photographer's hand blocks camera's view of flashlight bulb

On the following pages, you will see some other images I created on the same weekend while shooting at a junk yard in California. All were shot under a full moon.









HOW IT WAS DONE:

While visiting a friend at his lake vacation home, I decided to capture an image to remember the weekend by. This is my buddy Wes (he works for Wacom, the people who make graphics tablets) in his golf cart. That's the default mode of transportation near his vacation home. Here are some of the techniques that make this image unique:

- This image was lit with both sparklers and flashlights. I captured a total of 29 exposures that ended up being used in this end result. Why so many? Well, unlike a flashlight, a sparkler doesn't have an on/off switch. So, if you want to create an image that is made out of unconnected sparkler graffiti lines, then you'll need to close the shutter between the time you draw one line and you move to where the next should begin. That means that I had someone at the camera with a cable release in their hand and I yelled my standard "open" and "close" commands to tell them when to start and stop each exposure.
- I started by lighting the entire golf cart using a flashlight. That was done in five exposures.
- Next, I had Wes step into the scene and take position behind the wheel. I lit him with a flashlight and then created a second exposure where I added some sparkler streaks in his general area.
- After capturing Wes, I allowed him to walk out of the scene while I lit the rest of the image with sparklers.
- Since Wes was not in the scene for all the exposures, many of the exposures (like the one of the seat he's sitting on) had to be masked so that the light didn't overlap his body.
- When opening the sparkler-lit images in Adobe Camera Raw, I upped the **Clarity** setting, which caused the sparklers' shape to become more pronounced.



Here's a version made from the exposures that were lit with a flashlight.



Light painted golf cart minus Wes.



Light painting masked to allow for Wes' addition.





HOW IT WAS DONE:

The subject of this image is the owner of a recording studio in New York City. This is the wall in his office where all the artists' award-winning albums are displayed. This was no easy shoot because there were so many reflective surfaces (picture frame glass, metal albums, metal plaques) that could cause unintentional glare or reflected light graffiti. Here are some details on how I pulled it off:

- I composed the shot with the office lights turned on and a friend standing in for the studio owner. The owner was present for less than two minutes total during this shoot, so I had to do a lot of prepping to make it work.

- I stood on a chair and used a penlight-style flashlight that had a flexible stalk. This allowed me to point the light toward the wall while the barrel of the flashlight was pointed straight up. That's how I lit the edges of the picture frames. I lit as many frames as I could reach, then closed the shutter, moved the chair and continued with the next exposure until I got them all.



- The shiny albums were lit using a standard flashlight fitted with a custom paper cone. The cone was just a piece of office paper that I held in a cone shape in an attempt to get the light output to be the exact same size as each album. That way, I didn't get any light beyond the album and avoided flare by keeping the light about two feet away from the wall.



My first attempt at lighting an album produced glare and reflected light graffiti.

- When the owner of the studio arrived, I turned on the office lights and quickly positioned him where my friend had stood

when I was composing the image. I then turned the lights back off and took three exposures of him: one lit from the right side, one from the left and a final one where I lit the wall surrounding him.

- I had to mask the exposures of the wall that I had taken earlier. Otherwise, they would have overlapped the studio owner.
- At some point during most of my complex light paintings, I like to take what I call an ambient exposure. That's where I either turn on the room lights, or light the subject with a bright light from far away so that soft light is created and lights the scene evenly. Ya just never know when you'll end up with an image that needs something from this exposure added. In this case, I masked many of the album labels and stole some of the reflections on the albums from the ambient exposure. I ended up masking it to only get the areas I needed and then lowered the opacity of that layer until it wasn't obvious that they came from a "normal" shot. I think I ended up at around 35% opacity.



Here's what the subject looked like with the room lights turned on. Not too exciting if you ask me.



Here you can see a hint of the paper cone I used to direct the beam of the flashlight.



Before masking to add the studio owner and before the ambient exposure was incorporated.





HOW IT WAS DONE:

In this case, the subjects are the owners of a winery shot in the barrel room where they age the wine. The technique used to capture these images is no different than what I've shown you in other examples. The main thing I want to show here is that by working with multiple exposures, I was able to come up with multiple variations to present to the client, even though they were in the room only long enough to capture the images needed for a single image. Here are some notes:

- I started by composing the image with a stand-in for the owners so I'd be ready by the time they arrived.
- When the owners were ready, I lit them with just a few exposures knowing that they wouldn't be accustomed to holding still for any length of time and that they would quickly bore with being blinded by a flashlight. With those exposures under my belt, I let the winery owners go on their way while I stayed behind to light the rest of the room.
- The blue you see showing up between the barrels was created by a blue-gelled flash that I popped off a few times from various positions near the edge of the barrels.
- The red rectangles in one shot were created by pointing a red LED flashlight in the direction of the camera and tracing the framing of the barrel supports.

RIGHT: Here's what the room looks like with more normal lighting, just to give you a sense for the environment.

LEFT: I combined the exposures in different ways to create a variety of results.



HOW IT WAS DONE:

For this image, I traveled to Teakettle Junction in Death Valley National Park. I came to this spot right as the sun had set and this monument to travelers would have appeared as a silhouette if I hadn't light painted it. Here are a few details about the image:

- I started by experimenting with my exposure until I found a setting that would render the sky and background with detail and give me enough time to paint with light on the subject. I ended up using an exposure of 40 seconds at f/16 and ISO 200.
- In one of my first tests, I found that I was getting too close to the teakettles and was producing unintentional light graffiti. In my second attempt, I found that I was blocking the light from the sky too much with my body, which caused me to show up as a dark ghost in the image. In my third and final attempt, I made sure to move around more so I wouldn't be in the same place long enough to show up and I stayed a bit further back to create a softer look.
- I did experiment with other effects when light painting just in case I wanted to create a composite image, but decided that I liked the simplicity of the single-shot version.





You can see the ghost of me on the left and right as a dark area. That's because I was trying to stay out of the way and paint from the left and right sides of the frame, but didn't realize that I was blocking the light from the sky and therefore appeared as a shadowy figure.



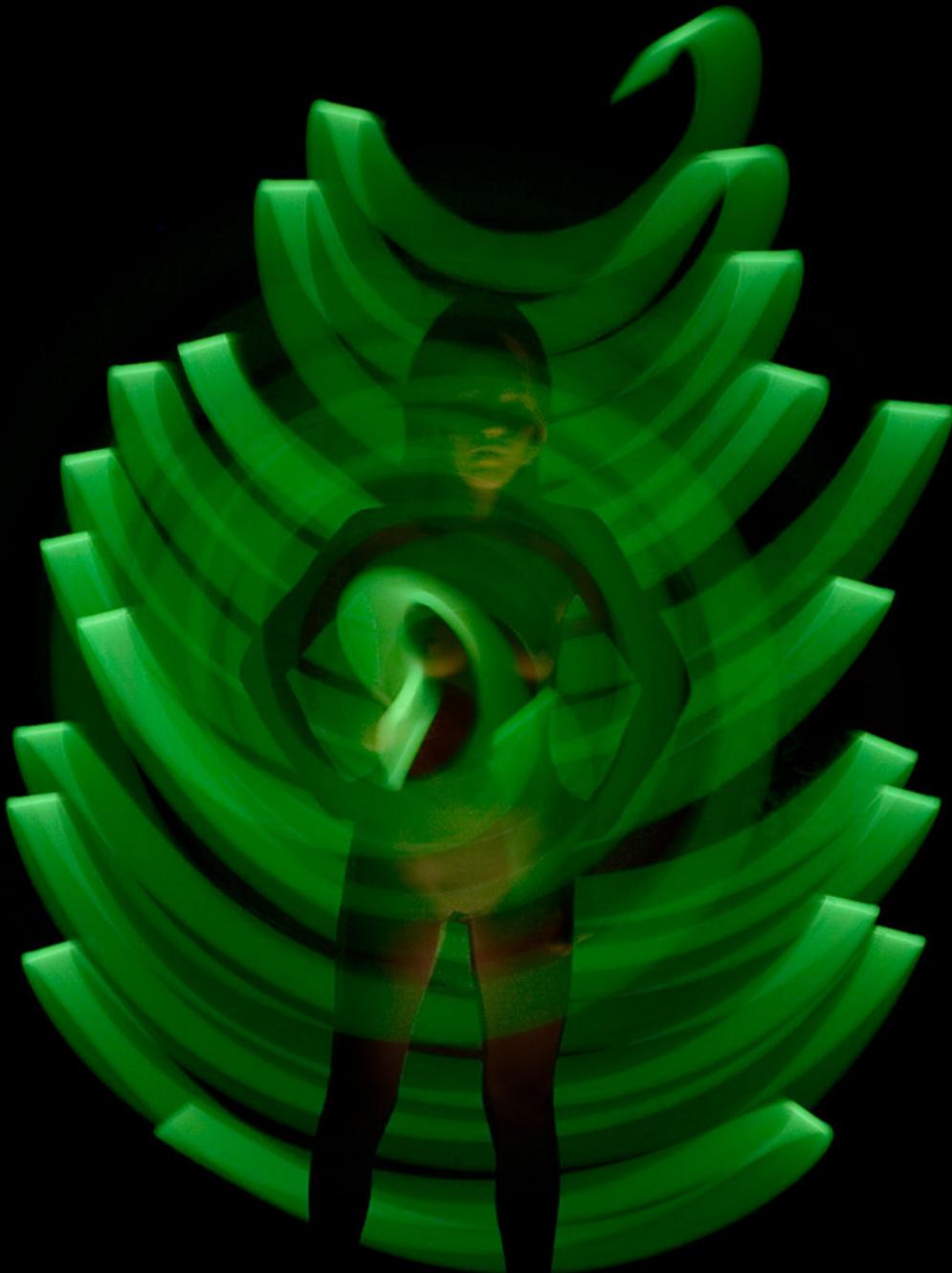
Another exposure that I thought I might use in a composite, but ended up discarding.



Here's an ambient light exposure for reference.

For comparison, here is the final image shown on the previous page.





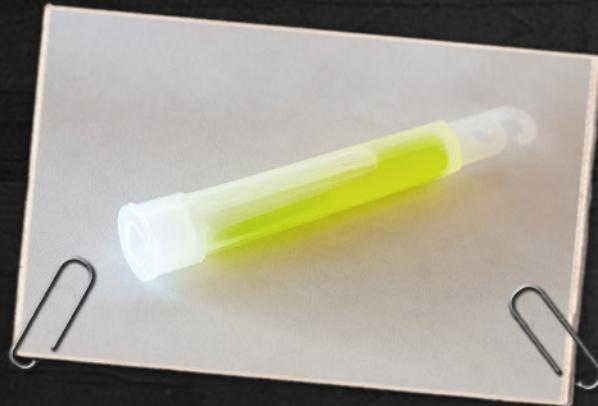
HOW IT WAS DONE:

Our subject in this case is a naked model standing in an otherwise boring warehouse-like environment. As usual, when I shoot a nude, I prefer to infer the nudity more than blatantly show it and I thought light painting would be a fun technique to experiment with. This is a composite of three exposures. Here's how this image went together:

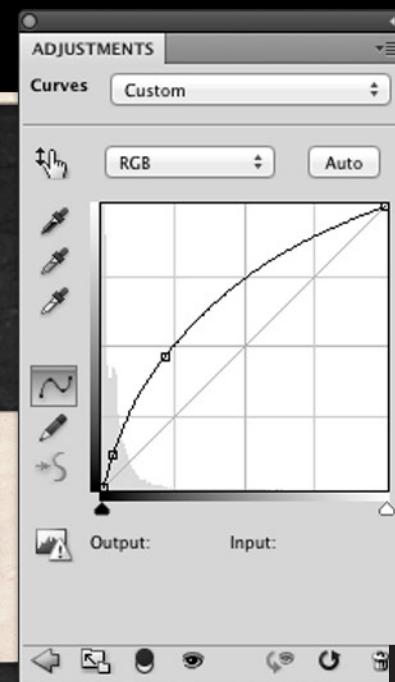
- I started by attaching a glow stick to a long string. These are those standard snap, shake and glow-style sticks that glow for a few hours from a chemical reaction and that have been available for decades.
- I knew that I was going to only infer nudity in this shot and thought one good way of doing that was to show the body as a silhouette. With that in mind, I posed the model so that her arms and legs separated from her body in such a way that it was easy to recognize the subject.
- With the subject posed, I moved behind her and started to swing the glow stick back and forth while I yelled to an assistant to open the shutter. Once the shutter was open, I proceeded to shorten the string, which had the result of raising the height of the glow stick as it swung across the scene.
- As a second exposure, I had the model spin the glow stick and allow the string to wrap around her arm so that it wound up into a shorter length as it rotated around her arm and produced a spiral.
- The final exposure was lit from below with Christmas tree lights that I laid on the floor. I ended up masking that image and only used the area where the model's face and chest were lit, which I thought made the image more interesting than just a silhouette.
- When compositing the image, I also added a Curves adjustment layer to brighten the image as a whole.



LEFT: Original capture. CENTER: The spiral exposure is added. RIGHT: All three exposures



This Curves adjustment layer was used to brighten the glow stick image.







HOW IT WAS DONE:

One day, a friend invited me to attend a dance party in the desert under a full moon. I couldn't resist bringing my camera and attempting to capture the energy of the event with a few light paintings. As usual, I set up my tripod, put my camera in bulb mode at ISO 100 and did a few test exposures to figure out the f-stop that produced a result that wasn't too bright or dark. In this case, I ended up at f/4.5 by chance. Here are some details from the shoot:

- After doing some test exposures, I decided to give a quick light painting demo to a few friends and then get them to light paint themselves, all in single exposures.
- In my self portrait (shown on the previous page), I raised my left hand above my head and then painted light over it with the flashlight that was in my right hand. I then turned off the flashlight, moved my arm down a little, turned the flashlight back on and lit that arm a

second time. I repeated that process for a total of four times before I changed which hand was holding the flashlight and start to light my right arm. That's what made me look like a had a dozen arms.

- Once I was done lighting my arms, I lit my head and body. I could easily bend over to light my legs without causing a problem with my torso because no light was falling on my torso when I bent over and therefore it wasn't being recorded at that time.
- I then turned the flashlight toward the camera and painted some white streaks in an attempt to illustrate the motion my arms might be making.
- After finishing the light painting demo, I handed my flashlight to a friend and had him give it a try. I liked the creative results he achieved.





Ambient daylight exposure for reference.



Sky exposure that was masked to prevent daylight from influencing the scene too much.



This is what the final image would have looked like if the sky exposure was not masked to prevent daylight from influencing the tufas.

HOW IT WAS DONE:

While visiting Mono lake in California, we decided to visit an area known as the South Tufas. They are interesting formations that were once under water and have become exposed more and more each year. Here are some of the things that made this shoot unique:

- Lighting the tufas in the far distance required the use of a very powerful flashlight. I used the 18 million candle power Cyclops that I acquired at Costco. I had to spend a lot more time lighting the distant tufas compared to the close ones because the brightness of the light falls off as it has to travel over a longer distance. I had to take a few exposures before I figured out how long I needed to spend lighting them to get an acceptable exposure.

- One of the images used was shot to get a good exposure of the sky. I was unable to get such a shot without having the daylight falling on the tufas, so I had to mask the resulting layer to prevent a mix of daylight and flashlight.

- The flashlight I used produces very yellow light. I liked the warm feeling, but had to adjust the white balance of the shots as a group to make sure the scene wasn't overwhelmed with overly yellow light.

With so many tufas in the scene, I had to carefully review all the shots to make sure I ended up lighting all the tufas I wanted to be visible. It would have been very easy to not realize that I missed a few of them.



Another composition to show what it looks like without the distant tufa lit.



HOW IT WAS DONE:

This image was captured in the parking lot of the South Tufas at Mono Lake in California on the same night that the other example images from the same area were captured. Here's what it took to capture the overly faint Milky Way:

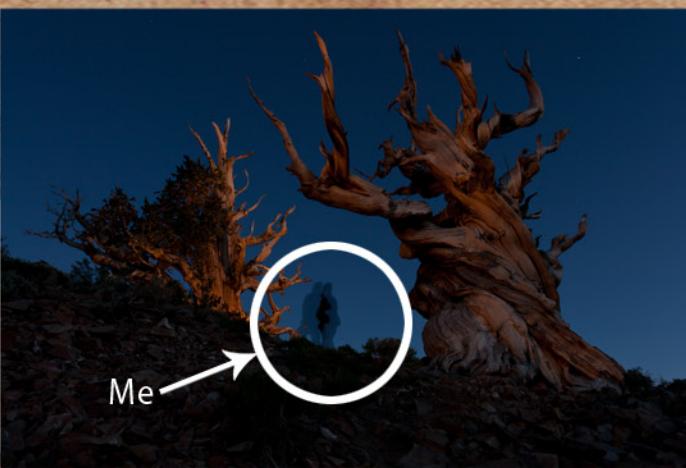
- I started by setting my camera's ISO setting to the highest setting that doesn't produce overly noisy results and still allows me to render fine details like stars. For my Canon 5D Mark II, that's 1600 ISO.
- I used a 30-second exposure since that's the longest I can get away with without having the stars looking more like lines (star trails) than sharp points in the sky.
- I set my aperture to f/2.8 to allow as much light as possible into the lens. I made sure to choose one of my lenses that was able to open up that much. Had I settled for an f/4 lens, it would have either caused me to double the exposure time or double my ISO setting, both of which were already set at the maximum value that will produce an acceptable result.
- I set the camera to manual focus and focused the lens at infinity (∞).
- I made sure that long exposure noise reduction was activated to minimize the amount of noise captured.
- Finally, I light painted the car using the flash on my iPhone®. I painted so fast that it felt like I almost didn't add any light to the image (since my camera was set to be so sensitive to light). It took me three tries before I figured out how little light I needed in order to get the car to show up.



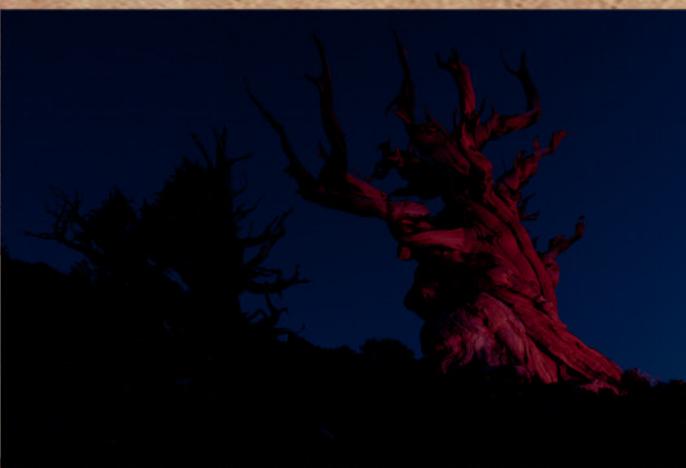
Natural light exposure for comparison.



Exposure where I stayed in the same area long enough that I appeared as a shadowy ghost because I blocked the light from the sky for an extended period of time.



Example of typical colored light exposure. Brightened just slightly to make it easier to see detail.



HOW IT WAS DONE:

This image is a 19-shot composite of a bristlecone pine tree, which is one of the oldest trees on Earth. I ended up with so many exposures because I had to physically traverse a large amount of space in order to light the trees from the angles I desired. Had I done fewer exposures, then the sky would have been very bright in many of the exposures and I'd have to mask that area to prevent multiple sets of stars from appearing, since they move over time. In the end, I did end up with five longer exposures, which made it necessary to retouch the stars anyway. Here's what was unique about this shoot:

- On most of my shoots, I can paint a particular color of light over the entire area I desire from one standing position. In this case, I had to climb up a rocky hill to get from one place to the next and use a flashlight to illuminate my way to make sure I didn't trip over anything in the dark. That meant that I had to use many exposures. Otherwise, you would have seen the light of my flashlight illuminating my path as I walked from one area to the next.
- It was somewhat difficult to visualize exactly what I was getting since I was viewing the scene from a very different angle than the camera. To compensate for that disadvantage, I took more exposures than I usually would, lighting things from a variety of angles, knowing I was going to end up masking many of the exposures to produce a desirable composite image.
- When I was done with the composite, the top two thirds of the image looked a little dark, so I added a curves adjustment layer, brightened up the image, and then painted on the attached mask to prevent the adjustment from affecting the bottom portion of the image.

HOW IT WAS DONE:

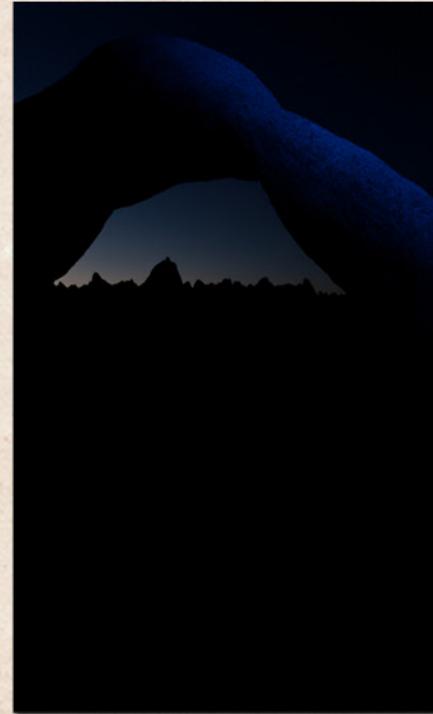
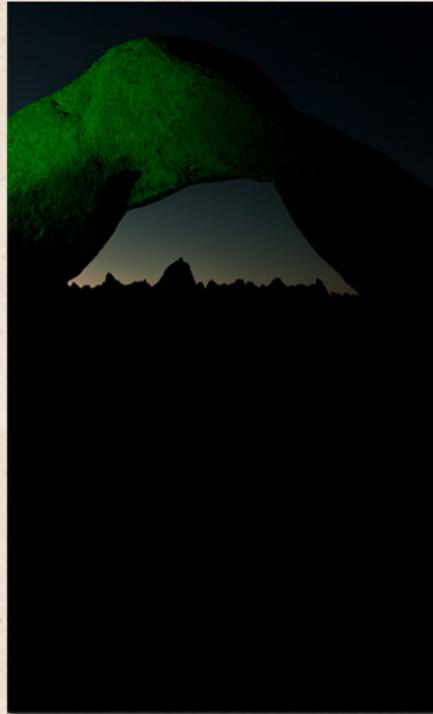
This image was captured in a location known as the Alabama Hills in the Eastern Sierra region of California. It is a composite of eight separate exposures. I ended up creating multiple versions of the image in the end because I wasn't sure if I'd like what the image looked like with such a rainbow of colors included. Here are some of the things that make this image unique:

- I used a single color of light in each exposure in order to make it easier to adjust the colors individually in Photoshop. By having separate layers for each color, I had the ability to apply Hue/Saturation adjustments to shift the colors in each shot.
- This image benefitted from using multiple exposures because it allowed me to keep the sky and distant rock formations dark. That means I could walk all the way around the arch, lighting it from various angles while keeping the shutter closed while I was walking. Using **Lighten** mode instead of **Screen** mode meant that Photoshop only used the brightest version of the sky instead of adding the light from each exposure, which would have produced a much brighter sky.
- I purposely masked the brightest version of the sky so that it only appeared inside the arch, leaving a darker sky from another exposure surrounding the arch in an attempt to keep your attention near the middle of the image.

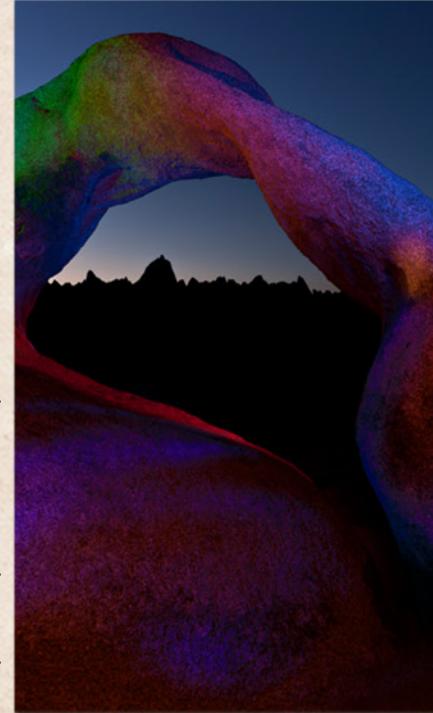


Here are a few examples of the exposures used to create this composite. Eight shots were used in the final image, but more like twenty were taken of the scene.

If these were all captured in a single exposure, then the brightness seen in each sky would have added up to an overly bright sky.



RIGHT: Version with sky left bright from the same exposure as the area under the arch.



FAR RIGHT: Here's what the scene looks like with ambient daylight only. This was taken as I was composing the scene and waiting for it to get dark enough so that I could start light painting.





HOW IT WAS DONE:

This image is a composite of at least a dozen shots. The orb was done in a single exposure, there was another for the sky, and then I lit the rock from five different angles, each in a separate exposure, while the tree was lit from four angles. The rock and tree were done like any other object described in this e-book. What makes this image stand out is the multi-colored orb. Let's take a look at how that was done:

- I wasn't planning on making an orb, so I didn't have the right equipment on hand. I made a makeshift orb tool by attaching seven different colored key chain LED lights to a carabiner and used gaffer's tape to

attach the carabiner to the end of a spare cable release I had with me. You can do the same thing with white LEDs if you don't need an overly colorful orb.

- If I knew I wanted to make an orb, I would have used a chain-style dog leash, which I could have quickly clipped to the carabiner.
- With all the LED lights turned on, I proceeded to spin the cable release in a circular fashion by rotating my wrist. That motion produced a large circle where the LEDs almost hit the ground in front of my body at bottom of the stroke and went above my head at the top of the stroke.

Once I started to produce a consistent circular spin, I watched the point at which the LEDs were hitting the bottom of the stroke and positioned that over a lens cap that I had set on the ground. I then proceeded to walk around in an imaginary circle that surrounded the lens cap, making sure that the LEDs always remained directly above the lens cap. I was continuously looking down at the lens cap to see that the LEDs were directly over it as they reached the bottom of each rotation.

- An orb can be made by walking around half of a circle, but I decided to go a full 360° to have an orb made of more lines.

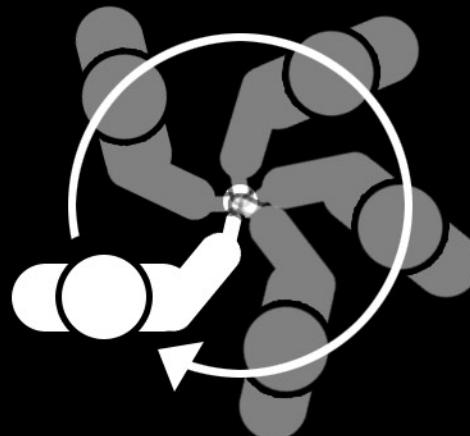
View from front



Lens cap on ground
for reference point

Use a reference point to mark
the center axis of the orb

View from above



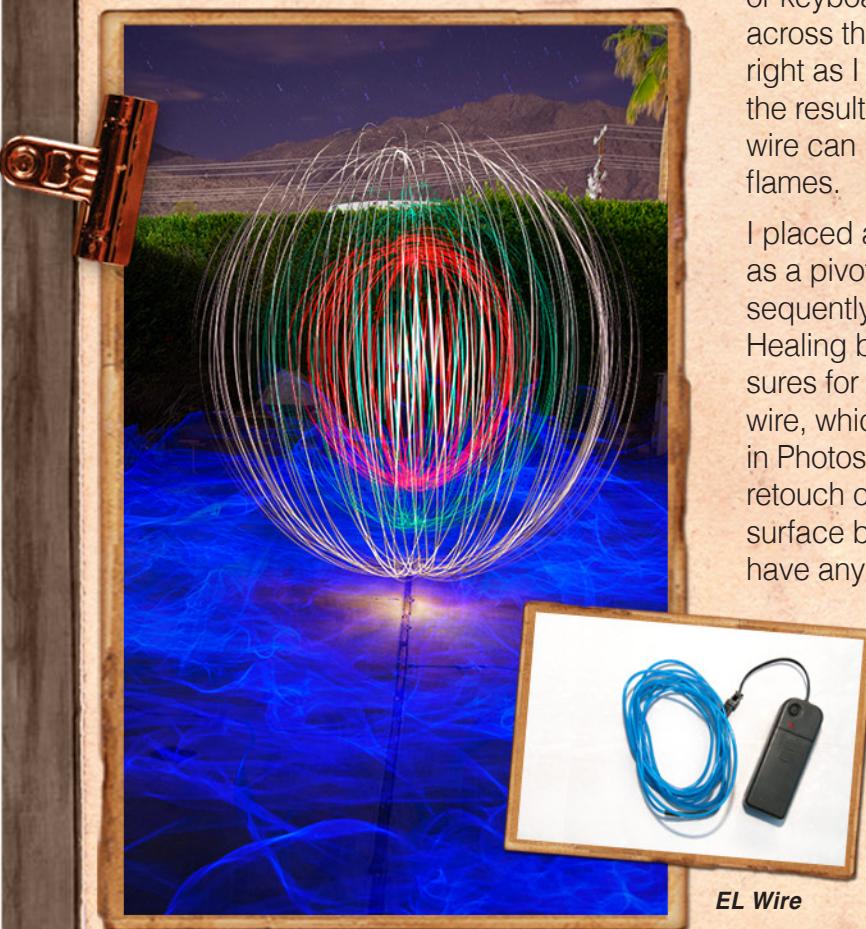
Move around that point, keeping your hand
over the lens cap (or other marker) at all times



This is an example of the type of setup that can be used to create an orb. You can either use white lights or multiple colors for a different effect.

HOW IT WAS DONE:

The image shown below was created by attaching a white LED key chain light to the end of a chain dog leash. A second LED (green in this case) was attached about ten inches from the end of the leash. A red LED was attached to the same leash about ten inches above the second one. That's all that was needed to produce three orbs in a single shot. I would have produced a better

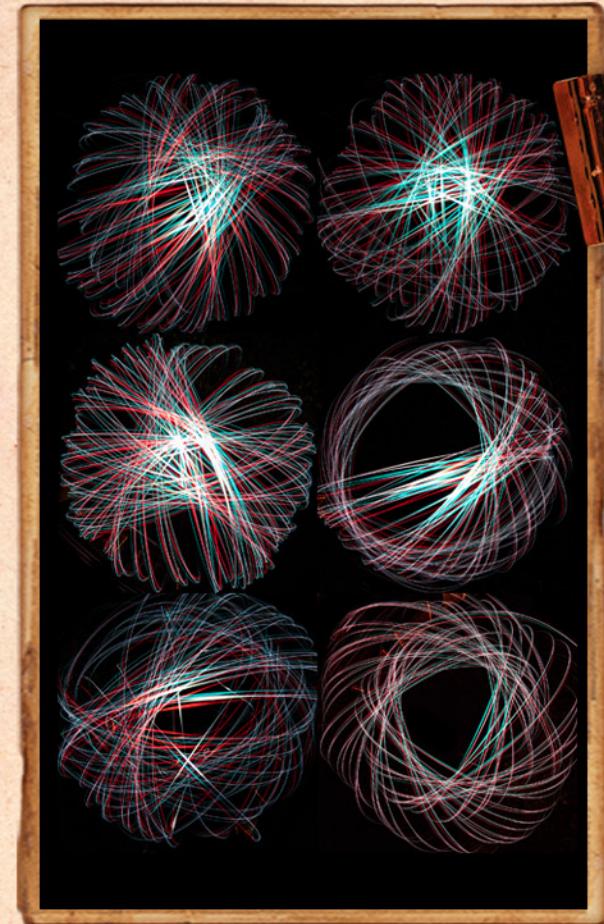


looking orb if I had used more than one LED at each location on the leash since it would have filled in more of the gaps in the orb.

The ground surface was colored blue using electroluminescent wire (commonly referred to as EL wire). EL wire is a battery-powered product that gives off light that is not dissimilar to a neon tube, but it's as thin as the cord that might come off your computer mouse or keyboard. All I did was randomly sweep it across the scene by flicking it to the left and right as I walked through the frame. I think the result resembles water. Using red EL wire can produce an effect that resembles flames.

I placed a lens cap on the ground to use as a pivot point for reference, which I subsequently retouched out using Photoshop's Healing brush tool. I had separate exposures for the background, orb and blue EL wire, which I combined using Lighten mode in Photoshop. That made it much easier to retouch out the lens cap since the concrete surface below the orb was clean and didn't have any of the blue EL wire which would have made the retouching job much more difficult.

The six images shown on the right are the results of experimenting by setting my camera on the ground facing straight up while using a fisheye lens. I then went through the same process I



use for creating an orb, but used the camera as my reference point upon which to rotate around. I tried different techniques such as spinning the LEDs at a 45° angle instead of straight up and down. That helps to give the camera a view into the center of the orb without having the bottom of the swing block its view of the interior.



HOW IT WAS DONE:

This image is a composite of seven exposures. It could have easily been done in a single exposure, but I prefer to composite multiple exposures because I find I have more control over the end results.

- The base exposure was 11.5 minutes long at ISO 200 and f/11. The front of the building is being lit by the full moon. The length of that exposure is what caused the stars to become lines instead of points in the sky. I could have ended up with much longer lines, or star trails, by bringing my ISO setting down to 100, which would have doubled the length of the exposure needed to keep the image as bright as my original settings. ISO 50 would have caused me to

double the length once more. Changing my aperture setting to a higher value would also have caused me to extend my exposure, but I find that my lens starts to produce a softer image if I use a setting higher than f/11 and I wanted sharp star trails.

The other exposures I created:

- 1) I lit the top of the church's bell tower.
- 2) I lit the side of the building.
- 3) I lit the side of the entrance and stairs.
- 4) I lit the side of the shed that is in front of the church entrance.
- 5) I lit the entrance to the church.
- 6) I lit the front window.

- The exposure of the front window was unique because I did not actually light the window. I could have lit the front window from behind by shining my flashlight through one of the side windows, but that wouldn't have been too noticeable, other than making some of the dirt on the window easier to see. Instead, I lit the back wall of the church where it would be seen through the front window. That's something to think about anytime you want a window to light up. Don't light the window itself (unless it has non-clear frosted glass). Instead, light the interior of the building where it could be visible through the window.



LEFT: Moon-lit base exposure of the church before being combined into the multi-shot composite.

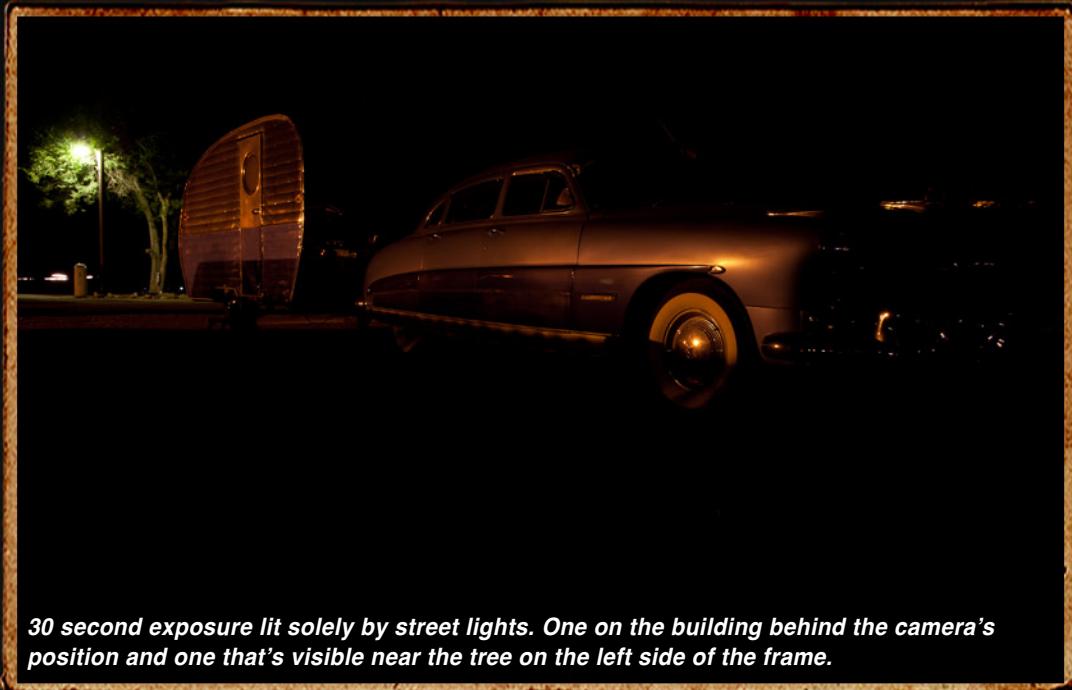
RIGHT: Here's another image taken on the same night as the church. These images were captured during a full moon in the ghost town of Bodie, CA, which is a state park. A special permit was needed to shoot at night, which was obtained as part of a night photography festival I was attending.



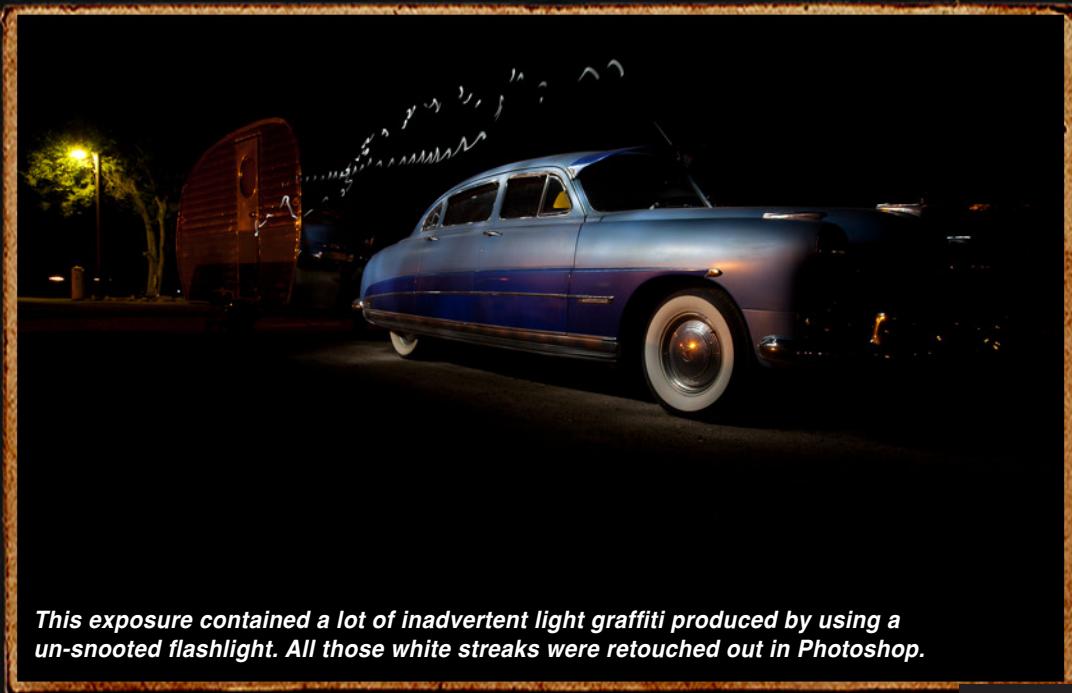
HOW IT WAS DONE:

While traveling on Route 66 in Albuquerque, NM, I ran across this car/trailer combination at an RV park near the edge of town. I originally wanted to shoot the car along with a twilight-lit sky, but spent too much time eating dinner at a local restaurant and returned to find a black sky. That turned out to be a nice way to completely isolate the car from its environment, which would have included some trees and a few modern RVs. Here are some of the ideas that went into creating this image:

- I shot a total of 16 exposures over a ten-minute time span. My fiancé Karen served as my voice-operated camera trigger and I yelled “Open” and “Close” to let her know what to do with the shutter.
- There were two streetlights nearby, one behind the car near a tree and another attached to the building that was behind me. These two lights gave off different colored light, one orange and the other somewhat green. I started by taking a 30-second exposure to see what the existing lights would produce. I was able to minimize the effect of the existing light sources by keeping most of my exposures short and using **Lighten** mode.
- I was using a bare flashlight, which caused little white streaks of light to appear in some of the exposures when the camera caught a glimpse of the front of the flashlight. That forced me to mask a few of the exposures to prevent those white streaks from appearing in the final image. A snoot would have prevented the problem.
- Once I knew I was going to end up with a detail-less black sky, I decided to try to visually remove the car from its surroundings. That meant that I had to place an empty layer on top of the layers stack and paint with black to cover up the tree and light that was behind the car.



30 second exposure lit solely by street lights. One on the building behind the camera's position and one that's visible near the tree on the left side of the frame.



This exposure contained a lot of inadvertent light graffiti produced by using a un-snooted flashlight. All those white streaks were retouched out in Photoshop.

HOW IT WAS DONE:

The two images shown on this page are single exposures that were lit using a laser pointer. My subject is a model named Batel. She's the same one that appeared elsewhere in this e-book with red wings and a yogi pose. Here are a few details about the shoot:

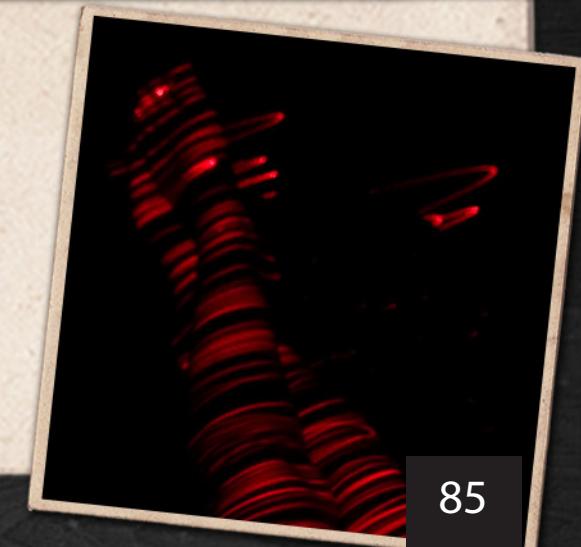
- I positioned Batel on a very dark bear-skin rug in an attempt to prevent the laser pointer from registering on the background. I was largely successful, but still ended up painting with black in a few areas to remove a few red specks from the background. If there wasn't already a rug in the room, then I would have tried to find some black velvet to use as a backdrop since it doesn't reflect much light.
- I found that the laser pointer was most effective when I scanned it across her body horizontally using a very consistent motion. Random squiggles made it overly difficult to interpret what was being photographed.
- Simple and clean poses that would work well as silhouettes seemed to be the most successful since it was difficult to see fine detail in the resulting images.
- Anytime when lighting human subjects with a laser, it's essential to have them keep their eyes closed to prevent damage.



LEFT: Lit using only horizontal lines.

RIGHT: Lit using random squiggles.

BOTTOM RIGHT: You can see some of the over spray beyond the feet and in the background here, which was later retouched out in Photoshop.





HOW IT WAS DONE:

This image was created in Hawaii on the island of Maui. A friend had arranged for me to stay in someone's guest house while I was visiting the famous town of Hana. As a thank you, I decided to create a light painting on his property. Here are a few details from the shoot:

- This is a composite of multiple exposures. At the time I was shooting it, I wasn't sure if I wanted to go for an up-close painterly look, or a softer look by lighting it from farther away. I ended up shooting using both styles and then combined

them to introduce some of the painterly look where the surfboards are.

- Capturing the dog at the bottom of the frame was quite a challenge as she was constantly walking in and out of the scene and was rarely still. I lit her a half a dozen times, each time she paused to eat from the bowl. I had to mask and combine two exposures to end up with a satisfactory result. I also had to mask the light falling on the ground from other exposures to prevent it from overlapping the dog.



*FAR LEFT: unmasked background before dog layers were added.
LEFT: Dog exposures.
ABOVE: Mask used to prevent background exposures from overlapping the dog.*

HOW IT WAS DONE:

This image was captured on someone's private property near Los Osos, CA. I was teaching a workshop in the area and wanted to produce an image that almost looked like it was shot under daylight. Here are some details of the shoot:

- I started by creating an exposure that was lit completely by the full moon. A three-minute exposure was long enough to have the moon illuminate the background of the scene and was used as the base for the image.
- When composing the shot, I positioned the camera so it was pointed at an area of the car that was in shadow. I lit the car from a distance to keep a nice soft quality to the light.
- When compositing the image, I had to mask all the exposures except the moon-lit background, otherwise the star trails would have a dashed appearance due to the pause between ending one exposure and starting the next. After masking a single layer, I held the Option key (Mac), or Alt key (Win) and dragged the mask to any other layers that needed the sky masked. I could have alternatively moved all but the moonlit background shot into a folder and then added a mask to the folder.
- I had to adjust the white balance of the flashlight-lit exposures to get the color of light to look like it could have come from the moon.



Moon-lit exposure.







30-second exposure that captured only the sky.



Clockwise from upper left:
Lava in **Lighten** mode,
Lava in **Screen** mode,
Lava in **Normal** mode,
Mask before retouching,
Mask after retouching,
Masked version in **Normal** mode
that was used in final image.

HOW IT WAS DONE:

While teaching a two-week shooting workshop in Botswana, Africa, I thought it would be interesting to create an image that looked completely different from the safari-style images we were shooting during most of the trip. During our nightly sunset happy hour stop, I composed this image where I attempted to turn a termite mound into a volcano.

I created the lava flow by using a red LED keychain-style light while standing behind the termite mound and pointing the light toward the camera. When compositing the image, I ran into a problem where my artificial lava largely disappeared into the sky exposure (which was a 30-second exposure at f/8 and ISO 100) because it wasn't consistently brighter than the sky. Here's how I dealt with the situation:

- I found that using **Lighten** or **Screen** mode did not produce a satisfactory result.

I changed the mode to **Normal** for the lava exposure and decided to mask that layer instead of using a blending mode to combine it with the background.

- To create a mask, I held the Option key (Mac), or Alt key (Win) and clicked on the eyeball icon for the layer that contained the lava. That caused all the other layers in the document to become hidden. I next opened the Channels panel (**Window>Channels**), held the Command key (Mac), or Ctrl key (Win) and clicked on the thumbnail image for the RGB channel, which caused Photoshop to create a selection based on the brightness of the lava layer.

- After switching back to the Layers panel, I clicked the layer mask icon, which converted the currently active selection into a mask. After doing that, the lava layer showed up 100% wherever the original lava layer con-

tained white and showed up less where the lava was darker than white.

- At this point, I made all the other layers used in this composite visible once again by Option-clicking (Mac), or Alt-clicking (Win) the eyeball icon for the layer that contains the lava so I could see how it looked on the backdrop of the other layers.
- Next, with the mask still active, I chose **Image>Adjustments>Levels** and moved the upper right slider to the right until the lava started to show enough.
- I finally Option-clicked (Mac), or Alt-clicked (Win) on the mask to view its contents. This mask should only contain the lava, but I found that parts of the sky and stars were showing up. That's when I painted with black to clean up the mask so that it only contained the shape of my faux lava. Done!



HOW IT WAS DONE:

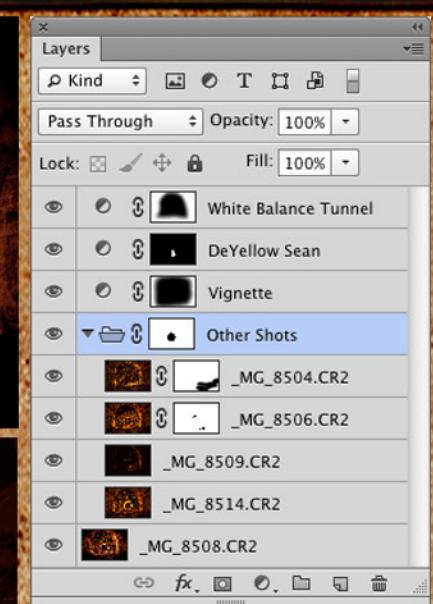
This image is a variation of the example shown earlier in this e-book. The one on page 20 was a single exposure, whereas this one is a composite of five exposures. I wasn't planning on using more than one exposure, but I thought it might produce a nice effect after I noticed that my buddy Sean (www.SeanPatrickMahoney.com), who was spinning the steel wool, always returned to the same location for each exposure.

We started by setting up a pretty effective steel wool holder by attaching a kitchen whisk to the end of a chain dog leash. Next, we spread out a pad of steel wool so that it wasn't tightly clumped together. That helps to allow more oxygen to get to the steel wool, which will help it burn. Then the steel wool was stuffed into the whisk and small areas of it were lit with a disposable cigarette lighter. Once it started to glow in a few spots, Sean started to spin it much like the beginning steps to creating an orb. The faster the steel wool was spun, the more air got into the mixture which caused more molten metal to fly from the whisk. Also, the more forcefully the leash is spun, the more centrifugal force will cause the molten metal to fly far from the person spinning the wool. Note: If you're used to creating orbs, resist the temptation to look down when spinning steel wool. Look toward the camera since you will be visible in the shot.

Our location was a small creek that runs below a railroad bridge. We picked this location for three reasons:

1) It was somewhat remote and we didn't want any spectators, 2) All the surroundings were made from non-combustible materials, 3) We hoped that the water would produce a nice reflection of the molten metal flying off the whisk.

After we were done shooting, I loaded the images into Photoshop, used Lighten mode to composite them into a single image and then masked each layer so that only one version of Sean was being used in the center of the image.



UPPER LEFT: Single exposure example. LOWER LEFT: Multiple exposures combined in Lighten mode. UPPER RIGHT: Layers palette view of multiple exposure version.



This is what a simple steel wool setup looks like. We used a metal whisk attached to a dog leash.

FINAL THOUGHTS

If you were new to lightpainting when you started to read this e-book, then you will find that getting started in painting with light can be a frustrating experience. You largely have to fail until you succeed by quickly learning what works and what doesn't. There's only so much you can learn from reading ... the real learning happens very quickly once you start shooting.

Just remember to start by testing your exposure to make sure it's appropriate for your light source and speed of painting. Then experiment multiple times until you come up with something you like. The more often you practice this art, the better you'll get. It's through experimentation that you'll learn more than I could attempt to teach you here.

I've had my share of light painting failures, but most of the time I can overcome them before I'm done shooting. Below you can see a few examples of where I had what I consider to be a failure and how I didn't quit until I produced a successful image.

I hope this e-book will shorten your learning process so that you can start to enjoy painting with light as much as I do.



Here's one of my latest light paintings. I continue to experiment, in this case by pointing the flashlight directly at the camera lens to create a glow in the doorway.

Lightpainting can be one of the most creative ways to produce a unique photograph. I delight in it every time I try.

-Ben Willmore



Failure: blurry due to subject movement, etc.



Success: getting the subject to do the painting



Failure: way too busy and complex looking.



Success: the same night I succeeded by simplifying and moving outside.

INSPIRATION

It's always good to see what others have been doing with light painting so that you can get ideas and try to push yourself to create images that have not been seen before. Here is a list of web sites that you might find to be inspiring. This is by no means a complete list. I'd suggest you also do searches for "light painting," "light graffiti" and "night photography" on google.com and flickr.com to find more resources.

When viewing the images on these sites, try to guess how each one might have been created. Consider what type of

light source they might have used, how they might have modified it (gels, cinefoil, string, etc) and their method of painting. It's not always easy to figure out, so experiment on your own to see if you can create results similar to what you found and then try to move beyond that since most people will be more interested in light paintings using techniques they are unfamiliar with.

In no particular order, here are some of my favorite web sites for inspiration:



- <http://lightpaint.tumblr.com/>
- <http://www.davidgilliverphotography.com/>
- <http://www.burnblue.com/>
- <http://kaalam.free.fr/>
- <http://americanprideandpassion.com/>
- <http://www.lapp-pro.de/>
- <http://www.twincitiesbrightest.com/>
- <http://www.bertholdsteinhilber.com/>
- <http://www.lightmark.de/>
- <http://deanchamberlain.com/>
- <http://www.denniscalvert.net/>
- <http://www.patrickrochon.com/>
- <http://lostamerica.com/>
- <http://www.tackyshack.net/>
- <http://www.daveblackphotography.com/>
- <http://www.on-sight.com/>
- <http://joereifer.com/>

You can also view some of my more recent light paintings at <http://www.thebestofben.com>

DigitalMastery
.com



To learn about more Ben's e-books, seminars, DVDs, and follow his adventures, visit DigitalMastery.com



The Home of Everything Ben