Hand-Blending High Dynamic Range (HDR) Images Using Luminosity Masks

Tony Kuyper

Table of Contents

Hand-Blending High Dynamic Range (HDR) Images Using Luminosity Masks

©2009 Tony Kuyper

Introduction

Several tutorial readers have written to ask about using luminosity masks to help blend different exposures in high dynamic range (HDR) scenes. It would seem logical to try this since luminosity masks allow easy access to specific tones and provide feathered blending of the tones they select. Unfortunately, it's not quite as easy as it sounds. Simply putting a layer mask of a luminosity selection onto one of the HDR exposure layers doesn't work too well. While a variety of luminosity masks can be made to mask different tonal ranges, it's hard to generate the perfect one to mask a specific exposure.

Luminosity painting (painting through a luminosity mask) could potentially be very useful in this situation. Luminosity painting allows the effect of the action-generated luminosity masks to be increased or decreased depending on how much paint is applied through the mask's selection. The technique essentially allows the creation of an unlimited number of user-created luminosity masks and thereby much finer control in the tones that are masked—or unmasked, as the case may be. So instead of relying on a computer-generated luminosity mask to mask the HDR exposures, luminosity painting should, at least in theory, be able to create a highly specialized mask tailored by the user for one particular exposure. Luminosity masks, as part of their creation, are perfectly feathered to blend with the image they are created from. This means that luminosity painting through these custom-made masks should be able to blend different HDR exposures fairly well.

I don't take many of HDR-type pictures, so my ability to test this idea is somewhat limited. I have one image from a few years back where I manually blended exposures, but it required so much Photoshopping afterwards that I haven't tried "hand-blending" since. While I used luminosity masks to facilitate this original blend, it was in a very crude manner compared to what luminosity painting can do. I thought it might be interesting to see how and if the blend could be improved using luminosity painting. The following sections describe the techniques I tried and what I learned in the process.

The steps outlined make use of the information in the [Luminosity Masks](#), [Luminosity Painting](#), and [The Magic Mid-tones](#) tutorials. I'll explain things the best I can, but some of the information here will assume familiarity with the techniques in those tutorials. Please refer to these tutorials for more detailed information.

NOTE: When this tutorial was written, different color settings were used to produce the luminosity masks. At that time, the Lights-series consisted of Expanded Lights, Lights, Light Lights, Bright Lights, and Super Lights. The Dark-series consisted of Expanded Darks, Darks, Dark Darks, Shadow Darks, and Super Darks. The luminosity masks have since been updated. The Expanded Lights and Expanded Darks have been removed and the Ultra Lights and Ultra Darks added, as discussed in the Luminosity Masks tutorial. The concept for blending exposures by painting through luminosity masks remains the same; just the mask names have changed.

Blending the Light Tones

Figures 1, *2*, and *3* show my original exposures.

Figure 1—Underexposed

Figure 2—Normal

Figure 3—Overexposed

Figure 4

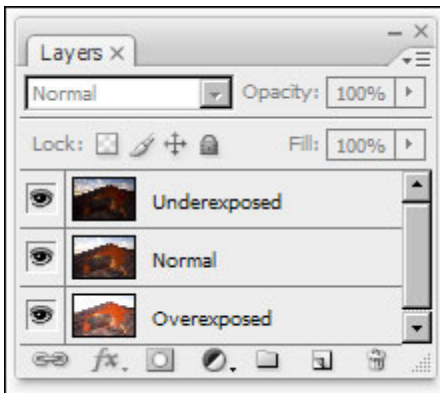I arranged them in a layer stack as shown in *Figure 4*.

Figure 5

The first order of business is to blend the lighter tones from the Underexposed image into those of the Normal exposure. In order to make this happen, a tone mask is needed for the Underexposed layer that reveals the light tones and masks the dark tones. That would be one of the Lights-series masks: Expanded Lights through Super Lights. Since there is often an element of experimentation required to figure out which mask will work best with luminosity painting, it's a good idea to just make all the masks in the series—Lights-series in this case—and let them sit on the Channels palette (*Figure 5*) for easy access.
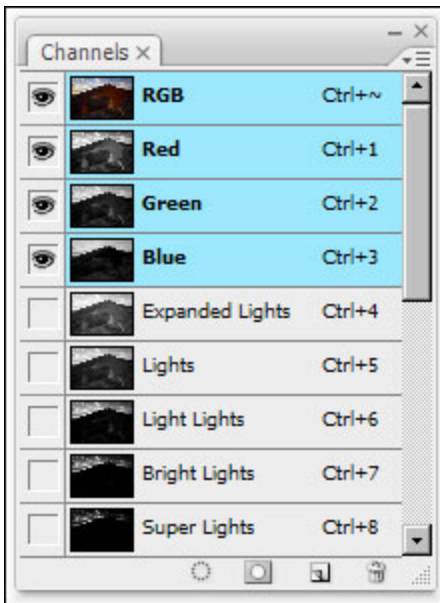
Figure 6—Light Lights mask

Both the Light Lights (*Figure 6*) and Bright Lights (*Figure 7*) seemed to have potential for matching the correct tones needed in this situation; they are very light in the brightest tones and black in the darker tones.

Figure 7—Bright Lights mask

This means either might be useful in revealing just those tones that need to be visible on the Underexposed layer. In the end, I chose to use the Bright Lights. While it may look like the Light Lights reveals the blue sky better and would thus work better, my experience is that a more restrictive mask often works best for luminosity painting. As the paint is applied repeatedly through the selection created by the mask, enough also passes through the darker areas, such as the blue sky areas of the Bright Lights mask, to have the proper effect.
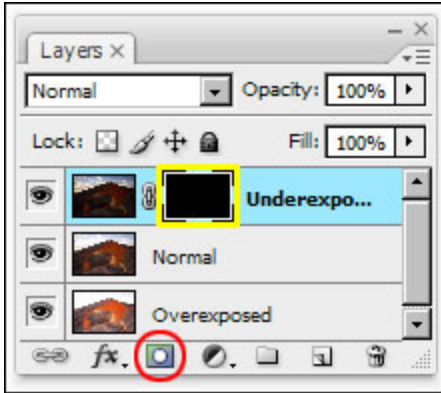
Figure 8

In order to paint, a canvas is needed to paint on. In this case, the canvas is going to be a black layer mask on the Underexposed layer. To make this mask, Alt+click (Mac: Opt+click) on the Add-layer-mask button at the bottom of the Layers palette. (*red circle Figure 8*). The menu command Layer > Layer Mask > Hide All can also be used. When completed, there should be a black layer mask next to the image on the Underexposed layer (*yellow square Figure 8*).

With the layer mask in place, load the selection of the Bright Lights by doing a Ctrl+click (Mac: Cmd+Click) on the mask itself on the Channels palette. Be careful not to click in the box to the left of the mask which turns the eyeball on and causes some problems. Then hide the marching ants by typing Ctrl+H (Mac: Cmd+H). This command only turns off the ants, the Bright Lights selection that was just loaded is still active and selecting the appropriate tones. Painting requires constant visual assessment, so turning off the ants means they won't interfere with making judgments about where and how much to paint.

Make sure the painting brackets surround the layer mask as in *Figure 8* on the Underexposed layer. If not, click once on the layer mask to move the brackets to the mask.

Select the Brush tool (type the letter B). From the drop down menu on the options bar for this tool, choose an appropriate diameter for the brush and a low-percentage hardness so that the brush is well-feathered. Set Mode to normal, Opacity to 100%, and Flow to 100% (*Figure 9*).

Figure 9
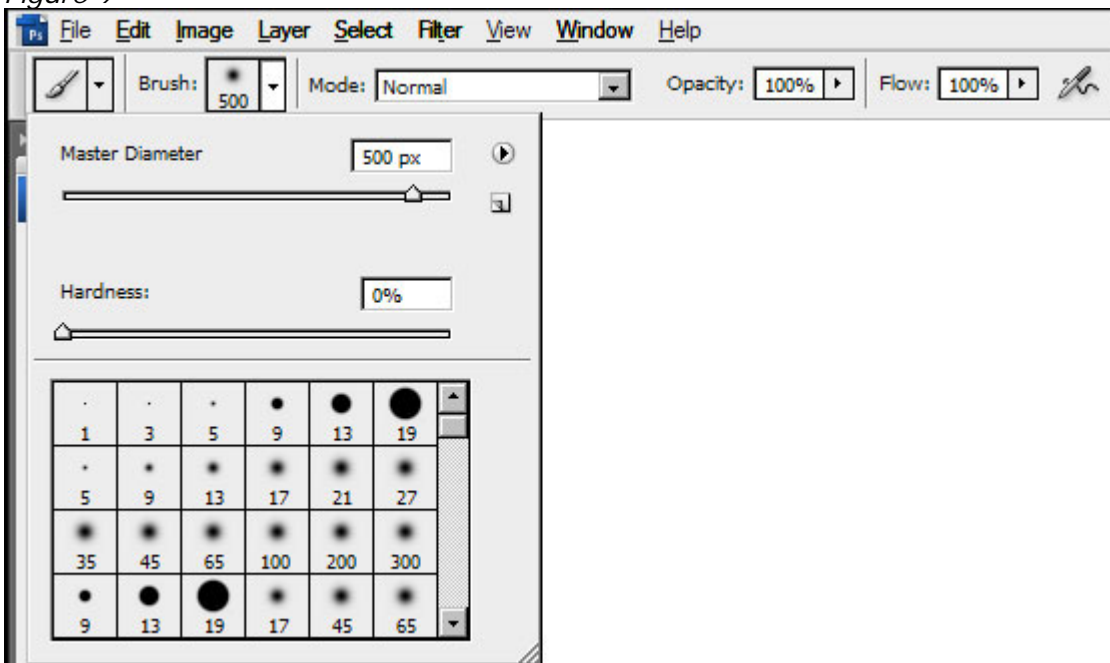
I've started using 100% opacity on all my initial luminosity painting strokes since it often takes high-percentage opacity to force enough paint through the selection onto the canvas to make a visible difference. If it looks like 100% provides too great an effect, then I undo the step and lower the opacity. However, more often than not, I need multiple strokes at 100% to build up to the desired effect, especially if I'm using a restrictive luminosity selection.

Figure 10

Since the layer mask is black, white paint needs to be applied to reveal what's in the image, so make sure the foreground color is set to white. (*Figure 10*). If not, type D to restore the default colors and/or type X to reverse the foreground and background colors. The white square should be on top before starting to paint.

Now it's simply a matter of painting over the sky area on the layer mask until the desired amount of properly exposed light tones is revealed. The black mask starts turning white when selected pixels are painted. Because painting occurs through a mask (Bright Lights), the paint is applied in proportion the brightness of the pixels in that mask. The lighter the pixel, the more paint the pixel receives. So the white that emerges on the layer mask is not solid. It is perfectly textured and feathered to match the tones from which it was created, which are the tones in the Underexposed image. This feathering in the painted-on layer mask reveals pixels in the Underexposed image in a way that insures they blend well with the Normal image below.

Keep in mind that there are many options while painting. If the effect is too strong, simply undo the brush stroke—Ctrl+Z (Mac: Cmd+Z), lower the brush's opacity, and paint again. It's also possible to reverse the revealing effect of the painted-on mask by changing the color of the paint to black (type the letter X) and painting the areas that need to be concealed. Don't forget that if the first luminosity mask choice doesn't seem to work, it's very easy to discard the layer mask, load a new luminosity selection from the masks on the Channels palette, and paint through the alternate selection. Lastly, it's also possible to lower the effect of the parts of the image revealed by the painted-on mask by decreasing the layer's opacity. That's what was done here. While the final paint job revealed the right pixels in the Underexposed layer, the sky became a little too dark in the process. I lowered the Underexposed layer's opacity to 65% to allow some of the lightness in the Normal layer below to show through to mitigate this.

Figure 11

Figure 11 shows what the layer mask looked like when painting was finished. It's obviously quite different than the Bright Lights mask shown in *Figure 7* above. By using multiple brush strokes through the Bright Lights mask, luminosity painting essentially provided a method to customize the Bright Lights mask for the Underexposed image.

Figure 12

Figure 12 shows the results. The painting procedure does a nice job of revealing the light areas of the Underexposed image in a way that helps them blend well with the normal exposure (though the normal exposure obviously still needs blending work also to make it less dark).

It's important to note that because the selection for the Bright Lights is totally black in the area where the arch is, there's no fear or worry that the painting will accidentally reveal the severely underexposed arch on the Underexposed layer. The active selection being painted through makes sure this can't happen. So painting can be fast and sloppy and haphazard and still turn out well. Painting through a luminosity mask selection insures that only the right pixels get painted so that only the right pixels will be blended from the Underexposed layer. Anything too dark and not part of the selection—like the arch—gets no paint at all and stays concealed.

Blending the Dark Tones

Believably increasing the brightness of the dark tones in the image turned out to be more of a challenge than recovering the light tones. Luminosity painting was again used, but required a bit more experimentation. Here's the way I ended up doing it.

First, turn off the top Underexposed layer by clicking off the eye in the box to the left of the image. The new masks that will be created to blend the dark tones will be affecting the Normal layer, so it's important to create the masks from this layer. Turning off the Underexposed layer means the actions will create the new masks using the tonal information from the Normal layer.
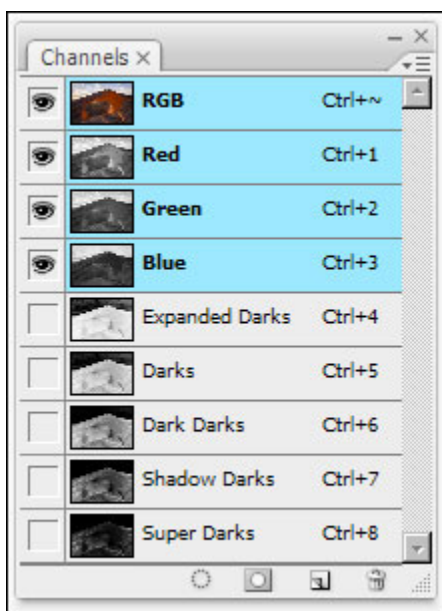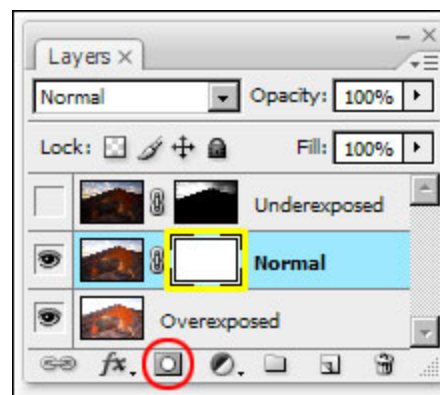

Figure 13

Next, make all the Darks-series masks on the Channels palette (*Figure 13*). Since blending is now concerned with rescuing the dark tones, one or more of the Dark-series masks will be needed.

Figure 14

Create a Reveal All layer mask on the Normal layer. Click the Add-layer-mask button at the bottom of the Layers palette (*red circle Figure 14*) to add a white mask to the Normal exposure layer. The newly created layer mask should be white this time, not black. (Don't Alt+click the Add-layer-mask button like last time or the mask will be black.) Alternatively, use the menu command Layer > Layer Mask > Reveal All to create the white layer mask. When finished, the Layers palette looks like *Figure 14* (the new layer mask is outlined in yellow).
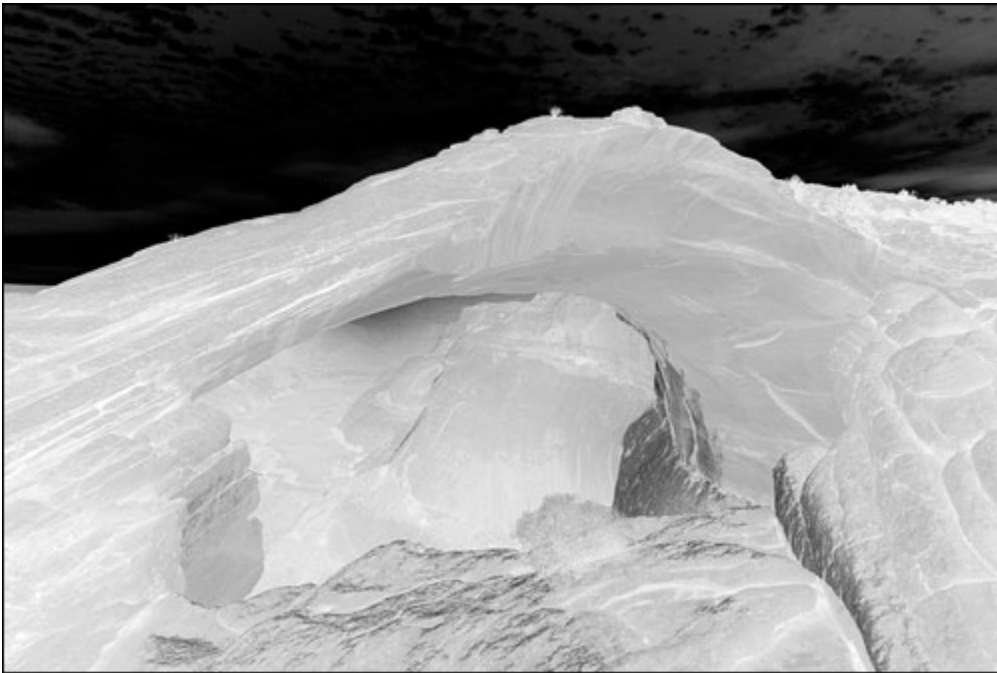
The proper mask for the painting operation this time turned out to be a combination of two masks from the Darks-series. I loaded the Darks as a selection—Ctrl+click (Mac: Cmd+click) on the Darks mask on the Channels palette—and then subtracted the Shadow Darks—Alt+Ctrl+click (Mac: Opt+Cmd+click) on the Shadow Darks mask. What resulted is one of those special offset mid-tones masks discussed in The Magic Mid-tones tutorial. One of the straight Darks-series masks will not work here because painting through it reveals too light of tones underneath and loss of depth in the shadows. I need to preserve the darkest values of the normal exposure, and subtracting the Shadow Darks from the Darks allows this to occur.

Figure 15a

Figure 15b

The mask of the darks minus the Shadow darks is shown in *Figure 15a.* Looking at this mask it can be seen that the darkest textural details in the arch and surrounding rocks are also dark in the mask. This comes from subtracting off the Shadow darks when the mask was created. These dark details help retain the dark values of the Normal layer during the painting operation. *Figure 15b* shows a mask of just the Darks, no subtraction. As you can see, the darkest values are very light in the un-subtracted mask and would over-reveal the light tones in the Overexposed layer underneath if just the Darks mask was painted through. So the subtraction of the Shadow Darks is essential to preserving the darkest textural details in the image. Don't forget to turn off the marching ants—Ctrl+H (Mac: Cmd+H) once the subtracted mask selection is created.

Before starting to paint on the mask on the Normal layer, turn the top, Underexposed layer back on by clicking the eye box next to the Underexposed image. This makes it possible to visually take into account the already blended light values in the sky while painting to restore the proper brightness in the dark tones.

Figure 16

Painting is occurring on a layer that already appears too dark, so the goal is to conceal some of the darker tones in the Normal exposure and allow the lighter tones from the Overexposed image to show through. Black paint is needed to conceal, so black is chosen as the foreground color (*Figure 16*).

Figure 17 shows how the final paint job for the layer mask looked. It's quite different than the subtracted mask that was painted through (*Figure 15*). For one thing, it's a negative of the subtracted mask. That's because black was used for painting, which creates a negative image as it paints through the luminosity selection. Also, it's much blotchier in some areas where extra paint was applied to the layer mask. This was done to better hide the dark tones on the Normal layer and allow the lighter tones in the Overexposed layer to show through. So even though it looks quite different, luminosity painting through the subtracted mask once again allowed that mask to be highly customized for this particular image. The painted layer mask also clearly shows how the dark-textured elements from the Normal layer are still light in the finished mask. This means that they are still revealing the dark tones of Normal layer instead of the lighter tones in the Overexposed layer underneath—exactly what was desired.
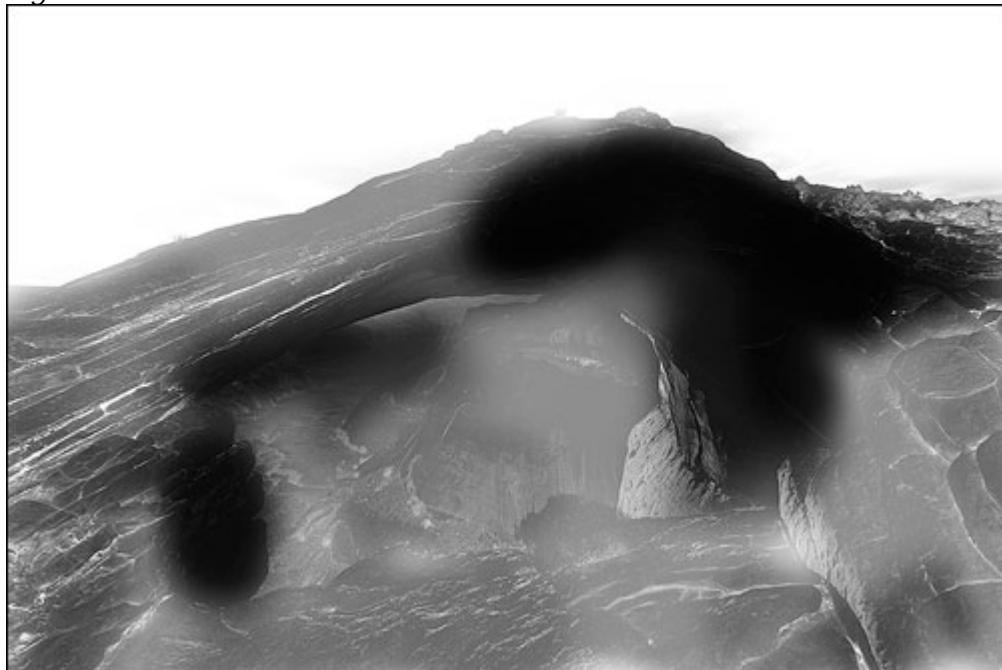
Figure 17

Figure 18

Figure 18 shows the blended image.

Figure 19

Figure 19 shows what the Layers palette looks like after the two custom blending masks have been completed.
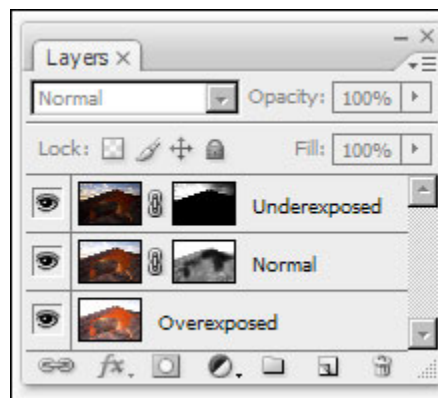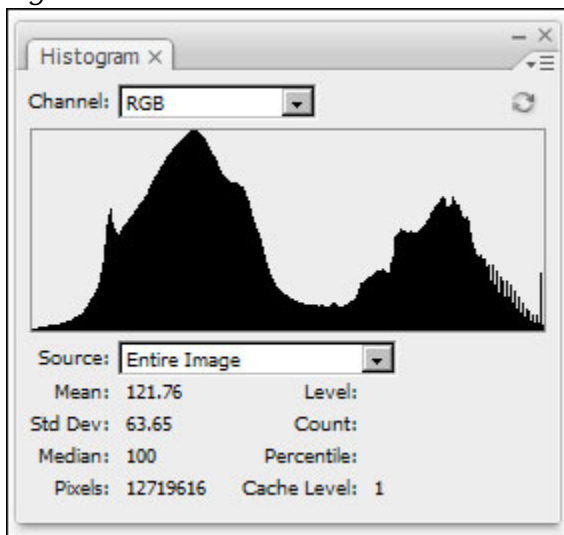

Figure 20

While it's not done yet, the histogram (*Figure 20*) is looking pretty good. From here it will be relatively easy to Photoshop the image to its final form.

The Magic Brush

This was a first attempt at hand-blending HDR exposures using luminosity masks and luminosity painting. It took about 30 minutes to figure out, but now that I have a feel for the method, it should go faster next time. It certainly turned out much better than my previous attempt (*Figure 21a*), which was done without the benefit of luminosity painting. For easy comparison, the much improved new version is shown below in *Figure 21b.*

Figure 21b

I've not run these images through Photomatix or any of the other HDR programs to see if I could get better results. To me this new version looks quite natural and is very much Photoshop-ready. It'll be easy to work with the blended image to improve the overall color balance, saturation, and contrast that I do with all images.

One thing that I especially like about this method is that instead of sliding sliders and typing numbers in control panels in HDR software, I am able to paint the effect exactly as I want it. There is almost a tactile quality to this in that I immediately see on my monitor what my painting does to the image. I can add more or less paint as desired and I can easily reverse what I did. Nothing is permanent with the masks. As the image develops in Photoshop, I can even return and update the blending masks if need be.

As mentioned previously, because the selection of a luminosity mask completely controls which tones get painted, even if I'm careless with the brush, the results turn out well. I've started to think of the paint brush in luminosity painting as something almost magical. It's impossible to paint "outside the lines" because the brush actually creates the lines as it paints. This magic brush is the key to allowing the user to create the specialized masks for blending the different HDR exposures. And the magic isn't only in the way that luminosity painting picks out just the right tones to paint. It's also in the way that it allows the painter to touch the light in a very individualized manner. HDR exposures provide a lot of tones to work with. Luminosity painting provides the control to blend these tones into an image that expresses the photographer's personal feelings for the scene. In creating customized blending masks, the photographer's own hand is determining how the blend occurs and how it will look in the end.

While I've not experimented with enough images to check out other possible workflows, I think the steps performed on this image would be a good starting place for anyone wishing to try this technique, though different masks in the Lights- and Darks-series may need to be used. In summary, the steps are:

1. Stack the images on the Layers palette with the darkest exposure on top and the lightest on the bottom.
2. Create a Hide All (black) layer mask on the layer with the Underexposed image and paint white through a Light-series mask to reveal the lighter tones of this layer.
3. Create a Reveal All (white) layer mask on the layer with the Normal exposure and paint black through a subtracted Darks-series mask to conceal the dark mid-tones on the Normal exposure in order to allow the lighter tones from the Overexposed image on the bottom layer to show through.

I'm certainly going to try this again and hope you will too. It's still pretty new to me, so I would enjoy hearing about your experiences in using luminosity painting to blend your HDR images. You can always contact me with any comments, questions, or suggestions.