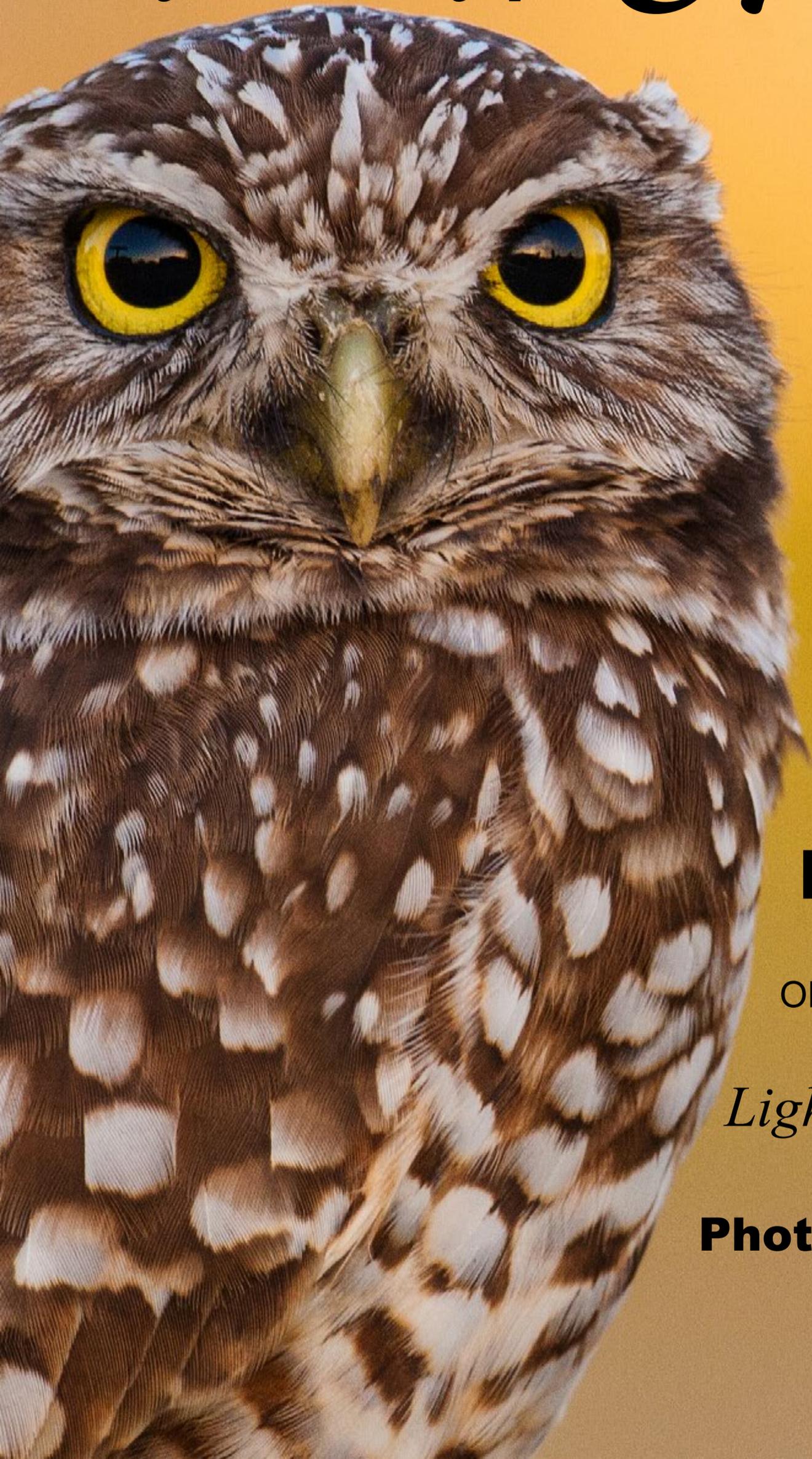


# Pixology

The Magazine for Photographers

September 2012



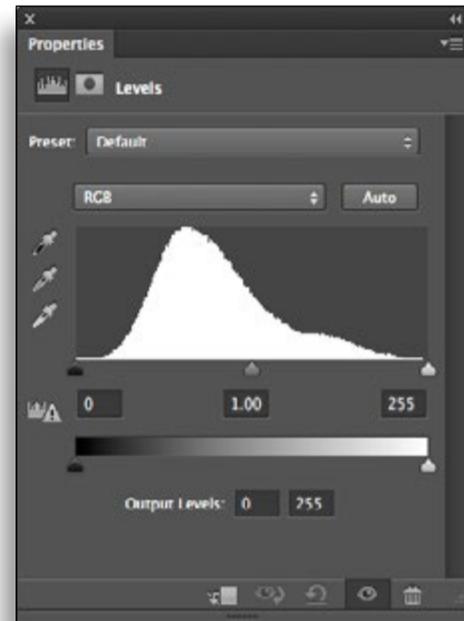
## **Levels in Detail**

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# From the Editor

A couple of years ago I had the opportunity to photograph burrowing owls in southwest Florida. While I certainly have other photos I like better, one photo of a burrowing owl from that trip keeps catching my attention.

The setup was simple, the image didn't require any processing after the fact, and the result is rather straightforward. And yet it somehow remains a photo I greatly enjoy.

Perhaps it's just the memory of a great experience that makes this image seem better than it is, as I discuss in an article toward the end of this issue. I'm not sure. And I'm not sure I need to understand. Sometimes it is better to simply enjoy a photo without thinking too much.

I hope the articles in this issue of *Pixology* help you improve your photographic images and experiences. I welcome your thoughts via email at [tim@timgrey.com](mailto:tim@timgrey.com).

Thank you,



Tim Grey  
Editor



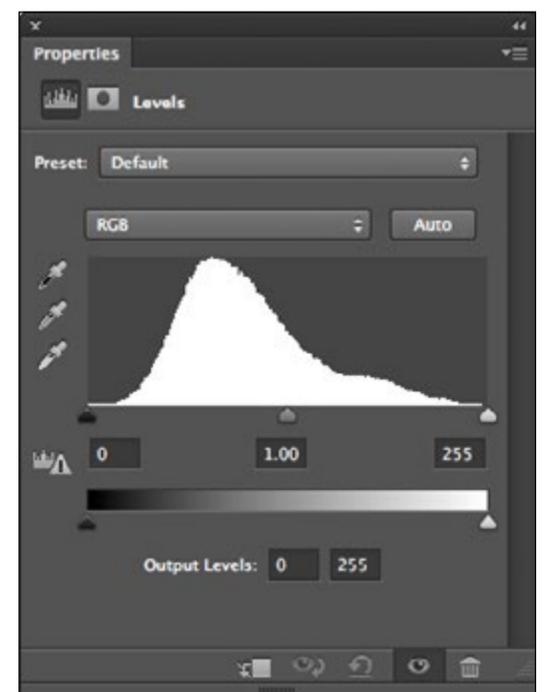
# Levels in **Detail**

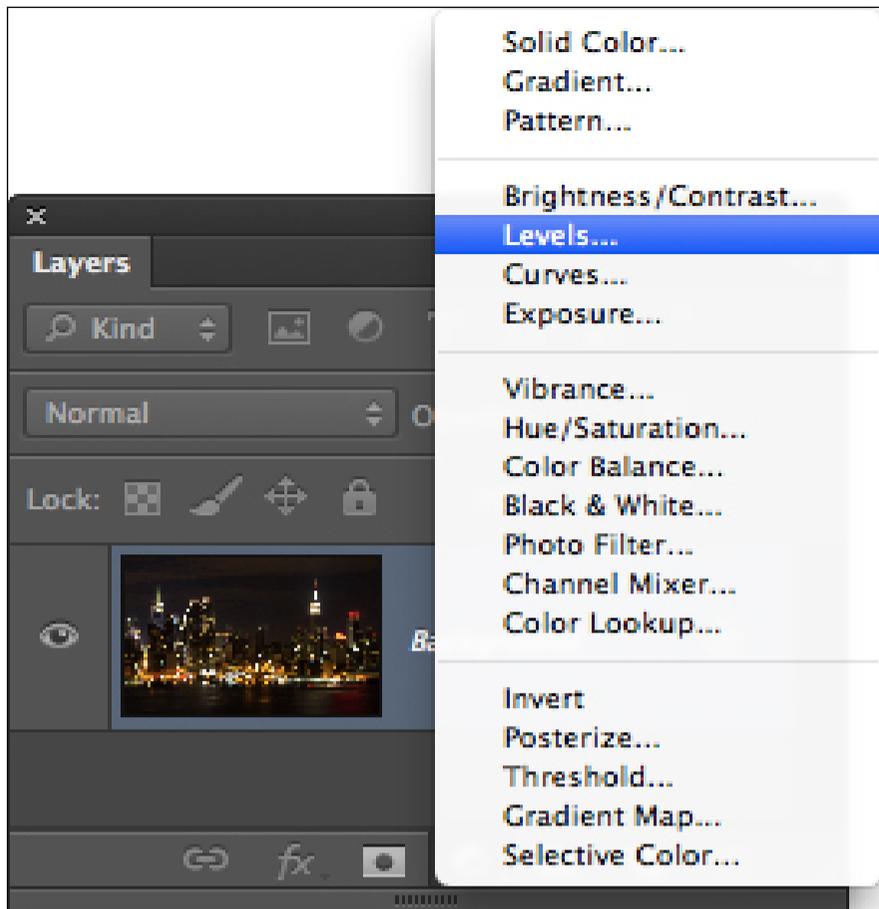


## A Close Look at a Powerful Adjustment

By Tim Grey

The Levels adjustment in Photoshop and Photoshop Elements is generally regarded as a relatively basic tool for enhancing overall brightness and contrast in a photo. Once you understand all of the various options available with the Levels adjustment, however, I think you'll have a much greater appreciation of this powerful tool for adjusting both tonality and color in your photos.





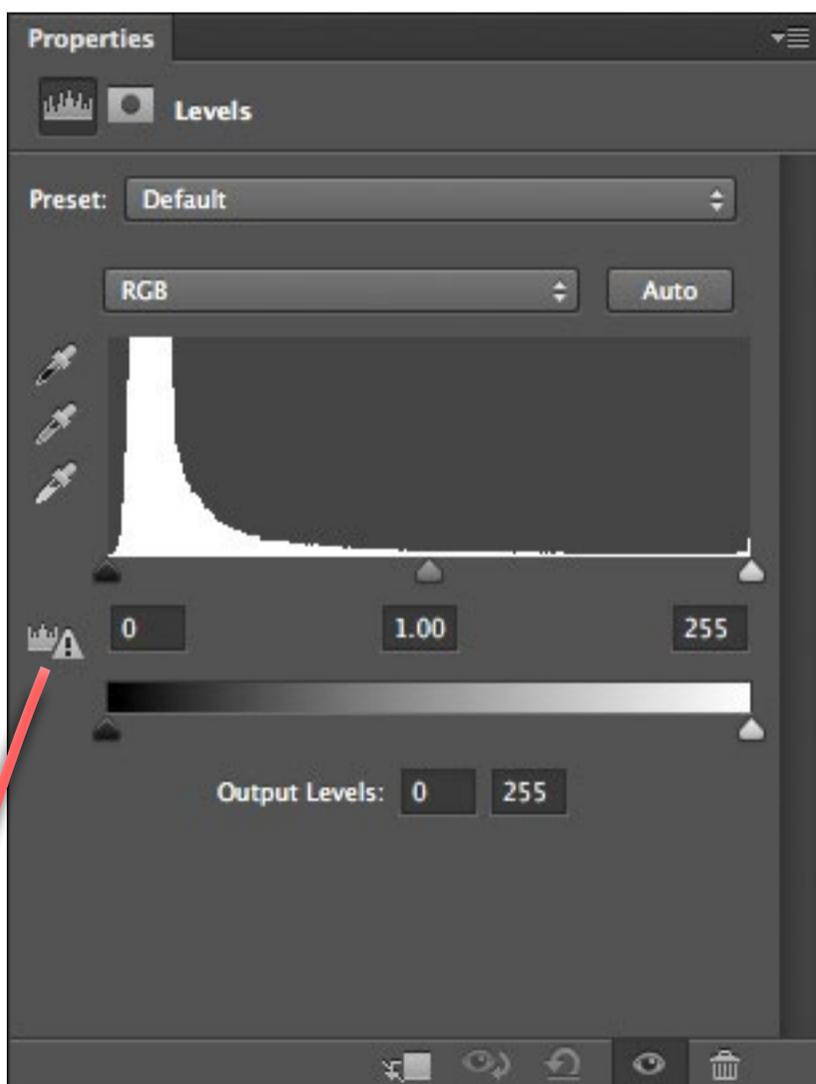
## Adding an Adjustment Layer

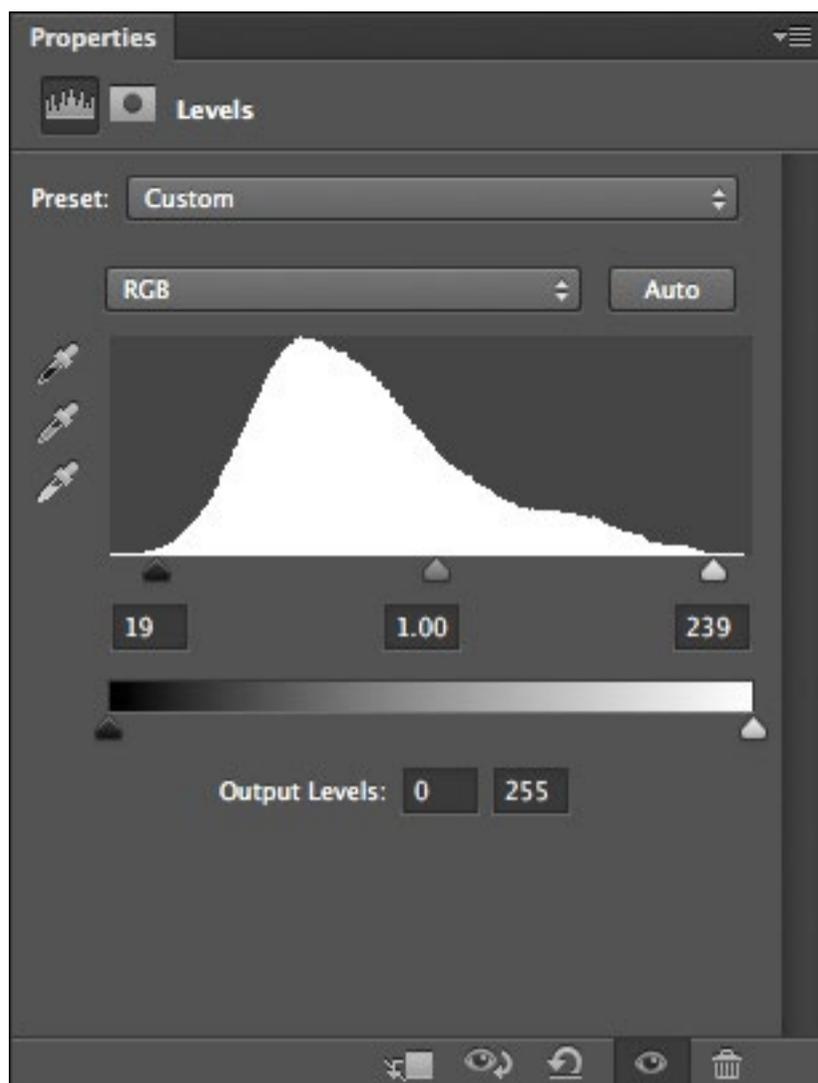
I highly recommend making use of the Levels adjustment as an adjustment layer. Doing so ensures that all of your work with Levels is done non-destructively, preserving the underlying pixel values. It also enables you to hide or reveal the adjustment for a quick “before and after” review. Perhaps most importantly, by utilizing an adjustment layer you are able to return to the image at any time and refine your adjustment.

To add an adjustment layer, simply click the Add Adjustment Layer button (the half black and half white circle icon) on the Layers panel and choose Levels from the popup menu. The Levels adjustment layer will be added to the stack on the Layers panel, and the adjustment controls will appear on the Properties panel in Photoshop CS6 or the Adjustments panel in Photoshop Elements.

## Updating the Histogram

You may have noticed at times a warning symbol associated with the Levels adjustment. In Photoshop CS6, for example, that symbol appears as an exclamation point on a triangle, overlaid on a representation of a histogram. That icon indicates that the histogram display is not currently up to date, but rather is based on a cached version of the image. If you click on the warning icon the histogram will update based on the actual image, and the warning symbol will go away. The difference in the histogram is almost always very minor, so this really isn't something I would concern yourself with. It is just better to know what the warning sign means, so you know it is safe to ignore the warning.





## Input and Output Concept

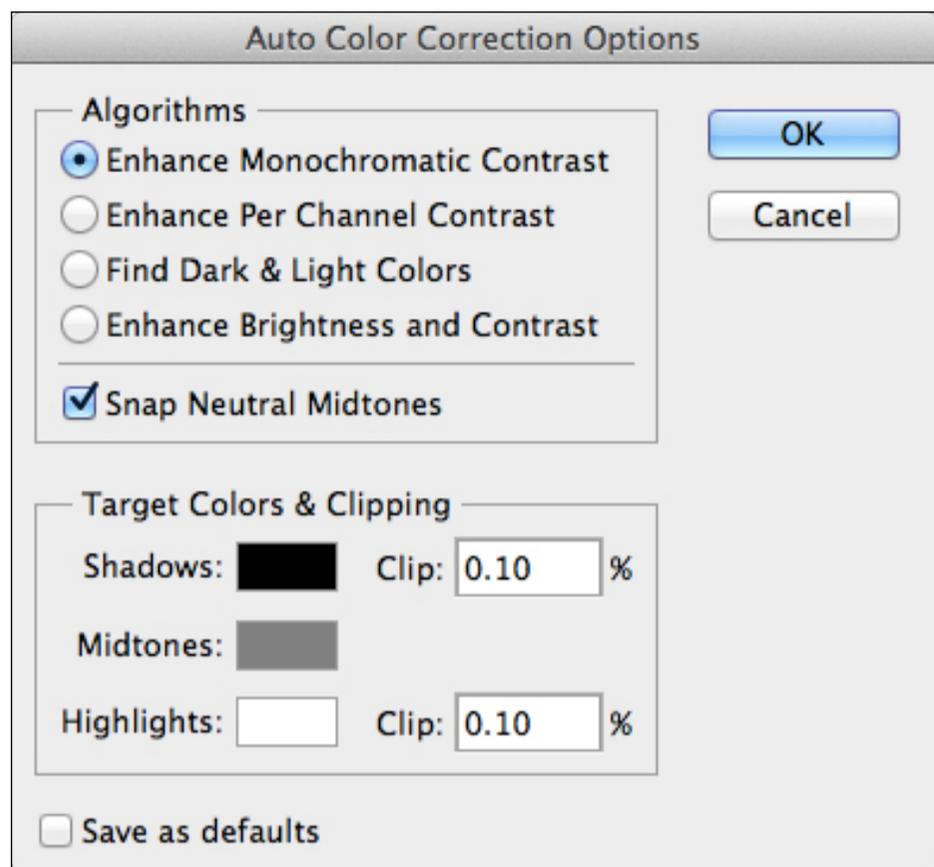
The Levels adjustment employs input and output values for applying an adjustment. You can think of the input values as the “before” values, and the output values as the “after” values. The input values are shown directly below the histogram, and the output values are labeled below the gradient. The scale is based on an 8-bit value, so it ranges from 0 to 255 for the black and white values for both input and output. When you adjust the black or white input value, what you’re really doing is defining a shift in pixel values.

As an example, let’s assume a particular pixel in the image has a value of 10 on a scale of 0 to 255. That would be a rather dark pixel, but not entirely black. However, if you move the black input slider over to a value of 10, any pixel that has a luminance value of 10 or lower will now be black, since those pixels will be shifted to the output level for black.

In most cases you won’t really need to reference the input and output values, but it can be helpful to understand the basic concepts involved with the Levels adjustment, so you can better determine what adjustments might be best for a photo.

## The Automatic Adjustments

There are some adjustment options for Levels that work automatically, or semi-automatically, and in some cases these automatic adjustments can be very helpful. The most basic option is the fully automatic adjustment that provides no user input. All you do is click the Auto button, and the image will be adjusted based on very simple criteria.



There are two additional automatic options available in Photoshop, but not in Photoshop Elements. The first is the ability to use a preset to apply a Levels adjustment. You can simply choose an option from the Preset popup, and the image will be adjusted based on the saved settings. You can also save your own presets by clicking on the small button at the top-right of the Layers panel and choosing Save Levels Preset from the popup menu. To load a saved preset later, choose Load Levels Preset from the popup menu.

In addition, Photoshop allows you to adjust the automatic adjustment settings. To do so, click the panel popup menu button at the top-right of the Layers panel and choose Auto Options from the menu. This will bring up the Auto Color Correction Options dialog, where you can choose the specific settings for the automatic adjustment. There are four adjustment methods listed under the Algorithms heading: Enhance Monochromatic Contrast, Enhance Per Channel Contrast, Find Dark & Light Colors, and Enhance Brightness and Contrast. All of these algorithms are aimed at improving overall contrast and tonality for the photo, with each taking a slightly different approach. Because the results will vary depending on the specific image you're adjusting, I recommend clicking through each of the algorithms to see which provides the best result.

If you select one of the first three algorithms, you can also choose whether you want to turn on the Snap Neutral Midtones checkbox. With this checkbox turned on, the midtone value for each of the individual color channels will be shifted in order to achieve a neutral gray for values that are determined to be middle tones that should be neutral. In some cases this will produce a quick and accurate color correction, while in other cases it will

simply cause a color shift that may or may not be good for the photo. So, again, toggling this checkbox on and off while evaluating the image is the best way to determine whether you want to utilize this option.

For the first three algorithms you can also have the option to adjust the target color values for black, gray, and white, as well as to adjust the degree of clipping for shadow and highlight detail. In most cases I recommend leaving these values at their default, which includes perfectly neutral values for black, gray, and white, and minimal clipping of detail.

If you want to enhance contrast by sacrificing shadow or highlight detail, simply raise the Clip value for Shadows and/or Highlights from the default value of 0.10%. The value for each can range from a minimum value of 0.00 (for no clipping) and a maximum value of 9.99%. Unlike the options that exist when working with the manual controls for Levels, when adjusting clipping in the Auto Color Correction Options dialog there is no way to preview the degree of clipping other than by simply evaluating the image visually.

If you click on the color swatch for Shadows, Midtones, or Highlights, the Color Picker dialog will appear, allowing you to establish the target value for black, gray, and white in the image. In almost all cases you will want black to be black and white to be white, so it isn't very common to adjust the values for Shadows or Highlights. However, at times you may find it helpful to adjust the value for Midtones. For example, you can apply a warming effect by choosing a color that has a very subtle yellow tint to it. Just keep in mind that the value for Midtones will only affect the image if you have the Snap Neutral Midtones checkbox turned on.

Finally, at the bottom of the Auto Color Correction Options dialog you'll find a Save as Defaults checkbox. If you find settings that you're happy with, and that you feel would represent an optimal starting point for other images, you can turn on the Save as Defaults checkbox and the settings in place when you click OK will become the new default values for the automatic adjustment. That also means the behavior of the Auto button on the Properties panel in Photoshop will be changed to reflect the settings you established in the Auto Color Correction Options dialog.

In virtually all cases I prefer to work manually with the various controls available for Levels, but at times I do find the automatic adjustment options to provide a quick improvement for an image.

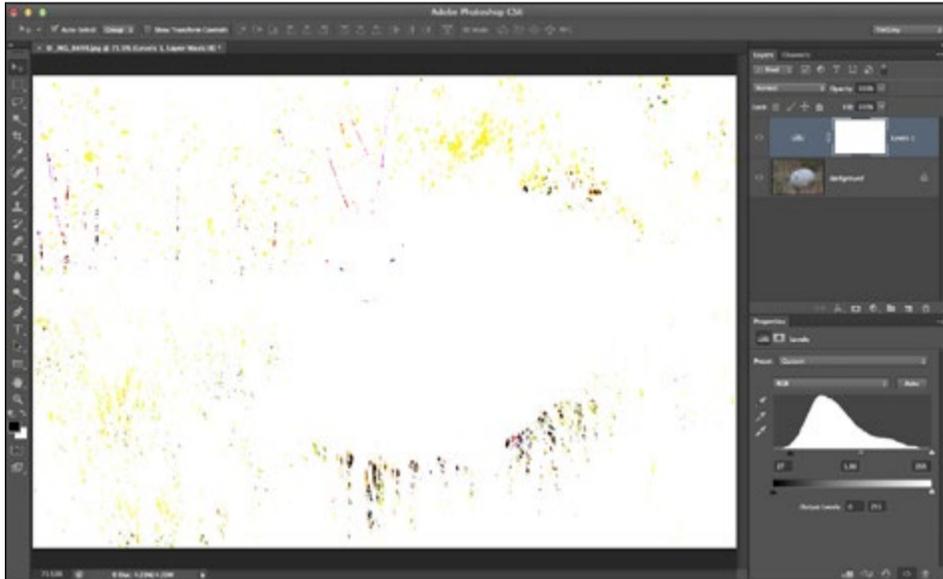
## Setting Black and White Points

One of the key reasons I recommend using the Levels adjustment instead of the Brightness/Contrast adjustment is that Levels enables you to adjust contrast with independent controls for black and white. This control enables you to maximize the tonal range within a photo while choosing whether (and to what degree) you're willing to sacrifice shadow or highlight detail.

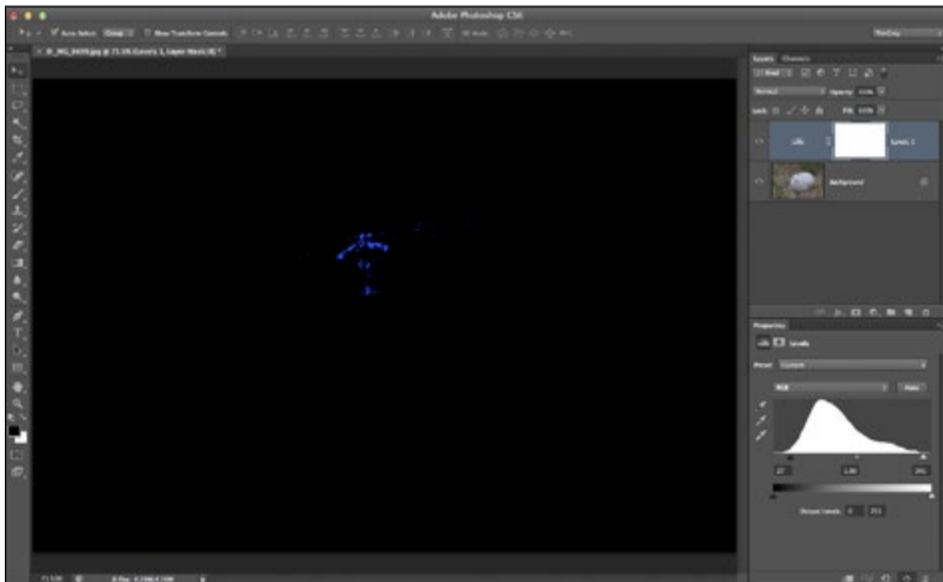
The basic operation of the black and white input value sliders is quite simple. You can drag the black slider to the right to darken shadows, and move the white slider to the left to brighten highlights. But of course, to produce the best effect in the image you'll want to be cautious about the degree to which you adjust these sliders.

In a general sense, to maximize tonal range in a photo you want to make the darkest pixel

black and the brightest pixel white. In effect, that means you typically want to drag the black and white sliders inward to the dark and bright extremes of the histogram display. But I recommend taking a more informed approach to establishing black and white values with Levels by taking advantage of the clipping preview display.



The clipping preview display provides you with an indication of the degree to which detail is being lost in the shadow or highlight areas of the photo, and identifies which areas of the image are being affected by that clipping. In Photoshop (but not Elements) there is an option on the panel popup menu to enable the clipping display. However, I prefer a different approach that works with both Photoshop and Photoshop Elements and that provides a higher degree of information.



To enable the more detailed clipping preview display, simply hold the Alt key on Windows or the Option key on Macintosh while adjusting the black or white input level slider. When adjusting the black point the image will appear entirely white except for areas that are clipped, and when adjusting the white point the image will appear entirely black except for areas that are clipped.

The color of the clipping preview pixel display indicates the degree to which detail is being lost. Colored pixels indicate areas where one or two channels are losing detail, with the color indicating which channels are affected. Areas that appear black when adjusting the black point or white when adjusting the white point have completely lost detail on all three channels, and thus will appear as black or white in the image.

I typically start with the black value, holding the Alt/Option key and dragging to the

right until pixels start to appear in the clipping preview display, and then drag to the left until just reaching the point that the clipping preview display indicates no pixels have completely lost detail. I'll then repeat the same basic process for the white point, holding the Alt/Option key while dragging to the left until pixels appear in the clipping preview display, and then dragging to the right until the last of those pixels disappears.

Of course, this sort of somewhat formulaic approach to won't always lead to the best results. Maximizing the tonal range using this technique does work well for a surprising number of images, but you still want to review the results for the photo all by itself. Also, at times you actually do want to have at least a little clipping. You might intentionally cause a loss of detail in shadow areas of the photo to create a silhouette, for example. Or you might want to enhance the appearance of specular highlights, allowing a little extra highlight detail to be blown out. The key is to put the clipping preview display to use to help you make a more informed decision about the optimal adjustment for a photo.

## Setting the Midtone Value

Once you've established the values for black and white, the overall contrast for the photo will be pretty well established, but you may want to refine the brightness level. This is where the midtone slider comes into play. The midtone slider is the gray slider that starts out halfway between the black and white sliders below the histogram display. You may here this slider referred to as the "gamma" slider, because it operates by applying a gamma curve adjustment to the image.

To darken the photo, move the midtone slider to the right, toward the white slider,



and to brighten the photo move the slider left toward the black slider. This may seem backwards, but this behavior is based on the effect you're having on the tonal distribution within the photo. When you move the slider to the right you're specifying that a value that had been brighter than middle gray in terms of luminosity should be darkened. You'll also notice that when you move the slider to the right you're enlarging the space between the black slider and the midtone slider, indicating that more pixels in the image are darker than middle gray than are lighter than middle gray.

There's no such thing as a clipping preview for the midtone adjustment, since you're not adjusting the value of black or white when you brighten or darken with the midtone slider. That means you'll simply have to evaluate the image using just your eyes as you determine the best value for the midtone slider.

## **Adjusting Output Levels**

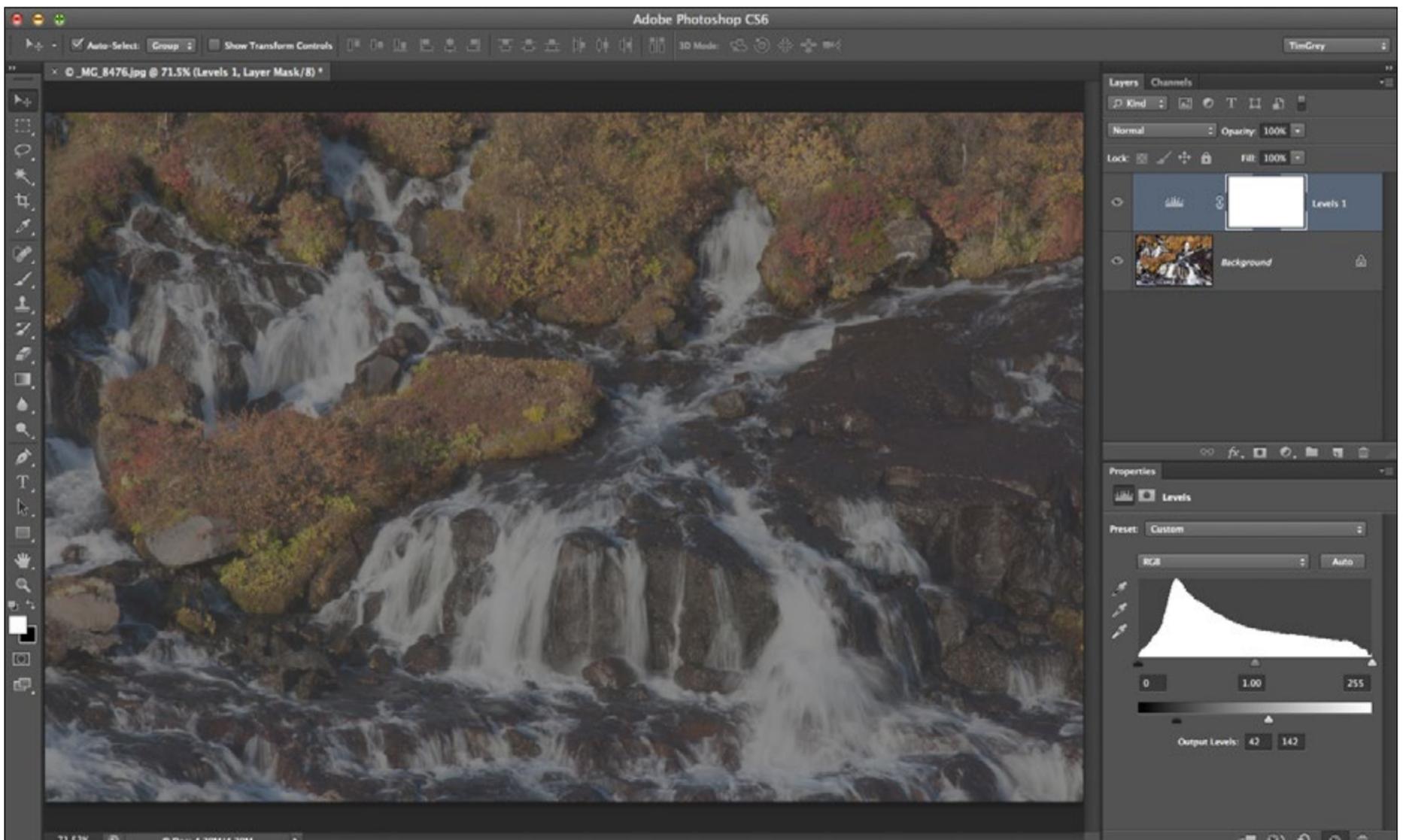
When it comes to applying a normal effect to a typical photographic image, you almost never need to adjust the values for Output Levels. After all, we usually want black in the image to appear black, and white in the image to appear white. However, sometimes you may want to lighten the blacks or darken the whites.

It is important to keep in mind that when you adjust the Output Levels you're not actually increasing the amount of detail in the photo. In fact, when you adjust the Output Levels for purposes of changing the appearance of the photo, you're really making a compromise. If you want to brighten up shadow detail you should apply a Curves adjustment or use the Shadows/Highlights adjustment. If you have blown highlights in a photo, reducing the value of white so there is at least some information in those highlights won't produce

a good look. Instead of an area that is all white with no texture you'll have an area that is very light gray with no texture.

Sometimes applying a minor adjustment to the Output Levels can help, but generally these are not tools for image optimization. However, they can prove remarkably helpful in improving detail when printing a photo. This is because, even with a good profile, some printer, ink, and paper combinations aren't able to produce discrete values with extremely bright or dark areas. For example, you might produce a print that is otherwise very good, but where shadow detail has been lost because the printer isn't able to produce a full range of dark values that can be distinguished from each other.

For example, the printer might create a result where any value within about ten tonal levels of black appears as black, causing subtle detail in the darkest areas of the photo to not be visible in the print. To compensate for this



issue, you can increase the black value for Output Levels to 10, so that black in your photo is re-mapped to the darkest discrete value your printer can produce. In other words, this would be an output-compensation adjustment, not an adjustment intended to optimize the photo itself.

## Utilizing the Eyedroppers

In addition to the sliders that enable you to adjust tonal values within the photo, you can also utilize the set of eyedropper buttons to the left of the Levels histogram. I personally prefer not to use these eyedroppers in most cases, but they can be helpful at times.

The basic concept of the eyedroppers is that you can choose one of them, and then click within the image to apply an adjustment that causes the pixel you clicked on to be changed to the target value. For example, you can click on the black eyedropper and then click on a pixel within the photo. This will cause an adjustment to be applied that causes that pixel to become black, and of course the adjustment also affects all pixels within the image.

One of the reasons I tend not to use this approach is that there's a tendency to need to click multiple times throughout the image to find the best pixel to click on to produce a good result. I can generally apply an adjustment directly to the sliders faster than I can click around and find the right place to click. Also, it is quite likely that I'll want to fine-tune the positions of the sliders anyway, so I usually prefer to simply work with the sliders in the first place.

The gray eyedropper behaves a little differently from the black and white eyedroppers, in that it is focused on



establishing a color value rather than a tonal value. By default, the gray eyedropper causes the image to be adjusted so that the pixel you click on becomes neutral gray. For example, if the pixel you clicked on is nearly gray but just a little tinted toward blue, the entire image will be shifted toward yellow so that the pixel you clicked on becomes blue. As such, if you click on a pixel that should be perfectly neutral gray, you'll correct the color for the overall image so that it is presumably accurate, or at least neutral.

It should be noted that when you utilize the eyedroppers within the Levels adjustment, you're really accessing the Eyedropper tool. That means the settings for the Eyedropper tool affect the behavior of the eyedroppers in Levels. The most significant of these options is the Sample Size (this is actually the only option for the Eyedropper tool for users of Photoshop Elements).

To change or review the settings for the Eyedropper tool you need to first switch to the Eyedropper tool by choosing it from the toolbox. You can then adjust the settings as desired on the Options bar. The default setting is Point Sample, which means only the single pixel directly under the mouse pointer will be sampled. You can also choose options that cause the sample to be taken from an average from several pixels. This includes "3 by 3 Average" and "5 by 5 Average" options in both Photoshop and Elements, sampling a total of 9 and 25 pixels, respectively. Photoshop also includes additional options ranging up to a 101 by 101 pixel sample, averaging a total of 10,201 pixels including the pixel you click on.

Generally speaking, when working with the eyedroppers associated with the Levels adjustment I prefer to use the Point Sample

option for the Eyedropper tool, so that only the pixel I actually click on is used to apply an adjustment to the overall image. However, at times you may want to increase this sample size, such as when you're having difficulty finding the right pixel to click on when using the gray eyedropper to correct for a color cast, but the average of the area you want to sample produces a good sample.

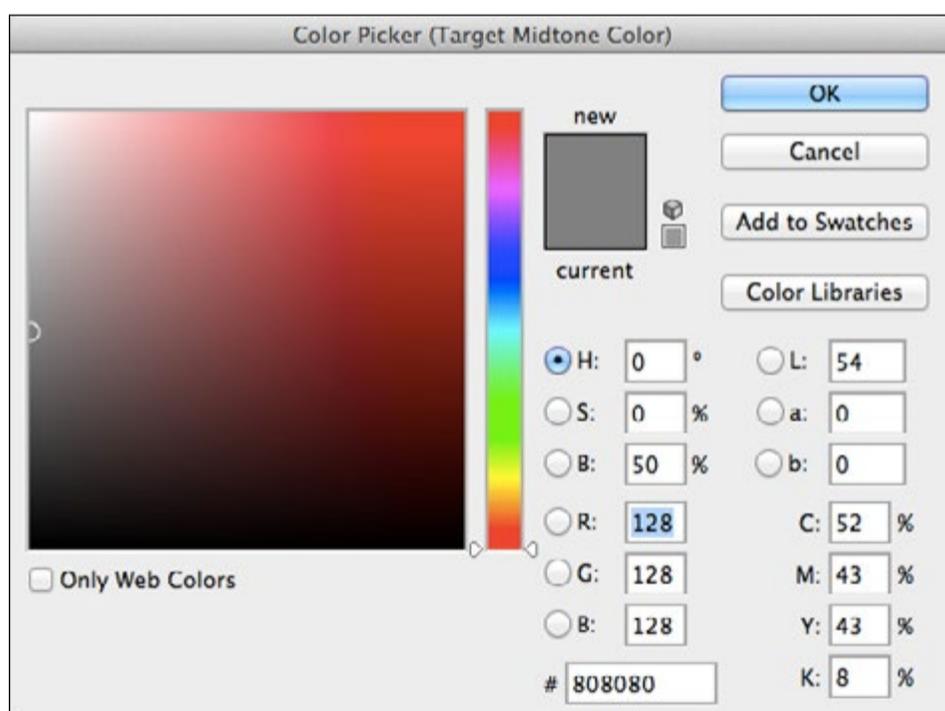
In the context of a basic image-correction workflow, using the eyedroppers is quite simple. You choose the black eyedropper and click on the darkest shadow area you can find in the image, and then you choose the white eyedropper and click on the brightest highlight area you can find. This establishes overall contrast, and you can then choose the gray eyedropper and click on an area of the photo that you would like to have appear as a neutral gray, and the color will be corrected.

However, in many cases you may want to apply an adjustment where black, white, and neutral values aren't adjusted to exactly equal black, white, or a shade of gray. In most cases I prefer to keep the values for the black and white eyedroppers at their defaults, which is a pure black and pure white. In situations where I want the black or white value to be different, I would tend to use the Output Levels sliders within Levels.

However, quite often you may find that you want to apply an adjustment that is applying a color correction, but creating a "neutral" value that isn't exactly neutral. You might, for example, sample a neutral gray object within the photo, but prefer to have the image adjusted so that gray value is warmed up a little, thus applying a slight warming effect to the entire photo.

To achieve results that are different from the defaults of black, neutral, and white, you simply change the target value for the eyedroppers in Levels. To do so, simply double-click on any of those eyedroppers to bring up the Color Picker dialog. You can then choose a new target value for the selected eyedropper. For the black or white eyedropper I would tend to keep the value neutral, but perhaps brighten the black value or darken the white value. To accomplish that you can adjust only the “B” (Brightness) value in the HSB section of the color picker, or reduce the value for all three of the red (R), green (G), and blue (B) in the RGB section while keeping each at the same value. When applying such an adjustment to the black or white value you would in most cases want to keep the adjustment relatively modest, keeping those values no more than about a 2% to 5% difference from black or white when evaluating the Brightness (B) value.

Adjusting the target value for the gray eyedropper is a little more flexible. You can choose any color value you’d like, and that will become the overall color (but not tonality) of the pixel you click on, adjusting the overall photo accordingly. Of course, in most cases you will want to keep the adjustment relatively modest, with the target value for the gray eyedropper being relatively close to a neutral gray value. In other words, the values for red (R), green (G), and blue (B) should be relatively close to each other in the RGB section of the color picker.



That said, you can set any target value you’d like, and try it out within the image to see how the results turn out. When choosing a color within the Color Picker I recommend clicking on the option button to the left of the hue (H) value in the HSB section so that the vertical gradient represents hue and the larger

gradient represents saturation and brightness. You can then click anywhere in the hue slider or drag the slider handle on either side of that gradient to select a base color. You can then click and drag within the larger gradient to finalize your color selection. The horizontal axis in this case will adjust saturation, with more highly saturated colors to the right. The vertical axis will adjust brightness, with brighter values toward the top. Keep in mind, however, that the gray eyedropper only adjusts the overall color of the image, without altering luminance values.

Once you've selected the color you want to use as the target for the gray eyedropper, you can click the OK button to close the Color Picker dialog. You will be asked if you want to set the value you have just established as the new default value for the corresponding eyedropper. I recommend choosing "No", because altering the target values for black, white, and the neutral value is not something you would typically want applied to all images.

You can then click anywhere in the image to apply an adjustment that will shift the color values in the photo so that the pixel you clicked on matches the overall color of the target value you have established. With any of the eyedroppers in Levels you can continue clicking within the image as long as the eyedropper is selected, refining your adjustment. The image will be sampled based on the original pixel values, not based on the values as they have been changed by the eyedropper adjustment.

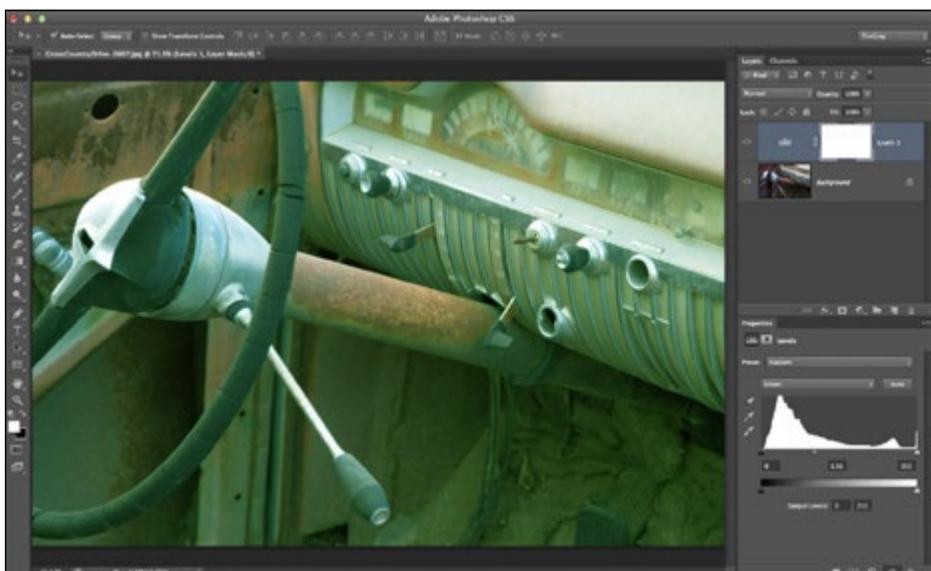
Even after having changed the target value for the eyedroppers before putting them to use, you'll still likely find that you need to click multiple times around the image until you find just the right spot to click on to create the desired effect. That's not to say that these

eyedroppers can't be useful, but in many cases you may find that they provide merely a starting point for the image, and additional refinement of the adjustment will be necessary using the various sliders in Levels.

## Working on Individual Channels

The Levels adjustment is often regarded as a tool to be used purely for tonal adjustments to your photos, affecting overall brightness and contrast. However, it is also possible to apply color adjustments to your images using Levels. The key is to work on the individual color channels rather than the composite channel. In other words, instead of working on the overall RGB channel with a typical image, you would work on either the Red, Green, or Blue channel.

The Red channel allows you to shift the balance between red and cyan, the Green channel allows you to shift between green and magenta, and the Blue channel allows you to shift between blue and yellow. To select a specific color channel to work on, you simply click on the popup and choose a different channel.



For very basic adjustments, you can shift the color balance for an image by shifting the midtone slider for the selected color channel. Moving the midtone slider to the left will shift the color balance for the image toward the color for which the channel is named, such as toward red for the Red channel. Moving to the right will shift the color balance toward the opposite of the color for which the channel is named, such as cyan for the Red channel.

Applying a shift in color using the individual midtone sliders for each of the color channels provides an adjustment that is effectively

the same as you might achieve with a Color Balance adjustment. However, you can take things a bit further with Levels by also adjusting the black and white values for each of the individual color channels.

When adjusting the black and white point values for an individual color channel, you are effectively increasing contrast for that channel. However, you're also adjusting the color balance of the black and white values within a photo. As such, you can apply a sophisticated color adjustment by bringing the black and white values for each of the individual color channels in to where the histogram data begins for each channel. You can even use the clipping preview display while adjusting these individual black and white points by holding the Alt key on Windows or the Option key on Macintosh. The result is both greater contrast in the overall image, as well as neutral values in the darkest and brightest areas of the photo.

## Simple But Powerful

What I find most fascinating about the Levels adjustment is that it is so simple on the surface, and yet provides for such a high degree of control once you dig a little deeper than the simple black, midtone, and white sliders. I always encourage photographers to have a solid understanding of the tools they are using in their photography, and Levels is certainly a tool that can be very helpful in optimizing your photos, especially if you go beyond the basic capabilities.



### *Photoshop CS6 Image Optimization Workshop*

To learn more about applying adjustments in Photoshop to optimize the appearance of your photos, take a look at the video training course “Photoshop CS6 Image Optimization Workshop”. This course features over two hours of high-definition video training, and you can even follow along with the included sample images. To get more information, view sample lessons, or purchase this title, visit the Tim Grey video2brain online store here:

<https://partner.video2brain.com/timgrey/course-18489.htm>



# Lightroom's Loupe View **Snafu**

By Tim Grey

## Lightroom View Modes Can Offer Unpleasant Surprises



I've seen more than a few photographers face a rather scary scenario in Adobe Photoshop Lightroom. They select a group of images and then apply some updates. Perhaps they add one or more keywords that are applicable to all of the selected photos. Or perhaps they apply a star rating that they'd like to have affect all of the selected photos. Whatever the changes happen to be, they apply them and move on. And then at some later time, they discover that some of their photos don't reflect the updates they applied. In fact, upon further examination, they discover that for

each of the updates they intended to apply to a group of selected photos, only one of the photos actually got updated.

When you are in the Loupe view in Lightroom, even with multiple images selected on the Filmstrip, updates will only affect the single image you see in the Loupe view.

The issue is that Lightroom behaves differently depending on which view mode is currently active. There's a certain degree of logic behind the variable behavior, that

logic isn't employed consistently, at least from my perspective. But even if the logic makes perfect sense, the variable behavior most certainly isn't obvious if you're not aware of it, and Lightroom doesn't offer up any warnings about the behavior.

In short, if you want to apply updates to a group of multiple images, you must be in the Grid view. If you are in any other view, such as the Loupe view, the Compare view, or the Survey view, only the primarily selected image will be affected by your updates.

To apply updates to all selected images in Lightroom, you must be in the Grid view.

The idea is that if you're in the Loupe view, even if you have multiple images selected on the Filmstrip, you're really focusing on

*“...if you want to apply updates to a group of multiple images, you must be in the Grid view.”*

*When viewing an image in the Loupe view in Lightroom, even if you have multiple images selected on the filmstrip, updates will only affect the single image.*



a single image. And therefore, updates you apply will only affect that single image. In Grid view, of course, you are looking at multiple images. So if you have multiple images selected and are in the Grid view, updates will affect all of the selected images.

The logic breaks down a little bit in the Compare and Survey views, because in those views you are able to see more than one image at a time. However, at any time in both the Compare and Survey views there is actually only one image that is primarily selected, and only that one image will be affected by any updates you apply.

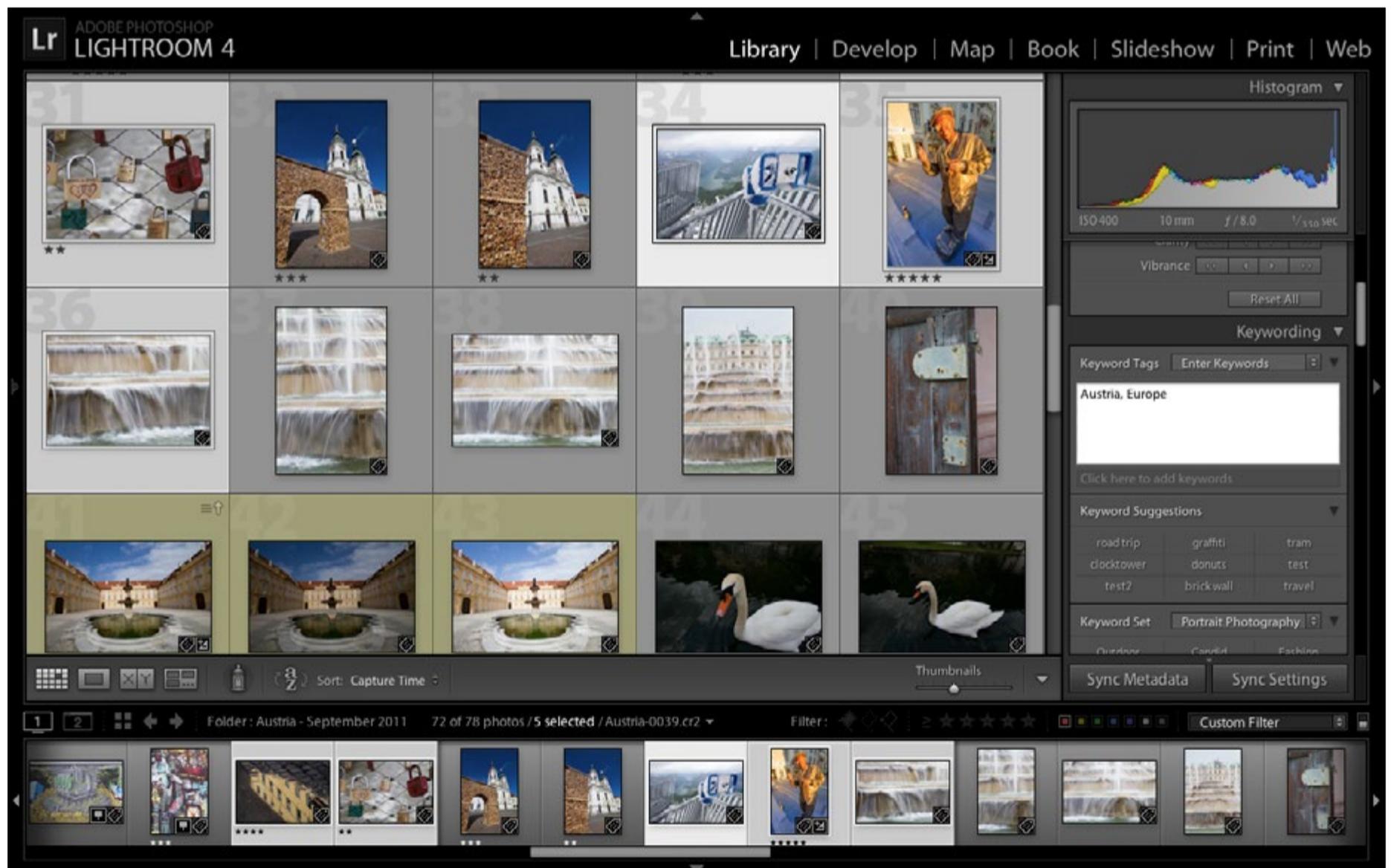
One of the reasons this variable behavior is so problematic is that the Filmstrip is available to you regardless of which view mode you're in. So even if you're in the Loupe view, focusing on a single image,

you can still view and select multiple images on the Filmstrip.

The first defense here, of course, is to be aware of the behavior. Once you know that you must be in the Grid view to apply updates to multiple images, you can just be sure to switch to the Grid view before applying updates, even if you had been in Loupe view using the Filmstrip to select the multiple images. To switch to the Grid view quickly, simply press the letter "G" on the keyboard, and regardless of which module you're currently in, you'll be taken to the Library module and switched to Grid view.

My recommendation, however, is to take this a step further to help you avoid the problem. Rather than trying to remember to switch to Grid view before applying updates to multiple images, I recommend getting in the

*You must be in the Grid view in Lightroom if you want to apply updates to multiple selected images.*



habit of switching to the Grid view whenever you're going to select multiple images. In other words, use the Grid view display for actually making the selection of multiple images, rather than the Filmstrip.

In some cases the actual process of selecting multiple images will actually take care of this issue for you. The Library Filter for example, which is accessible by choosing View > Show Filter Bar from the menu or by pressing the backslash (\) key on the keyboard, is only available in the Grid view. So if you use the Library Filter to initially filter images, you'll automatically be in

Grid view when you want to select multiple images based on the filtered results.

If you've used the Library Filter to filter specific images, you'll have been automatically switched to the Grid view.

Hopefully by being aware of this rather important behavior in Lightroom, and perhaps by getting in the habit of always using the Grid view mode when you want to select multiple images, you'll be able to avoid situations where the updates you think you're applying to multiple photos are actually only being applied to a single image.

*The Library Filter is only available in the Grid view, so if you've used the Library Filter to locate images you're automatically in the Grid view and can apply adjustments to multiple images.*





## An Interview with Astrophotographer **Robert Gendler**

Interview By Tim Grey, Images by Robert Gendler

Like many photographers, I've often looked up on a star-filled night and marveled at the expansive beauty above. On occasion I've even attempted to photograph the stars and the Milky Way, generally incorporating these celestial subjects into a terrestrial composition. There are other photographers, however, who have made those distant subjects their primary focus. A perfect example is Robert Gendler.

Robert is an amateur astronomer and talented photographer who has been producing remarkable images since the early 1990's. His images have been published in a variety of magazines including *Sky & Telescope* and *Astronomy Magazine*. He has also had images published on the NASA Astronomy Picture of the Day website.

I enjoyed the opportunity to have Robert respond to some questions about his craft.

What came first for you, astronomy or photography? Was photography a hobby before you started photographing celestial objects?

From a very early age I was fascinated by the universe. I grew up in Brooklyn, New York, and while in elementary school we made frequent class trips to the famous Hayden Planetarium. The planetarium show was wonderful and I remember looking forward to those trips immensely. This was in the 1960's and astrophotography of that era consisted of wonderful black and white photographs of distant galaxies and nebulae, plus the moon and planets. Those iconic photographs of distant worlds surely planted the seeds of my future adult passion. It was also the age of Gemini and Apollo. I remember being totally immersed in the space exploration events of that special time.

My father was a professional photographer and photographic equipment was always around the home. That said I really didn't get involved in photography until I was an adult. The attraction to the visual however was something that must have been in the DNA as I later became not only a radiologist but also an astrophotographer. My father is 85 and retired but still enjoys photography. I think its in the genes!

When I think of “astrophotography”, I tend to think of heading out to the desert and photographing the stars and the milky way with my “normal” photographic gear. You obviously take things quite a big step further as is clear from your



*“The Galactic Center”, a 50-frame mosaic with a cumulative exposure time of 60 hours. © Robert Gendler 2009.*

photographs. Are there “categories” of astrophotography based on equipment or subject matter?

Astrophotography today is a complex craft with many sub-disciplines and applications. The various sub-disciplines include deep sky, solar, lunar, eclipse, nightscape imaging, video, etc. Then there are amateurs who do science by imaging exoplanets, variable stars and supernovae. The field of astronomical imaging has expanded enormously in the last decade because of advances at both the hardware and software levels of the craft.

This does not necessarily mean it requires very expensive equipment. People who do outstanding solar, lunar, eclipse or cometary imaging can do it from their backyard with affordable equipment. Deep sky imaging requires dark skies and larger apertures so the necessary equipment and conditions for high quality “deep sky” imaging requires a bigger investment. Sure, astrophotography can be simply imaging the Milky Way with simple equipment. It's really anything you want it to be.

My evolution as an astrophotographer was circuitous. I started imaging from my driveway with simple equipment in 1995. I did that until 2005. Then I sent my equipment to New Mexico Skies and began

imaging remotely over the internet. In 2007 I began using another remote observatory in Australia that I used to image the southern skies until very recently. Over the last few years I've been involved in assembling complex images using data from professional archives to make very high resolution composite images. Some of these images were made from as many as 4 different data

sources including both professional and amateur data sets. These are very complex and daunting projects and many of these images were selected to be an "Astronomy Picture of the Day".

As an aside, "Astronomy Picture of the Day" is a NASA run site that features a single image each day along with a description

*"The Tulip Nebula" (Sh2-101), with image acquisition by Michael Joner and David Laney (BYU) at the West Mountain Observatory. Image processing by Robert Gendler.*



written by a professional astronomer. The site has a worldwide reach with many mirror sites around the world. I've had my images selected 84 times for [APOD](#) which is more than any other amateur in the world.

I've heard many photographers suggest that astrophotography is still the domain of film photography, and yet you adopted digital tools for astrophotography quite early. Is there an advantage to film in astrophotography?

Astrophotography today is almost exclusively digital. CCD cameras started to take over in the early 1990's and these days I really don't think anyone doing serious astrophotography is using film. Film can offer very nice results, but the advantages of digital imaging are many. Many of the last film holdouts converted to digital when modified DSLR cameras became available for astrophotography. The CCD has so many advantages over film including greater sensitivity, lack of reciprocity failure, linear response, the digital darkroom, etc. For a while

*"Barred Spiral in Fornax" (NGC 1365), with a total exposure of 14 hours. © Robert Gendler 2007.*



digital detectors were small and film offering a larger medium still had a niche. These days CCD detectors are much larger format so there's no advantage to film any longer.

For many photographers a long exposure is measured in seconds, or perhaps minutes. But many of your images take hours to record. I notice, for example, your photo "The Galactic Center" has a sixty hour exposure. How is that even possible?!

Deep sky imaging today involves "stacking" many hours of accumulated data. Astrophotography of faint objects is done by taking many sub-exposures (often 10 to 30 minutes each) and then summing these exposures to achieve a very long cumulative exposure (sometimes dozens of hours). This builds the signal and lowers the noise so the image ultimately reveals very faint detail and the noise level is low. Exposures can be made of the same object on multiple nights since specific objects can be imaged for several weeks or even months during the year before they disappear beyond the horizon as the seasons change.

Some of your beautiful photographs look like they must have been captured from outer space. Can you give us a sense of the most "extreme" equipment that might be used?

Most of my images were captured using conventional telescope and camera equipment. Many amateur astrophotographers have similar equipment. The art of bringing



*“The Cone Nebula and NGC 2264”, a three-frame mosaic with a total exposure of 25 hours. Image data acquired at the Nighthawk Observatory. © Robert Gendler 2005.*

out detail is part of image processing and comes with years of experience. I have also processed many images taken with professional observatory equipment like the Hubble Telescope and other large ground based instruments. Of course these types of images are very detailed and revealing because of the nature of the equipment.

For the photographer who is interested in astrophotography but doesn't have a budget on the scale of the known universe, is there a reasonably affordable way to get started and still produce incredible photos?

Astrophotographic equipment is available for all budgets these days. Probably one would need to spend a few thousand dollars to purchase a small refractor, a mount, and an entry level CCD camera. Someone with this equipment could produce with time some wonderful images of very beautiful and distant objects. This combination could keep someone busy for years and can capture some extraordinary cosmic vistas. There is of

course a learning curve and the craft requires much patience but it is achievable.

Photographs of stars, galaxies, and other celestial bodies can represent beautiful artwork, to be sure. But is there a value beyond art for these images?

Some of these images have scientific value in that amateurs have discovered supernovae and previously unknown nebulae and other objects. By and large the greatest contribution is educational. High quality astronomical images inspire people to learn and experience the universe for themselves. I can safely say that all astronomers, both professional and amateur were probably inspired in some part by astronomical images early in their life.

Is there any sort of “dream shot” of the cosmos you've been hoping to capture and haven't yet achieved?

I'm planning on a multi-frame mosaic composite image of the great spiral M33. The data will come from the 8.2 meter Subaru Telescope, the Hubble Space Telescope, and

*“The Helix Nebula” (NGC 7293), a composite/mosaic image with a total exposure of 26 hours. © Robert Gendler 2006.*



some data from my own telescope. This is in the planning stages but I'm very excited about this project.

## What makes a great astronomical photograph?

Good question. A great astronomical image is one that captures the viewers imagination not for a moments but for an extended period or even a lifetime. A great image is one you can go back to time and time again and always find something new and different that you didn't notice before. It is always refreshing and inspiring. Probably the same definition applies to any great photograph.

Learn More about Astrophotography from Robert Gendler:

*Treasures of the Southern Sky*

By Robert Gendler, Lars Lindberg Christensen, and David Malin  
Hardcover Book, 2011

<http://amzn.to/PQuWOO>

*Capturing the Stars: Astrophotography by the Masters*

By Robert Gendler  
Hardcover Book, 2009

<http://amzn.to/PFlpuf>

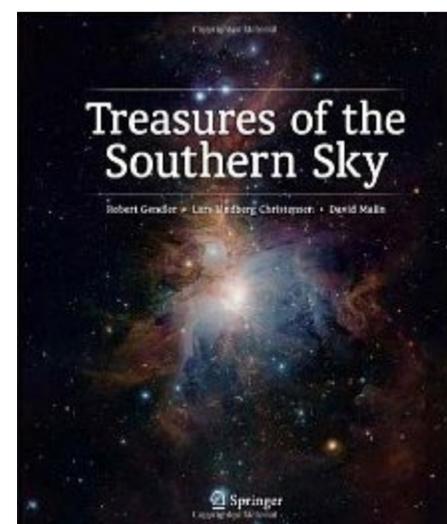
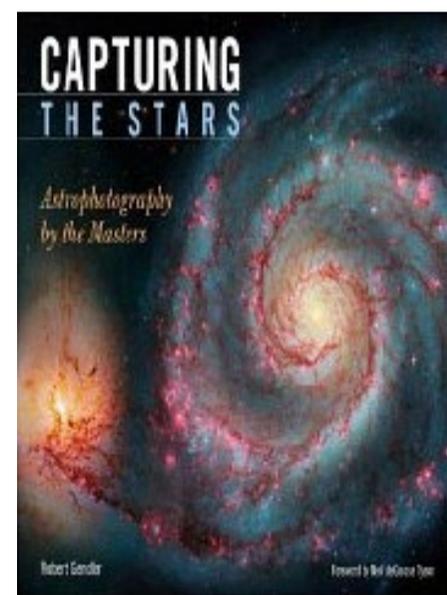
*Capturing the Stars: Astrophotography by the Masters*

By Robert Gendler  
Kindle Edition, 2009

<http://amzn.to/QflpSO>

Robert Gendler's Website:

<http://www.robgendlerastropics.com>





## Producing Fun Results in Photoshop with a Cool New Filter

By Tim Grey

I always find it interesting when something suddenly becomes very popular, even though it isn't new. The "tilt-shift" effect is just one of those things. Tilt-shift lenses have been around for a long time, and before that view cameras provided the same basic capabilities. But recently a miniaturization type of effect became quite popular, featured in a wide variety of photos and video clips and featured in gallery shows, television commercials, and more.

Of course, you can create a "tilt-shift" effect right in the camera by using a tilt-shift lens. But the tilt-shift lens is a somewhat specialized lens that is a little bit expensive, so many photographers feel buying tilt-shift lens just isn't worth the investment. Fortunately, the miniaturization effect you can achieve with a tilt-shift lens can also be achieved quite easily with a little post processing. To make things even better, Photoshop CS6 now includes a Tilt-Shift Blur filter, making it remarkably easy to apply the miniaturization effect to your images.

When I say "miniaturization", what I'm referring to is an illusion that is created with a specific application of a tilt-shift lens where the depth of field is set to a very narrow range of the photo. In effect, the depth of field is tilted on its side, so that it isn't so much a "depth" but rather a "height" of depth of field. The result is an image that looks like the subjects in the photo are tiny figures contained in a diorama model.



## The Right Photo

The key to a good Tilt-Shift Blur effect is to start with the right photo. Generally speaking the best photos to use for this effect are those where the people or other key subjects are relatively small in the frame. Besides using a relatively wide field of view, it is generally best to photograph the subject from a relatively high angle of view.

That's not to say the effect can't work well with images with a single key subject dominating the frame, or from a relatively low angle of view. It's just to say that the "classic" effect generally works best with a particular type of photo.

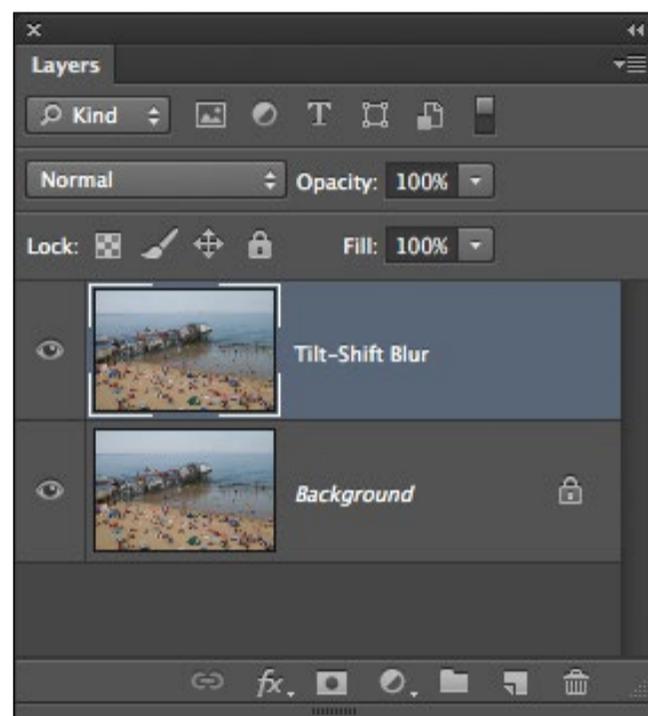
## Creating the Effect

Once you've found a photo you'd like to transform with the tilt-shift effect and opened it in Photoshop, the process of creating the effect is quite simple.

**Here are the steps for creating a tilt-shift effect in Photoshop:**

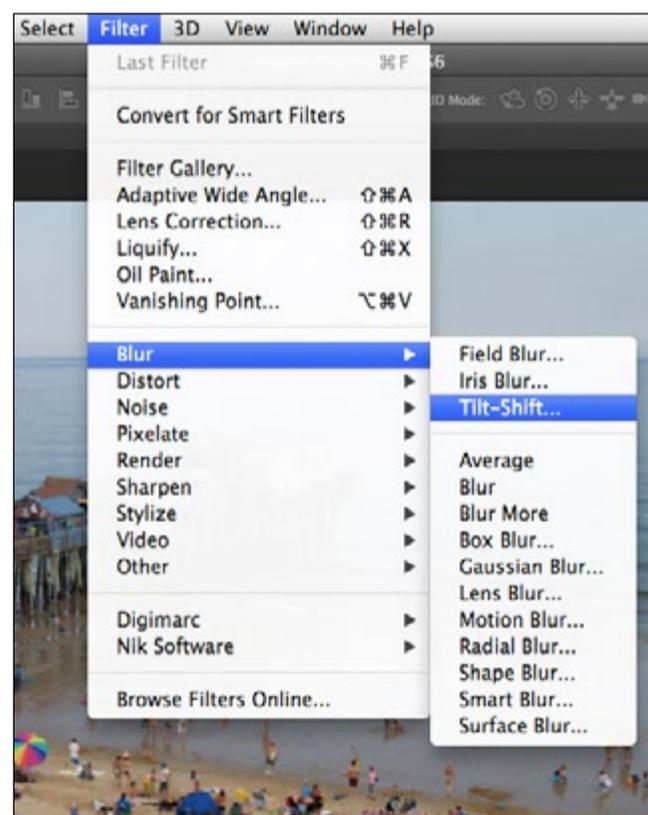
### Make a Background Copy

Create a copy of the Background image layer by dragging the thumbnail for the Background image layer to the Create New Layer button (the blank sheet of paper icon) at the bottom of the Layers panel. You can also rename this layer by double-clicking on the name of the layer, typing a new name, and pressing Enter/Return on the keyboard.



### Launch the Tilt-Shift Blur

With the Background Copy layer active, choose Filter > Blur > Tilt-Shift from the menu.



## Reposition the Effect

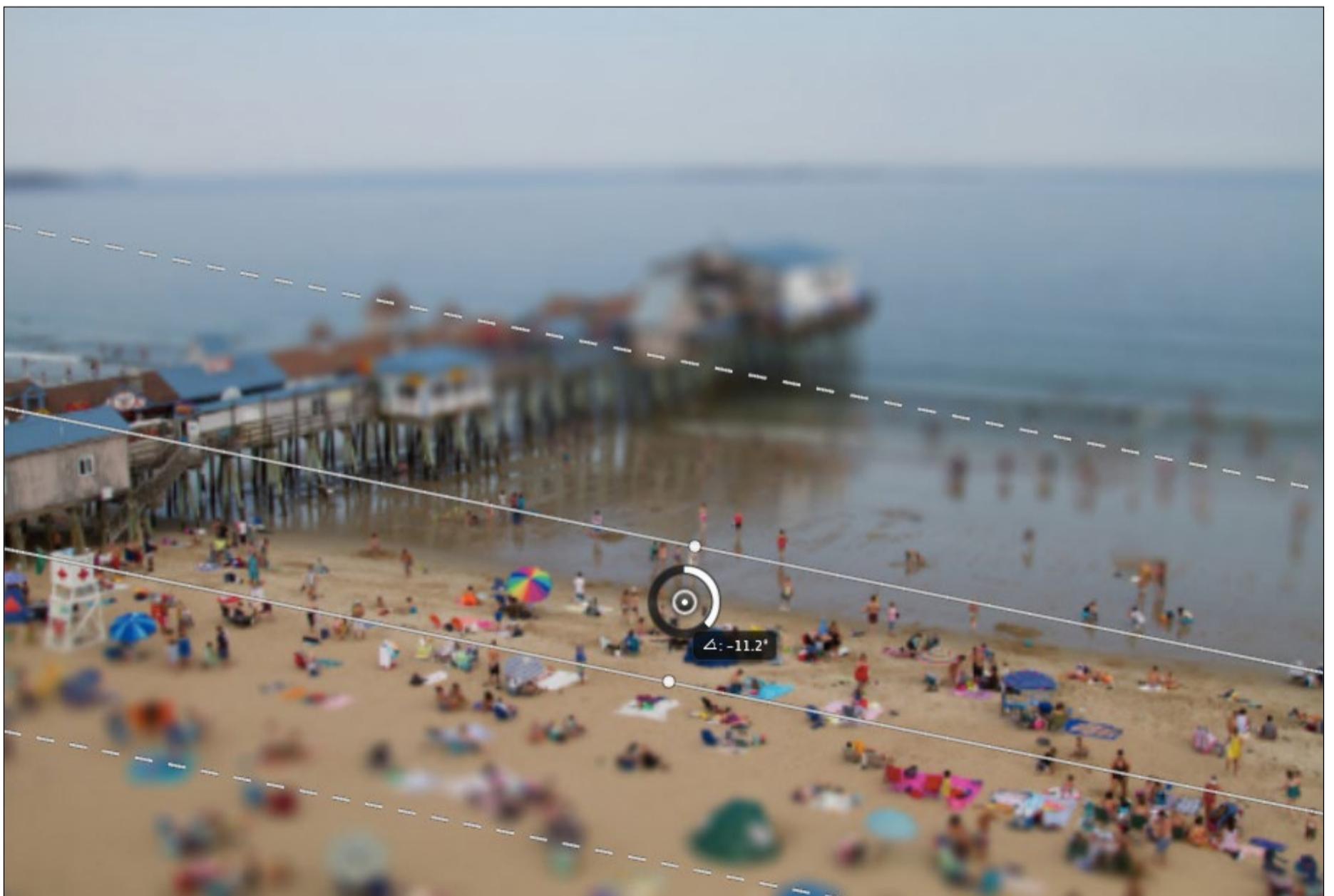
Point your mouse at the “bull’s eye” at the center of the controls that appear on the image, and drag the center of the effect to the desired area of the photo, generally at about the center of the key area of interest in the image.

## Adjust the Size

Drag the upper and lower solid horizontal lines up or down to adjust the overall size of the area of the photo that should remain sharp.

## Rotate the Effect

If desired, drag the small circular handle at the center of each solid horizontal line to rotate the direction of the area that will remain in sharp focus. You can hold the Shift key while dragging to constrain the rotation to 22.5-degree increments.

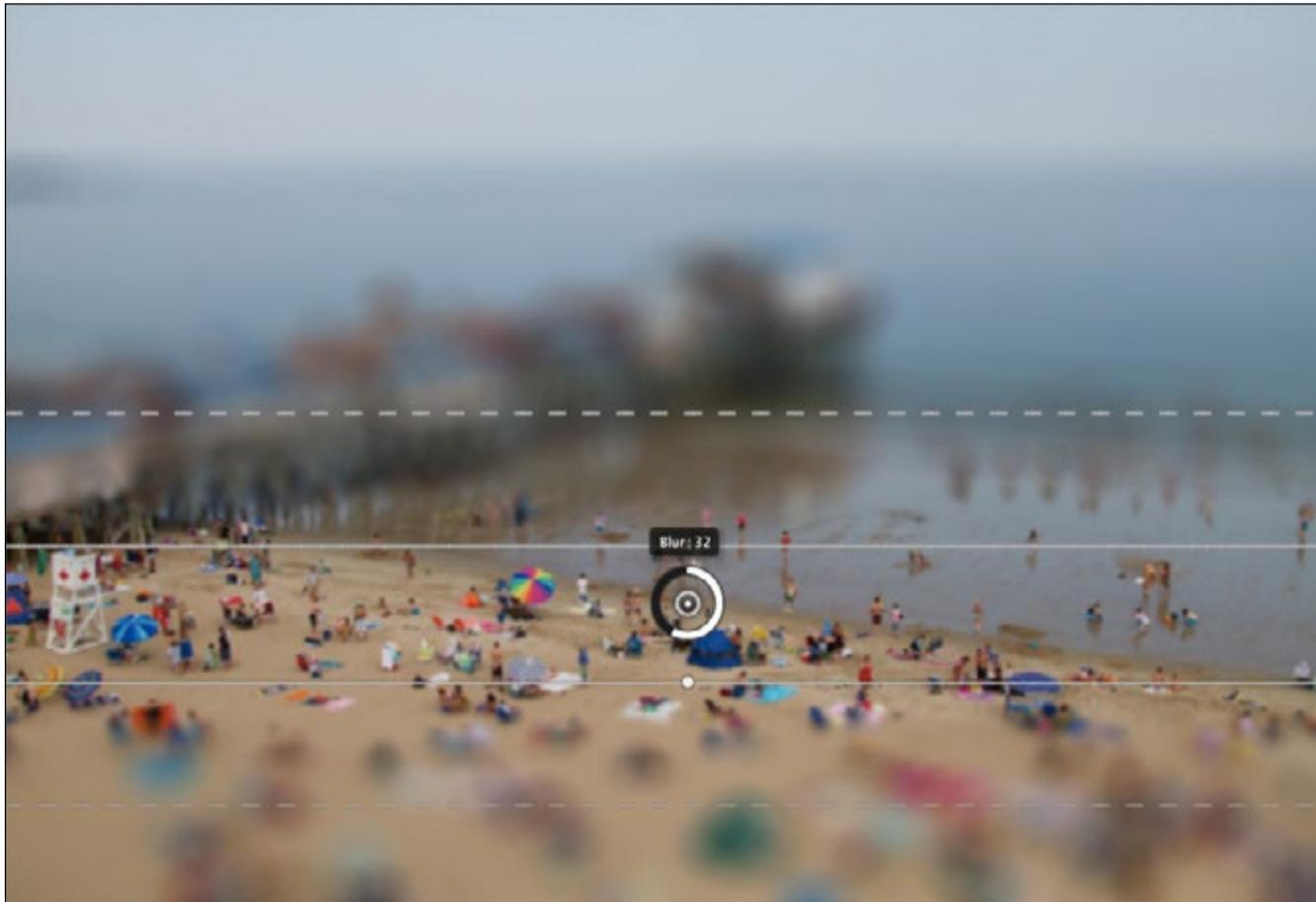


## Resize the Transition

Drag the upper and lower dashed horizontal lines to adjust the distance of the transition between the area that will remain sharp and the area of the photo that will receive the blur effect.

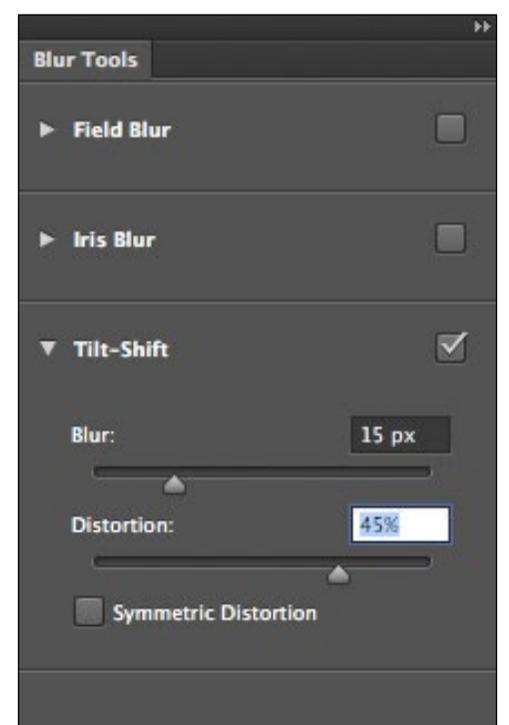
## Set the Blur Strength

Click and drag within the circle around the center button to adjust the degree of blur to apply to the photo. The amount of white in the circle indicates the strength of the effect.



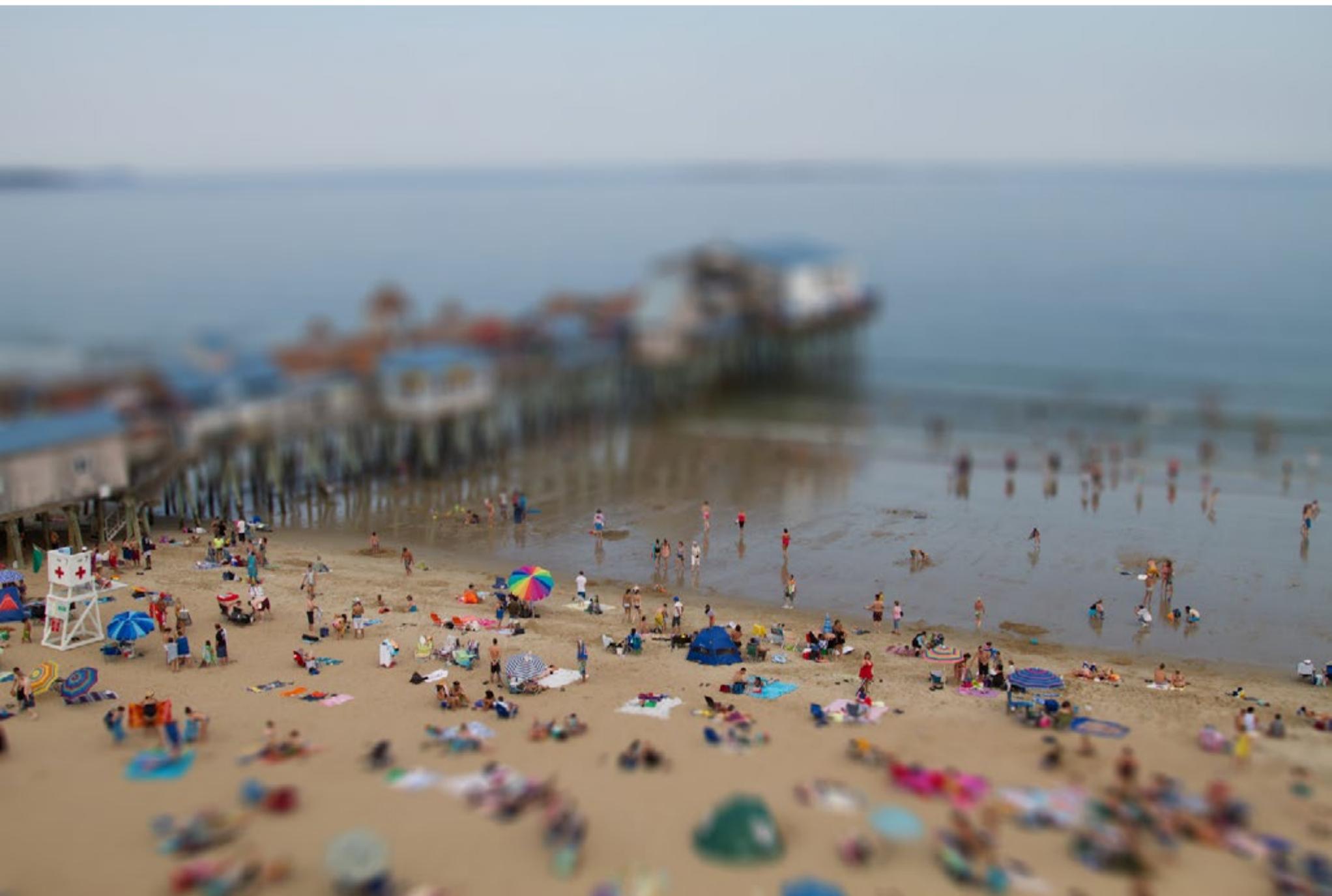
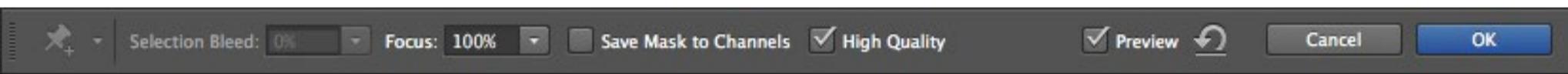
## Apply Distortion

On the Blur Tools panel, adjust the Distortion slider, which enables you to add something of a motion blur effect to the blurred areas of the photo. If you want this distortion effect to apply to both the top and bottom of the image, turn on the Symmetric Distortion checkbox. In most cases I prefer to leave this checkbox turned off so the distortion is only applied to the lower portion of the image.



## Finalize the Settings

While it is possible to click within a different area of the image to add a new gradient defining an additional sharp area of the photo, in most cases you'll find that a single sharp area works best. Continue refining the settings for the Tilt-Shift Blur, and turn on the High Quality checkbox on the Options bar to improve the bokeh blur effect for out-of-focus areas. You can also turn on the Save Mask to Channels checkbox if you want to create what is in effect a saved selection defining the area that is receiving the blur, which you can then use as the basis of targeted adjustments affecting only the blurred area of the photo. To finalize the image with the Tilt-Shift Blur effect click the OK button on the Options bar.



# Optimal HDR Exposure

By Tim Grey

## Making the Most of your High Dynamic Range Images



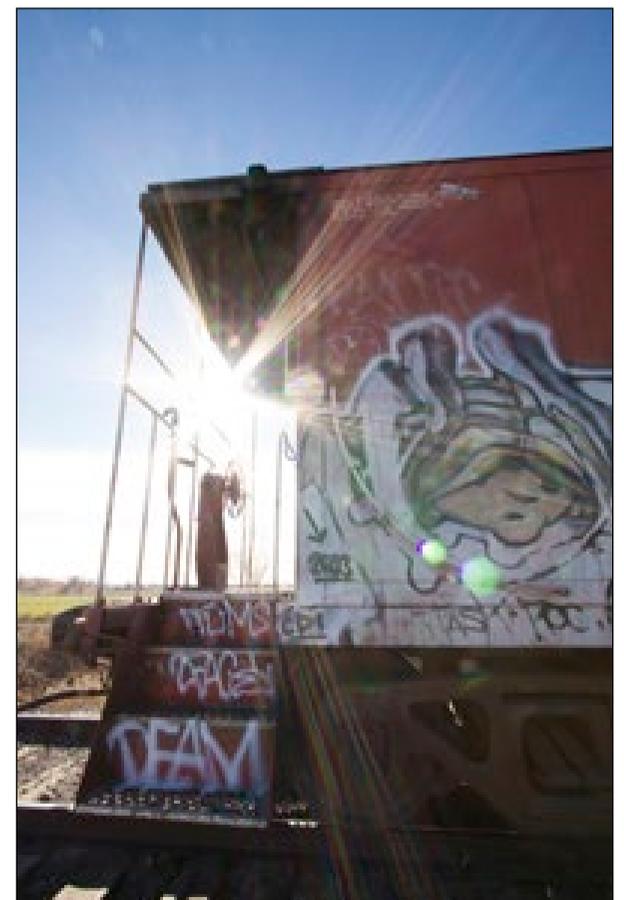
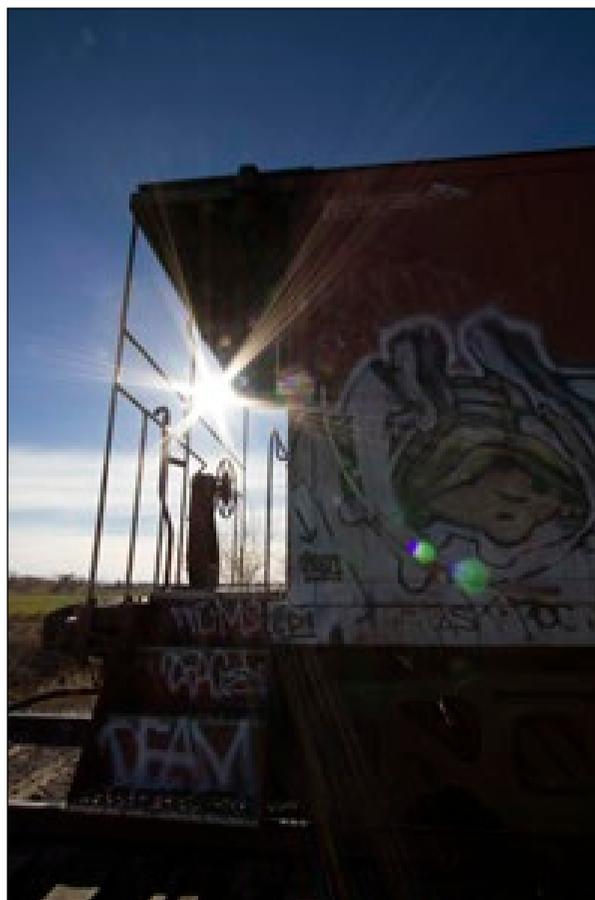
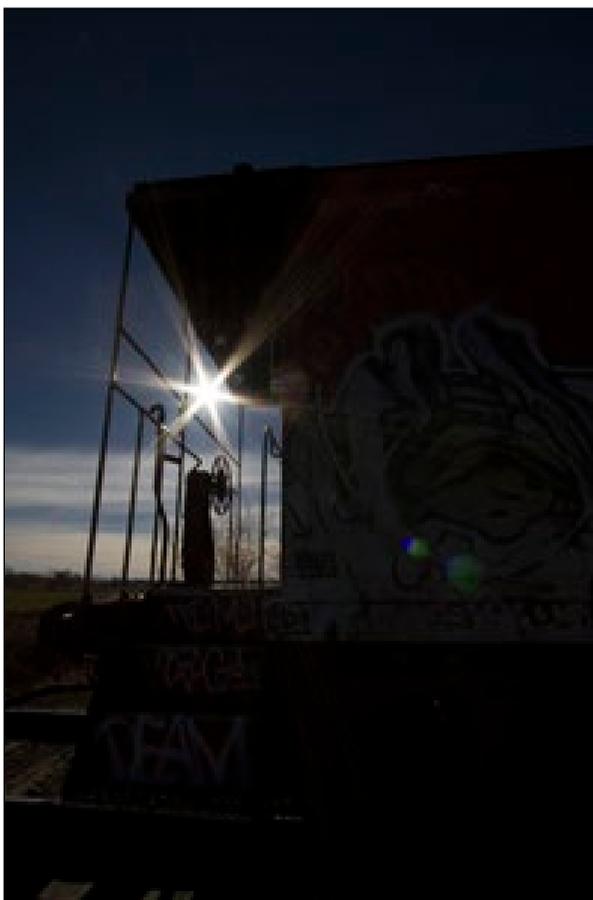
High dynamic range imaging seems to be more popular than ever, as photographers aim for photos with maximum detail or an additional creative impact. The emphasis for HDR photography seems to be on software processing rather than photography, but the settings you use at the time of capture can be equally important, if not more important. Let's consider some of the things you can do to ensure the very best HDR results right from the start.

## Tip #1 Use a Tripod

This one probably goes without saying. I hope. You can most certainly produce a great HDR image with automatic exposure bracketing holding the camera in hand. But you will greatly reduce the risk of ghosting in the final image if you utilize a tripod. You'll also enable yourself to go beyond the number of exposures your camera limits you to for bracketing, which is anywhere from three to nine exposures for most cameras.

## Tip #2 Only Adjust the Shutter Speed

Creating the individual captures that will later be assembled into an HDR image requires a series of different exposure values. When creating those different exposure values it is important to only change the shutter speed. Changing aperture will alter the depth of field from frame to frame, which is the worst thing you can do in terms of changing settings for different exposures with an HDR photo. Changing the ISO setting will change the noise levels from frame to frame, which isn't necessarily terrible, but is less than ideal.



## Tip #3 Separate Exposures by One Stop

Truth be told, separating the individual exposures for an HDR result by two stops is perfectly fine. But you'll give yourself a bit of an insurance policy by separating your exposures by a single stop. This will create more overlap in the exposures than is really necessary, but that additional overlap can also help eliminate any risk of posterization or other artifacts in the final result.

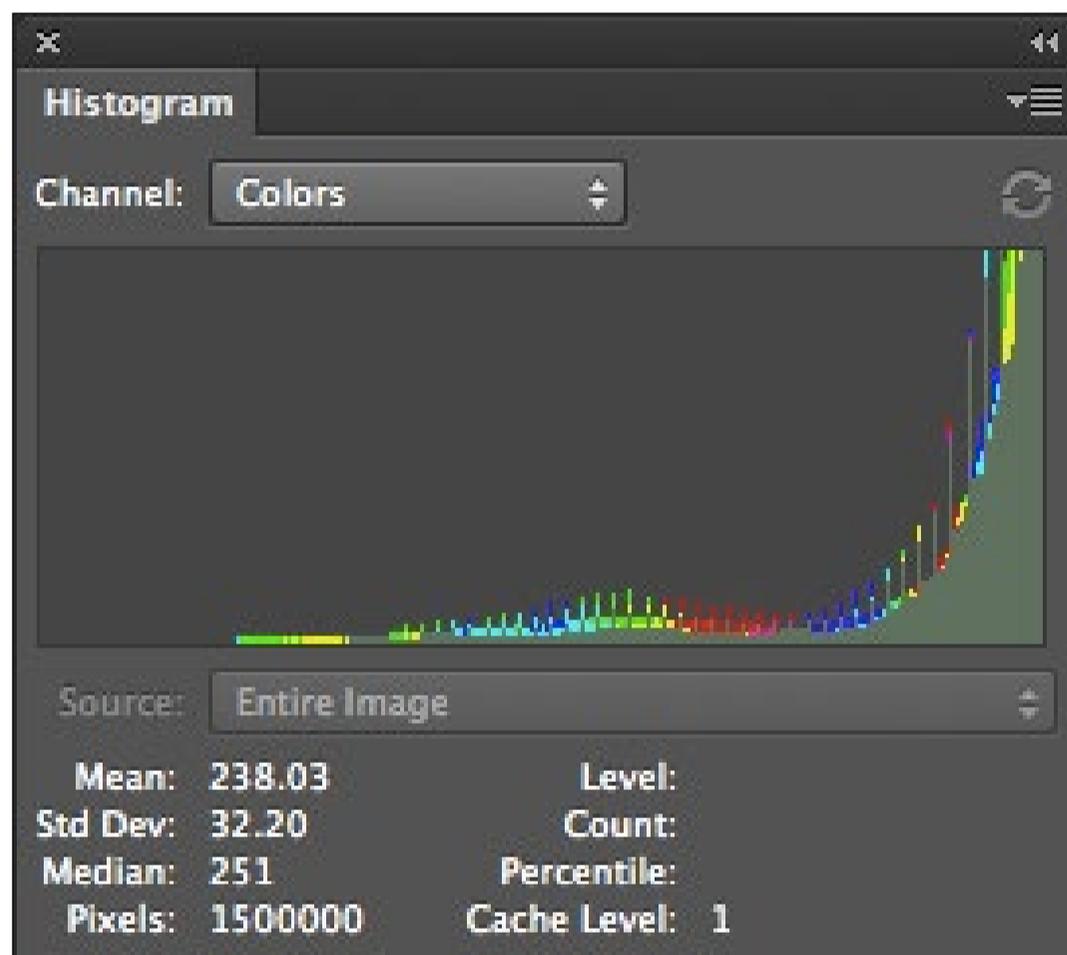
## Tip #4 Start Just Shy of Highlights

Generally speaking the key focus of HDR photography is maximizing detail, and in many cases the focus of that detail is the highlights. For this and a variety of other reasons, I prefer to start with the "highlights" exposure. Whether you are able to read the scene and determine optimal exposure settings to preserve highlight details, or you need to take a few test exposures first, start off your series of HDR frames with an exposure that retains highlight detail. In some cases you might leave some clipping for extremely bright details such as specular highlights or the sun included in the frame. But start with the dark exposure set to retain as much highlight detail as you feel is important, and work from there.



## Tip #5 Bring Black All the Way to Gray

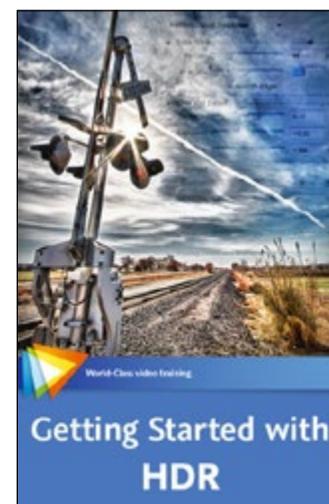
The histogram on your camera's LCD display can be a valuable tool in where you start and finish your exposure. When it comes to the "highlights" exposure that's pretty easy. You just need to make sure the right side of the histogram isn't clipped. You might therefore assume that you simply need to keep adjusting your exposure brighter and brighter until the histogram shows that the shadows are no longer clipped. However, I recommend taking things a step further, continuing to brighten your exposures until you reach the point that the histogram shows that the darkest values in the image are around a middle tone gray. Doing so will help minimize the amount of noise represented in the shadow areas, and thus reduce the overall noise and maximize the detail in your final result.



### *Getting Started with HDR*

To learn more about creating unique and dramatic High Dynamic Range Images, take a look at the video training course "Getting Started with HDR". This course features almost two hours of high-definition video training, and you can even follow along with the included sample images. To get more information, view sample lessons, or purchase this title, visit the Tim Grey video2brain online store here:

<https://partner.video2brain.com/timgrey/course-26651.htm>





By Tim Grey

# Learning to *Not* Care

Getting Comfortable with your Favorite Photographs

While it may feel like I've been making presentations for photographers forever, there was a time when I was new at it. Back then, I didn't know what to expect in terms of response from the audience. But I had confidence in my ability, my knowledge, and my photographs. But my photographic confidence got a test early on.

One photograph in particular stands out. I can still remember capturing it. I was standing just above the Santa Monica Pier in California, and was using a first-generation Lens Baby lens. I had been having all sorts of fun capturing images in the area, and captured a few different frames of the sign over the entrance to the

pier. I worked on the photo in Photoshop a bit to make it a little more dramatic, and proudly added it to some of my early presentations.

The feedback wasn't great. In fact, there were some negative comments audible from the stage at more than one presentation. I have to admit, hearing the criticism really stung. And I heard it more than once at more than one presentation.

It took me a long time to start to accept that some folks might not like some of my better images. And it took me even longer to realize that the photograph really wasn't all that great. In fact, in many respects it was simply a poor photograph. But I still liked it. In fact, I liked it a lot.

At first, I kept the image in my presentations. But as the realization sunk in that the photograph really wasn't all that great, I started to realize what was going on.

I came to the realization that the photo was special to me not because it was a great photograph, but rather because it was a special photograph to me.

That photo represented many things that were important to me. I was born in Santa Monica, California. I visited the pier often in my younger years, especially when visiting my grandmother. I even built sand castles in the shadow of that pier with my grandmother. In my teen years, I revisited that pier often and looked out to the horizon. I saw many sunsets on or near that pier. I loved seeing the pier and especially the sign for the pier in movies and television shows. Countless memories

were tied in to that place, and the photo represented all of that to me.

At this point I was no longer defensive of the photo. I realized the real reason the photo was important, and I was no longer concerned about those who didn't care for the photo. I still loved it, and I still do.

A similar thing happened just prior to the launch of Adobe Photoshop CS6. I had been playing with the public beta just before the official launch, and noticed that there was a new Oil Paint filter. I immediately thought of a poppy photo I had captured in central California, thinking it would be a good fit for an oil paint treatment. I opened the image, played around with the various settings for the Oil Paint filter, and just loved the result.

In advance of the official launch of Photoshop CS6 I produced a free video title with the help of my friends at [video2brain](#) covering my "top ten" favorite features of this new update to Photoshop. Among my top ten favorite features was most certainly the new Oil Paint filter.

Once the free "top ten" free video course was available, I received a few rather vocal emails from photographers who strongly disagreed with my feelings for the Oil Paint filter. Some were more polite than others, but the consensus seemed to be that this new filter was any self-respecting photographer would avoid.

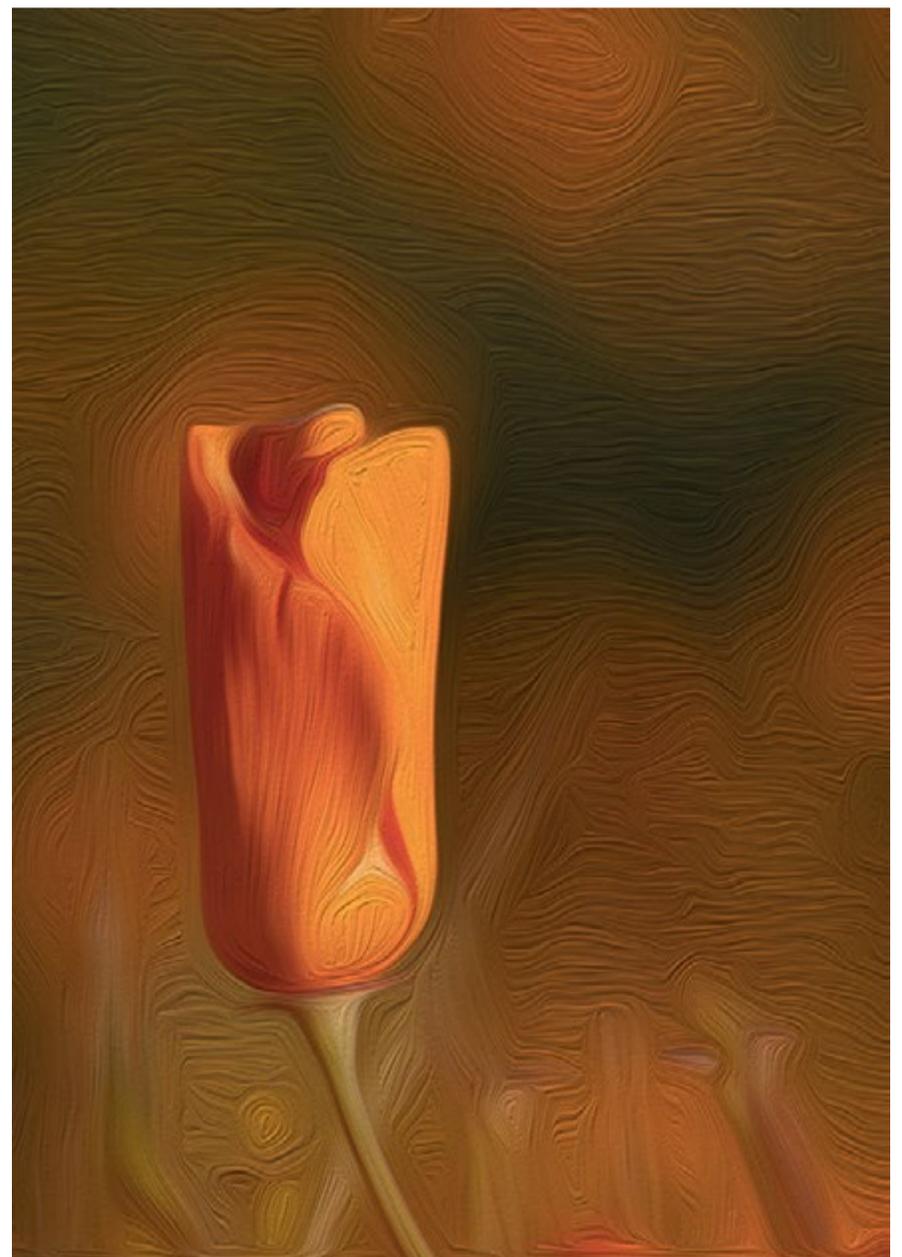
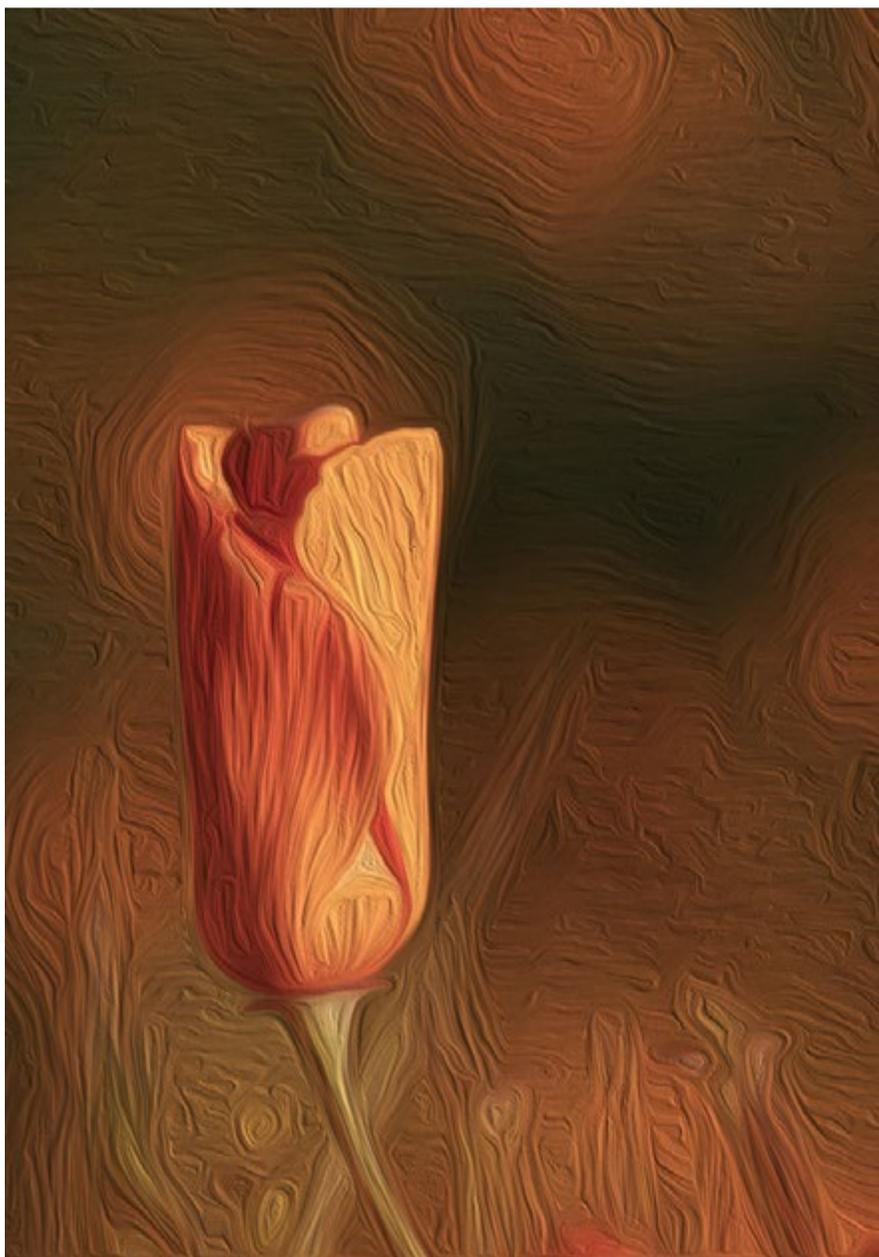
To be sure, the Oil Paint filter is one I would use here and there on certain images that seemed best-suited for the effect. And

often I have used it on a duplicate layer at a reduced opacity to tone down the effect, or in conjunction with a layer mask so it only affects a limited portion of the image. But I really like the effect, and I will continue to use it when I feel it works well for a photo, even if others don't care (or even strongly dislike) the effect.

In other words, with time I've learned to be respectful of the opinions of other photographers, but to not let those opinions derail me. I've learned to know when I really like one of my photographs, and I've learned

to appreciate the reasons I like a particular photograph. I've also learned to take the feedback from other photographers, but to put it through my own filter and decide for myself whether I'll change anything as a result of that feedback.

I think this is incredibly important for all photographers. It is important to have confidence when it is warranted, and humility when it is due. But it is also important to love the photographs that are special to you, even if nobody else agrees.



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**October 10-14, 2012**

Tim Grey will return for the third straight year to the California Photo Festival on the central coast of California to present a series of photography and digital imaging sessions. Choose from a wide variety of topics presented by various instructors, and of course get the opportunity to learn from Tim in his sessions and during free time.

<http://www.californiaphotofest.com/events.php?instructor=9>

### Olympic National Park Workshop

**May 5-11, 2013**

Experience the remarkable forests, rugged coasts, and quaint towns of the Olympic Peninsula with this week-long workshop led by Tim Grey and Wolfgang Kaehler.

<http://timgreystore.com/index.php?app=ecom&ns=prodshow&ref=OLYMPIC2013>

### Palouse Photo Workshop

**June 15-21, 2013**

Experience the incredible landscape of the Palouse region of eastern Washington state with this week-long workshop led by Tim Grey and Wolfgang Kaehler.

<http://timgreystore.com/index.php?app=ecom&ns=prodshow&ref=PALOUSE2013>

# Pixology

The Magazine for Photographers

*Pixology* magazine is published electronically on a monthly basis. For more information, visit [www.pixologymag.com](http://www.pixologymag.com)

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## About Tim Grey

*Tim Grey is regarded as one of the top educators in digital photography and imaging, offering clear guidance on complex subjects through his writing and speaking.*

*Tim has authored more than a dozen books and hundreds of magazine articles on digital imaging for photographers, and has produced over a dozen video training titles on a wide variety of subjects. He publishes the [Ask Tim Grey](#) email newsletter in addition to [Pixology](#) magazine. Tim teaches through workshops, seminars, and appearances at major events around the world.*



## For more information:

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# Parting Shot

