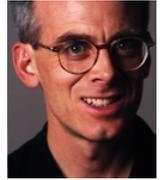




*If you've ever experienced a total solar eclipse, then you know that film truly cannot capture the entire visual experience. Many have tried, using complex darkroom printing techniques, but now Adobe® Photoshop® changes everything. Using some simple Photoshop techniques, we can combine, enhance, and sharpen the available pixels in a scanned negative and bring the eclipse image to life.*

Eclipse photos courtesy of Fred Espanak © 1998



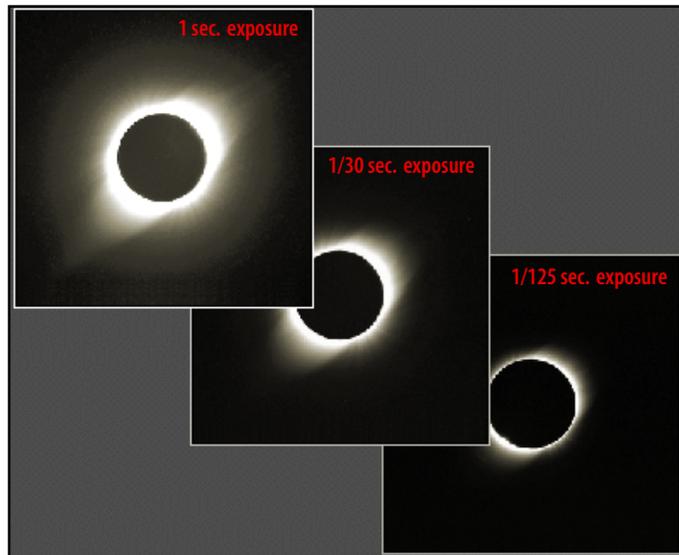
Adobe Senior Creative Director Russell Brown reveals the secrets of eclipse imaging with Adobe Photoshop 5.

**ADVANCED**

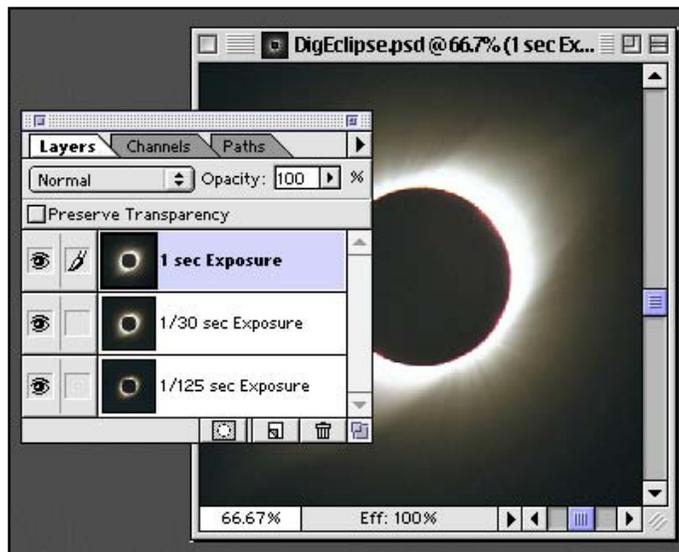
## DIGITAL ECLIPSE



1. Start with three or more different exposures. Be sure to scan all the originals at the same size. (These images were scanned at 48 bits per pixel.) Photoshop can now do many tasks at this resolution. The advantage to initially working in this space will be the increased dynamic range of the image. Correct the images with Curves or Levels first, and then convert the images to 8 bits just before you start your project.



2. Put all the images into one file and indicate what the exposure is in each layer. Put the longest exposure at the top. Our goal in the first part of this project is to create a composite image of all three exposures.



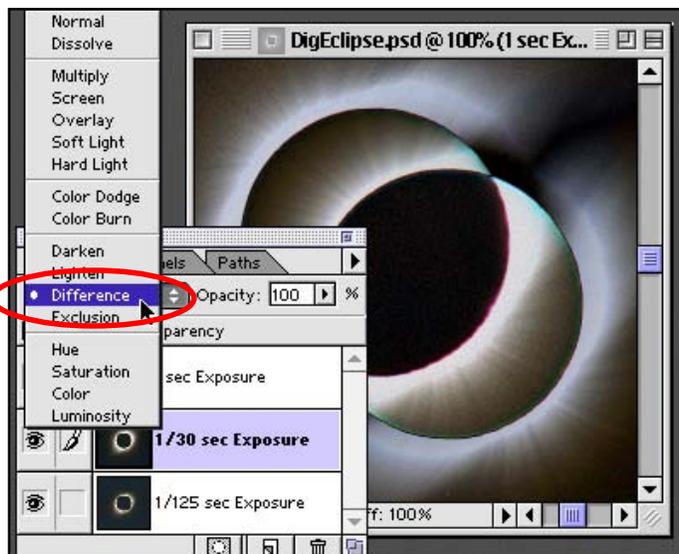
3. Turn on Rulers (Command/ Ctrl + R) and drag a guide out from the side and center it within your working area. Drag a guide from the top and center it also. Our goal is to define the center point of our image and then position the eclipse images in the center, because we will use a radial blur in a following step and we need everything to rotate around the center. Now, align your bottom layer by centering the eclipse where the guides cross.



**Ruler tips**  
Set your ruler units preference to percentage, and then move the guides to the 50% location. Hold the Shift key and the guides will snap to the center.

4. Next we need to perfectly align the other two layers of exposures with the bottom layer. Here's a great tip on how to do just that.

First, with the bottom layer centered and the only layer visible, select the layer just above the bottom layer and set the mode to Difference! Wow! It looks pretty strange, but here's the trick: Simply move the top image with the move tool and arrow keys until you see the least amount of image.



**Difference mode**  
Looks at the color information in each channel and subtracts either the blend color from the base color or the base color from the blend color, depending on which has the greater brightness value. Blending with white inverts the base color values; blending with black produces no change.

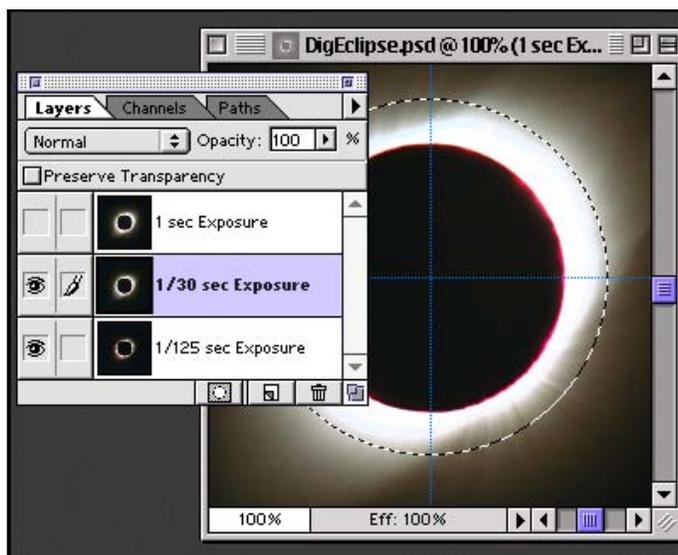
5. As you can see in this step, the image is almost black. Some image will still be visible, because the images have some differences. That's what makes this technique so accurate. If you move the images until the least amount of image is visible, then you know that they are exactly aligned. Note, however, that some rotation or scaling may be necessary if you did not scan the originals at the same sizes or orientation. Set the Mode back to Normal before continuing to the next layer.



**Centering layers**  
Continue through all the layers, starting from the bottom, until they are all aligned. This technique works well for a variety of alignment tasks in Photoshop.

6. Now that we have the images aligned perfectly on top of each other, we are ready to combine the optimal exposures of each photograph into one image. To do this we are going to use Layer Masks.

Start by making just the bottom two layers visible, as shown in this image. Target the second layer from the bottom, and make a circular selection that will include the area closest to the edge of the moon.



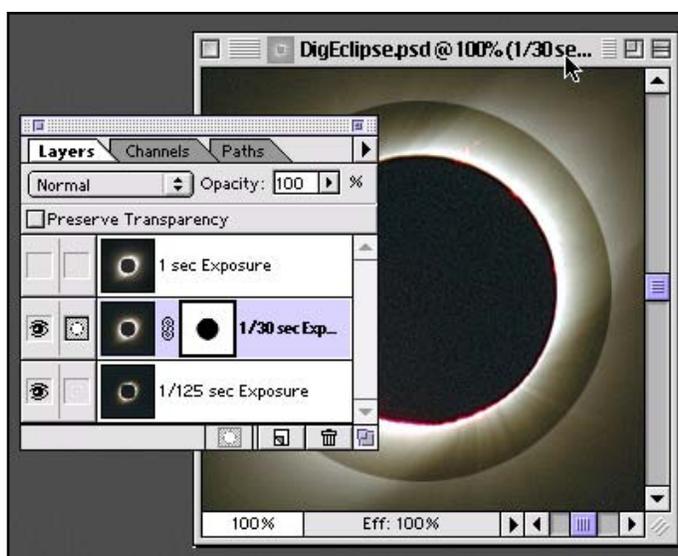
### Making selections

You can use your guides again, and remember these handy keyboard commands:

- Option/Alt key draws the selection from the center.
- Shift key constrains the selection to a circle.
- Spacebar + drag allows you to move the selection while you are drawing it.
- Arrow keys move the selection 1 pixel.

7. From the Layers menu choose Add Layer Mask > Hide Selection. A mask that is linked to the second layer appears.

Notice that we now have cut out a window that shows through to the bottom layer. The transition is to abrupt, but we can fix that in the next step.



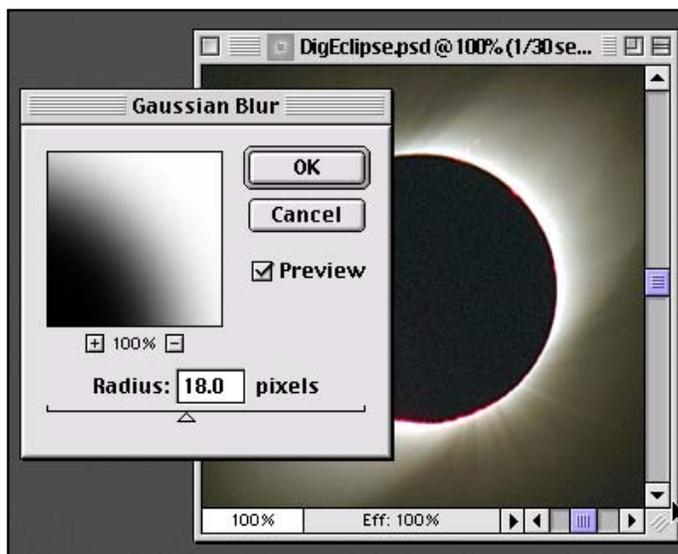
### Layer mask

A layer mask controls how different areas within a layer are hidden and revealed without actually affecting the pixels on that layer.

### Layer mask options

- Option-click displays the layer mask.
- Command-click loads the layer mask as a selection.
- Shift-click turns the layer mask on and off.

8. Make sure the layer mask is your current targeted image and apply a Blur > Gaussian Blur to the layer. Adjust the radius of the blur until the two images blend together seamlessly.

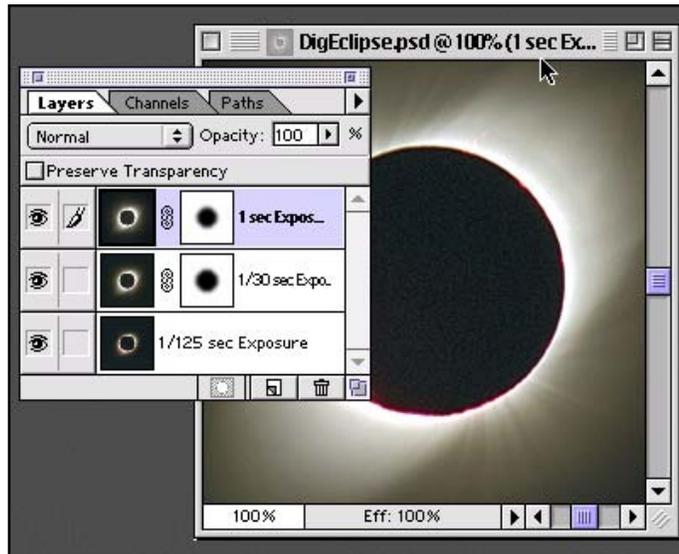


### Super hint!

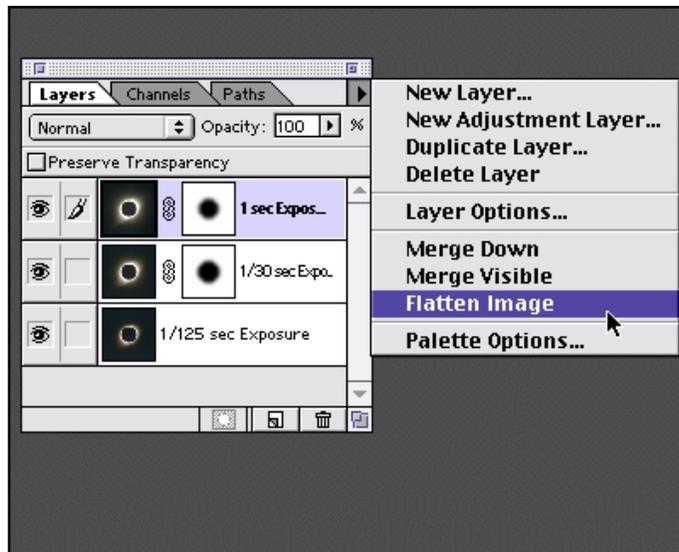
You can adjust the layer mask with even more detail by making a Levels adjustment. Moving the white point, black point, or mid tones will achieve different results. Give it a try!

9. Repeat steps 6 through 8 on the next layer in the project.

At this point you have successfully blended the image in to one continuous exposure. Amazingly you have created a dynamic range of shades that would not be possible in just one exposure of an eclipse captured on film.

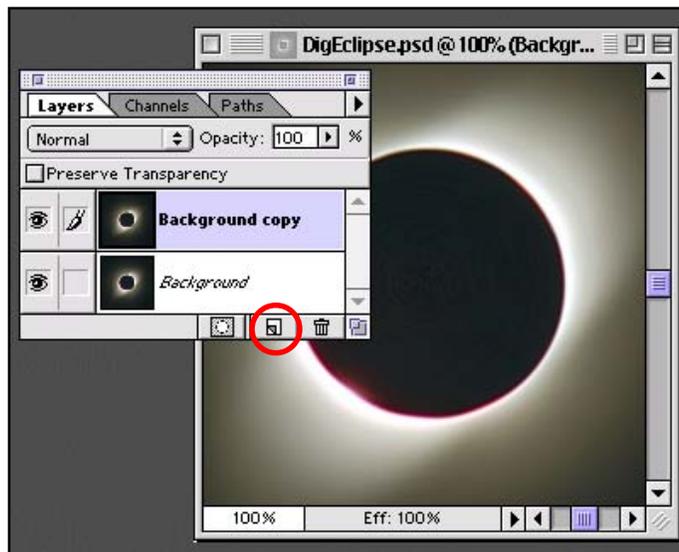


10. If you would like to simplify your project at this time, then flatten the image from the Layers palette. Advanced users can maintain the layers for further adjustments as the project continues. I have chosen to flatten the image.



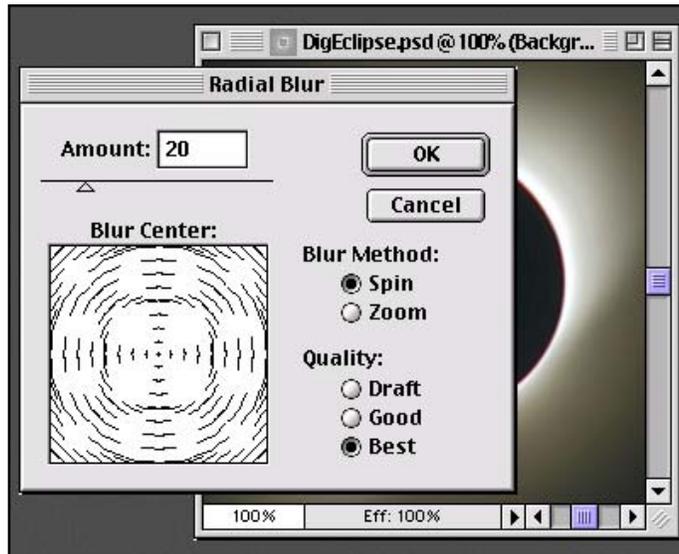
11. You could stop the project now, but wait—there's more!

Let's enhance the image with a special unsharp mask. To do this, start by duplicating the Background layer from our flattened image. Drag the Background layer onto the new layer icon in the Layers palette.



**Unsharp Mask**  
Unsharp masking is a traditional film compositing technique used to sharpen edges in an image. The photographic negative is sandwiched along with a slightly out-of-focus duplicate negative—an unsharp mask—and the exposure time is roughly doubled. With the unsharp mask and the exposure time increased, the light side of the edges becomes lighter and the dark side darker, heightening contrast and thus making the image look sharper.

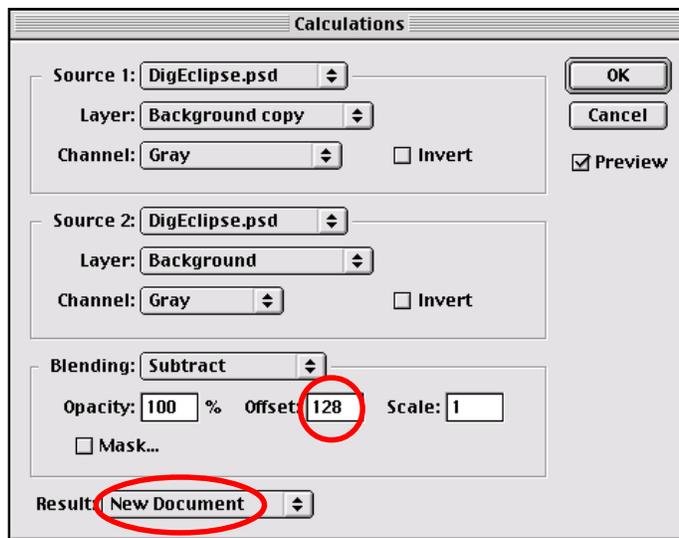
12. Next run a Blur > Radial Blur on the copy of the background layer. Adjust the settings to match those used in this image. Then try changing the amount of blur for different results. Not enough blur, and you won't see the detail; too much blur, and there will be too much detail at the end. Each photographer's images will be different, possibly along with the resolution, so there may not be an exact amount that is perfect for all images.



### Calculations!

Don't run away! This next step may look scary, but it's very powerful and worth giving a try. I searched for a simpler way to do this and I could not find it. I've always said everything can be done with layers—well I was wrong.

13. You now have two layers—the Background layer that is normal, and the copy that is blurred. If you subtract the values of the original image from the blurred image, you will end up with only those areas that are different, in this case, an image that enhances the edges of the sun's flares. Choose Image > Calculations, and set it up as shown to the right. Be sure to select New Document for Result.

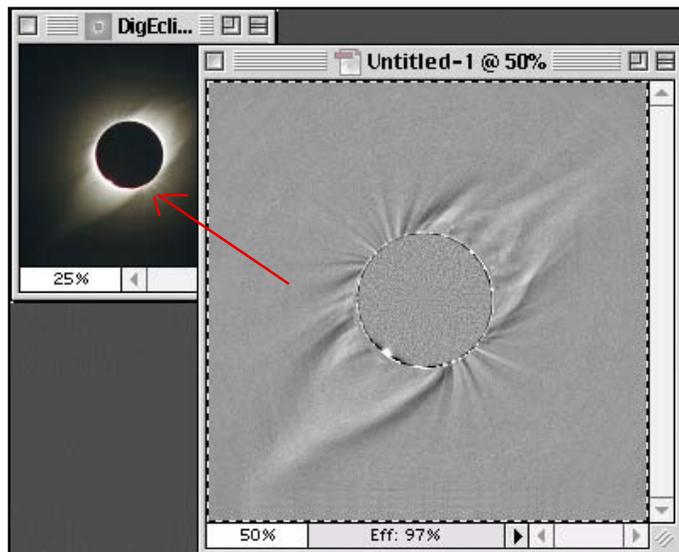


### Notice

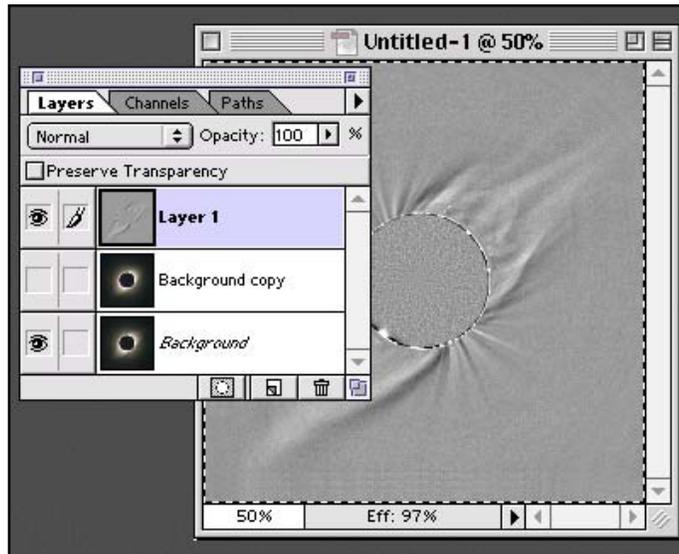
The edges of the sun are not blurred, only the light surrounding the sun is. Now you understand why we went to so much trouble to center the images in the work space.

14. Your results will look something like this. You will now have two images on your screen: The original composite image, and the unsharp mask we created with Calculations.

Next we need to combine the two images to finish our project. Use Command/Ctrl + A to select the entire unsharp mask image, and then copy. Target the original image, and paste the image into the project.

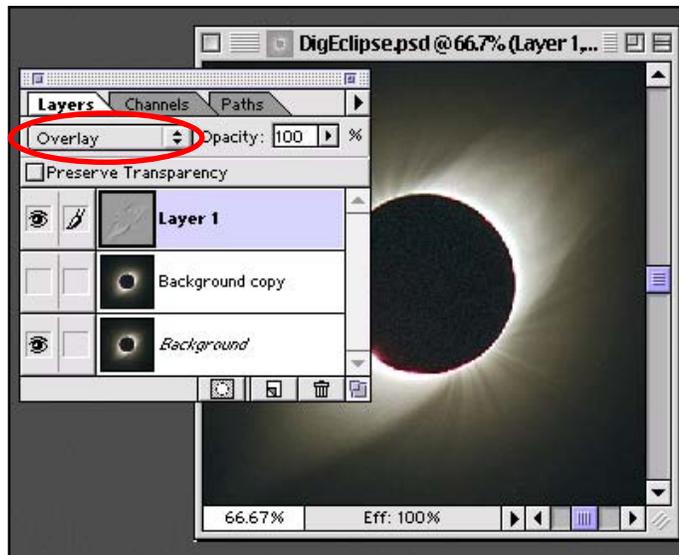


15. You should now have three layers. Hide the blurred Background copy that we used in the calculation and stack the layers as shown to the right.



16. Here comes the magic!

Set the topmost unsharp mask layer to a mode of Overlay. Wow! The hidden detail in the image is magically revealed! If you want to reduce the effect, just change the opacity of the unsharp mask layer. If you want more edge enhancement, then duplicate the unsharp mask layer and you will get an increased effect.



### Overlay mode

Screens the colors, depending on the base color. Patterns or colors overlay the existing pixels while preserving the highlights and shadows of the base color. The base color is not replaced, but is mixed with the blend color to reflect the lightness or darkness of the original color.

Wow! It looks great, but not even Adobe Photoshop can capture the amazing play of light that only the human eye can capture.

Here's some advice from Russell Preston Brown. Go experience an eclipse in person! There is absolutely nothing like it in the world.



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