

Basic Image Editing

These simple processing tips can transform your astrophotos from bland to beautiful.

Unlike daytime snapshots, night-sky photos almost always require some amount of post-processing to bring out the very best each frame has to offer. Indeed, a working knowledge of basic image editing is as important as a detailed understanding of how to use your camera.

The following recipe offers some simple steps you can follow to transform your raw images from bland to beautiful. In this discussion I'll describe methods using *Adobe Photoshop Lightroom*, but you can obtain similar results with almost any photo-editing software.

Quality Ingredients

As with cooking a fine meal, you need to start with high-quality ingredients to

ensure a successful photographic result. You can't fix trailed stars, camera shake, or poor focus with post-processing. Setting your camera to shoot in RAW mode (rather than JPEG) will provide the greatest latitude for making adjustments to your images.

Even with post-processing magic, it's still crucial to get the exposure right "in camera." While you can recover some shadow detail in an underexposed image, it's impossible to rescue blown-out (or "clipped") highlights. Since stars are often the brightest objects in a night-sky photograph, it's important not to overexpose them as this tends to wash out their vivid colors.

The best way to ensure the correct exposure is to utilize your camera's his-

togram display. A well-exposed night-sky image will have a histogram hump fully separated from the left side of the graph, while not extending too much past the midway point.

Correcting Colors

As shot, all astronomical images have some sort of color cast straight out of the camera. When you drop your images into *Lightroom*, you could just set the **White Balance** setting in the Edit panel to Daylight (the Sun is just another star, after all), but this usually results in a brownish background sky — especially in light-polluted areas.

Since it's extremely hard to detect subtle color casts, one trick I use is to temporarily set the **Saturation** slider in

► THE RAW AND THE COOKED

These two images portraying the Lagoon and Trifid nebulae in Sagittarius show the effects of the basic editing steps described in the text. All adjustments were made in *Adobe Lightroom*. Compare the modified version (left) to the original image (right) and note the pleasingly neutral background sky, higher contrast, reduced noise, and increased saturation. All this detail was present in the original RAW file and just required some adjustments to reveal. Since the alterations are non-destructive, they can be revisited later to obtain a different look.





▲ **ARTIFICIAL INTELLIGENCE AT WORK** In 2023, Adobe added an AI-powered feature called **Denoise** to *Photoshop* and *Lightroom*. The software uses machine learning to differentiate between fine details (including stars) and unwanted noise in high-ISO images. This before-and-after comparison of a cropped-in photo of the Andromeda Galaxy shows its benefits. The original 30-second exposure (left) was shot at ISO 16,000 and displays a large amount of digital noise, which appears as confetti-like colored speckles. A similar, standalone product called *Topaz De-Noise AI* is also available from Topaz Labs.

Lightroom to +100, which makes any color issues more obvious. Next, as you adjust the **Temp** and **Tint** sliders, watch the Histogram display and simply line up the colored humps to maximize the grey area in the middle of the graph. I find this to be an extremely sensitive way to color-balance my wide-field astro images.

Once you've eliminated the color cast, you can return the **Saturation** slider to a more reasonable value. The final setting is very much one of personal taste, but I usually leave it around +15 or so. The **Vibrance** slider offers a more subtle form of adjustment that increases the intensity of the less-saturated colors while leaving already-saturated colors alone. Again, adjust to personal taste.

At this point, you'll have a neutral white balance. This is fine, but you may

want to circle back to make your photo a little warmer (more yellow) or cooler (bluer) for purely aesthetic reasons. A winter image may benefit from a cooler tone, while a desert landscape may work better with a warmer setting. Try some minor white balance tweaks and see what resonates with you.

Tone, Texture, Clarity, and Noise

Astro images are odd ducks that often have a whole bunch of information packed into a fairly narrow luminance range. You can use the sliders in *Lightroom's* **Edit** panel to enhance the overall brightness and contrast in your image. This is where shooting in RAW format pays off, because you can make more aggressive adjustments than possible with a JPEG image.

Start with the **Exposure** slider to adjust the overall brightness of the image. If you've followed my recommendation to expose the original image to protect the highlights, then you may need to brighten the image a bit. If the stars start to blow out, you can recover some detail in them by reducing the **Highlights** slider. If your image lacks contrast, you can darken the sky background by reducing the **Blacks** slider level. (If you're old enough to remember graphic equalizers on component stereo systems, this set of sliders is the visual equivalent.)

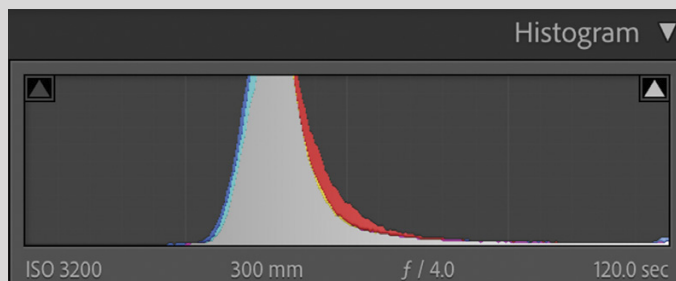
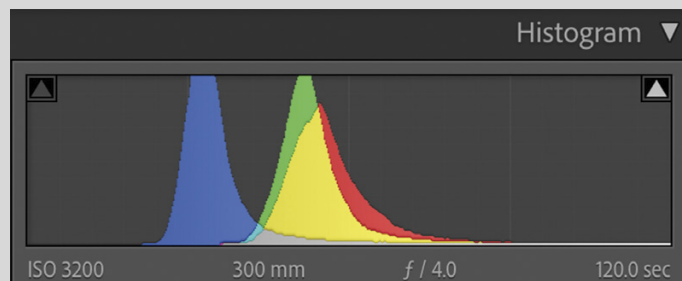
Use the **Texture** slider to increase the visibility of mid-level brightness features in your photo, without affecting the fine details. You may need to zoom in to 100% magnification to properly judge its effects.

The **Clarity** slider is one of my favorite tools for enhancing wide-field astro images. It adds midtone contrast, which helps bring out details in nebulae and galaxies without affecting the highlights or shadows in the photo. It's easy to overdo it, though, so use it sparingly — a little goes a long way.

If you're imaging from an urban area, your images will suffer from light pollution, which makes any atmospheric haze look worse. Dragging the **Dehaze** slider to the right can cut through the fog and help reveal more detail and color. It also helps add some punch to a moonlit nightscape.

Noise Reduction and Lens Correction

Quite often when imaging faint astronomical objects you'll have to resort to



▲ **GRAPHIC EXAMPLE** The screen at left shows the appearance of the Histogram in *Lightroom* when the image was initially imported. Note how the red, green, and blue humps in the display aren't lined up. A simple trick to neutralize the color cast of a wide-field image is to line up the three humps by adjusting the **Temp** and **Tint** sliders. And as the illustration on the facing page demonstrates, you can also use these sliders for creative purposes.



▲ **A MATTER OF (WHITE) BALANCE** This triptych illustrates the creative options available when setting the white balance for a night-sky image. The center panel is technically correct since it displays a neutral color with the **Temp** slider set to 4,000K. The frame on the left has the white balance set to a cooler 3,000K value, which gives a wintery appearance. The panel on the right has a white balance of 5,000K, giving it a warmer cast.

high-ISO settings. This can give images a grainy, sandpaper-like appearance. You can minimize this problem by utilizing *Lightroom's* **Luminance** and **Color** noise-reduction sliders. Unfortunately, these adjustments can also eliminate some of the natural color variation among stars — and you may even start to lose faint stars.

Last year, Adobe introduced an AI-powered feature called **Denoise**, which uses machine learning to differentiate between fine detail and unwanted noise in a high-ISO image. It works remarkably well on night-sky images — all with the press of a single button! The default setting seems to be effective, but if you want to manually adjust the amount of noise reduction there is a slider you can tweak. A similar, standalone product called *Topaz DeNoise AI* is also available from Topaz Labs (topazlabs.com).

One advantage of shooting with a standard camera lens is that you can use *Lightroom's* built-in lens profiles to automatically correct issues like distortion, vignetting, and chromatic aberration. In the **Optics** subsection, simply click the **Enable Lens Corrections** box, then select the Make and Model of the optic you used for the photo. (If your lens isn't listed, check the Adobe Lens Profile Downloader.) The only time I don't enable the profile corrections is when I'm shooting with a fisheye lens.

Experiment and Tweak

At this point in the process, you should have an image that's dramatically different from what you started with. Since every photo is unique, you'll probably want to go back and revisit some of the adjustments you've made. The good news is that all the changes you make to RAW files are completely non-destructive and reversible. So, feel free to experiment!

After I do an initial edit of my image, I usually set it aside overnight to “let it simmer.” I'll come back the next day and see if there are any revisions I want to make upon second viewing. Once I'm happy with how things look, I move on to cropping. It's the final step, and it should be done after all other post-processing is complete.

The specific aspect ratio you choose will largely be determined by how the image will be displayed. Different social media outlets have different requirements, and if your goal is to create a print you can hang on a wall, you'll make different choices. Of course, there's no reason why you can't create different versions for each application.

After cropping, export your final version in JPEG format. Before you do this, take a moment to scan around the perimeter of your image. This “border patrol” can turn up unwanted intrusions (such as a tree branch, or

half a star) that poke into the frame and detract from the overall composition. Tightening your crop a bit to remove such distractions will instantly strengthen your image. Like cutting a diamond, it's often what you remove rather than what you keep that will ultimately make your photo sparkle.

Sharing and Feedback

It's worth remembering that there's no “correct” outcome when it comes to image processing — it's very subjective and depends on your particular taste. Regardless, make sure that all your editing choices are completely intentional rather than just accepting whatever comes out of your camera. Don't be afraid to experiment. If it makes for a better photo, then go for it!

Finally, to improve your editing skills, consider posting your final image on one of the many online astrophotography forums. You might get some helpful tips and suggestions. However, it's up to you to decide if the feedback you receive is worth considering or not. After all, the route you take on your creative journey is yours alone to choose.

■ **TONY PUERZER** is a retired professional photographer and an avid amateur astrophotographer. He loves discovering the details hidden in a properly exposed night-sky image.