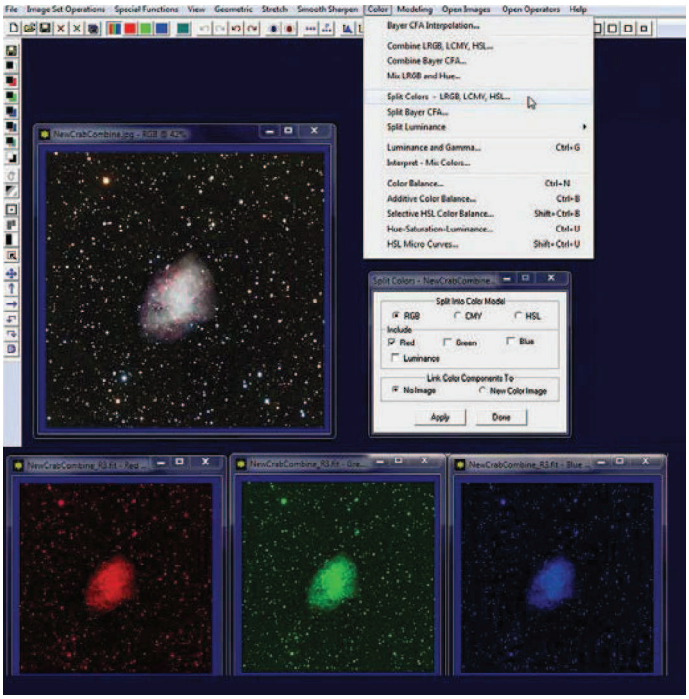
To combat this problem, I've developed an easy technique to enhance my images by layering in new data and mixing the color channels using the software *ImagesPlus* (**www.mlunsold.com**). *ImagesPlus* was written specifically for processing astrophotos from OSC and DSLR cameras as well as standard monochrome CCD cameras.

Isolating Nebulosity

An OSC camera incorporates individual color filters over every pixel, commonly known as a Bayer filter. This filter array divides the pixels of your camera into three colors, much like a television screen: 50% of the pixels have green filters, 25% have blue, and the other 25% are red. When this array records a photo, software interpolates the gaps between the pixels in a single color channel to create the full-color image. In the past, the result was of perceptibly lower resolution than those made with monochrome images recorded through color filters. Interpolation algorithms have improved to the point that today the difference is almost imperceptible.

Roughly a decade ago, noted astrophotographer Robert Gendler proposed that, much like combining narrowband hydrogen-alpha (Hα) images with color data, a red-filtered image mixed with the luminosity information in an astrophoto will produce a "poor man's" Hα-enhanced image. After all, Hα is captured in red-filtered images recorded with OSC and modified DSLRs. This technique turns out to be quite useful for OSC cameras.

For example, in an average color image of the Crab Nebula (M1), the red tendrils of gas are muted and difficult to see. With an Hα exposure added to the photo, these tendrils become much more pronounced and vividly colored. We can obtain a similar result by using a red luminance image, since the detail we wish to enhance is already recorded in the red channel. Instead of taking additional exposures through an Hα filter, we can record more color exposures, combine them into a single new



The first step to red luminance layering in *ImagesPlus* is to separate your image into its individual color channels. Once accomplished, the program helpfully displays each channel in its assigned color, as shown here.

RGB image, and extract the red channel for use as a luminance image. Since you will only be using the red data, try to take almost twice as much exposure time for this red luminance as you did for the original unenhanced color result to ensure a deep, smooth result.

Most emission nebulae contain large amounts of Hα light. But they also contain smaller amounts of hydrogen-beta (Hβ), which emits in the blue/green spectral region, and hydrogen-gamma (Hγ), which emits in blue. If we tried to simply layer the red luminance onto the original color image, the nebula would appear an odd salmon

Extended nebulosity is contained in all of your images taken with OSC and modified DSLR cameras. But mixing a red luminosity channel requires a little more work to enhance your image while still retaining a pleasing color balance. The Crab Nebula (M1) image at left is a normally processed OSC color photo, while the center image replaces the luminosity channel with the red channel data, distorting the overall color in the photo. By mixing a small percentage of the red channel with the blue and green, a pleasing result is achieved at right.