

Nebula filters, from page 1

extent, but don't expect them to magically make the sky dark through the eyepiece of a scope. The first key point to remember about filters is that they do not make objects brighter, only dimmer! What they can do is improve contrast, making an object easier to see and often bringing out more detail.

Enhancing nebulae

The second two types in the diagram are what are considered to be nebula filters: narrowband and line. Narrowband filters pass light in a region that encompasses both hydrogen-beta and oxygen-III lines. Some narrowband filters such as the Lumicon UHC and the Thousand Oaks have a hydrogen-alpha bandpass while the Orion Ultrablock does not. Line filters are very narrow filters which pass a specific emission line or set of lines. The O-III filter is by far the most widely used line filter.

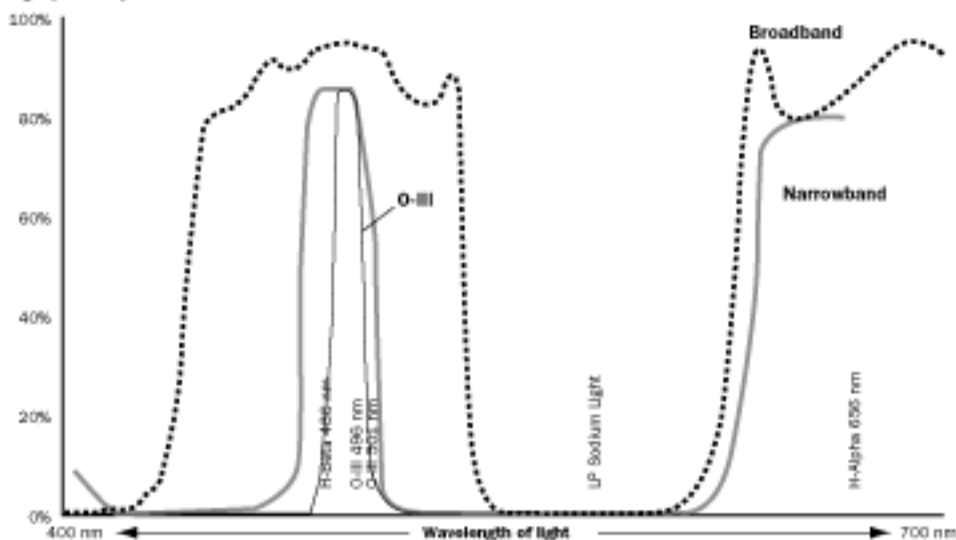
These filters can significantly enhance the visibility of nebulae, as nebulae typically emit much of their visual light as oxygen or hydrogen emission lines. But how well they

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work depends on the nebula and the aperture of the scope. For some nebulae, such as the Veil Nebula in Cygnus, a narrowband or O-III filter can make a huge difference in being able to see it. On others, the difference is not as noticeable. Some nebulae will respond better to a narrowband while others, including many planetary nebulae, respond better to an O-III. For beginners,

Bandpass ratios for 3 types of filters

Light passed by filter



the best way to learn about using these filters is to come out to a club observing session and try one.

Narrowband versus O-III

Because these filters can be expensive—typically \$50 to \$100 for a 1.25" filter or \$150 to \$200 for a 2"—a common question is: If I can only get one, should I get a narrowband or an O-III? You will find a difference of opinions on answers to this question. In general, if you have a smaller scope, you may be better off with a narrowband as that will pass more light. An O-III will significantly dim the view and may not be as helpful in a small scope as a narrowband. But this is not a hard and fast rule—I use an O-III in my 85 mm refractor when looking at large nebulae such as the Veil or North American.

For anyone who has a medium to large aperture scope and wants to hunt down planetary nebulae, an O-III becomes a must-have accessory in the eyepiece case. Many observers eventually end up getting both a narrowband, if not several, and an O-III.

Using filters at dark sites

One other misconception that comes up with nebula filters is that they are not needed for true dark sky sites. This misconception presumably arises from the fact that nebula and so-called light pollution filters are frequently lumped together. In practice, a narrowband or O-III filter can be even more

effective at a dark site in seeing faint details of a nebula or observing that very-hard-to-see planetary.

Where to buy them

Lumicon, which was the first company to make nebula filters for the amateur astronomy market and has long been the main brand name for UHC and O-III filters, suddenly went out of business at the end of September. So who are the other sources for nebula filters? There is Thousand Oaks (broadband, narrowband, O-III, H-Beta); Meade; Orion (broadband and narrowband only); and Adirondack Video Astronomy, which sells filters from Astronomik, a German company, which are getting high marks. Another alternative is to look for filters on Astromart.com, an on-line astronomy equipment classified ad site.

As I stated, this is only a brief introduction to nebula filters. For more information, there are some useful websites such as David Knisely's review in the accessory section of www.cloudynights.com. A book on astronomy equipment that includes a section on filters is the recently released 3rd edition of *Star Ware* by Phil Harrington. Another valuable resource is your fellow club members! Ask what filters they use, or borrow one at club observing sessions to try it out in your scope. ★