1. Welcome to Telescopic Filters: Teasing out the Details

2. Filters cut down on the glare of bright objects or they bring out features that are hidden without a filter. Filters always take something away; **filters always filter**. They remove certain aspects of the electromagnetic spectrum.
Paradoxically, you see more with a filter by taking something away from the light spectrum.
Except for solar filters, and this is a very important safety consideration, filters screw onto eyepieces and interpose themselves in the light path. They screw into a threaded recess at the end of the eyepiece furthest from the eye. This schematic cutaway shows the filter in the light path. The eye is to the right of the eyepiece and the draw tube of the telescope is to the left.
You can, in fact, stack filters for increased effect but two stacked filters is usually the practical limit. (1) More than two stacked filters can produce loss of light in smaller instruments and, (2) stacking more than two filters can mean you will strike the mirror diagonal if you are using one when you re-insert the eyepiece. You can get filters sized to screw into the standard 0.965, 1.25 and 2 inch eyepieces.

3. So to quickly restate things…[Read slide.]

4. Almost everyone eventually winds up with a basic set of four color filters. They come either in little individual plastic boxes or maybe they come in a round wheel box. The question facing every new amateur astronomer is what do I use them for and what can I expect to see with them?
Understanding how they work is key to the answers. Taking for example a red filter, the way they work is by scattering any red features observed through the telescope/eyepiece/filter combination. Red features are lost due to the properties of the red filter. **Red filters filter out red features**. Blue features will appear considerably stronger since they are passed by the filter. The reverse is true for a blue filter. Blue filters filter out blue features.
Here's a practical astronomy example: Jupiter's Great Red Spot. It does not always appear red but it usually does. When it does, to observe extra details of the Great Red Spot, use a blue filter. A blue filter will accentuate the reddish features.
In real life, however, things are mixed and not so straightforward. The truth is, in spite of the next four slides showing what each of these basic filters can be used for, sometimes trial and error with a grounding in color theory will be necessary.

5. It is useful to at least know about the existence of Kodak's standardization, the Wratten Series. You don't need to choose between dozens of colors though, only a few will do. Each color filter will have a Kodak Wratten number.

6. Let's discuss the basic set in some detail since that is very often all manybeginning and even intermediate amateur astronomers possess. [Read slide.]

7. [Read slide.]

8. [Read slide.]

9. [Read slide.]

10. Now let's extract all of this information into something truly useful in a specific project: Which One Do I Use for Jupiter? [Read slide.]

11. What about filtering Mars?

12. Here's one chart (and there are others) indicating which of the color filters (each having their own Wratten number) can be used for bringing out various planetary features. Notice how the colors on the chart are matched up to the colors of the individual filters.

13. In the interest of full disclosure there are Spectrum Color Filter Wheels available. [Read slide.]

14. So let's review again.

15. Why filter at all? Here are various reasons. [Read slide.]

16. Here the filter basics again. [Read slide.]

17. Still more filter basics. [Read slide.]

18. Here's the reminder of how filters actually work. [Read slide.]

19. And here is one often adapted scheme to organize telescope filters. [Read slide.]

20. There are any number of manufacturers of telescope filters. These seem to be the major ones. [Read slide.]

21. You can accumulate quite a collection of filters beyond the basic four color filters. Organizing them for use at the telescope can become a challenge. Here's one approach.

22. And now a word on Lunar filters. We've already discussed planetary filters.

23. [Read slide.]

24. A few words now about Nebular and Light Pollution Filters.

25. I have just purchased a Baader Contrast Booster filter for around $60.00 and am quite pleased with it on lunar observations. [Read slide.]

26. The Baader filter is very popular and does all these wonderful things!

27. Meade also makes a series of nebular filters. [Read slide.]

28. I also use Orion Skyglow Broadband Light Pollution Filters.

29. [Read slide.]

30. I use Orion Ultrablock Narrowband Light Pollution Filters.

31. [Read slide.]

32. Lumicon makes a series of Deep Sky filters.

33. [Read slide.]

34. There is the Lumicon UHC filter.

35. [Read slide.]

36. They are famous for their O111 filters.

37. [Read slide.]

38. They make hydrogen-beta filters for solar viewing.

39. [Read slide.]

40. And it should be mentioned while on the subject of filters that solar eclipse viewing glasses are readily available from a number of quality manufacturers.

41. [Read slide.]

42. Finally, there are the Astro-Solar filters – all of which attach OVER, i.e., IN FRONT OF the telescope objective. NEVER place any kind of so-called solar filter in the light path at the eyepiece.

43. [Read slide.] We haven't covered the famous line of Coronado telescopes and filters and we did not discuss the use of a variable polarizer for adjusting the amount of light while viewing the moon. There are many other filter topics but the important thing to do is experiment with other people's filters. Once you get past the basic set of four planetary filters try for a set of narrowband and broadband light pollution filters. Save up for an OIII filter for nebulae and be sure and get a competent, quality solar filter. If you need help with your drain filter try Drain-O!