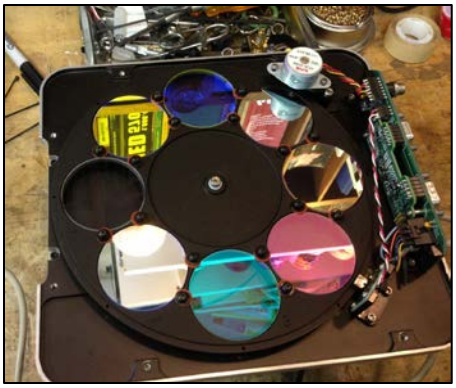
Skynet Telescope Filters



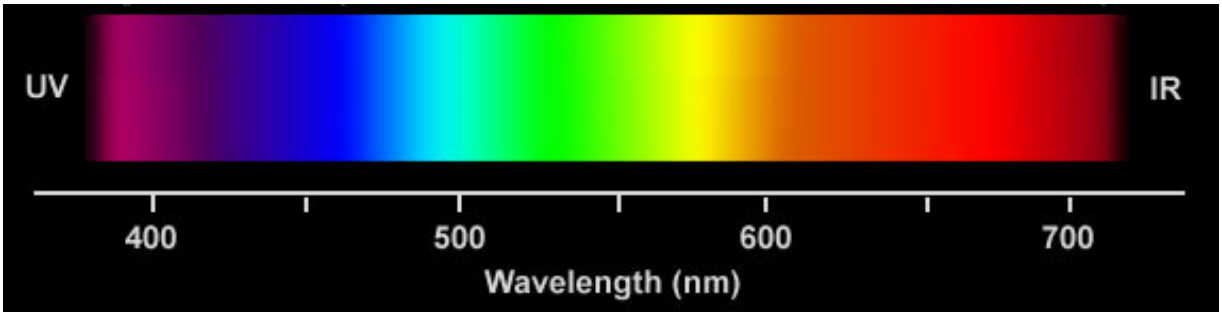
Filter Wheel for Yerkes 41-inch Telescope

Filters can be placed just before a telescope's camera to allow some colors or wavelengths of light to pass through while blocking others. Different telescopes on the Skynet Telescope Network have different filter combinations.

Sloan Digital Sky Survey (SDSS) Filters

These are the standard filters used for the Sloan Digital Sky Survey, and are the most common filter set used today. Even the Hubble Space Telescope uses SDSS filters. (These filters are properly represented with lower case letters. In some of our telescopes the SDSS filters might be listed with the word prime or as u' g' r' I' z'.)

Filter	Description	Central Wavelength
u	Passes ultraviolet light.	350 nanometers
g	Passes a combination of green-blue light	480 nanometers
r	Passes red-yellow light, but not all the red light.	625 nanometers
i	Passes long wavelength red light.	770 nanometers
z	Passes short wavelength infrared light.	910 nanometers



Visible light spectrum showing colors and wavelength

Johnson/Cousins Filters

These are filters for the UBVRI photometric system. The UBV filter system established by Johnson and Morgan has been the main means of measuring brightness and color in astronomy since 1953, but there have been some modifications. A major one was the addition of R and I filters by Kron and Cousins.

Filter	Description	Central Wavelength
U	Passes ultraviolet light.	360 nanometers
B	Passes blue light.	415 nanometers
V	V stands for visual. Passes yellow light.	520 nanometers
R	Passes red light.	600 nanometers
I	Passes infrared light.	800 nanometers

Narrow-Band Filters

These filters pass a very narrow range of light around a single wavelength or "spectral line." Atoms may emit or glow with light of very specific wavelengths. They are called "spectral lines." These filters are useful for observing objects like nebulae such as H II regions (Orion Nebula), planetary nebulae (Ring Nebula), and supernova remnants (Crab Nebula).

Filter	Description	Central Wavelength
H-alpha	Corresponds to emission from hydrogen, when an electron falls from third to second lowest energy level. Shows up in the red part of the spectrum.	656 nanometers
O III	Corresponds to emission from oxygen atoms that are missing two electrons. Shows up in the green part of the spectrum.	501 nanometers

Astrophotography Filters

Ordinary digital cameras make color images by combining light separately detected as Red (R), Green (G), and Blue (B). We can simulate the same approach by taking three black-and-white photographs through the Red, Green, and Blue colored filters, and sometimes adding a Luminance (Lum) that lets through most of the light and provides greater brightness. Note that good color images can also be made with the astronomically calibrated filter sets mentioned above.

Filter	Description
Lum (Luminance)	All optical light passes through but ultraviolet and infrared light does not.
Red	These filters are designed to mimic the response of the human eye. By taking images with each filter, the results can be combined into a single color image.
Green	
Blue	

Maximum Light Filters

These filters are useful for faint moving targets. Usually, you won't be able to see a difference between 'Open', 'Clear', and 'Lum'.

Filter	Description
Open	No filter. All light passes directly to the camera
Clear	Similar effect as 'Open' except light passes through clear piece of glass

Generic Filters

A generic filter is a collection of multiple filters which have similar characteristics. By selecting a generic filter, Skynet will use any of the available filters from the collection. This will maximize the number of telescopes which can complete your observation.

Filter	Description
HiThru: Open, Clear, Lum	for faint objects or when you are not concerned with color
LoThru: OIII, SII, Halpha, U, uprime	for bright objects
GenR: Red, R, rprime	reddish filters
GenG: Green, V	greenish filters
GenB: Blue, B	bluish filters