Overview

There are times when it is hard to image two closely spaced Double Stars.

When this occurs, this presentation provides one method to try and use Filters combined with stellar type to create separation between the stars through the manipulation of their light distribution.
Points of Interest:

- The magnitude of the A star (MAG1 in line 1) is 5.16
- The magnitude of the B star (MAG2 in line 1) is 12.00
- Estimated differential magnitude of 6.84
- Given the last observed separation in 1922 of 8.7 arcseconds, this combination poses a significant threat to being able to image this system.
- Close separations with high differentials in brightness, make imaging stars, such as these, difficult.

The case of WDS 05247+3723 provides an excellent teaching opportunity. Given the following summary from Stelle Doppie, we then click on the link “GO TO SIMBAD”
The initial page on SIMBAD provides a list of nearby stars with reported magnitudes and spectral types. It is IMPORTANT to note that these magnitudes and spectral types are displayed as reported in published academic/scientific papers. The references are outlined and available on Simbad if you desire more information.

The A star of this system is reported in line #1. There are three important lines for this star: Sp Type, Mag V, and Mag B.
- Sp Type: reported as K3III (we’ll break this down in a second)
- Mag V 5.007 (NOTE: V band is similar to G or Green)
- Mag B 6.479
- Keep in mind how the magnitude is decreasing as we move towards the Blue side of the spectrum.

Let’s break this down......
The A star is a Spectral Class K3III.

This HR Diagram has the colors superimposed on the graph. Remember: Blue is Hot....Red is Cool.

Look at the bottom where it says: Spectral Type. The letters from O to T are from Hot to Cool.

Our star is a K star. Therefore, it is redder in color.
In the graph to the right, we see something called Wien’s law. Basically, what this says is that the hotter an object is, the more light it puts off in the Blue….little less in Yellow….little in Red.

The hotter an object
• The bluer
• The less Red light is emanated

The cooler an object:
• The redder
• The less blue light is emanated.
With this understanding, and now knowing the star is a K3III star, use Wien’s Law diagram below coupled with the HR diagram to understand the images to the right.

A K-class star will emanate more in the red than the blue. Image #1 was taken with a Red filter and Image #2 with a blue. As a result of the star emanating less light in the blue, we have a smaller radius for A which allows star B, at 8 arcseconds from the A, to be seen.
Here is a final comparison:

**Successful Blue Filter**

**Unsuccessful Red/Ha Filter**
Questions?