# Obtaining a Spectra of the Two Stars of Albireo

## The process of using a Star Analyser 100 Grating

Albireo is a double star in the constellation of Cygnus. Since Cygnus is the swan, and Albireo (Beta Cygni) is located at the head of the swan, it is sometimes called the "beak star".

This double has been selected due to the two stars having marked differences in composition and spectral type.

The main star Albireo is a magnitude 3 K3 type star on the main sequence with a surface temperature of about 4000 degrees K and shows visually as orange.

The secondary star B2 Cyg is a 4.7 magnitude B8 type star with a surface temperature of 14000 degrees K and shows blue in colour.

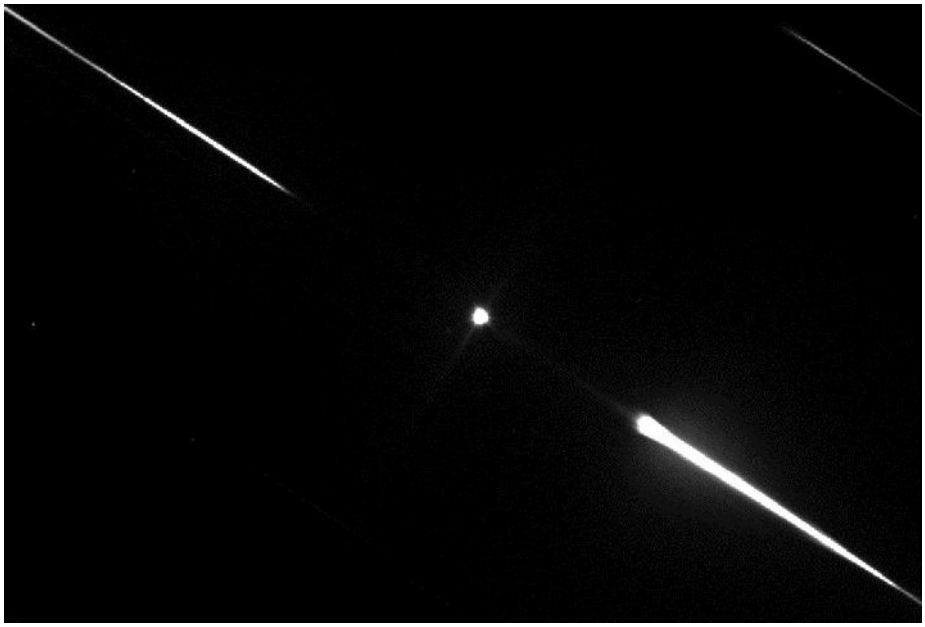
# Star Analyser 100 grating

The Star Analyser 100 (SA-100) grating is designed specifically for amateur astronomical spectroscopy. It can be mounted on a telescope just like any other 1.25” filter. It’s is easy to use, and works with most cameras. Capturing the spectrum of a star is easy using the grating, a DSLR and small telescope.


The Star Analyser is attached to a camera using a normal 1.25” mount.

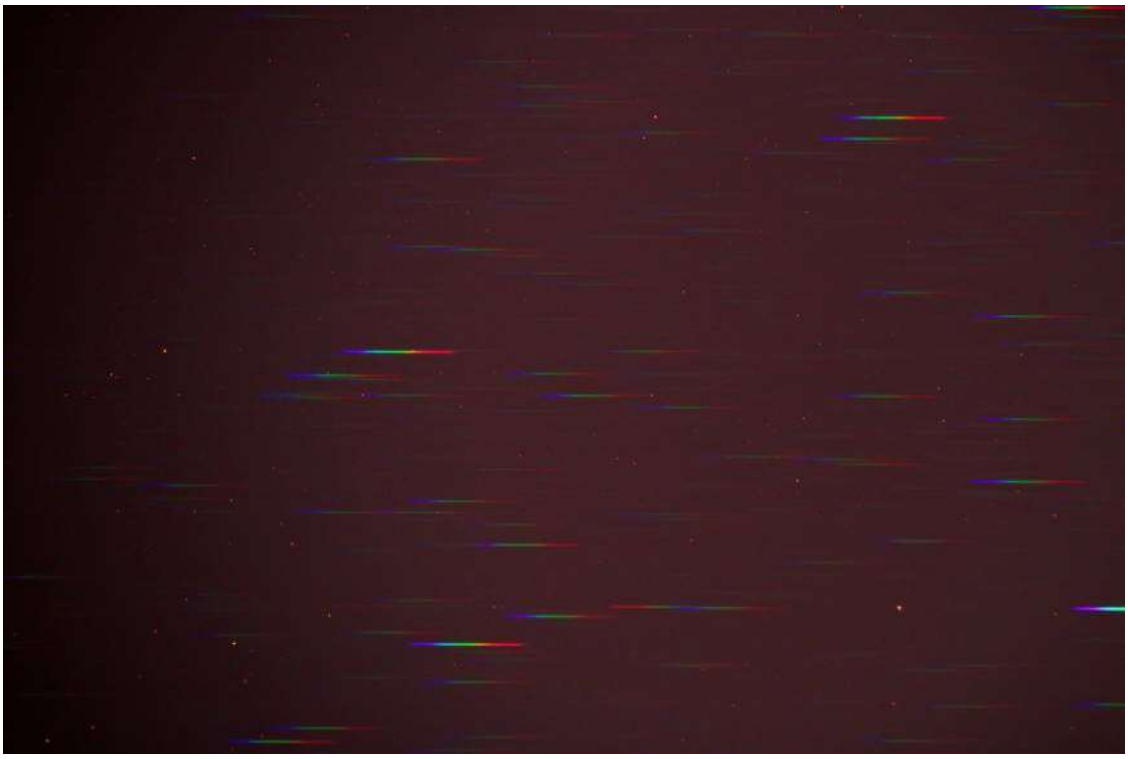
It is preferable to align the spectra with the camera sensor such that the spectra is horizontal with the blazed spectrum to the right of the star image. This can be done with short exposures of a bright star and most mounts have 3 small screws in the camera section to allow rotation. (Be careful to not slacken the screws too far as the camera can become detached.)


Before adjustment it may be more like this (Over exposed but suitable for adjustment.)



The blazed spectrum is on the right so the adjustment required is about 30 degrees anti-clockwise. It is worth spending some time getting this adjustment correct as it will make later processes easier.

Set the camera on an ISO of about 800. Point the telescope at Albireo and take an exposure of about 10 seconds. This will give you a starting point to gauge the final exposure. Actual time will vary due to telescope design and aperture. All the stars will give a spectral image.



This is the correct exposure which gives a good spectra range without overexposing any parts. Identify Albireo and rotate the camera and grating in the nosepiece of the telescope to get the best separation of the 2 spectra.

Once a good pair of spectra are obtained crop out the 2 spectra using any suitable image processing software. (This is why it is important to get the correct aligning of the spectra with the sensor).

You should now have 2 spectra as below.

Albireo

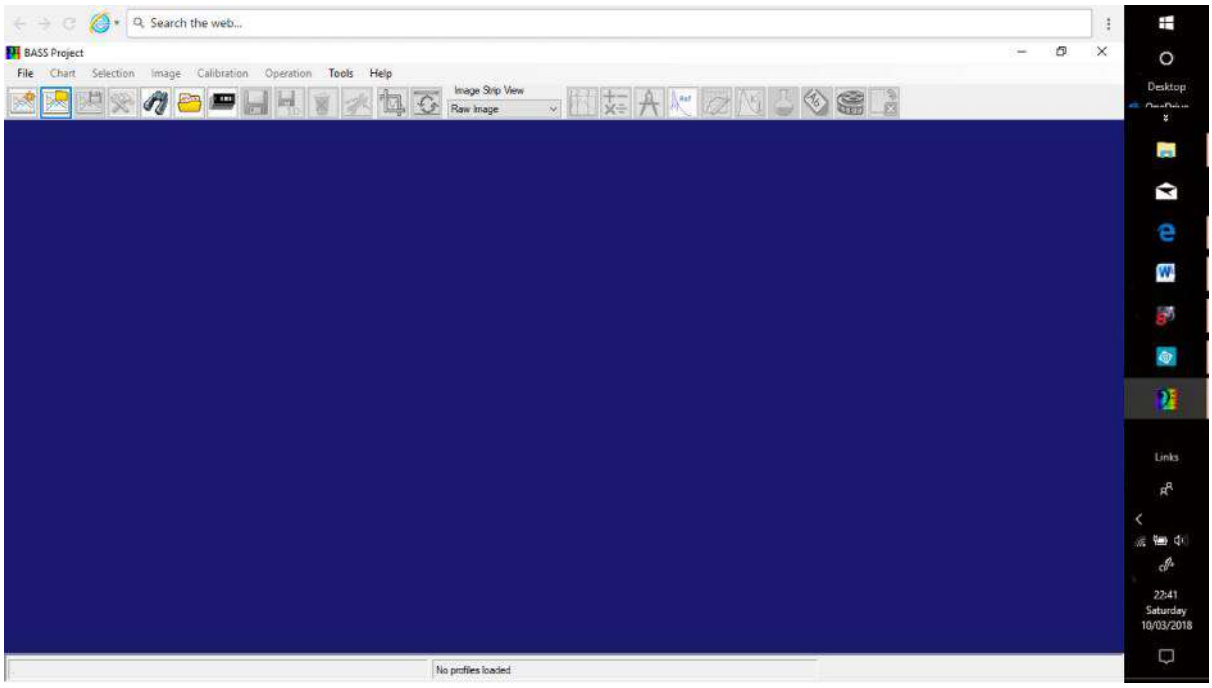
B2 Cyg

Even at this stage it is possible to see the differences in the 2 spectra. Albireo is far brighter in the red region and B2 Cyg is brighter in the pale blue region. Also some of the absorption lines are clear. With practice classification of stars into spectral types can be done at this stage. To find out more, specialist software such as BASS (Basic Astronomical Spectral Software) can unlock more details.

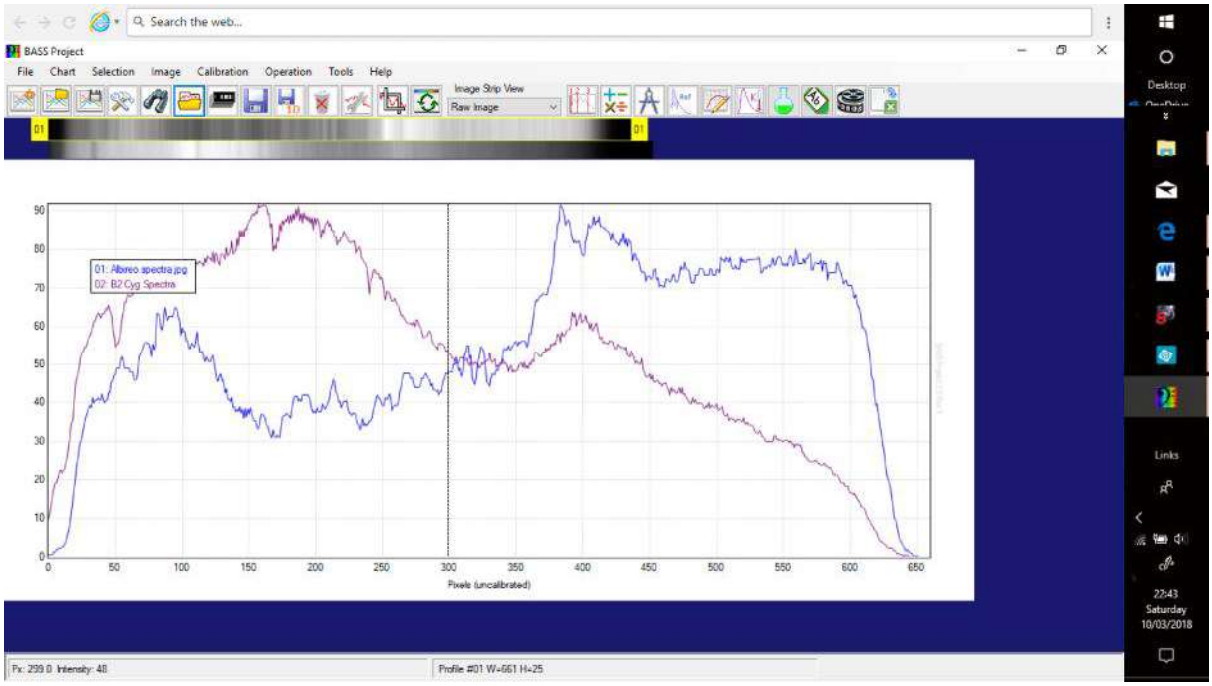
# Processing Using BASS

Here is a short run through of the use of the BASS program (free to down load).

Open The BASS program.




Import the 2 Spectra (Albireo and B2 Cyg).




This is uncalibrated, but shows the differences in the 2 spectra.

If further presentations on the use of BASS would be helpful please let me know.