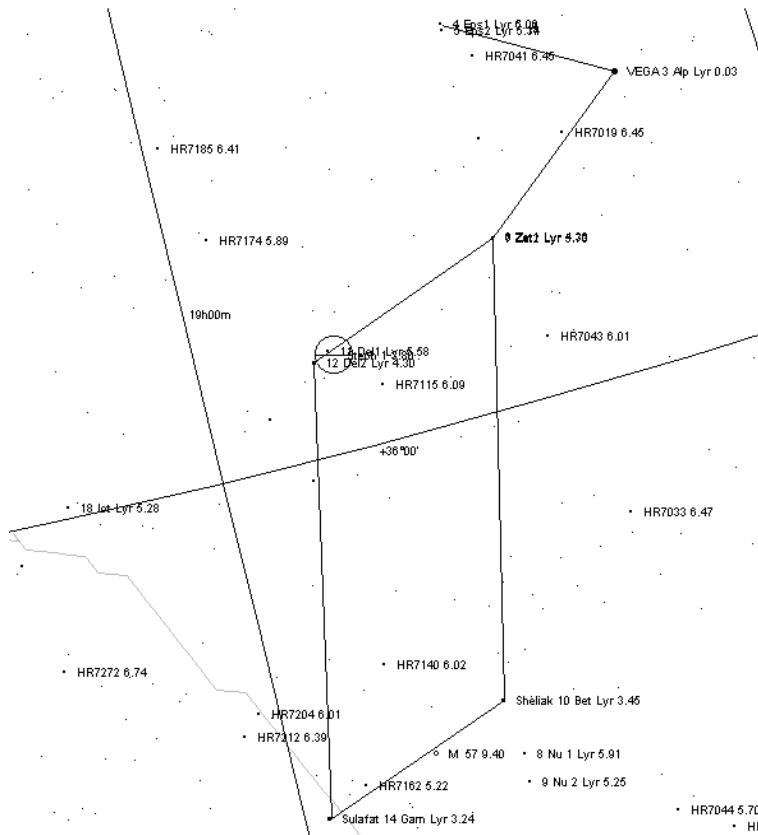


# Another Spectacular Double Double in Lyra

By Greg Morgan

Only 7 degrees SW of the famous Epsilon Lyra Double Double is another double double whose primary member is HR7272 at magnitude 6.74. Find it on the chart below in the lower left corner. The coordinates are: RA 19 09 Dec +34 36. This pair should be observed along with and compared to Epsilon Lyra. I hope you will find the magnitudes, colors and position angles striking!

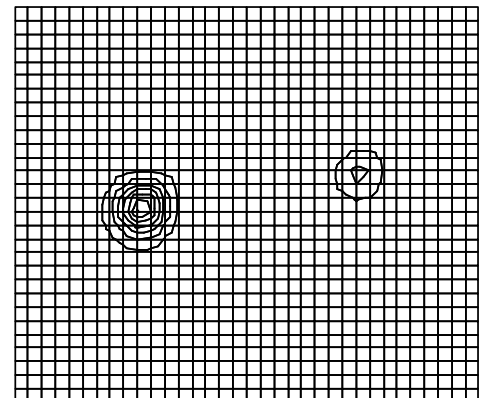


A digital photo (negative) of the four stars. The north pair and a south pair are separated by about twelve arcminutes (compressed for printing below). North is up, East to the Left.

North Pair:  
 Left: HD178849 A, magnitude 7.05  
 Right: HD178849 B, magnitude 8.44  
 Separation: 13.8 arcseconds

South Pair:  
 Left: HR 7272 or HD178911 A magnitude 6.74  
 Right: HD178911 B magnitude 8.12  
 Separation: 16.2 arcseconds

Brightness 2D Contour Map



The series of pictures and graphs to the right shows how the raw pixel values of a digital camera make a photo (right, top), a 2D contour map (right, center) and a 3D surface curve (right, bottom). The peaks in the surface curve are called centroids. The top right photo was a 1 second exposure taken with the ST-7 through a 10" LX200 f/6.3 at prime focus. The image has been enlarged so that the individual pixels can be seen.

Centroid widths are used as (among other things) a tool to measure seeing. Under poor atmospheric conditions, the width of a centroid would be wider, more unusually shaped and even shift slightly in its RA Dec position. A technical description for centroid widths is called Full Width Half Maximum or FWHM. This is the width of the centroid half way between the base and the peak. The number is expressed in arcseconds. A similar idea is "stellar half width" and a related concept is the Point Spread Function or PSF. In this widely separated double, the centroids are clearly individual peaks. A future study will be to show how the centroids look and how the centroids interact for more closely spaced doubles.

The 4.2m William Herschel Telescope has shown the green (500nm) FWHM values at that scope to range between 0.5 and 2.0 arcseconds for good and poor seeing respectively. With a 10" scope here in Fresno, measurements show FWHM values ranging from 1.4 to 4.5 arcseconds respectively. This illustrates that for resolution, the atmosphere is truly the limiting factor rather than aperture.

I wish to give a special thanks to Randy Steiner for his interest, input and enthusiasm in the study of this double double. His research into these stars revealed that HD178911 B was in the news March of this year. Michel Mayor's team of planet hunters used their doppler spectroscopy to discover a 6.47 Jupiter mass planet orbiting this star at about the distance of Mercury.

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