

Constellation Map Spreadsheet

This Microsoft Excel spreadsheet converts celestial coordinates and magnitudes into a plot that approximates a constellation's visual appearance. Stars are plotted in approximately the correct angular relation to each other, and the plot sizes indicate their visual magnitudes. The plot reproduces the field of view of the stars when held at a viewing distance of 14 3/4 inches.

Go to the class web site at <http://www.barransclass.com/astr1070>. Click on the "units" link, then on the "stars" unit link. Right-click on "Star plot spreadsheet" and save it to your student account.

Enter the Data

Before you begin, have a list of the brighter stars in your constellation, along with their celestial coordinates (right ascension in hours, minutes, and seconds; declination in degrees, arc minutes, and arc seconds) and apparent magnitudes. Find the downloaded spreadsheet in your account and double-click to open it. The cells in the spreadsheet requiring your input are salmon-colored. Enter the data for up to fifty stars into your spreadsheet.

The spreadsheet will convert your coordinates to a centered star plot. This requires several transformations of coordinates that are not of interest in this class. Columns "I" through "W" in the spreadsheet carry out that transformation. They are hidden to minimize distraction. The output of the transformation is shown in columns "U" through "W", which are colored light blue. These values themselves are not of particular interest except that they allow Excel to make a plot.

The Plot

The chart page "StarMap" should now contain a plot of your constellation. To see it, click on its tab (lower right). Unfortunately, I have not found a way to make Excel write the star names by the stars, so it can be somewhat of a challenge to figure out which circle on the plot represents which star. The best work-around I have found is to hold the cursor over one of the circles (stars) in the plot: soon, a little box will appear reporting its coordinates. Unfortunately, these are the transformed coordinates, not the star's celestial coordinates. All the same, you can find out which star it is from the coordinates. Just look back to the blue columns and find the row with the coordinates matching the ones displayed. The name of the star will be in the first column of the row.

If you wish to make a professional-looking plot, you can label the stars using Microsoft's drawing commands.

Print out your star map. I hope it comes out 7 3/8 × 7 3/8 inches square. If it doesn't, don't try to re-scale. Download the blank spreadsheet again, and copy and paste the stars' names and coordinates into the blank spreadsheet. The new spreadsheet should now contain a star map with the intended scaling.