Science Assignment 7: Edwin Hubble and his equation

Edwin Hubble (for whom the Hubble Space Telescope was named many years later) was an American astronomer who is credited with discovering (and identifying) galaxies outside of our own Milky Way. He is also known for developing what would be known as the “Hubble Law”.

Work individually or with a partner who knows how to manipulate Windows and Excel.

1. Open a browser and go to the URL


You should be at the “Sloan Digital Sky Survey SkyServer” site.

2. Open the Excel spreadsheet and graphing program, and begin a spreadsheet by typing in the following headings:

<table>
<thead>
<tr>
<th>Galaxy</th>
<th>Magnitude (u)</th>
<th>Redshift (z)</th>
</tr>
</thead>
<tbody>
<tr>
<td>J233724+002330</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notice that the galaxy name (number, really) is not the same thing as the “Object ID” number that the SkyServer uses. And, be aware that there are two different “z”s: one of them is a magnitude value, which we won’t use (use “u” instead, the redshift z is located well below the magnitude information.

3. Shrink both windows (the browser and Excel) so they fit side-by-side.

4. Follow the instructions of the SkyServer site; you don’t need to answer the red box questions, but you should do the green box exercises. Whatever it says to write down numbers and click “Save in Notes” enter this data into the Excel spreadsheet in the appropriate column you’ve already set up.

5. Finish exercises 3 and 4 on the page (which have very nicely detailed instructions for how to make a graph in Excel and add “best-fit” lines on graphs); you may complete the rest of the exercises on the page (which have you plot another graph) if you wish, for extra credit. Print out the graphs you make.

6. To turn in: The graph specified at the end of exercise 4 on the page, titled “Hubble’s Law”. Make sure the axes are labeled.