**Distances from Apparent Diameters of Spiral Galaxies**

We can measure the distances to spiral galaxies by measuring their angular diameters, and from knowing that most spiral galaxies have about the same radius, about 22 Kpc (the MW is a big spiral!).

Visit the website <http://www.astro.washington.edu/courses/astro211/HubbleLaw/galaxies.html>

and select “Image” for two galaxies to see images of the galaxies and measure their diameters. (Two have been pre-selected for you in the table below, and an example is included in the table.)

Measure the angular size of your galaxies using their images. *If there is more than one galaxy in the image, the galaxy of interest is the one closest to the center.* To measure the size, click on opposite sides of the galaxy, at either end of the longest diameter and record the pixel values in the chart below. **Measure all the way to the faint outer edge, or you will dramatically underestimate the size of the galaxy.** Estimate from the pixel values what the diameter is in pixels. For galaxies not aligned north-south or east-west, you may need the Pythagorean Theorem (a2 +b2 =c2) to calculate the length of a diagonal, or just approximate from your measurements.

Each pixel corresponds to an angle on the sky of about 2 arc seconds, so each 30 pixels corresponds to an angle of about 1 arc minute. To convert diameters in pixels to diameters in arc minutes, divide by 30.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Galaxy Name | First Edge(x,y) | Second Edge(x,y) | Approximate Diameter (pixels) | Angular Diameter (arc minutes) | Distance (Megaparsecs) |
| NGC 1357 | X=202y=245 | X=331Y=274 | 132 | 4.4 arc min | 18 |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

To determine the distance to the galaxy in megaparsecs (assuming its actual, physical diameter is 22 kiloparsecs!) use the chart below.