Lab Report – Milky Way

3.1 Galaxies and Galaxy Classification

A. What is a galaxy? (3)

B. What is meant by “Local Group”? (3)

C. Identify the following galaxies as elliptical, spiral, barred spiral, or irregular. (4)

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d) __________________________

### 3.2 Galactic Coordinates
B. “O” stars in the Milky Way (see section 2.2B)

Figure 3.1 Horizontal scale is galactic longitude. Vertical scale is galactic latitude.

C. Long-period variable stars (mostly cool giant stars) in the Milky Way (see section 2.2C)

Figure 3.2 Horizontal scale is galactic longitude. Vertical scale is galactic latitude.
D. Spiral Arms (see section 2.2D)

(3)

Figure 3.3 The plane of the Milky Way near the Sun.
3.3 General Questions on the Milky Way

A. From your results plotted in Figure 3.1 and Figure 3.2, where can you conclude that recent star formation has occurred in our Milky Way Galaxy: in the disk or in the halo or in both? Why? (3)

B. What are spiral tracers? (3)

D. What difference is there between a lenticular galaxy and a spiral galaxy? (3)

E. Which elliptical galaxy would have the most elongated shape, and “E2” galaxy or an “E6” galaxy? (3)
3.4 Luminosity Distance Formula (see section 1.4)

A. Find the distance to a Sun-like star ($L=3.8\times10^{26}$ watts) whose apparent brightness at Earth is $1.0 \times 10^{-10}$ watt/m$^2$. (3)

B. You measure the apparent brightness of a particular star to be $2.5 \times 10^{-10}$ watt/m$^2$. A parallax measurement shows the star’s distance to be 42 light-years, or about $4 \times 10^{17}$ meters. What is the star’s luminosity? (3)

C. Find the luminosity of a star whose apparent brightness is $1.03 \times 10^{-8}$ watt/m$^2$, and whose distance is about $3 \times 10^{18}$ meters. (3)