

Observing Exercise using the UMM Telescope

Due at the last class of the semester (May 8, 2008)

Before you go to the telescope, you need to make some finding charts:

- Go to the computer lab (SCI 2530) and start up *The Sky* software. Follow these [instructions](#) to get a **full-sky chart view** from Minneapolis (close enough) at the starting date and time for the observing [session](#) you plan to attend. From the [list of suggested targets](#), pick an object you will look at with the telescope, and find it on your display. Make sure it will be high in the sky when you are observing – remember there are trees and building in the way near the horizon. Turn **View** → **Labels** → **Common Names** off, change the **print setup** to **landscape** and print your full-sky chart, making sure that the full sky is shown, and east is to the left and west to the right (click on the **Z-in-a-circle** button if the orientation is not right). Now toggle the **Common Names** on and off until you can mark the location of your object on your printed chart, so you can find it easily at the telescope (in the dark!). [See an example chart](#).
- Now you need a **close-up view of the stars near your target**. Click on (or near) your object to bring up the **Object Information** box. The first button on the info box toolbar (the four arrows) allows you to center on the object as you zoom in (by using the magnifying glass buttons on the main toolbar). Now zoom in on your object, keeping it in the center, until you have a high resolution view that contains a few dozen nearby stars. Turn **Common Names** back on, which should label your target object. Print this view, and again mark the location of your object if it isn't already labeled. [See an example chart](#). On this example chart, I have labeled the SAO numbers for two relatively bright, nearby “guide stars.” That is your next step.
- Look around your target for two relatively bright, nearby stars (nothing “fuzzy”) to use as **guide stars** when locating your object. (If you didn't turn on the magnitude & SAO ID settings, do that now.) Try to find two stars closer than 2° from your target and brighter than 5th magnitude. This won't always be possible, but do the best you can. If necessary, choose one bright star that might be a bit farther away, then one fainter star that is closer. [To figure out if a star is less than 2° away from your object, first click on your object, then on the star. In the info box for the star, at the very bottom of the text window, it will say *angular separation: 00° 21' 43" (from Pluto)*. Remember to click on your object again before clicking on the second guide star.] Record on your “zoom view” chart the SAO number, magnitude and angular separation for the best two guide stars you can find, as in the example chart.
- Finally, in the info box for your target object, read the **Type** and write this in the comment box on your zoom view chart. Go to <http://antwarp.gsfc.nasa.gov/apod/lib/aptree.html> (APOD) and look for images of this type of object. If you find your target object, great! If not, pick your favorite image of the same type of object. Print out and read the **APOD picture-and-description page** before you come to the telescope, to get a better idea of what you will be looking at. Bring your two charts, guide star information and APOD page to the telescope during a PHYS 1053 observing session. (If your night is clouded out you don't need to re-do your charts! We can fake it as long as your object was reasonably high above the horizon to begin with.)

At the telescope:

- Make sure I know you're there and ready to do your observing! (It's hard to see who's there in the dark.) I'll help you point the telescope at your guide stars and then at your target.
- While you're at the telescope, make a sketch of your object as seen through the eyepiece, and record on your sketch the date, time, object name, the focal length of the primary mirror and the focal length of the eyepiece you looked through. Use the equation in chapter 2 of the text to calculate the magnification of your image.

At the telescope or by the last day of class, turn in your two charts, APOD page, and sketch with observing info and magnification all stapled together – don't forget your name!