Ph 344  Mini Lab 1  Getting to Know the Sky (virtual)

Due: Thursday, January 29, 2004

**Purpose:** In Astronomy today, computers are used to control telescopes and CCD cameras, view images from the optical system, and process and analyze the images. We will be using a number of programs, *The Sky*, to control the telescope, *CCDops*, to control the CCD camera, and *IDL* for image processing and analysis. This mini lab introduces you to *The Sky*.

**Procedure:**

a. Log into a PC and start *The Sky* by clicking on the icon. *The Sky* has both menu items and toolbars. Go along the toolbars, pointing at each icon with the mouse to read the tooltips that tell what the button does. Find the corresponding items in the menu. You should try to get used to using toolbars as much as possible.

b. Using the Data menu at the top of the window, select Site Info and then Date-Time. Turn off using the computer clock and set the date and time to that of your virtual observations. For the sake of uniformity, let’s choose Serin Observatory for the site and 8 pm, January 29 2004 for time and date. I encourage you to try different sites and dates after you have completed this assignment.

c. Turn on the constellation lines (if they are not already on) and turn off all grid lines.

d. Experiment with zooming in and out with the magnifying glass buttons. Go from a view that shows the whole visible sky (the horizon as a circular ring around the edge with compass directions) to a view of a very small portion of the sky. Note that at some point during zooming in, *The Sky* will switch to a second, more numerous, catalog of stars (it will ask whether this is OK). Also try panning the display using the left, right, up, and down buttons.

e. Note the different kinds of symbols on the display. Determine the symbol for each of the following by “blinking” them on-off-on-off: stars, planets, double stars, star clusters, nebulae, and galaxies. Click on one example of each symbol and look at the information panel that comes up describing the object. Describe in your report what each symbol is (it may be best to sketch it) and what it stands for.

f. Using the View menu at the top of the window, select filters, and ensure that “stars” are selected (this is another way to turn symbols on and off). How does changing the faint magnitude limit in this panel affect the display (you have to click OK for the change to take effect)?

g. Zoom out to an appropriate scale, turn on the planets, and determine the constellations in which Jupiter, Saturn, and Mars are at the time of your virtual observations. Include this information in your report.

h. Use the Find button to find the star named $\alpha$ Centauri (alpha Centauri) in a constellation *Centaurus*. Click on it and copy all of information from the panel. Briefly describe each
entry (one or two sentences) in your report. If you are unfamiliar with some items, do consult an appropriate-level astronomy text. At the time of your virtual observation, would you be able to point our real telescope at $\alpha$ Centauri? Explain why or why not. Is it ever possible to point our telescope at $\alpha$ Centauri? Explain.

i. Adjust the time step to 1 hour and advance the display using the forward button. Describe how the appearance of the sky changes. Continue advancing the time until morning. What planets are visible just before sunrise? In what constellation is the Sun? Moon?

j. Adjust the time step to 1 day. On what day will Jupiter cross over to the next constellation? What is its name? Determine the last day (approximately) when Jupiter is visible after sunset.

k. Use the Find button to find the great nebula in Orion, M42. Adjust the time step to 1 day and determine when (the approximate date) M42 is on the celestial meridian at midnight as seen from the Serin Observatory.