Welcome to our first observation session. This sheet contains a list of activities and observing targets, together with questions to answer about these. Most of the questions should be completed in the field. Some will require some follow-up at home. The lab sheet should be handed in, in class, within the next week. We hope you enjoy the evening, and also that some things we’ve been talking about are made more concrete and clear. To achieve this latter goal, make sure you spend some of your time looking up and around; take advantage of Shaama and Ronen’s presence to ask questions and extract explanations of where things are. Carefully log your observations on the enclosed sky chart. Getting a “feel” and familiarity with the sky is one of the great fringe benefits of taking PHY55, if you work at it.

The following list of observation targets is tentative. We may add things or remove things depending on visibility, schedule, etc. We may have some groups point at some object and others at others, and ask that you look through each others’ scope. When observing any object, take your time, acclimate your eyes. Look closely and try to tease out details of shape and color. It is often helpful to avert your gaze slightly from the object you want to observe. Averted vision is slightly more acute than direct vision. Try to find the object in the sky (with naked eye) and learn the features of its “neighborhood” so you can try to find it another day. Describe what you see in detail, and plot the object’s position on the sky chart included here. Back home, look up each object on “Starry Night” and find the distance to it (using the Info Window feature). Mark the distances to a few of the objects on your sky chart to give it some depth.

1. The first thing to do is set up your telescope, following the routine you have practiced on campus and the assembly and operation instructions available on the observation page. Please exercise extreme care with the delicate optical devices. If any questions or difficulties arise please do not hesitate to ask Shaama or Ronen.

2. When you turn the telescope on it will take some time to communicate with the GPS satellite and align itself. Take this time to look around at the sky and get familiar with what you are seeing. Locate the pole star. Plot it on your sky chart. Remember that the sky chart is designed to be held up to the sky; also remember that the center
of the chart is the zenith, so that distance from the center is angle from the zenith, with the outer circle representing the horizon, at 90° from the zenith. Locate some constellations you recognize, and plot their brightest stars on the sky chart as well. Label the constellations. Now use the pole star to locate the celestial equator in the sky, and plot this too on your chart. Find the approximate sidereal time. Use this to plot approximate lines of Right Ascension on your chart. Can you locate the Vernal Equinox? Label the chart with your name and the date and time of your observations. Note that the chart should reflect the time you noted; as the night moves on and the sky shifts you should take this into account when plotting. Can you see the Milky Way? Plot this too.

3. Our first target will be a binary star system, Albireo in Cygnus the swan. Select Object/Star/Named and scroll to Albireo, then press Enter and GoTo. Describe what you see, paying special attention to the color and relative brightness of the two members. Locate the star in the sky, describe what you see with your naked eye. Try as well nearby γ Delphinus, which you can find in the menus as HIP 102532 (Object/Star/HIP). This is a much closer binary system. Plot the binary system(s) you observe on your chart.

4. Next, let’s look at an open star cluster. Use the M shortcut on the 3 key, then enter the number to select objects from the famous list of Messier. Look at M39 and M52. Describe what you see, and plot it on your chart. Open clusters are often most striking when viewed through the finder scope. Try this!

5. We have another Messier object on our target list tonight. Find M57 and see if you can understand how it got named the Ring Nebula. We will talk about planetary nebulae later on, and this is the most dramatic specimen in the sky. Spend some time looking at this beauty; draw what you see.

6. A bit closer, we can see Uranus in the sky, just above and to the right of the bright red thing. Use the SS (Solar System) shortcut on the 5 key and scroll to Uranus. What color is the planet? Can you find it in the sky? Look next at Neptune, much farther and not nearly as bright. Can you note a color here? Last, but not least, head for Mars. Spend some time trying to see the polar ice cap (where is it on the planet?) and any surface features you can make out. Draw what you see. Record the time of your observation carefully. Later, you can check
http://skyandtelescope.com/observing/objects/planets/article_997_1.asp# to see which side of the planet was visible and compare your drawing with the composite photographs.

7. If time permits, ask if you can look at some globular clusters or at the brilliant Andromeda Galaxy. When you are done, **ask for permission** before shutting down the telescope and beginning to disassemble it.