

Lab #4: Find Objects with SkyGazer

In this exercise we use SkyGazer planetarium software to look up objects in the sky. This is how you do actual observation in astronomy: find out where your object is in the sky, how it looks and when is it visible. Only then can you go to a telescope and successfully find the object in the sky.

PROCEDURE AND LAB REPORT

Date: _____ Your name: _____ Partner's name: _____ Section: ____/____

Maximum two students may work together as partners!

This is not a separate lab, but rather a collection of exercises. Your lab instructor will assign some of these exercises to be done in part of your laboratory time.

Any of these exercises can be assigned only if the regular 'Orientation with Skygazer / TheSky6' lab has already been done by your section.

1. **Start up SkyGazer** (quit it first if it is running!) by double clicking on the setup file *FindObjects.vgr*, located in the *AstroLabs/AstroDocuments* folder. On the time panel click *Now*, then drag the hand of the clock to 10 pm.

2. First, find **the star μ Cephei**, a carbon star famous for its very deep red color. It is, obviously, in the constellation Cepheus. So, switch on constellations  and constellation boundaries , and use Center→Constellations→Cepheus→Center. You'll see the constellation and look up μ Cep within its boundaries. (If the field is too cluttered, you may have to zoom in a bit, then drag the sky with the mouse.) When you have found it, click and center, then zoom in. You will notice that it moves (this is the usual sidereal motion.) To follow its motion, click . Now read off its data:

Name: μ Cep Brightness: _____ What object: Star Spectrum: _____ Color: _____ .

Distance: _____ Transit time: _____ Sets: _____ Rises: _____ .

When is μ Cep visible? Zoom back out to 120° view, unlock, grab the clock and move it along the night, and see when μ Cep is highest up. Astronomical objects are not easily observable when they are not higher up than 30°. So you would look for μ Cep in the sky at _____.

3. Next, find the **Orion Nebula** in the winter, or the **Ring Nebula** in the summer. Because they are on the list of the ~ 100 brightest deep sky objects (the Messier Catalogue) under the names M 42 and M 57 respectively, you can shortcut the procedure by using the menu Center→Messier Object→M 42/57→Center. Now, the same way as with μ Cep, determine when you would observe your nebula:

Name: The _____ Nebula (M _____) Brightness: _____ What object: _____,

Distance: _____ Transit time: _____ Sets: _____ Rises: _____ . Observe at: _____ .

(For the object type, chose one of the six standard types of deep sky objects: open cluster, globular cluster, diffuse nebula, planetary nebula, galaxy, or supernova remnant.)

4. Next, try the find the other nebula in Exercise 2. You may get a message that the object is below the horizon; in that case, do not use the Star Atlas mode! Rather, drag the clock and see if the object is up at all tonight. In any case, fill out the rest of the data, and answer “unobservable” to the last question.

Name: The _____ Nebula (M _____) Brightness: _____ What object: _____,

Distance: _____ Transit time: _____ Sets: _____ Rises: _____ . Observe at: _____ .

5. Next, someone reported that he or she observed a supernova in a galaxy and gave the coordinates RA=9^h55^m08.9^s, DEC=69°38'54" (2000.0). Find this supernova's location in the sky. You can set the precession epoch under Chart→Set Precession→(Year). Switch to -view, then see that the data bar  indicates the coordinates of the *center of the field*. (The  box switches the data bar on/off.) Switch on  the coordinate grid. To have sufficient precision, you'll have to zoom  in as you drag the sky with the mouse to the correct place in the sky. Find the data of the host galaxy, and draw the location of the supernova in the galaxy. (Have North up; use a 20'×15' view to match the scale with the size of the box on the chart. Indicate the galaxy, its name, a few stars, and put a cross with SN for the location of the supernova.)

Name: _____ Brightness: _____ What object: _____ In what constellation: _____,

Distance: _____ Transit time: _____ Sets: _____ Rises: _____ . Observe at: _____ .

A blank chart is attached to the end of this write-up. You may use a separate sheet to make your own drawing and turn it in with your name(s) on it.

6. Up to this point, in each exercise you had the steps given to you in full detail. Now, use your own skills and repeat the procedure for a collection of objects. On the way, you'll practice recognizing the six types of deep sky objects, and you'll get used to some of the constellations. Depending how much time you have, your instructor may ask you to do more or less of this list.

The full list: M 1, M 13, M 20, M 27, M 31, M 45, M51; ϵ Aurigae, β Cygni, and the star at RA=14^h29^m42.2^s, DEC=-62°40'38" (2000.0).

Use the following slots to fill in the data:

Name: _____ Brightness: ____ What object: _____ In what constellation: _____,

Distance: _____ Transit time: ____ Sets: _____ Rises: _____ . Observe at: _____ .

Name: _____ Brightness: ____ What object: _____ In what constellation: _____,

Distance: _____ Transit time: ____ Sets: _____ Rises: _____ . Observe at: _____ .

Name: _____ Brightness: ____ What object: _____ In what constellation: _____,

Distance: _____ Transit time: ____ Sets: _____ Rises: _____ . Observe at: _____ .

Name: _____ Brightness: ____ What object: _____ In what constellation: _____,

Distance: _____ Transit time: ____ Sets: _____ Rises: _____ . Observe at: _____ .

Name: _____ Brightness: ____ What object: _____ In what constellation: _____,

Distance: _____ Transit time: ____ Sets: _____ Rises: _____ . Observe at: _____ .

Name: _____ Brightness: ____ What object: _____ In what constellation: _____,

Distance: _____ Transit time: ____ Sets: _____ Rises: _____ . Observe at: _____ .

Name: _____ Brightness: ____ What object: _____ In what constellation: _____,

Distance: _____ Transit time: ____ Sets: _____ Rises: _____ . Observe at: _____ .

Name: _____ Brightness: ____ What object: _____ In what constellation: _____,

Distance: _____ Transit time: ____ Sets: _____ Rises: _____ . Observe at: _____ .

Name: _____ Brightness: ____ What object: _____ In what constellation: _____,

Distance: _____ Transit time: ____ Sets: _____ Rises: _____ . Observe at: _____ .

Name: _____ Brightness: ____ What object: _____ In what constellation: _____,

Distance: _____ Transit time: ____ Sets: _____ Rises: _____ . Observe at: _____ .

The blank chart for exercise 5:

