

Locating objects using Setting Circles

Procedure

1. Select a suitable “naked eye” object (a bright star for example) with a known Right Ascension (RA) and declination (Dec) and use it to calibrate the RA setting circle.
2. Using the RA and Dec setting circles, move the telescope to the coordinates of the faint object.
3. Sketch the object and try to identify what type of object it is, and the object name from the star charts provided. Try different eyepieces and the silver light pollution filter. You may need to use observing techniques such as off center viewing to see the objects in the field.
4. If you are unable to locate an object using setting circles, switch modes and try to locate the object using the finder scopes and the star charts.

Object	RA	Dec	Difficulty
1	05 35	-05 30	1
2	08 40	+20 00	1
3	05 49	+32 33	2
4	02 22	+57 07	2
5	02 19	+57 09	3
6	05 35	+22 01	4

TargetObjectCoordinates

5. Observe the planet visible tonight. Make a sketch and try to note the position of the visible moons. Try a couple of the colored contrast filter and note the affect of each on the image.

HINTS:

1. It will work better if you use an object that is in the same part of the sky as the faint object you are trying to find.
2. Update your RA setting circles before you move the telescope from one object to the next.
3. Read the circles carefully. The width of one tick mark (the actual white line, not the space between them) on the RA circle is equivalent to about one 26mm eyepiece field of view.

For any object that you can not locate, identify it using a star chart and then do a little research. Provide a description of the object, it's proper and common name and based on your experience state which eyepiece would provide the best view and why. Would the light pollution filter help with this object? Why?

Discussion Questions

Was it easier to locate objects close to the celestial equator, close to the north celestial pole, or was there no difference? Why? (not quite the same as the question on the last lab. Consider telescope and mount design here, as well as ease of use)

The light pollution filter blocks a narrow frequency band of visible light that is produced by most common outdoor lighting. How does this affect the appearance of an object? For what types of objects is the filter designed? Would the light pollution filter eliminate glare from the moon, or evening twilight?

Which eyepiece (power) was best for observing EACH object types and why? What factors, other than the object type, might affect your choice of eyepiece? What effects did you notice when you went to very high power and why did they occur?

Suppose you discovered a previously unknown object in the night sky while observing. Knowing the limitations of the Meade telescopes setting circles propose a technique for accurately determining the objects right ascension and declination. Determining the coordinates of an object is referred to as Astrometry. You may need to do some research on the topic in order to provide the correct procedure. (Hint: The precision of the setting circles shouldn't even remotely affect the measurements)

The coordinates provided for the objects are Epoch 2000 coordinates. In this context, what does "epoch" refer too? Were these coordinates accurate enough to locate objects on this night of observation? What is proper motion and does it result in a substantial change of coordinates from year to year? Why or why not?