SIERRA COLLEGE OBSERVATIONAL ASTRONOMY LABORATORY EXERCISE		
NUMBER **II-Bb** **TITLE: Field of View – Supplementary Exercise**		
DATE- **DAY-** **LOCATION**	**PRINT NAME/S AND INITIAL EACH**	**GROUP** ☐

OBJECTIVE:

- Calculate the true Fields-of-View of several eyepiece-telescope combinations
- By using TheSky, simulate to use of the drift method to calculate the field of view of a particular eyepiece-telescope combination

DESCRIPTION:

Celestial objects come in a variety of sizes and shapes. When observing the moon, a planet, star cluster, or any celestial object, the size of the field of view (True Field) of a telescope will determine how much of the object will fit into the area of sky viewable through the eyepiece or camera. This activity will provide the opportunity to predict and measure the area of sky accessible of a variety of telescope and eyepiece combinations.

PROCEDURES AND OBSERVATIONS:

I. Magnification and FOV

1. Calculate and record in Table D: D_o and F_o of;
   a. A 8 in f/6.3 telescope.
   b. A 10 in f/10 telescope.
2. Calculate and record in Table D: the magnification and True FOV of
   a. A 8 in f/6.3 telescope with a 30 mm eyepiece
   b. A 10 in f/10 telescope with a 12 mm eyepiece?

TABLE D – TheSky Telescope True Fields of View						
Telescope		Eyepiece	Do	Fo	M	TF^{o}
10 in f/10		12 mm				
8 in f/6.3		30 mm				
Telrad	inner	xxxx	xxxx	xxxx	xxxx	0.5 ^{O}
	mid	xxxx	xxxx	xxxx	xxxx	2.0 ^{O}
	outer	xxxx	xxxx	xxxx	xxxx	4.0^{O}

II. Locating Objects in the Sky

1. Set the time to **8 PM** on today's date.
2. Go to View Menu, Select **Status Bar**, Select **Field Width**
3. Go to View Menu, Select **Field of View Indicators**
4. Select:
    a. **Telrad**
    b. **8 in f/6.3 30 mm eyepiece**
    c. **10 in f/10 12 mm eyepiece**
5. Select the **Pole Up** icon on the menu bar or go to **Orientation** Menu, select **Pole Up**
6. Find Betelgeuse – center on it
7. Zoom in until FOV is between 8 – 9 degrees
8. Using the up-down, left-right scroll bars and your SC001 chart to "star-hop", slew your "Telrad View" of the sky until you locate M42 - attempt to center it
9. Select M42 – The Great Orion Nebula, (right click on it) and center it (use the icon at the bottom left of the information box)
10. Zoom in and determine what Telescope/eyepiece combination would give the best view of M42 (a view that shows most of the nebula in the eyepiece? **Record the answers in your Bluebook**

III. Large Star Clusters FOV

1. Find and center M45
2. Zoom in and determine what telescope/eyepiece combination or Telrad ring would be best for viewing the Pleiades
   Put the answer in your Bluebook

IV. Separating Double Stars

1. Find Epsilon (ε) Lyrae (Double Double star) and center on it
2. What telescope/eyepiece gives the best view of the stars of ε Lyrae?
   Put your answers in your Bluebook

V. Moons of Jupiter

1. Find and Center Jupiter
2. What eyepiece gives the best view of Jupiter and all its moons?
   Put your answer in your Bluebook

VI. STAR DRIFT METHOD Using TheSky

1. Go the View Menu, Select **Field of View Indicators**. Select:
   a. the Telrad,
   b. 8 in f/6.3 telescope with 30 mm eyepiece and
   c. 10 in f/10 telescope with 12 mm eyepiece and
   d. click OK

2. Select the **South** (S) direction button on the toollbar

3. Set the Time Interval to 0.1 second

4. Use your SC001 chart **and select a star** near the Celestial Equator. **Center Star in FOV** with the time advance stopped.

5. **Zoom in/out** until the inner and middle Telrad FOV indicator rings, and the 8 in and 10 in telescope FOV indicator rings are within the screen.

6. Use the clock on the front wall of the lab to measure time intervals

7. Wait until the time reaches :00 seconds. Note the time in minutes and seconds, **and immediately select the automatic time advance double arrow.**

8. When the center of the star reaches **each of the following** FOV rings the note the time to the second and record in Table E:
   a. 10 in telescope ring
   b. Smallest of the three Telrad rings
   c. 8 in telescope ring
   d. Middle Telrad ring

9. Complete Table E

10. Which method of measuring FOV gave the best agreement with the actual values – The Direct Method (Lab II B-a) or the Star Drift method (Lab IIB – b)
    Record your answer in your Bluebook

TABLE E – Data for Star Drift Method			
Telescope/ Eyepiece	**Half-Times (sec)**	**Times "T" (sec)**	**TF^{o} (EQ. #4)**
10 in f/10 12 mm	x2=		
8 in f/6.3 30 mm	X2=		
Telrad Inner	X2=		
middle	X2=		

This is a conversion from time to angle based on the Earth's rotational speed of 15^{o} per hour.

EQ. #4

$$TF^{o} = T/240sec$$