

BU Astronomy Department – AS 10X Courses

Night Lab 1 – Motions in the sky

The objectives for this Night Lab are:

- To learn how to find Polaris and understand its significance
- To observe the motion of stars in the night sky
- To observe some celestial objects through telescopes

Humans have used telescopes to magnify and study objects in the night sky for just over 400 years. Even with a small telescope or just a pair of binoculars, the night sky is transformed into a rich laboratory for examining planets, nebulae, and other galaxies. Many of the professors and TAs in the Astronomy Department have been looking through telescopes for decades, even using some of the largest telescopes in the world for our research, but we still get a sense of wonder every time we see Jupiter and its satellites, the rings of Saturn, or the Orion Nebula through a telescope. If this is your first time using a telescope, welcome to the thrill of stargazing.

Your TA will introduce you to some equipment in the Observatory, to some wonderful objects in the night sky, and to the way astronomers navigate around the night sky. Binoculars or telescopes may be familiar to some of you, but you probably haven't heard of "celestial pipes" before.

What to bring to Night Lab 1

- A printout of this document
- Two pens or pencils
- A small flashlight
- Lots of warm clothes, gloves, hats, etc. Pretend you're going to Antarctica.

Now, please answer the following questions. Make sure to ask plenty of questions about what you're doing. **Make sure a TA initials the top left corner of the next page, which is how your professor verifies that you attended this night lab.**

TA Initials _____

Night Lab 1 Worksheet

Name: _____ Date of observation: _____

Class: _____ Professor: _____ Lab Section: _____

Observing conditions:

Start time	
End time	
Wind	
Temperature and humidity	
Sky conditions (clear, cloudy, hazy, etc.)	
The Moon (phase and location)	
Additional comments	

1. When you first get to the roof, locate the “North Star” Polaris and two or three other bright stars. Polaris is a star that is currently almost directly above Earth’s north pole. Use the celestial pipes to find the two-dimensional position (think left/right and up/down) of each star. Write down the time of your observations and the positions of the stars. Your TA will explain how to describe the positions of the stars. Also include a diagram of the positions of the stars.

2. Before you leave, locate those stars again and describe how their positions in the sky have changed. Make sure to write down the time of these observations as well. How has the position of Polaris changed since you arrived on the roof?

3. What causes the changes (or lack of changes) in the positions of Polaris and the other bright stars?

4. Identify and describe at least one constellation that you saw from the roof.

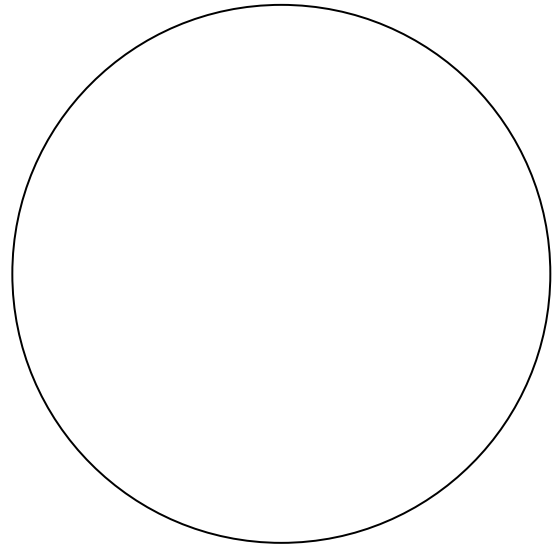
5. How do the weather and your location in the center of Boston affect your observations? Where would be a better place to observe?

6. Sketch and describe three objects that you observed using the telescopes on the roof. Give as many details as possible.

Object 1

i. Object name:

ii. Object type:



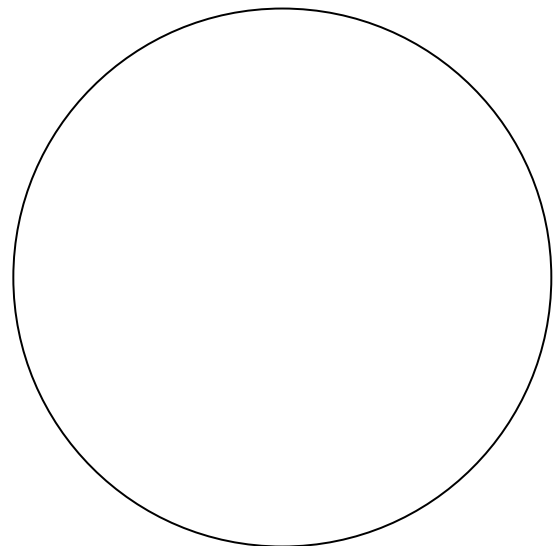
iii. Inside the circle to the right, sketch the object as seen through the reflecting telescope:

iv. Description of observations and other notes:

Object 2

i. Object name:

ii. Object type:



iii. Inside the circle to the right, sketch the object as seen through the reflecting telescope:

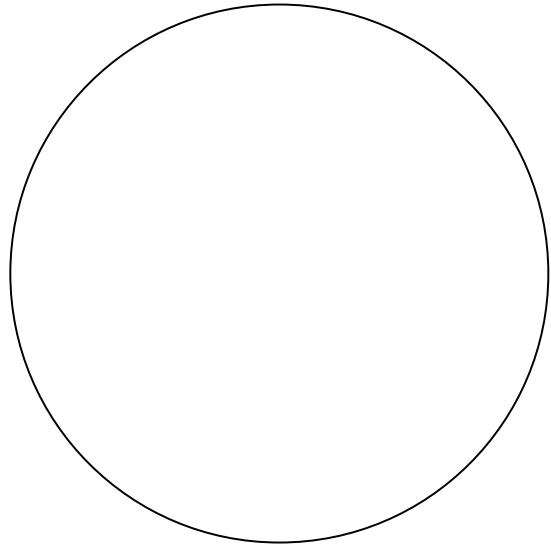
iv. Description of observations and other notes:

Object 3

i. Object name:

ii. Object type:

iii. Inside the circle to the right, sketch the object as seen through the reflecting telescope:



iv. Description of observations and other notes:
