SIERRA COLLEGE OBSERVATIONAL ASTRONOMY
LABORATORY EXERCISE

Lab N06: Designing a night of observing

NAME **GROUP**

OBJECTIVE:

- Design an observing session.
- Analyze the sky to determine things to observe.
- Research some cool things to see.

INTRODUCTION:

Today we will turn the tables, and have you think like your instructor does before an observing trip. Using the appropriate sky simulation programs and other references, you must analyze the sky and decide what are the best things to look for.

Your primary limitations are the objects which will be visible in the night sky, ideally at least 15° above the horizon. The telescope's limiting magnitude of around 10 or so (compared to a naked eye limit of about 6) is also relevant.

PROCEDURE I: Planetary objects

1. Unless specified by the instructor, all the calculations for this lab are based upon the date of the class's next scheduled "dark sky" observing trip. Write the date of the observing trip here. (Your instructor may provide an alternate date.) Also include the time of sunset for that date.

   Observing date: _____ Sunset time:_____

2. Suppose you were at a dark sky site on the observing trip date. What time of night—any time from sunset to sunrise—would you be able to see the largest number of naked-eye planets? Write down the names of the planets, and the constellations they are in.

Naked Eye Planets

Best Time: Planets visible:

3. Using a colored pencil, sketch the locations of the planets on the all-sky star charts in this lab. Label them.

4. Suppose you had access to one of our campus telescopes. In that context, re-complete Procedure steps #2-3. Record your revised answer below, and add to the star charts any additional planets that might be visible to you. Use the same color on the all-sky start chart as you used before.

Telescope Planets

Best Time: Planets visible:

PROCEDURE II: Requested objects

5. Suppose you were asked to find the following objects, sometime between sunset and 11 pm on your observing trip, at one of our usual observing sites. Which objects could be visible in the telescopes? Circle yes or no—assume the sky will be clear. If you conclude the object is not visible, provide your justification in complete, grammatical, properly spelled sentences.

Object	Visible	Why not?
Io	Yes No	_____
		_____
Mercury	Yes No	_____
		_____
Neptune	Yes No	_____
		_____
Pluto	Yes No	_____
		_____
M 21	Yes No	_____
		_____
M 64	Yes No	_____
		_____
Coalsack nebula	Yes No	_____
		_____

PROCEDURE III: Planning your night

6. Assemble in the group you typically observe with during observation nights. Select 7 objects from the data tables in this lab. These are objects you would like to observe on our next trip, and which you have not already seen.

   For each object, record the following information: name, constellation, apparent magnitude, angular size (in ‘ or “), and altitude (rounded to the nearest degree) at 8 pm and 11 pm on the observation date. Using a different color pencil from before, indicate the object’s location on your all-sky star charts.

7. Write two or three grammatical sentences about why each object is interesting.

Object	Constellation	m	size	8pm alt	11pm alt
1)					
Summary:					
2)					
Summary:					
3)					
Summary:					
4)					
Summary:					
5)					
Summary:					
6)					
Summary:					
7)					
Summary:					

Table A: Possible targets

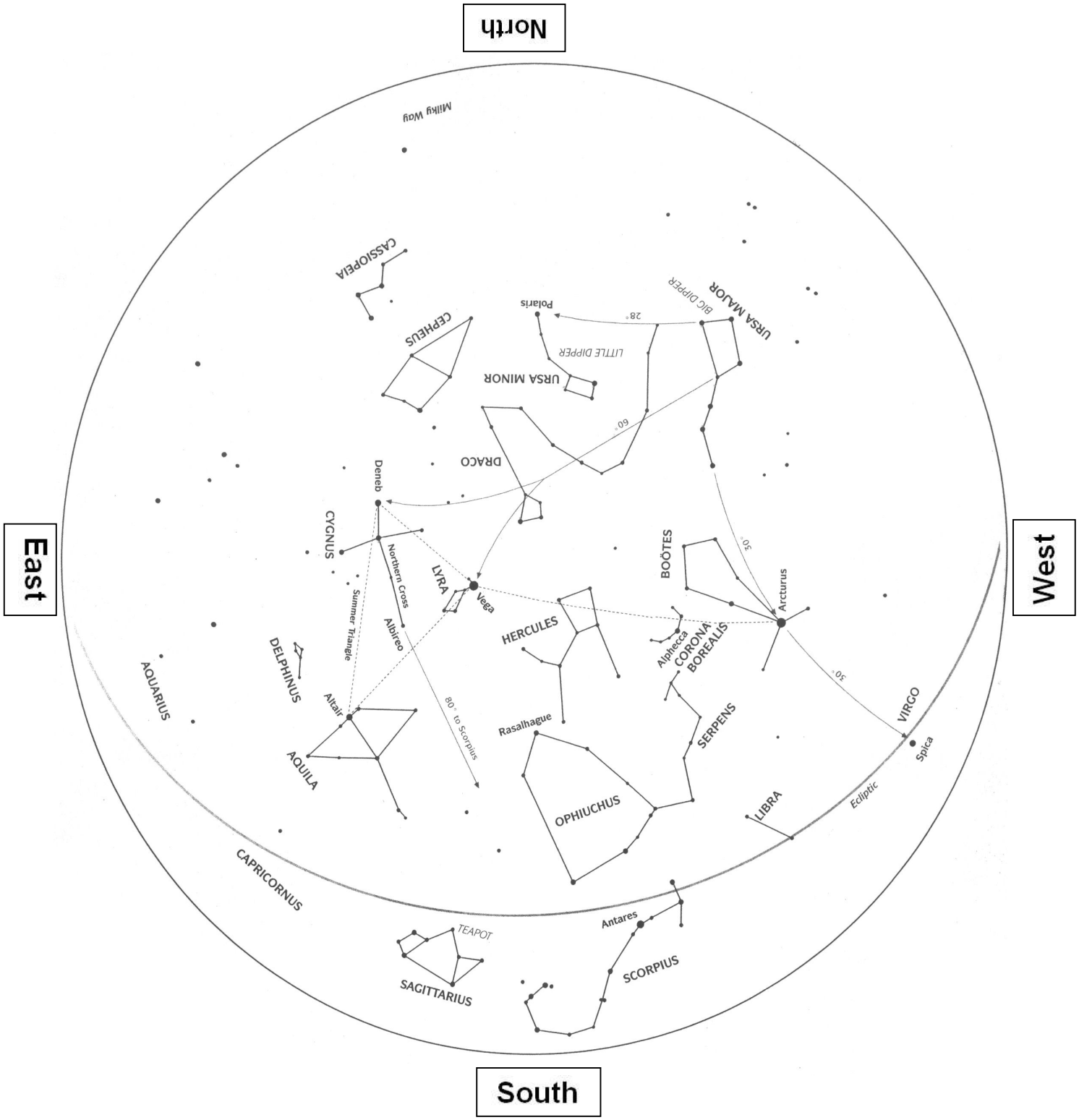
Object	Type	Right Ascension
Multiple stars		
Gamma Andromedae	Double star	02h 04m
Rigel	Double star	05h 14m
Ras Algethi / Alpha Herculis	Double star	17h 15m
Epsilon Lyrae	4-star multiple	18h 44m
Albireo	Double star	19h 31m
Gamma Delphini	Double star	20h 47m
Open and globular clusters		
M45	Open cluster	03h 47m
M79	Globular cluster	05h 24m
M35	Open cluster	06h 09m
M50	Open cluster	07h 03m
M44	Open cluster	08h 40m
M67	Open cluster	08h 51m
M3	Globular cluster	13h 42m
M13	Globular cluster	16h 42m
M12	Globular cluster	16h 47m
M10	Globular cluster	16h 57m
M92	Globular cluster	17h 17m
M7	Open cluster	17h 54m
M21	Open cluster	18h 05m
M11	Open cluster	18h 51m
M71	Globular cluster	19h 54m
M29	Open cluster	20h 24m
M15	Globular cluster	21h 30m
Various nebulae		
M42	Star formation nebula	05h 35m
M1	Supernova remnant	05h 35m
M57	Planetary nebula	18h 54m
M27	Planetary nebula	20h 00m
M110	Elliptical galaxy	00h 40m
M31	Spiral galaxy	00h 43m
M32	Elliptical galaxy	00h 43m
M33	Spiral galaxy	01h 34m

(Continued on the next page)

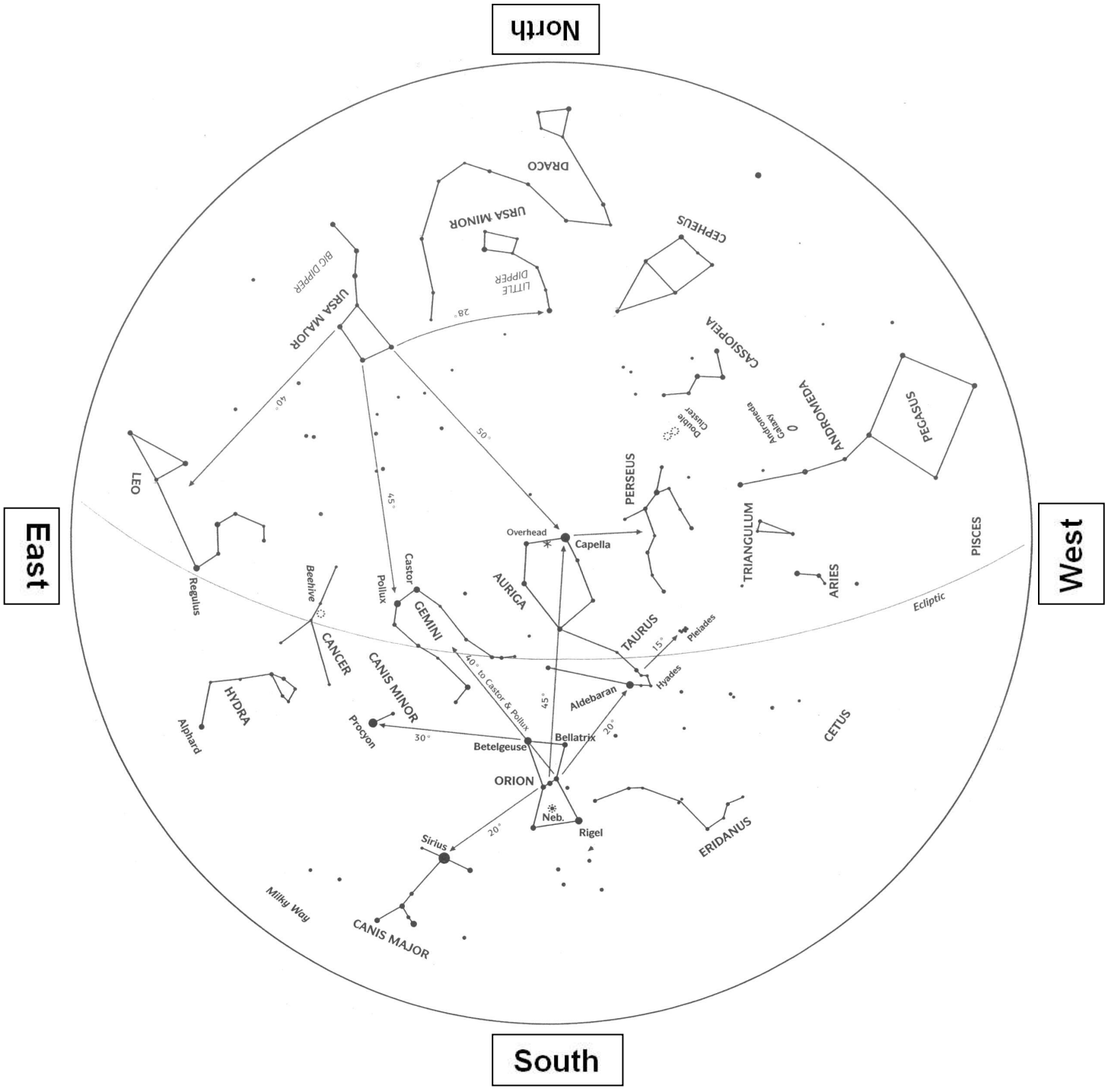
Table A: Possible targets (continued)

Circumpolar Objects		
Multiple stars		
Polaris	Double star	02h 32m
Mizar/Alcor	Multiple star	13h 24m
Open and globular clusters		
M38	Open cluster	05h 29m
M36	Open cluster	05h 36m
M37	Open cluster	05h 52m
M52	Open cluster	23h 24m
Various nebulae		
M76	Planetary nebulae	01h 42m
M97	Planetary nebula	12h 57m
M81	Spiral galaxy	09h 56m
M82	Starburst galaxy	09h 56m
M94	Spiral galaxy	12h 51m
M64	Spiral galaxy	12h 57m
M51	Spiral galaxy	13h 30m
M101	Spiral galaxy	14h 03m

Fall Semester/Evening
Spring Semester/Morning



Spring Semester/Evening
Fall Semester/Morning



This page intentionally left blank