

CONSTELLATION AND BRIGHT STAR IDENTIFICATION

SYNOPSIS: In this self-paced lab, you will teach yourself to recognize and identify a number of constellations, bright stars, planets, and other celestial objects in the current evening sky.

EQUIPMENT: A planisphere (rotating star wheel) or other star chart. A small pocket flashlight may be useful to help you read the chart.

Part I: Preparation, Practice, and Procedures

Part II contains a list of 30 or more celestial objects that are visible to the naked eye this semester. You are expected to learn to recognize these objects through independent study, and to demonstrate your knowledge of the night sky by identifying them.

Depending upon the method chosen by the course instructor, you may have the opportunity to identify these objects one-on-one with your lab instructor during one of your scheduled evening observing sessions. Alternatively, there may be the opportunity to take an examination over these objects in Fiske Planetarium near the end of the semester. In addition, there may be the opportunity to do both, in which case the better of your two scores would be counted.

If you are given the option, and if you wait until the end of the semester to take the verbal quiz and then are clouded out, you have no recourse but to take the Planetarium exam. *Do not expect your TA to schedule additional time for you. If you have not taken the oral test and are unable to attend the special exam session at Fiske, you will not receive credit for this lab!!! "Poor planning on your part does not constitute an emergency on our part."*

You can learn the objects by any method you desire:

- Independent stargazing by yourself or with a friend.
- Attending the nighttime observing sessions at the Observatory, and receiving assistance from the teaching assistant(s) or classmates.
- Attending Fiske Planetarium sessions.
- All of the above.

Observing and study tips:

- It is generally be to your advantage to take the nighttime verbal quiz if it is an option, since *you* control the method and order of the objects to be identified. In addition, it is easier to orient yourself and recognize objects under the real sky rather than the synthetic sky, since that is the way that you learned to recognize the objects in the first place. Depending upon your instructor, it *may* also be possible to later take the Fiske written quiz and use it to replace your oral quiz score if you feel it will improve your grade.

- The “Celestial Coordinates” section at the beginning of this lab manual (page 27) may help you visualize the night sky and the location of objects in it.
- We recommend using the large, 10" diameter Miller planisphere available from Fiske Planetarium: it is plastic coated for durability, is easiest to read, and includes sidereal times. The smaller Miller planisphere is more difficult to use but is handier to carry. Other planispheres are available from the bookstore or area astronomy stores.
- To set the correct sky view on your planisphere, rotate the top disk until the current time lines up with the current date at the edge of the wheel. Planispheres indicate local "standard" time, not local "daylight savings" time. If daylight savings time is in effect, *subtract* one hour from the time before you set the wheel. (For example, if you are observing on June 15th at 11 p.m. Mountain Daylight Time, line up 10 p.m. with the June 15th marker).
- The planisphere shows the current appearance of the entire sky down to the horizon. It is correctly oriented when held overhead so that you can read the chart, with North on the chart pointing in the north direction. The center of the window corresponds to the zenith (the point directly overhead). When you face a particular direction, orient the chart so that the corresponding horizon appears at the bottom. As with all flat skymaps, there will be some distortion in appearance, particularly near the horizons.
- Be aware that faint stars are difficult to see on a hazy evening from Boulder, or if there is a bright moon in the sky. On the other hand, a dark moonless night in the mountains can show so many stars that it may be difficult to pick out the constellation patterns. In either case, experience and practice are needed to help you become comfortable with the objects on the celestial sphere.
- Learn relationships between patterns in the sky. For example, on a bright night it may be virtually impossible to see the faint stars in the constellation of Pisces; however, you can still point it out as "that empty patch of sky below Andromeda and Pegasus". You can envision Deneb, Vega, and Altair as vertices of "the Summer Triangle", and think of Lyra the harp playing "Swan Lake" as Cygnus flies down into the murky pool of the Milky Way.
- If you merely "cram" to pass the quiz, you will be doing yourself a great disservice. The stars will be around for the rest of your life; if you *learn* them now rather than just *memorize* them, they will be yours forever.

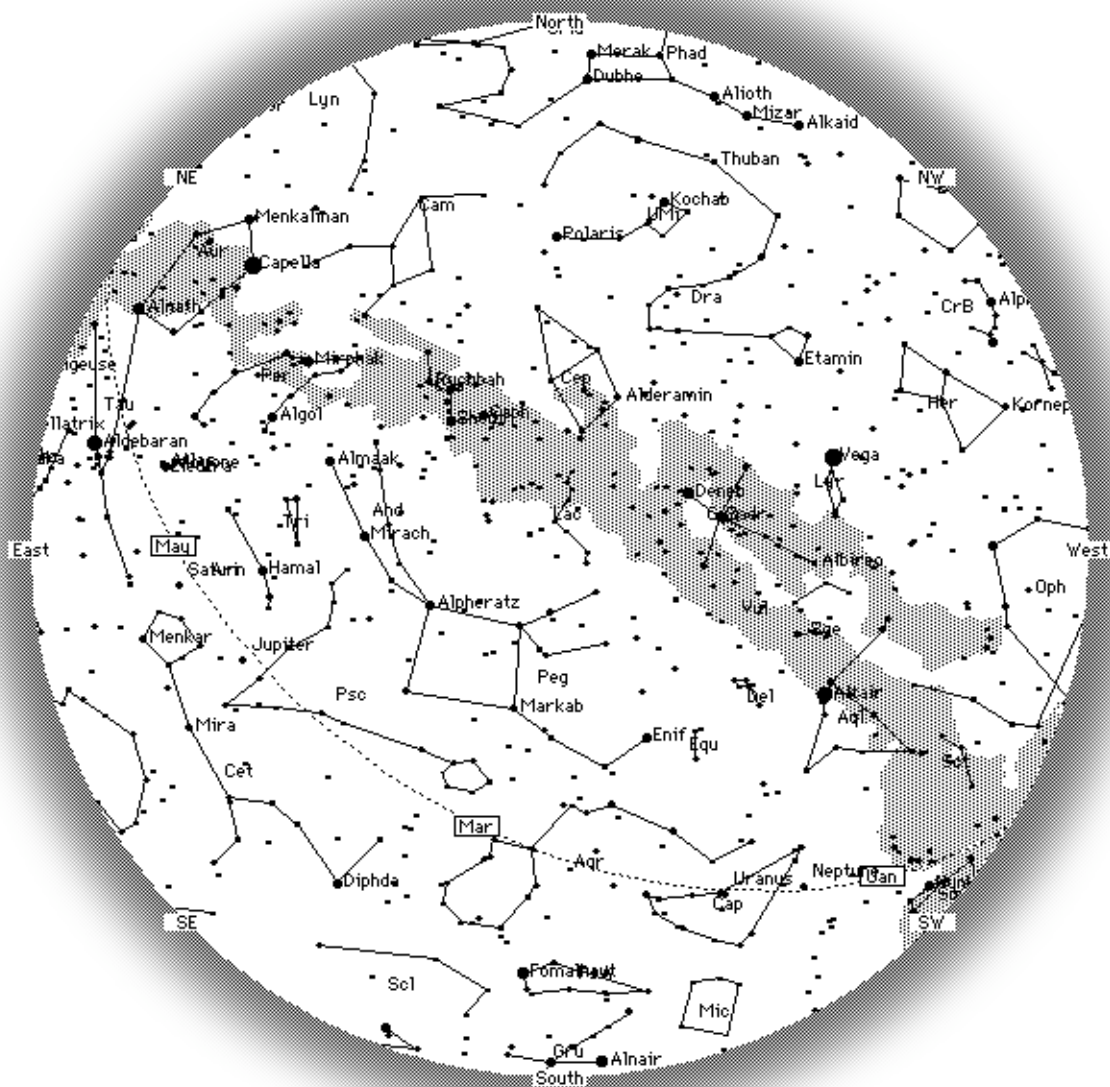
Good luck, good seeing, and clear skies ...

Part II. Fall Naked-Eye Observing List

Constellations	Bright Stars
Ursa Minor (<i>little bear, little dipper</i>)	Polaris
Lyra (<i>lyre, harp</i>)	Vega
Cygnus (<i>swan, northern cross</i>)	Deneb
Aquila (<i>eagle</i>)	Altair
Cepheus (<i>king, doghouse</i>)	
Capricornus	
Aquarius	
Pegasus (<i>horse, great square</i>)	
Andromeda (<i>princess</i>)	
Pisces (<i>fishes</i>)	
Aries (<i>ram</i>)	
Cassiopeia (<i>queen, 'W'</i>)	
Perseus (<i>hero, wishbone</i>)	
Taurus (<i>bull</i>)	Aldebaran
Auriga (<i>charioteer, pentagon</i>)	Capella
Orion (<i>hunter</i>)	Betelgeuse, Rigel
Gemini (<i>twins</i>)	Castor, Pollux

Other Celestial Objects or Regions

Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, Pluto, Asteroids, Comets	<i>any planets visible in the sky (check the Celestial Calendar at the beginning of this manual)</i>
Ecliptic or Zodiac	<i>trace its path across sky</i>
Celestial Equator	<i>trace its path across the sky</i>
Great Andromeda Galaxy (M31)	<i>fuzzy patch in Andromeda</i>
Pleiades (<i>seven sisters</i>)	<i>star cluster in Taurus</i>
Hyades (<i>closest star cluster</i>)	<i>near Aldebaran</i>
Great Nebula in Orion (M42)	<i>center 'star' in Orion's sword</i>



The Boulder night sky

10 p.m. October 15