

2014-15 Barge Astronomy 1st Semester Final Review Questions

Use the chapters in the textbook *The Cosmos: Astronomy in the New Millennium* by Pasachoff & Filippenko as a resource, either 2nd or 3rd edition.

Sun Earth Moon System (Handouts; Cosmos chp4)

What causes the different seasons we experience in Chicago?

How do the times the Sun rises and sets change over the course of a year in Chicago?

How do the locations on the horizon where the Sun rises and where it sets change over the course of a year in Chicago?

How would the length of a day be different at the north pole over the course of a year?

How is the ecliptic related to the zodiac (zodiac constellations or commonly referred to as zodiac signs)?

What causes us to see different phases of the moon throughout a month?

Why is the moon sometimes visible during the day?

Can you identify the nine phases of the moon by name and picture? Can you put the phases of the moon in order from a new moon to a new moon?

What is the difference between waxing and waning?

Why aren't the same constellations visible at night all year long? Why are there different constellations visible during different seasons? What do these ideas have to do with the orbit of the earth around the Sun?

In Chicago, how do stars appear to move across the sky? From the equator? The north pole?

In what direction would you look to see the Sun at noon in Chicago? In Australia? At the equator?

Can you define the following terms? Orbit, revolution, rotation, zenith, meridian, equinox, winter Solstice, summer solstice, autumnal equinox, spring equinox?

Ancient Astronomy

Can you explain what each of the following individuals contributed to the study of Astronomy?

Galileo

Tycho Brahe

Johannes Kepler

Isaac Newton

Ancient Greeks & Ptolemy

Constellations (Chp 1; Chp 4 pg 63-67; A Walk Through the Sky (small textbook); Star Charts)

Why aren't the same constellations visible at night all year long?

Why are there different constellations visible during different seasons?

How are stars' brightness measured (magnitude)?

What does this have to do with the orbit of the earth around the sun?

From Chicago, how do stars appear to move across the sky?

Be able to identify on a star chart and describe where in the sky (northern sky or southern sky) you can find the following constellations and their brightest stars: [stars are extra credit]

Fall

Summer Triangle – Cygnus (Deneb), Lyra (Vega), Aquila (Altair)

Cassiopeia, Ursa Major, Ursa Minor

Winter

Orion (Betelgeuse, Alnitak (east), Alnilam (center), Mintaka (west), Rigel), Canis Major (Sirius), Canis Minor (Procyon), Gemini (Pollux, Castor), Auriga (Capella), Taurus (Aldebaran), Cassiopeia, Ursa Major, Ursa Minor

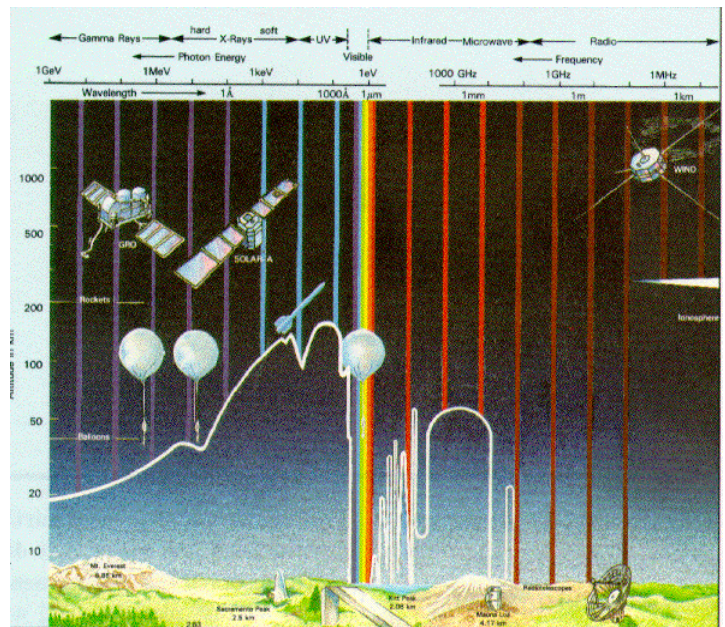
Telescopes (Chp 3; Handouts from class)

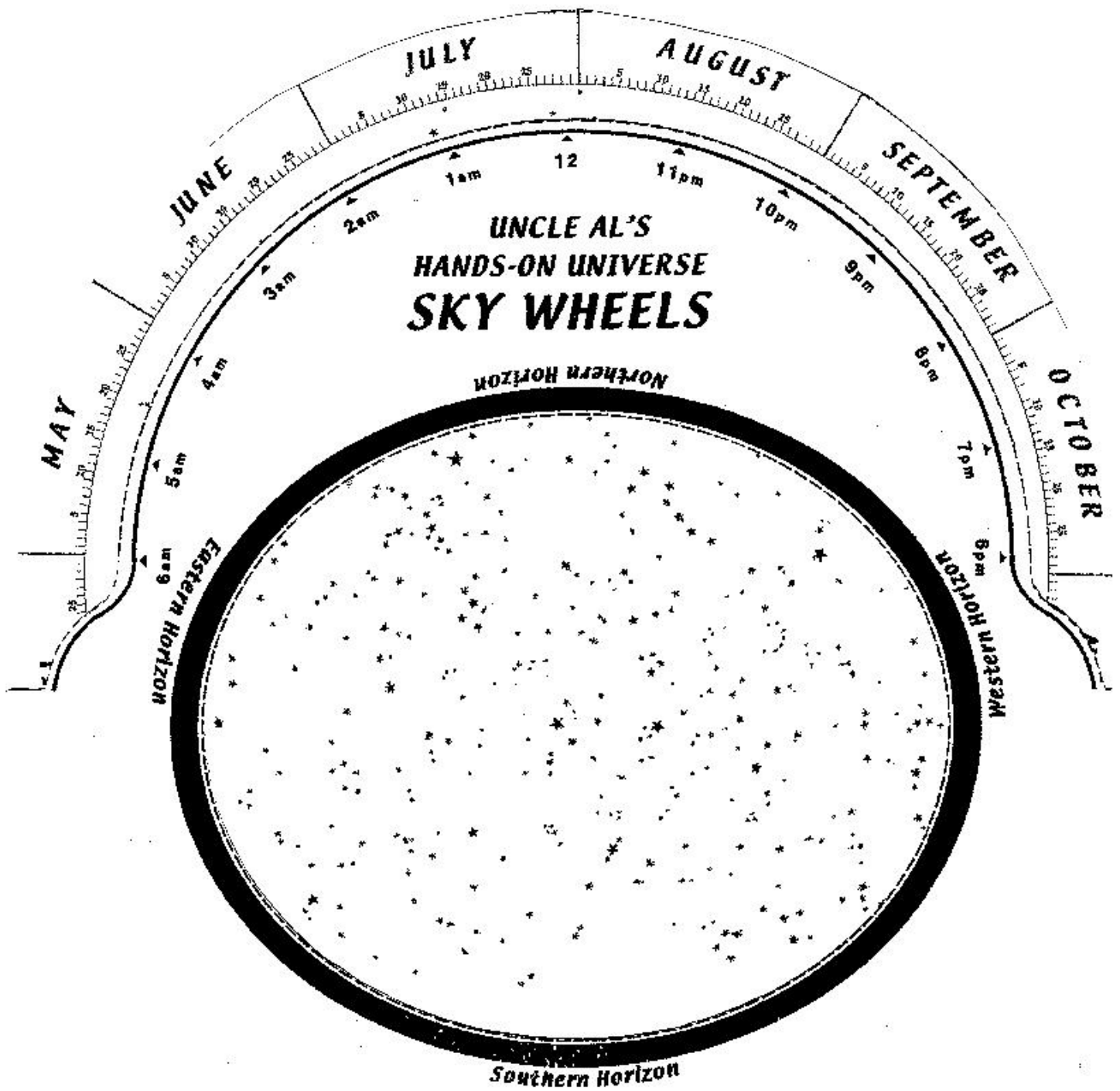
- Can you explain the basic differences between a refracting telescope and a reflecting telescope?
- Can you explain the difference between the objective lens or mirror and the eyepiece in a telescope?
- Can you define the following terms? Objective lens/mirror; aperture; eyepiece; focus; focal length; magnification (how do you calculate it)
- Could you trace light rays as they move through the following telescopes?
 - a. Reflecting
 - b. refracting
 - c. catadioptric (combination)
- What is the difference between a Galilean telescope and a Newtonian telescope?
- Who was the first person to record the use of a telescope on the sky? What did he discover?
- Who invented the reflecting telescope? Why?
- How did the telescope convince Galileo that Copernicus was correct in his heliocentric viewpoint?
- Can you explain how a ccd camera takes a telescope picture and how that picture is unique – what information is embedded in the pixels?
- What is MEM (Maximum Effective Magnification) and how do you calculate it?

Light (Chp 2 pg 21-23; Chp 3; Chp 5; class notes)

- Can you explain what light is? Can you use the following terms correctly to explain the electromagnetic spectrum?
 - Magnetic & electric fields; energy; frequency; wavelength; photon
- Can you name the different types of electromagnetic energy in order from most to least energetic?
- Can you explain why ionizing radiation (ultraviolet, x-ray, gamma) is dangerous?
- Can you explain what a light year is?
- Can you describe how the following people contributed to the knowledge of the electromagnetic spectrum?
 - a. Isaac Newton
 - b. William Herschel
 - c. Johann Ritter
 - d. Thomas Young
 - e. Hans Christian Orsted
 - f. Michael Faraday
 - g. James Clerk Maxwell
 - h. Henrich Hertz
 - i. Wilhelm Roentgen
 - j. Ernest Rutherford & Paul Villard

Can you describe the atmospheric window?
 (What does this picture mean? →)





Identify (trace and name) the following constellations on the chart above:

Ursa Major

Ursa Minor

Cassiopeia

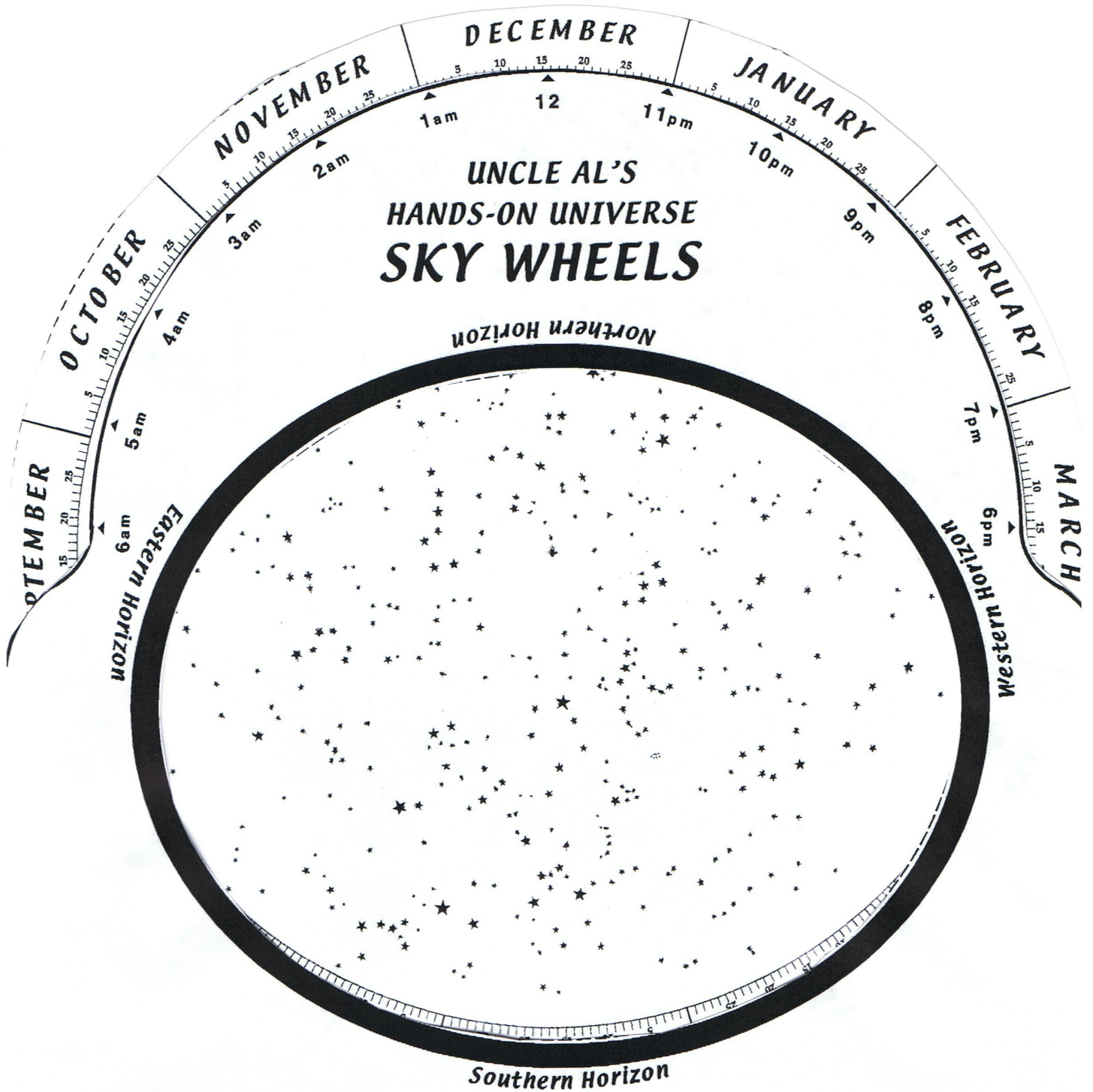
Lyra

Cygnus

Aquila

Summer Triangle

Correctly named stars are extra credit



Identify (trace and name) the following constellations on the chart above:

- | | | |
|------------|-------------|-------------|
| Ursa Major | Ursa Minor | Casseopeia |
| Orion | Canis Major | Canis Minor |
| Gemini | Auriga | Taurus |

Correctly named stars are extra credit