Motions of the Sky—2 Sep

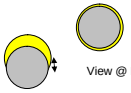
- Finish Hipparchus' measurement of distance to the moon
- Motions of the sky that we have noticed
- Models
  - Celestial sphere, a simplification of the
  - 3-dimensional model

Hipparchus measures the moon's distance~200BC

- At the Hellespont, the solar eclipse of 189BC was total. (Sparta defeated Athens there in 405 BC.)
- In Alexandria, the moon covered ¼ of the sun.
- "A clear picture is 90% of clear thinking."
- Draw a picture to show the relationship between the sun, the moon, the two locations, and the difference between a total & ¼ eclipse. (The diameter of the sun is ½ degree.)

http://www.livius.org

View @ Hellespont



View in Alexandria. Moon is offset by 1/4 diameter of sun

http://mkatz.web.wesleyan.edu/medea_lecture/hellespont.gif

Changes in the Sky

1. Name two motions of objects in the sky or changes in the sky that you have observed.

Changes in the Sky

- The sun sets south of west in winter.
- Winter days are short.
- Stars move east to west over a night.
- The constellations change over the months.
- The sun (and moon and stars) rises & sets.
- The sun is higher in the sky in summer than winter.
- Planets move with respect to the stars.
- Comets appear irregularly.

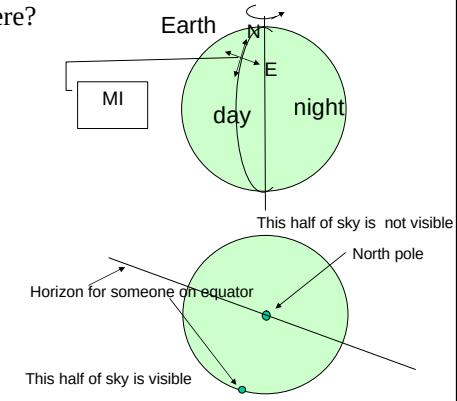
The Celestial Sphere

2. How do you explain day and night using the celestial sphere?
3. How do you explain seasonal changes in the sky?

The Celestial Sphere

2. How do you explain day and night using the celestial sphere?

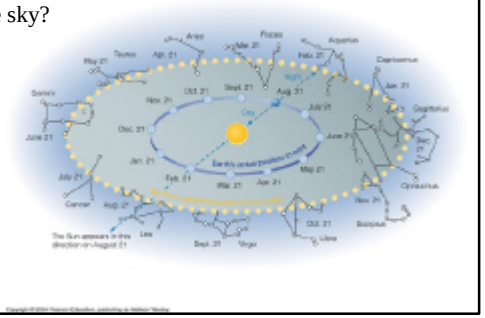
Sun



The Celestial Sphere

- The sun "moves" into different constellations of the zodiac during the year.

4. At midnight tonight, which constellation of the zodiac will be high in the sky?



Summarizing Question

- The star Aldebaran rises at 8 pm. When does it rise two months from now?