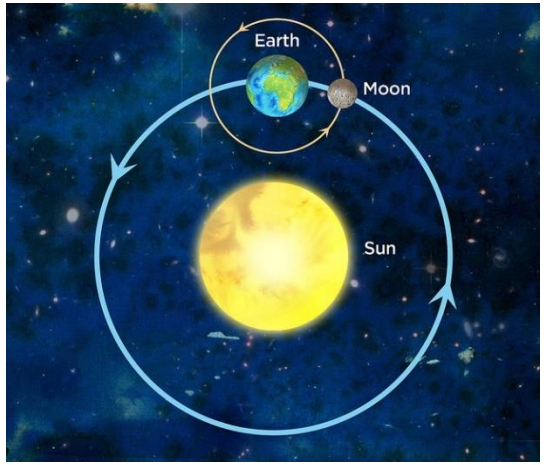
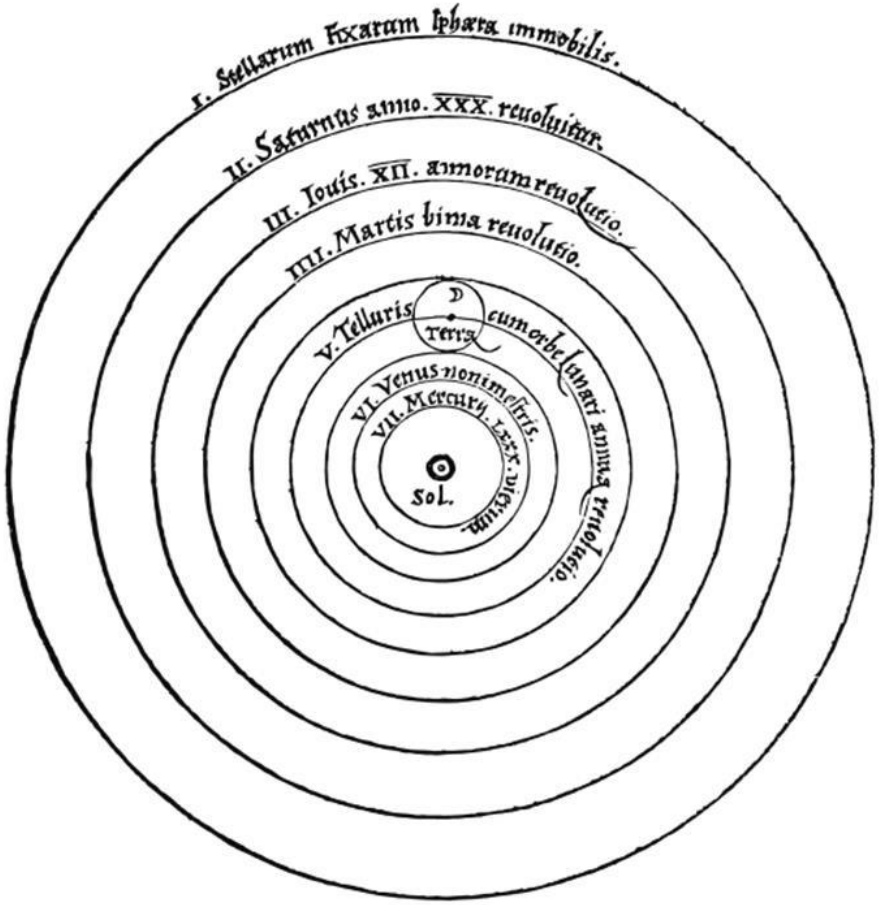
Question

- How is the orbital period of Earth measured from observation?
  - The stars in the evening sky move steadily from east to west during the course of a year.



Question

- Can the sidereal periods of the planets be measured from observations?



Question

- Consider Mars. Which quadrature comes after the opposition?
  a) Eastern
  b) Western

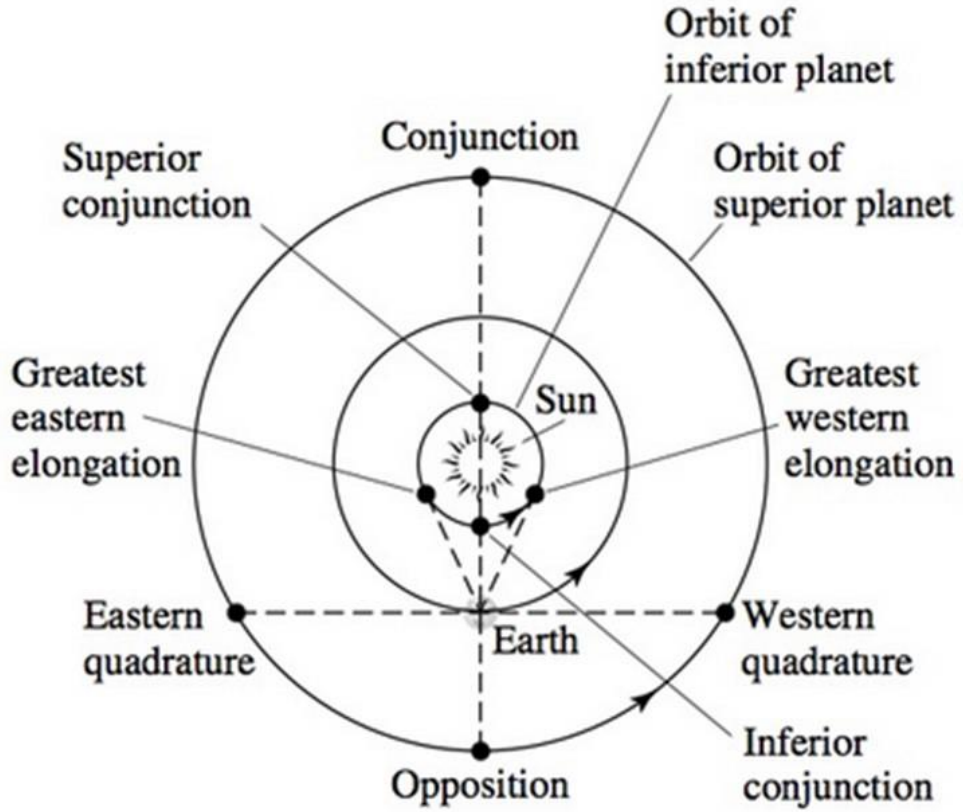


FIGURE 5 Orbital configurations of the planets.

Question

- Consider a superior planet (e.g. Mars). Prove the relationship between the sidereal period (P) and synodic period (S).
  a) Define:
     - $\theta_{\oplus}$ is the angular distance travelled by Earth over S.
     - θ is the angular distance travelled by Mars over S.

     What is $\theta_{\oplus} - \theta$?
  b) Express $\theta_{\oplus}$ in terms of S and $P_{\oplus}$.
  c) Express θ in terms of S and P.

Question

- Consider the reference frame in which the Sun and Earth are not moving. Can the angle subtended by the eastern quadrature and opposition be measured from observations?

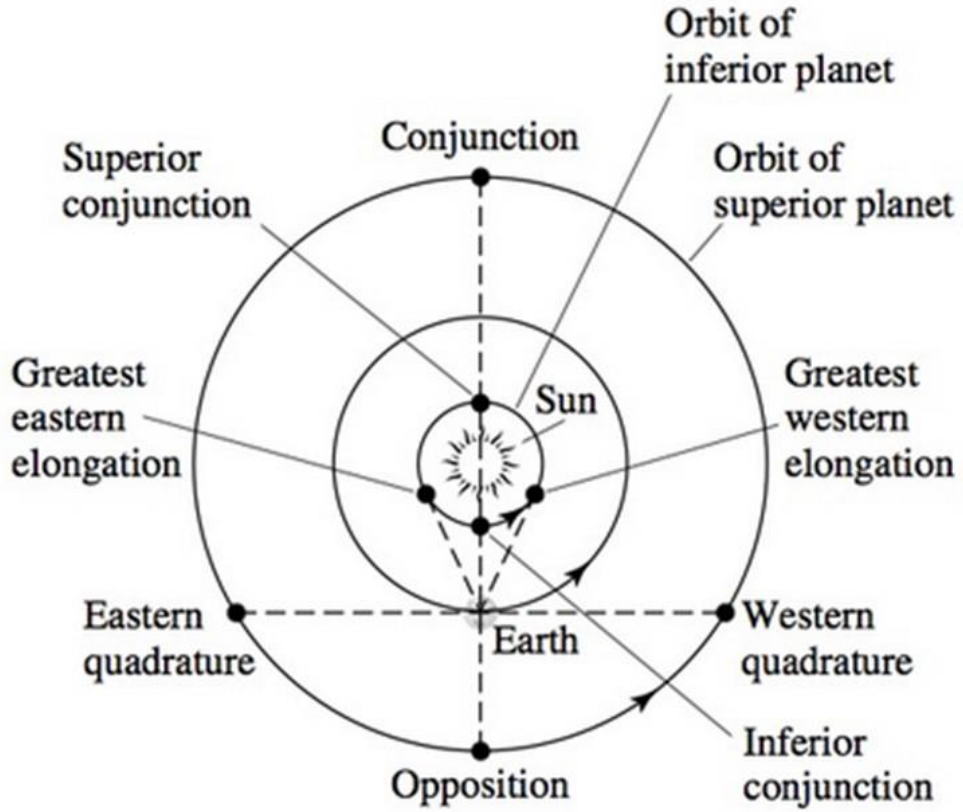


FIGURE 5 Orbital configurations of the planets.

Question

- Consider the north celestial pole (NCP). What is the zenith distance z (the angle distance between the NCP and zenith) if the observer is at the
  a) North Pole
  b) equator
  c) latitude of 10° N

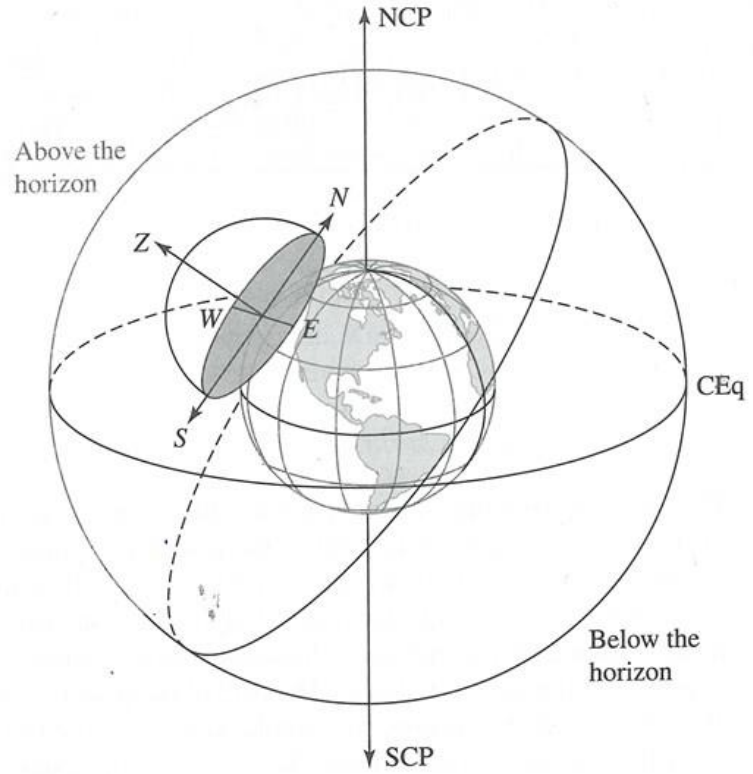


FIGURE 1.1 The celestial sphere surrounding the Earth. The Earth's north pole, south pole, and equator project onto the north celestial pole (NCP), south celestial pole (SCP), and celestial equator (CEq), respectively. For any observer, the horizon plane is tangent to the observer's location, and the zenith (Z) is directly overhead.

Question

- Consider the NCP. State its azimuth and altitude if the observer is at the
  a) North Pole
  b) equator
  c) latitude of 10° N

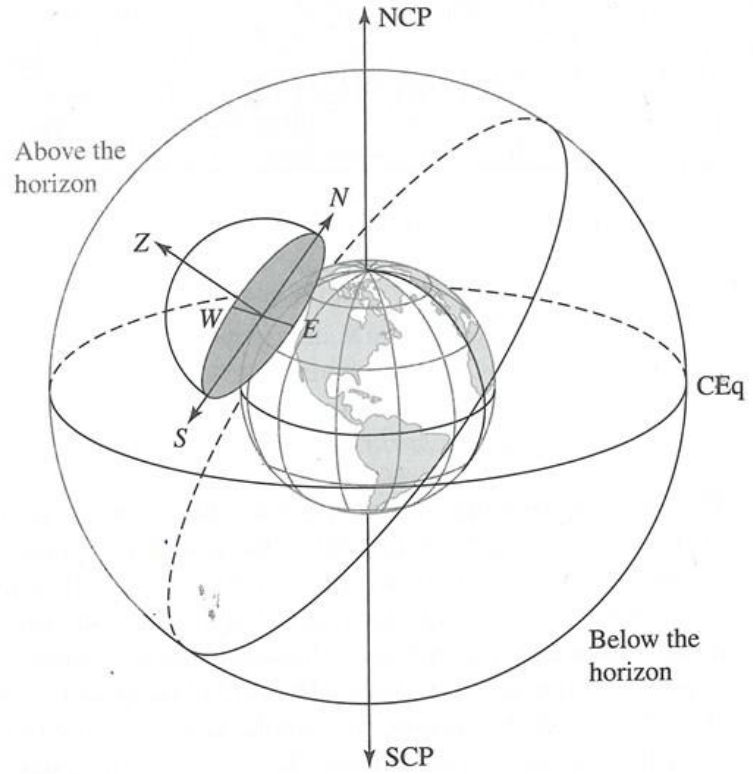
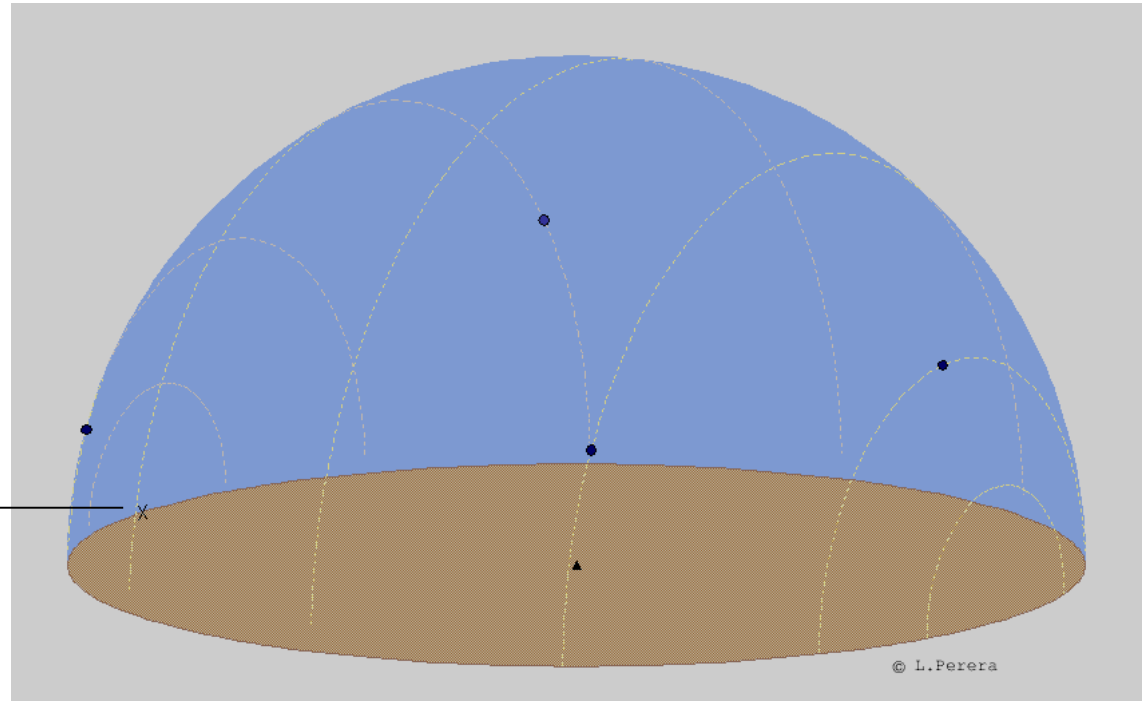


FIGURE 1.1 The celestial sphere surrounding the Earth. The Earth's north pole, south pole, and equator project onto the north celestial pole (NCP), south celestial pole (SCP), and celestial equator (CEq), respectively. For any observer, the horizon plane is tangent to the observer's location, and the zenith (Z) is directly overhead.

Question

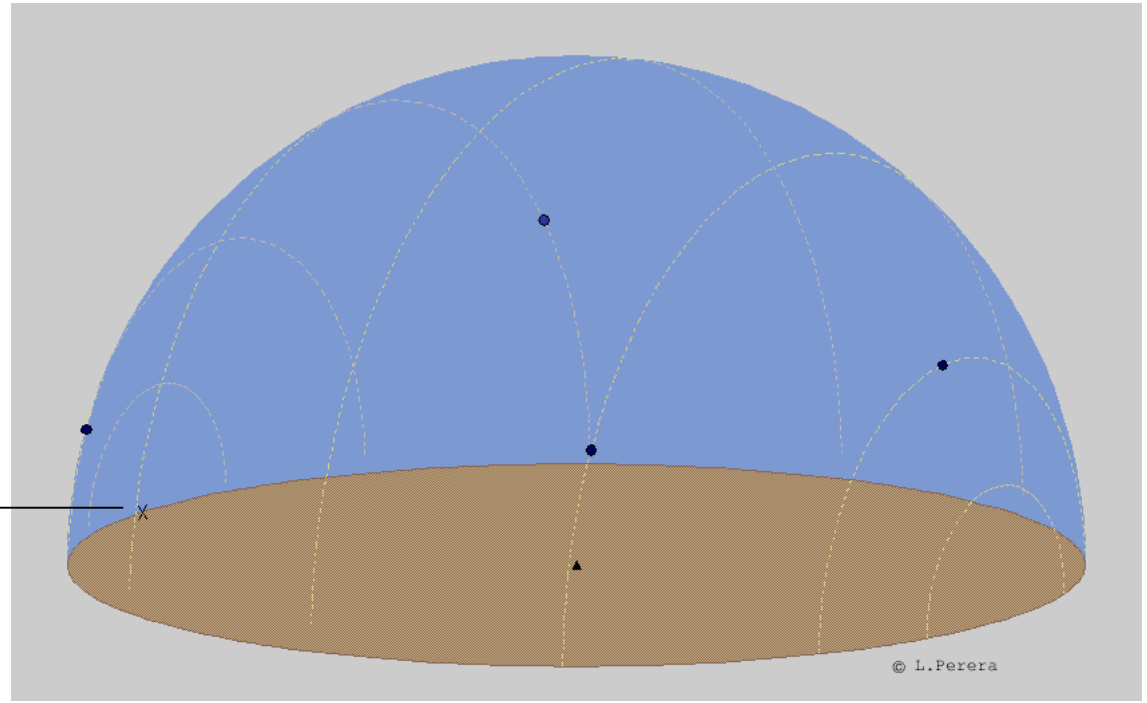
- Consider an observer at the equator and a star at $A = 90°$ and $h = 0°$. State the star's A and h after
  a) 1 hour
  b) 7 hours



https://www.phy.olemiss.edu/~perera/animations/sky_equator.html

Question

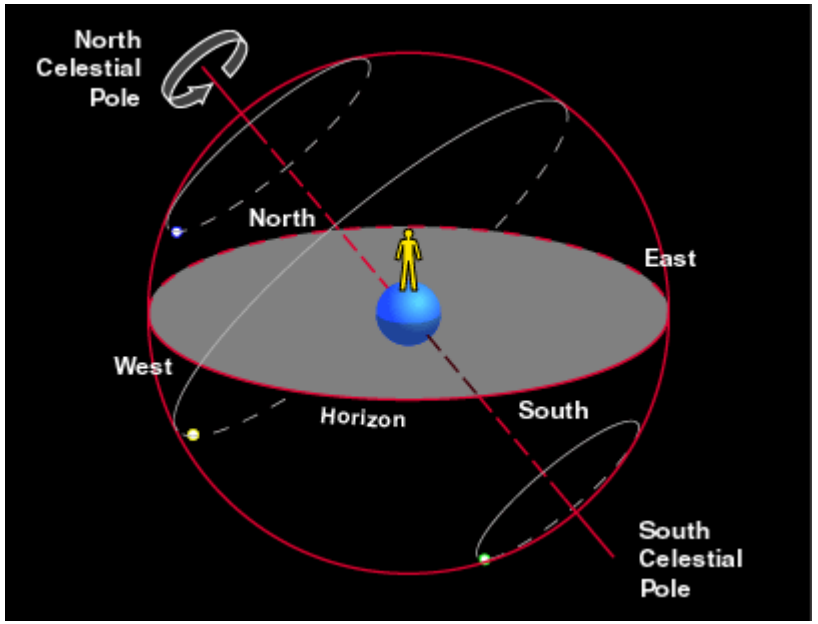
- Consider an observer at the equator and a star at $A = 80°$ and $h = 0°$. State the star's A and h when it transits the upper meridian.



https://www.phy.olemiss.edu/~perera/animations/sky_equator.html

Question

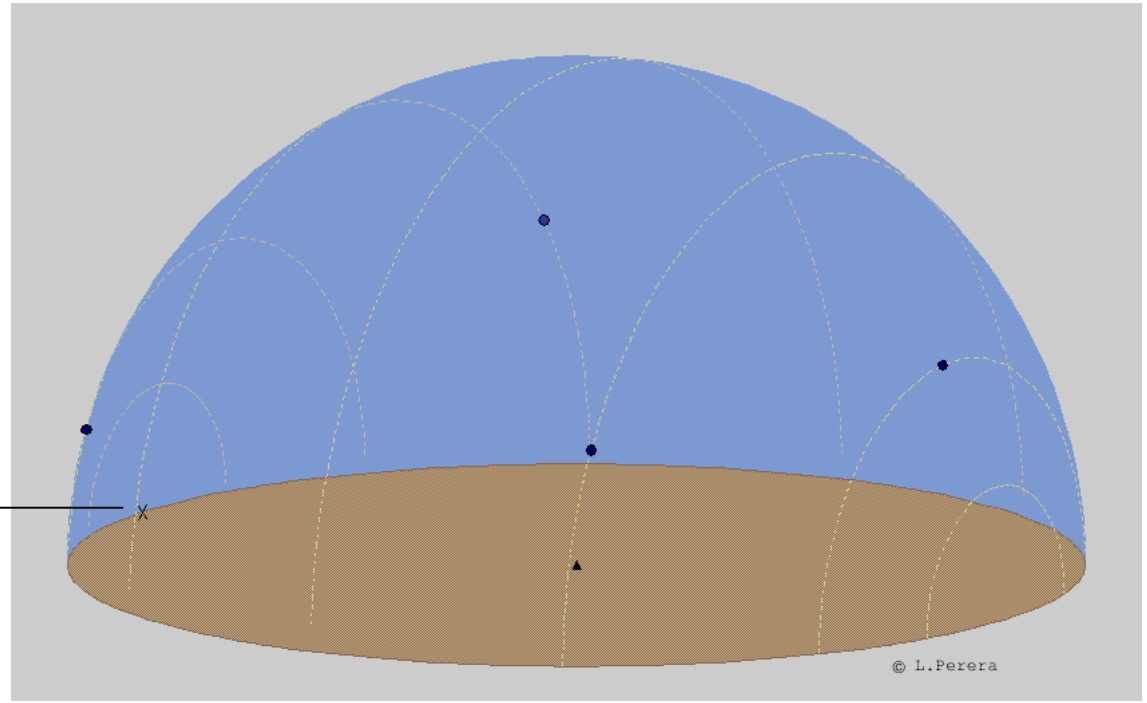
- Consider an observer at the latitude of 10° N and a star at $A = 90°$ and $h = 0°$. State the star's A and h when it transits the upper meridian.



http://lifeng.lamost.org/courses/Hongkong/Hongkong_En/lecture/ch02/ch02.html

Question

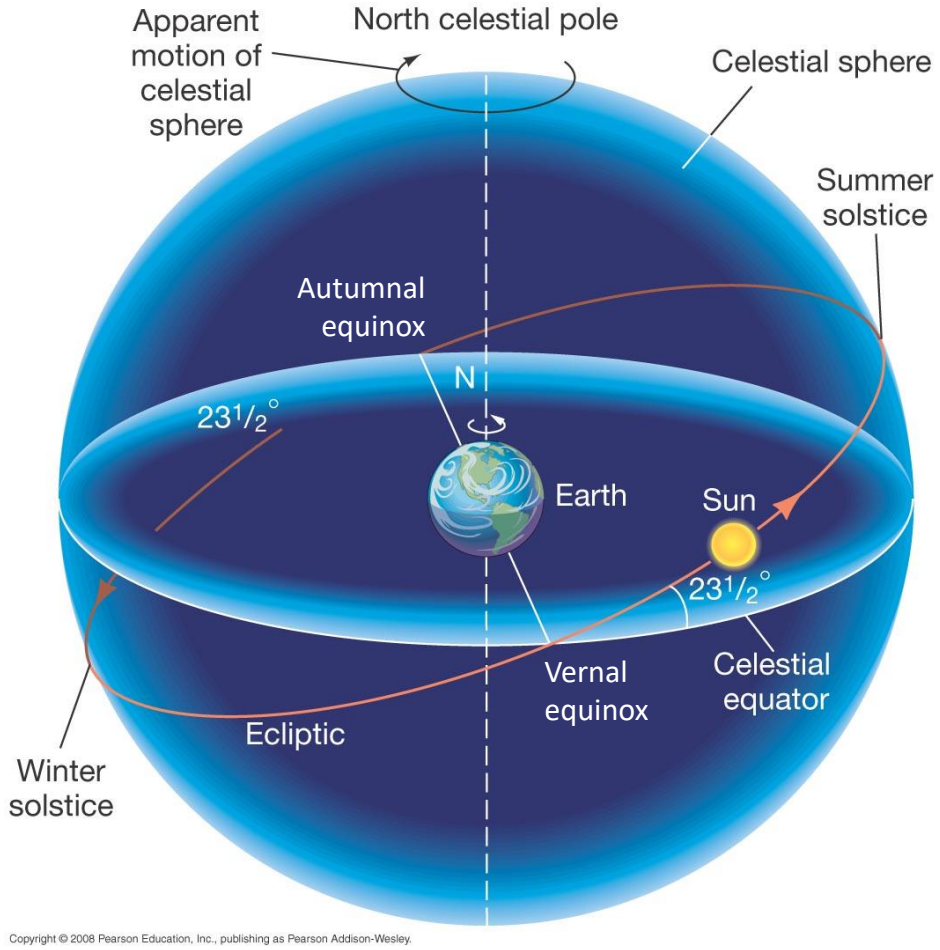
- Consider an observer at the equator and a star at $A = 90°$ and $h = 0°$ at 8pm. State the star's A and h at 8pm after 1 month.



https://www.phy.olemiss.edu/~perera/animations/sky_equator.html

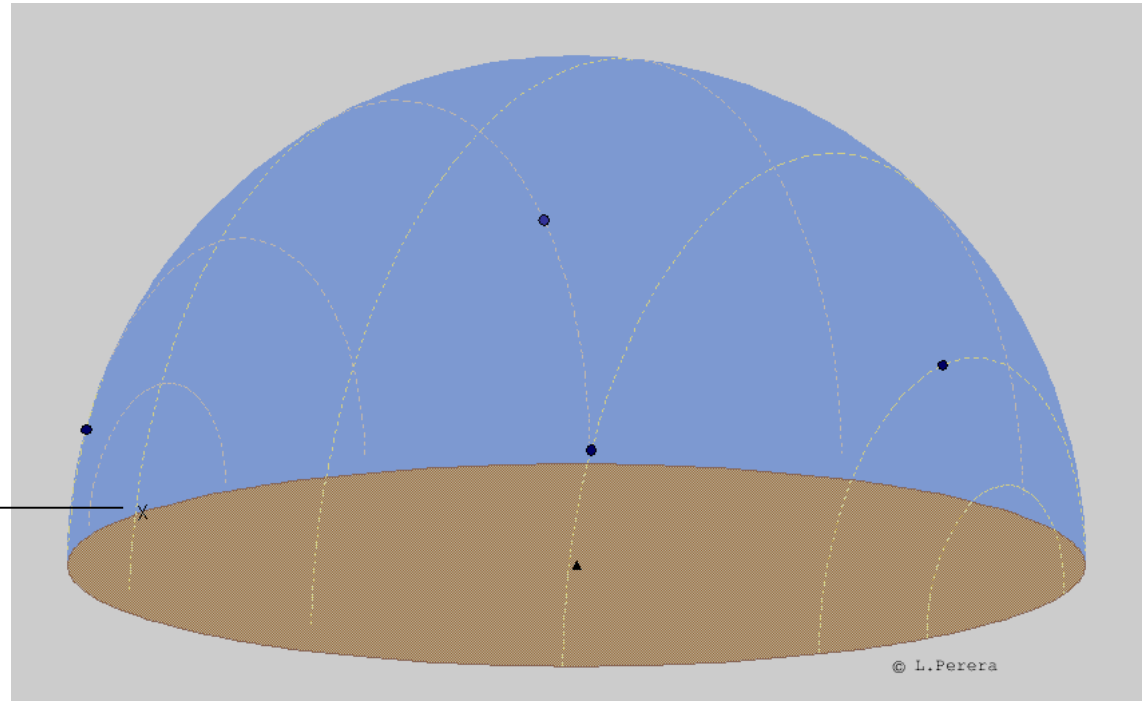
Question

- State the right ascension and declination of the equinoxes & solstices.



Question

- Consider an observer at the equator. What is the path of the vernal equinox during the course of a day?



https://www.phy.olemiss.edu/~perera/animations/sky_equator.html

Question

- Consider a star with $\delta = 0°$ and α = 1 hour. If the vernal equinox is at its meridian now, then at what time will the star be at its meridian?

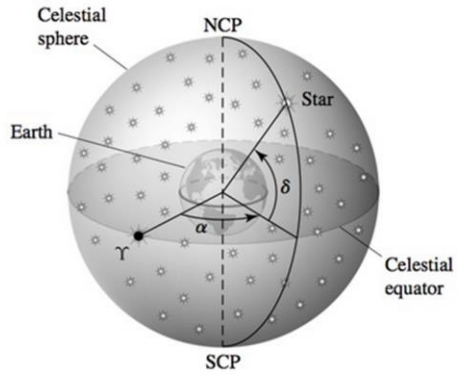
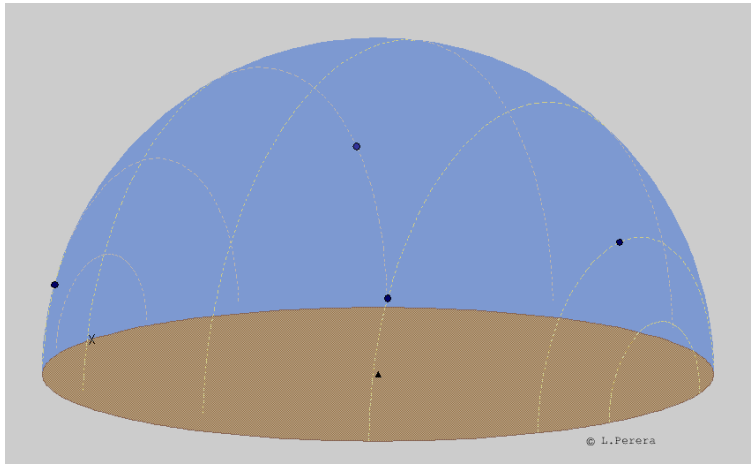


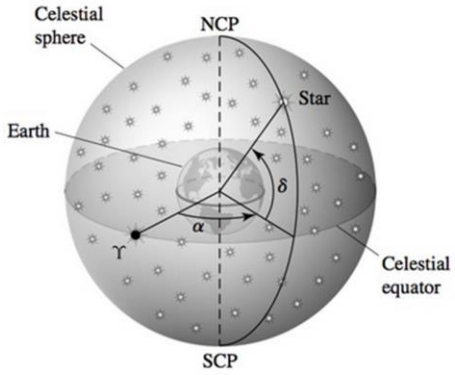
FIGURE 13 The equatorial coordinate system. α, δ, and Υ designate right ascension, declination, and the position of the vernal equinox, respectively.



https://www.phy.olemiss.edu/~perera/animations/sky_equator.html

Question

- Consider a star with δ = +10° and α = 1 hour. If the vernal equinox is at its meridian now,
  a) will the star be its meridian also 1 hour later?
  b) What are the azimuth and altitude of the star when it is at its meridian?



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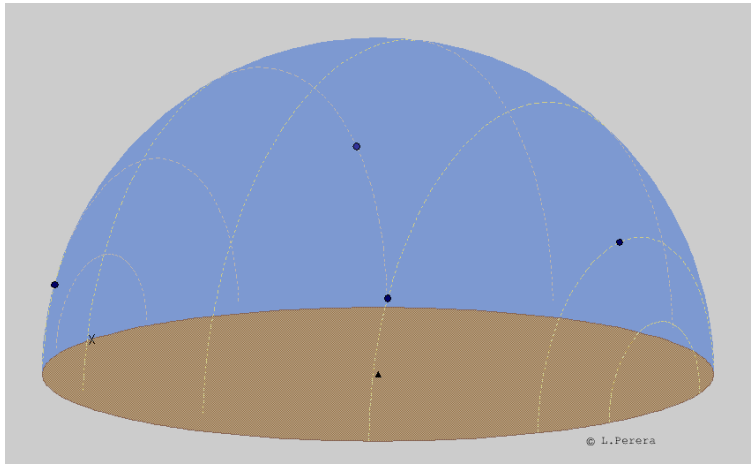


https://www.phy.olemiss.edu/~perera/animations/sky_equator.html

Question

- Consider an observer at the latitude of 20° N and a star with δ = +10° and α = 1 hour. If the vernal equinox is at its meridian now, what are the azimuth and altitude of the star when it is at its meridian?

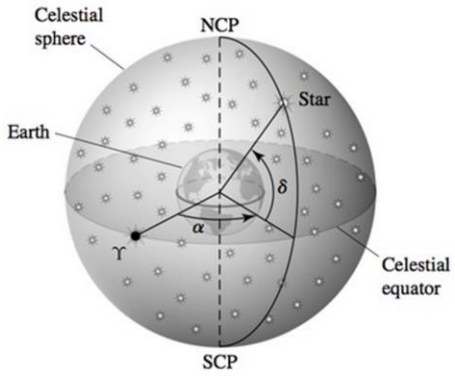
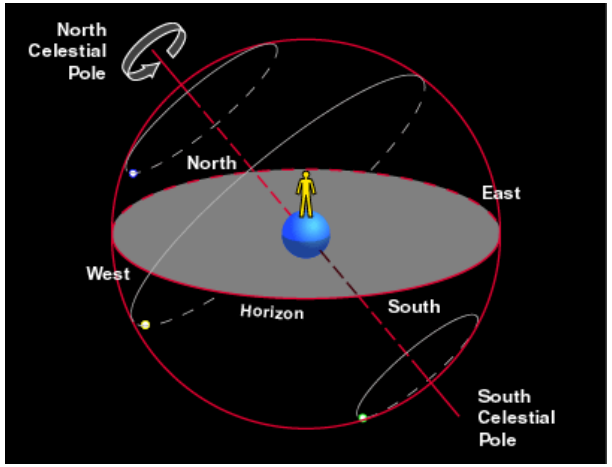


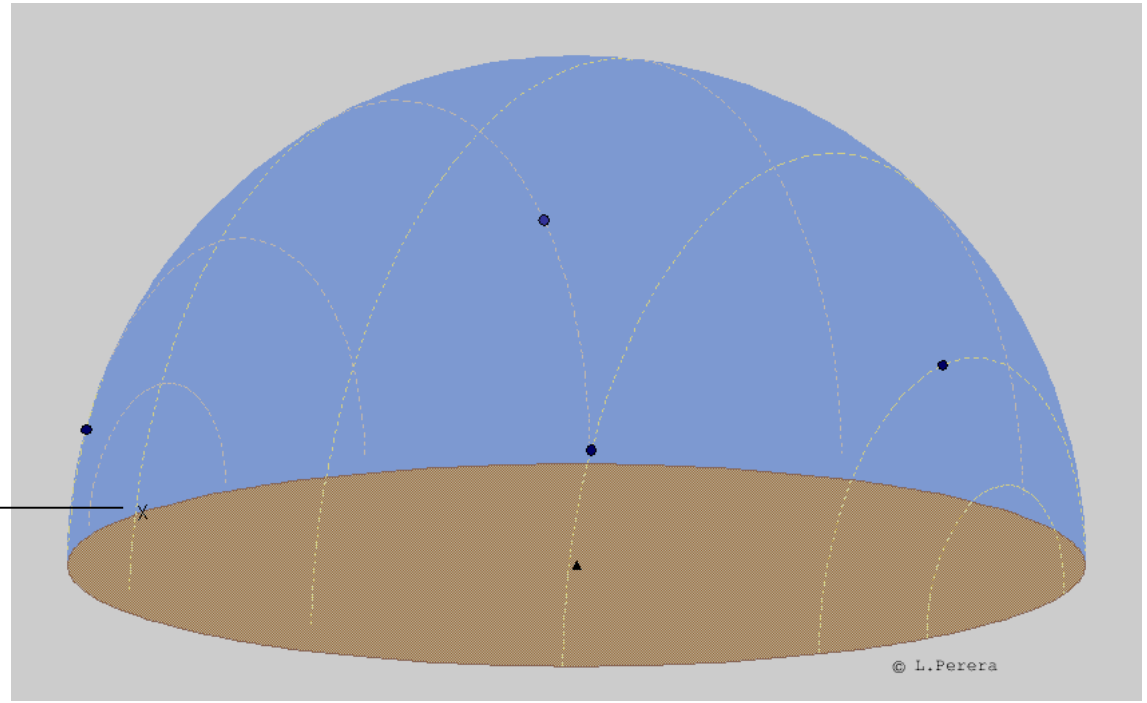
FIGURE 13 The equatorial coordinate system. α, δ, and Υ designate right ascension, declination, and the position of the vernal equinox, respectively.



http://lifeng.lamost.org/courses/Hongkong/Hongkong_En/lecture/ch02/ch02.html

Question

- Consider an observer at the equator and a star at $A = 80°$ and $h = 0°$. Calculate the star's A and h after 1 hour.

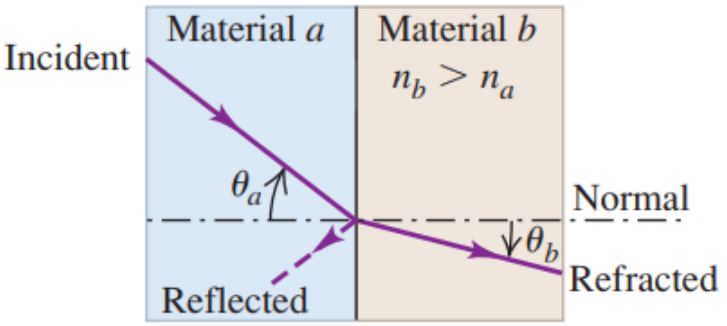


https://www.phy.olemiss.edu/~perera/animations/sky_equator.html

Question

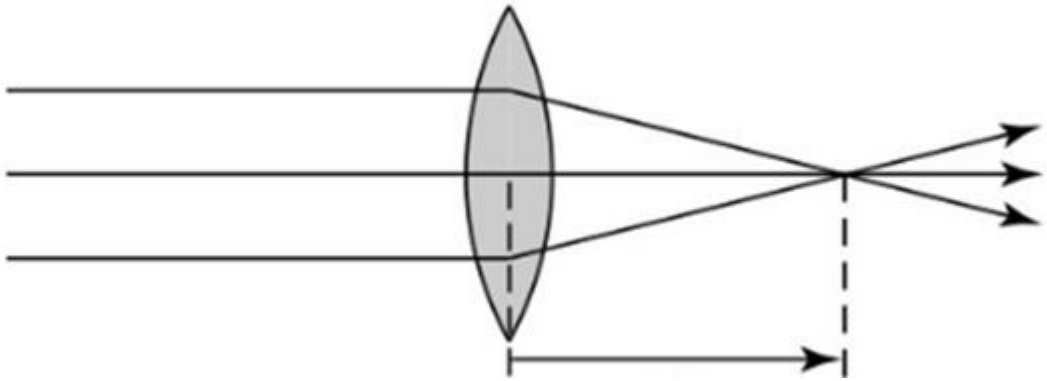
- Does the index of refraction depend on the wavelength?

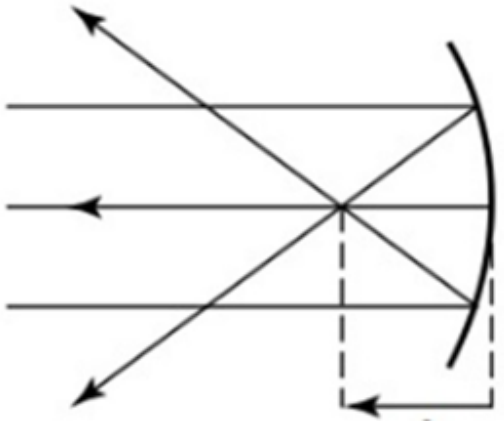
(a) A ray entering a material of *larger* index of refraction bends *toward* the normal.



Questions

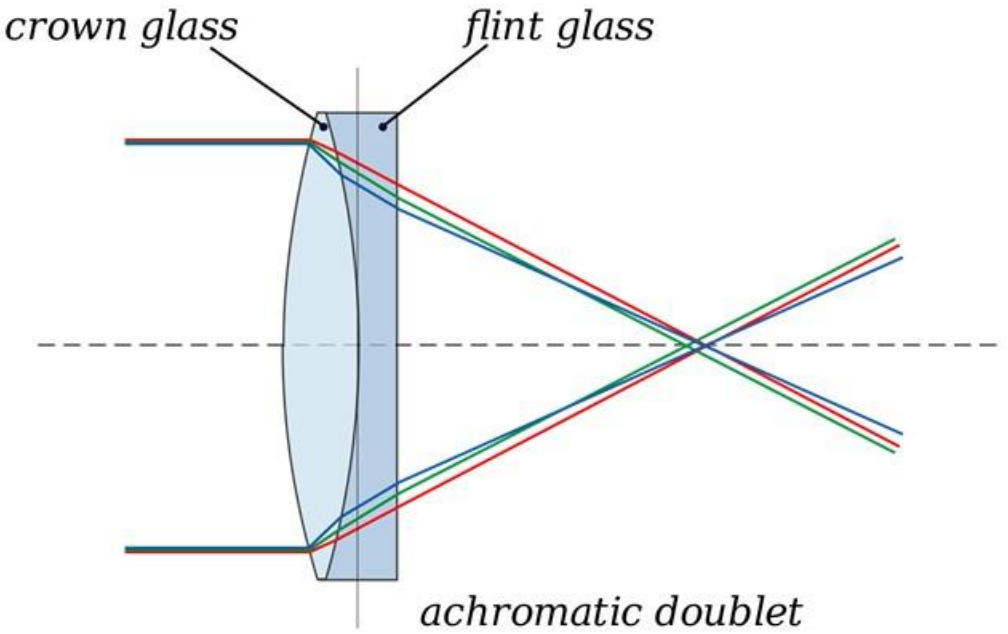
1. Does the focal length of a lens depend on the wavelength?
2. Does the focal length of a mirror depend on the wavelength?





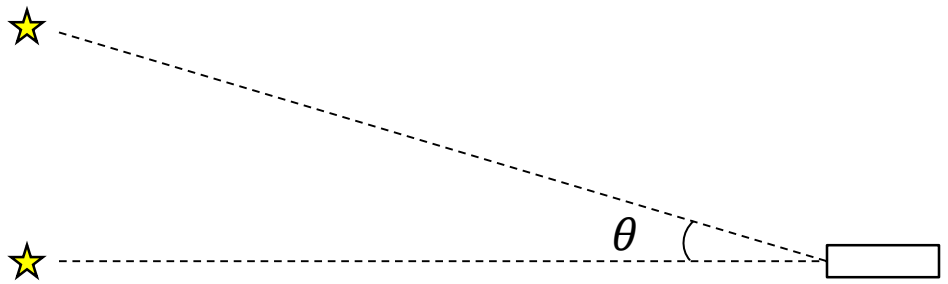
Questions

1. The _____ (crown/flint) glass has a stronger optical power.
2. The flint glass refracts light _____ (more/less) strongly than the crown glass
3. The flint glass has a _____ (longer/shorter) focal length than the crown glass.



Question

- How is the angular separation of the two point sources measured from their image separation?

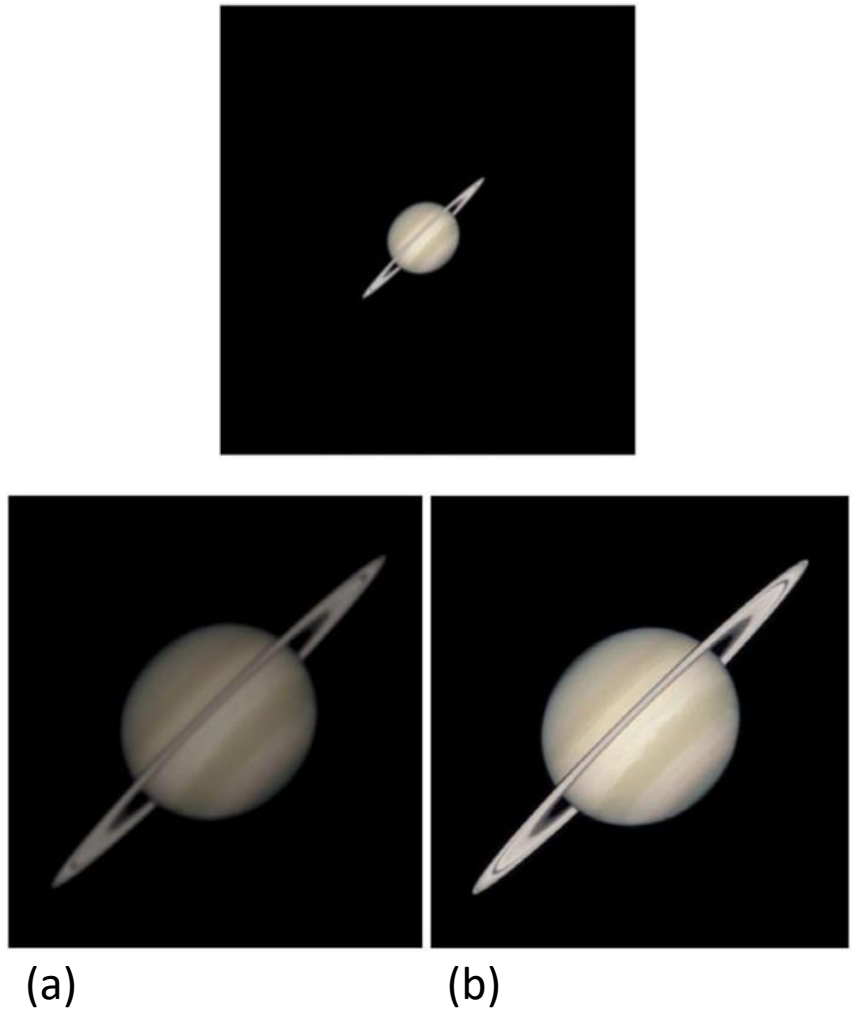


Question

- The image is large if the focal length is _____.
  a) long
  b) short

Question

- Which of the following is the new image if the lens is replaced by one with the same size but a longer focal length?



Question

- A telescope has a focal length of 650 mm. What is its plate scale?
- What is the unit of the plate scale?