

Notes: * Attendance Sheet

* Return Survey - Friday

* Number Sheets

HW Assignment - Due Friday Sept 1. at 5pm

- Will consist of problems - one has to "figure out" solution

* for each problem write a complete solution / provide ~~an~~ a calculation - include all reasoning

* return a paper copy

- this is how people learn physics.

Friday: Read

Motion of celestial objects

Celestial objects are visible in the night sky and include stars, planets, the Moon, etc.,... We will focus on objects in the solar system. These include

* the Sun

* the Moon

* planets

We can ask:

1) how are these objects arranged?

2) how do these move?

We now think that each planet orbits Sun in a roughly circular path and the Moon orbits Earth in a roughly circular path.

Demo: Solar System Scope

When making such statements we need to realize that this provides a "picture" or "model" of the solar system. This model helps us think about the solar system and predict what it will do in the future. We need to ask:

- * Has this always been the model for the solar system?
- * What other models are possible/have existed?
- * How can we check whether any model is correct or not? What types of observations, done from Earth, can support or reject any given model? How do they do this?

We first need to classify objects and their basic observed behavior. In the sky we can observe:

- 1) Sun
- 2) Moon
- 3) Stars
- 4) Planets

These have the properties:

- a) Stars - appear fixed relative to each other
- appear to move relative to Earth during one night

DEMO: * Astropix: Big/Little Dipper

* CIR0 Star Motion

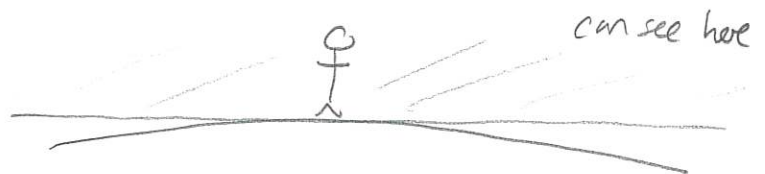
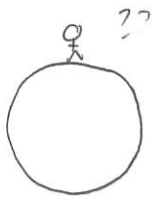
- b) Planets ~ move relative to fixed stars
~ move " to Earth during one night
~ visible planets: Mercury, Venus, Mars, Jupiter, Saturn.

DEMO: APOD ~ Jupiter / Saturn motion

We would like simple models to describe the apparent motion of these objects

Quiz 1 50%

We will need diagrams to help decide. These involve simple geometric constructions. The first step is the field of vision

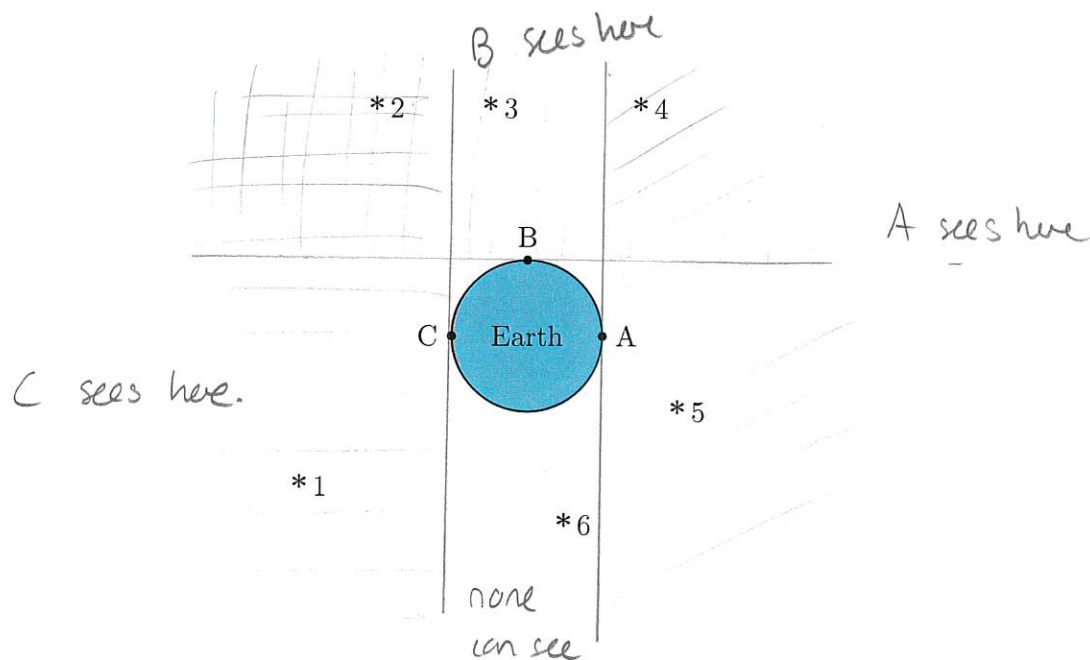


Concepts of Physics: Class 2

25 August 2023

1 Observations from Earth

Various stars, labeled 1, 2, 3, ..., are located around Earth as illustrated. People, labeled A, B, C, observe the sky from the indicated locations on Earth's surface.



- For each observer, list every star visible.
- Illustrate the region of that is visible to each observer on the diagram.
- Is there any region of the sky that is visible to all three observers?
- Is there any region of the sky that is visible to none of the three observers?

a) A sees 4,5 B sees 2,3,4 C sees 1,2

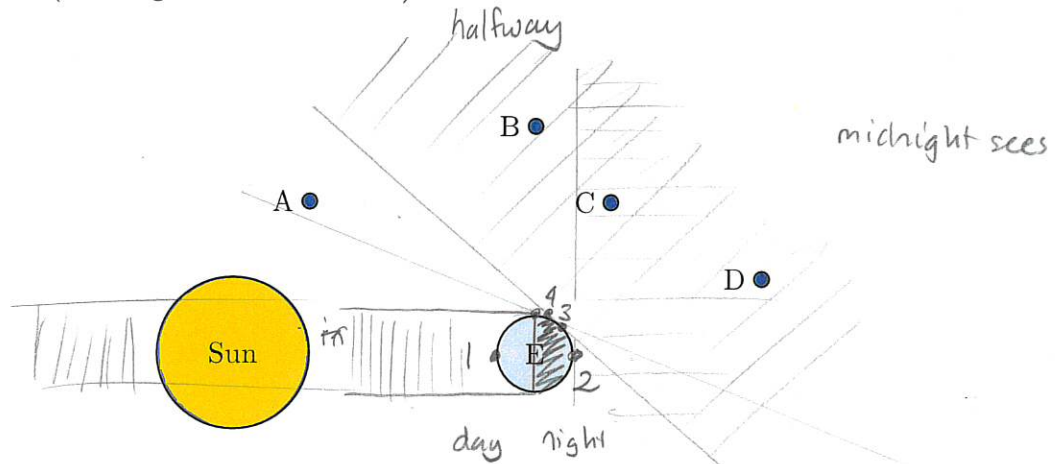
b) see diagram

c) no

d) yes, 6 is in here

2 Observing planets

Planets in the solar system can be observed when they reflect light from Sun to the observer. This light is too dim to be observed during the day. Consider Sun, Earth and several planets as illustrated (the diagram is not to scale).



- Indicate the portion of Earth where it is day. Indicate the portion where it is night.
- Indicate the location on Earth where it is midday. Indicate the portion where it is midnight.
- One person observes this at midnight. Which planets can this person see?
- Another person observes this halfway from sunset to midnight. Which planets can this person see?
- Are there any of these planets which are not visible from at least one nighttime location on Earth?
- Are there any locations where a planet could be so that it is not visible from any nighttime location on Earth?

b) Midday = 1
Midnight = 2

c) C, D

d) label location 3 → sees B, C, D

e) No, A can be seen by a person at 4

f) Yes in the range illustrated as ||||