

Lecture 2-The Sky Tonight



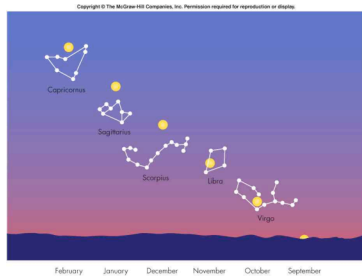
What will we see tonight, and how does it relate to this course?

One good way to know what's in the sky...program Starry Night Pro. It's on its way



demonstration

First event tonight: sunset at 5:11PM



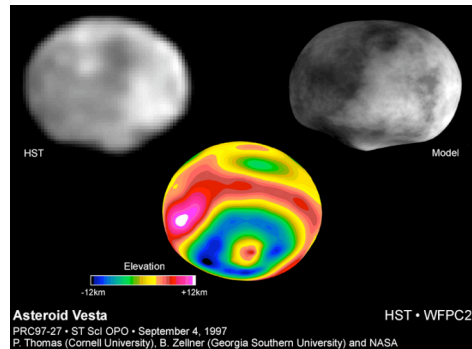
"azimuth angle" of setting Sun = 242 d

Question: how do you think the time of setting of the Sun, and the azimuth angle will change as the semester progresses?

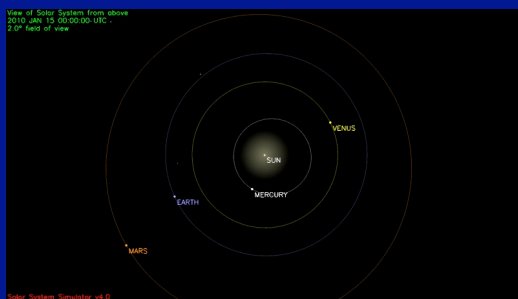
Other sights to look for (let's use Starry Night)

- Bright object low in southwest (what is it?)
- First quarter Moon. Note where it is at this time of day
- Look to south-southeast. Lots of stars
- At 8 pm...look east. The planet Mars is in the constellation of Leo
- 10:30 pm...look east. Bright object in constellation of Virgo. The planet Saturn (orbited by piece of U of I)
- Back to Leo. The asteroid Vesta is there, too

Vesta as seen by the HST



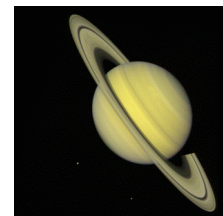
Next topic: overview of the solar system



What's there, how far away is it?

The "scale" of the solar system

How far away are the objects in solar system astronomy? What units do we use to describe them?



→ Audience participation...any suggestions?

New units (the metric system)

- Fundamental unit of size is the meter
- 1 kilometer=1000 meters
- 1km = 0.6214 miles

Size of the solar system: first stop...Iowa



Davenport - Council Bluffs = 504 km = 313 miles

Next stop: planet Earth

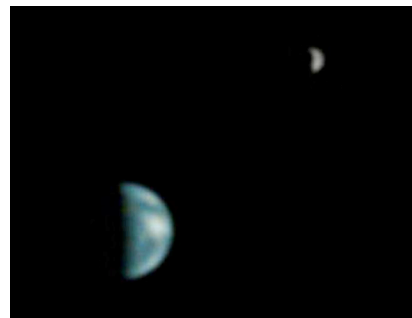
Diameter of Earth =
12756 kilometers
(look in appendices
of your book)

Compare with LA-
Sydney flying
distance of 12042 km

The diameter of the
Earth is a large, but
human-sized
distance



The Earth and Moon as a double planet

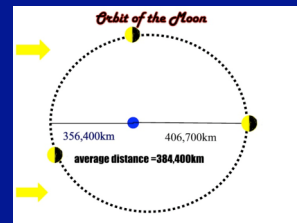


Picture taken from the MGS spacecraft at Mars!

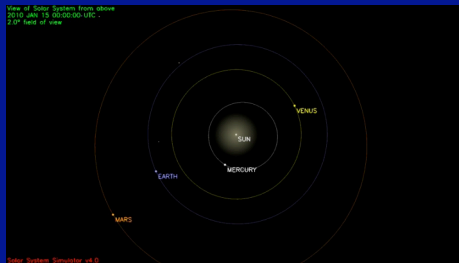
How far away is the Moon?

It took Apollo astronauts about 3 days to get there in a spaceship

The orbit of the Moon



What about the distances to the planets?
Here we have a big step



We refer interplanetary distances to the distance to the Sun

The unit for interplanetary distances:
the Astronomical Unit

- Average distance between the Earth and Sun
- The astronomical unit = 149,600,000 km
- In scientific notation: 1.496×10^8 km
- The AU = 93,000,000 miles
- The AU is 17 years in an economy class airline seat

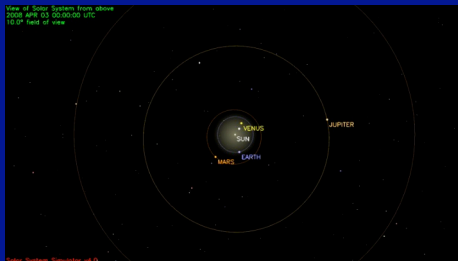
Average distances of “terrestrial planets” from the Sun

- Mercury 0.387 au
- Venus 0.723 au
- Earth 1.000 au
- Mars 1.523 au
- Separation between Mars and Earth at opposition on Jan. 29: 0.665 au

Where are the other planets you learned about in school? Where do they fall on our “map”?



The outer solar system



One of the most important things to learn about in solar system astronomy