Wednesday, Sep. 3

If you don't have them yet, pick up syllabus, ABCD card, and homework after class.

Syllabus, class notes, and homeworks are at:
www.as.utexas.edu → courses → AST 301, Lacy

Reading for this week: chapter 3 (1&2 for last week)

The homework handed out last Friday is due at the beginning of class this Friday.

Look for the Moon and planets tonight and the next two weeks.

Topics for this week

Know what the magnitudes of stars tell you about their relative brightnesses

Describe the apparent motions of stars across the sky during a night as seen from various locations on Earth

Describe and explain the apparent motion of the Sun relative to the stars during a year

Explain how the tilt of the Earth's axis causes the seasons

Describe how the path of the Sun across the sky during a day differs during different seasons

Describe and explain the phases of the Moon and the motion of the Moon relative to the stars during a month

Explain how eclipses occur

Magnitudes and Brightnesses

Long ago astronomers divided stars into 5 classes:

the stars of the 1st, 2nd, 3rd, 4th, and 5th magnitude.

1st magnitude stars are about 2.5 times brighter than 2nd magnitude stars.

And 2nd magnitude stars are about 2.5 times brighter than 3rd magnitude stars.

We still use the system, but in a more quantitative way.

Note: larger magnitudes means fainter, and each step in magnitude is 2.5 times fainter.

Motions in the sky during a night

Find a planetarium program on the web.

Stellarium (www.stellarium.org) looks pretty good.

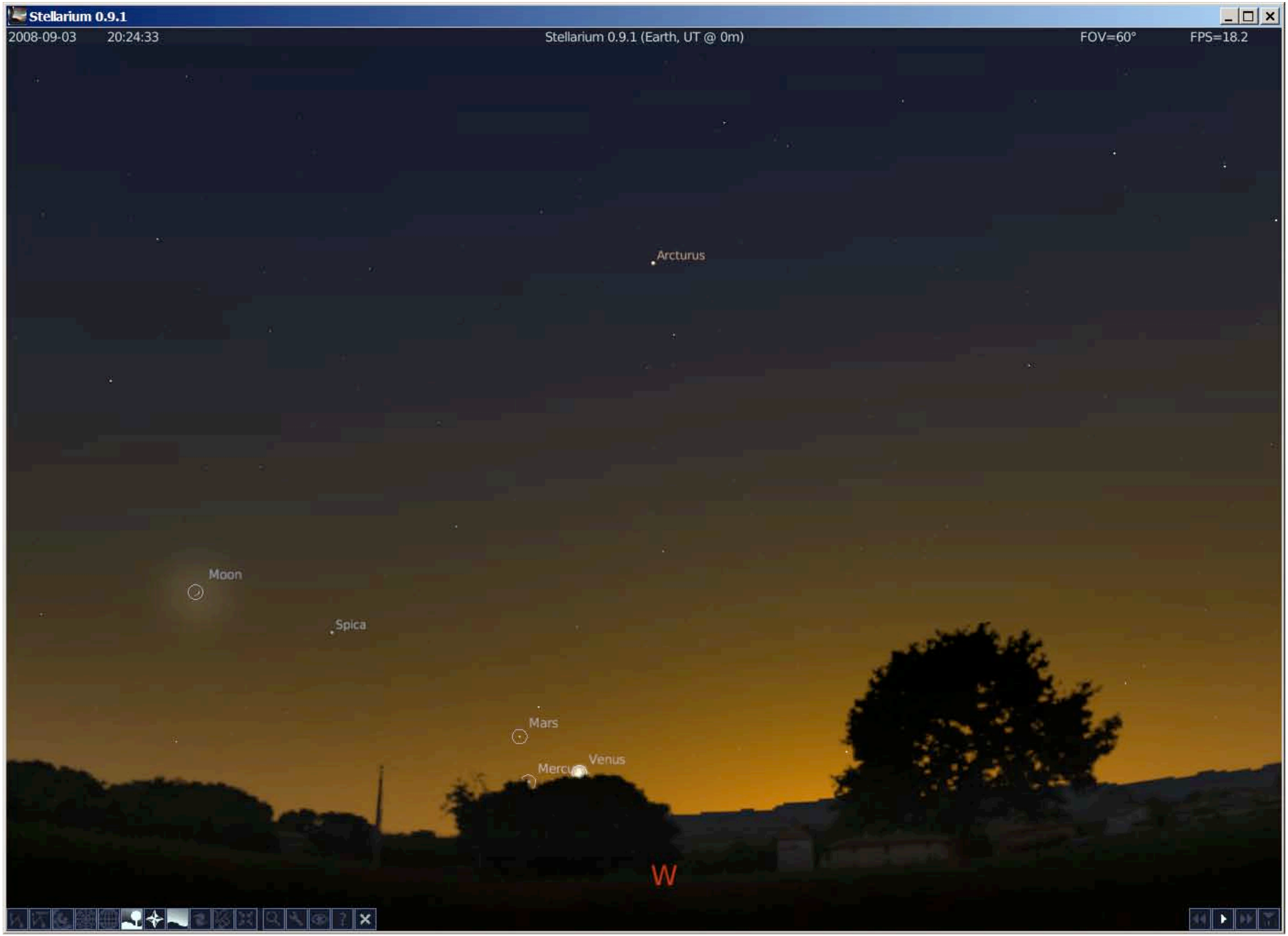
Set the location to Austin.

Use it to see how stars appear to move across the sky during a night.

General pattern:

- Most objects rise in east, follow an arc across sky, and set in west.
- Although some rise in the southeast and set in the southwest, and others rise in the northeast and set in the northwest.
- And some circle the North Star and never set.

Why? What causes this motion of objects across the sky?


Stellarium 0.9.1
2008-09-03 20:24:33
Stellarium 0.9.1 (Earth, UT @ 0m)
FOV=60°
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Arcturus
Moon
Spica
Mars
Venus
W

Assignment for the next two weeks

Look for Venus, Mercury, and Mars in the west in the evening. Look for them several nights.

Note how they move relative to each other and relative to Spica, the moderately bright star near them.

Look for the Moon.

Watch how its position in the sky changes during a night and from night to night.

Note how the phase of the Moon changes from night to night.

I will come to the star party tonight at 8:00 on top of RLM.

Motions of objects in the sky

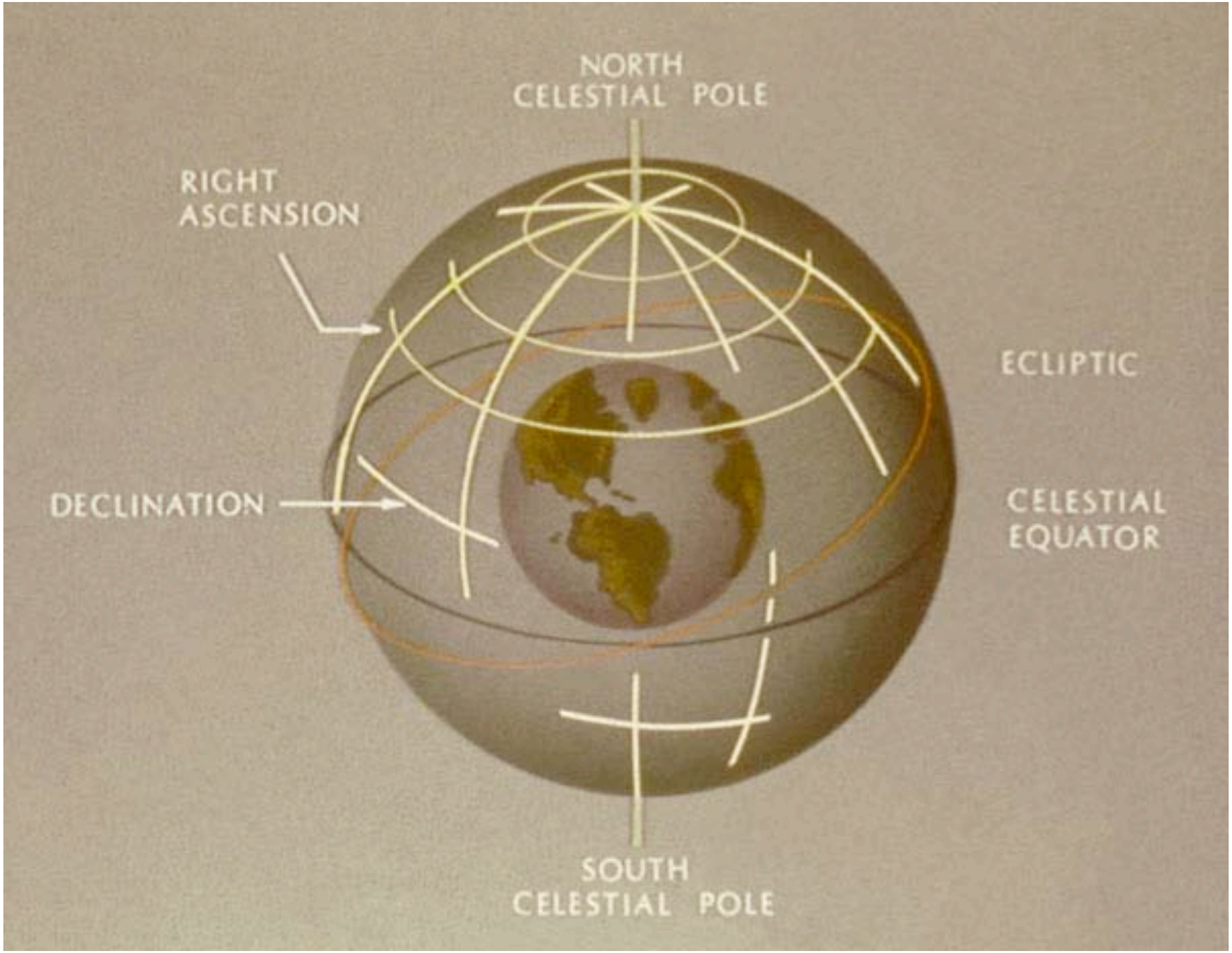
The Earth rotates on its axis once each day.

The Earth's axis passes through the north and south poles, and points at the north star (Polaris) above the north pole.

The rotation of the Earth on its axis makes the stars appear to move around the sky during the night.

It may be easiest to pretend that the sky rotates around the Earth instead of the Earth rotating.

Think of the stars as tiny lights on a glass sphere surrounding the Earth. The sphere rotates about a line through the Earth's poles and through the north star.


NORTH
CELESTIAL POLE
RIGHT
ASCENSION
ECLIPTIC
DECLINATION
CELESTIAL
EQUATOR
SOUTH
CELESTIAL POLE