

Astronomy II – Earth Motions

I. Earth Movement Through Space

A. Rotation

1. around axis (imaginary line)
 - a. counter clockwise W→E
 - b. rotates faster as the equator than poles
 - c. 15 degrees /hour
 - 1) all visible celestial objects thus rotate in our perception
2. tipped 23.5 degrees from vertical
 - a. unequal sunlight on N & S hemispheres
3. parallelism of the axis
 - a. causes seasons for Earth
4. Foucault pendulum
5. Coriolis Effect
6. causes day and night – 24 hours

B. Time

1. Solar noon
 - a. Sun is highest point in the sky
2. Standard Time Zones
 - a. 15 degrees between each
 - b. longitudinal meridian
 - 1) starts at Prime Meridian
 - 2) move westward, move clocks back 1 hour for each zone
 - 3) political boundaries bend zones for convenience
 - a) Eastern 75W
 - b) Central 90W
 - c) Mountain 105 W
 - d) Pacific 120W
 - 4) International Dateline
 - a) change calendar 1 day
 - b) move westward advance their calendars
 - c) move eastward back one day
 - d) always 2 dates on Ea at any one time
 - 1) cont. US behind Easia and Pacific Isles.
3. Daylight Savings Time
 - a. clocks advance 1 hour
 - b. adds daylight when people are awake
 - c. saves electricity delay eve use of lights
 - d. April → October

C. Revolution

1. Defined as orbit around the Sun
2. Parallax – shift in position of stars
 - a. stars should not appear to move
 - b. too far away
3. move counterclockwise

4. distance between Sun and Ea change
 - a. aphelion – winter July 4
 - b. perihelion – summer Jan 2
5. about 1 degree / day [360 degrees/ 365 days]

II Seasons ALL RELATIVE TO THE NORTHERN HEMISPHERE

A. 3 major parallels

1. Tropic of Cancer 23.5 N
 - a. 90 degrees insolation 1x/yr
 - 1) sun is highest in sky
 - b. June 21 – summer solstice
 - 1) N.pole 24 hours of daylight
 - c. S. Hemis. undergoing winter season
 - 1) sun is lowest in sky
 - 2) S. pole 24 hours of darkness
 - d. Equinoxes
 - 1) daylight and nighttime are equal
 - 2) in or around March 21 – spring equinox
 - 3) in or around Sept 23 – autumnal equinox
 - 4) Sun is directly overhead at the equator

**Know the Celestial Sphere diagram, all dates, parallels and degree values

2 Equator

- a. remains relatively equal in temp year round
- b. only small fluctuations , no seasons
- c. rains almost daily in pm
3. Tropic of Capicorn 23.5 S
 - a. 90 degrees insolation 1x/yr
 - b. Dec. 21 – winter solstice
 - c. S. Hemis undergoing summer
 - 1) sun is highest in sky