

← Lecture Notes for 10/16 *

• The Moon

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- Terrain features consist of craters, rays, maria, rilles, and highlands.
 - maria = ~~big dark patches~~ = composed of basalt (igneous rock);
Density greater → impact from very large impacts; early impacts on moon = interior of moon still molten = gives smooth dark surface - produce craters - molten rock seeping down.
 - highlands = oldest rocks on the moon; composed of anorthosite, 4.5 billion years old (same as earth)
 - rays = ejecta from craters (in maria - craters = rays overtop) younger
 - rilles = long dark deep canyons; lunar canyons
 - Craters = younger than maria. smaller; consist of central peaks and outer walls.

- moon different from the Earth: (impact structures)
erosion - get eroded on Earth over time

- nothing on moon that will change anything (except impacts)
- no liquid core on the moon - No magnetic field.
- rocks at edge of impacts → igneous (able to date the rock)
(Earth's atmosphere prevents objects (small) from hitting the Earth)
(large meteors are relatively uncommon)

Internal Structure of the Moon:

Surface = shattered rock fragments and dust (regolith) = a few 10 of m deep

Crust = 100 kilometers ~~thick~~ thick. much thinner on the side of the moon that faces the Earth. Not even from all the way around.

↙ Composed mostly of iron poor silicates.

our gravitational pull - close to the moon

Yours: Alex

Mantle = extends down 1000 km and is solid; composed of diverse w/out any convection

perhaps a small molten core

very little iron - low density

no magnetic field / feeble internal heat

= Lunar Atmosphere

- Subject to exact same processes as Earth
- but doesn't have enough gravity
- Sky on moon is black because the moon does not have an atmosphere so there's no scattering

= Motions of the Moon

Apogee = farthest earth-moon distance

Perigee = closest earth-moon distance

Moon orbits the earth on an elliptical orbit

= Origin of the Moon

Pre-Apollo theories =

- * capture theory = Moon was planet sized object - captured by Earth's gravity
- * twin-formation = condensed out of cloud
- * fission theory = moon came off Earth

BIG IMPACT THEORY - Current theory suggests that a large, Mars-sized object collided w/ a very young Earth to produce the moon



Eclipses =

moon's orbital path is inclined = so we don't have

an eclipses - Solar = Earth's shadow on moon
Lunar = moon's shadow on Earth

Moon has an orbit that is inclined about 5° to the Earth's orbit
Moon can cast a shadow on the Earth and vice versa

* Earth w/out the moon:

- Earth's spin faster
- Earth's spin axis = precession
- little to no tides (occur twice a day)