

Lecture Notes 10/09

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Earth's Atmosphere (cont.)

- * Ozone layer - absorbs UV, protecting us
 - found in 2 places - Stratosphere (Good)
 - (increasing) surface of the planet (Not Good)
- internal combustion → responsible for increasing ozone

Ozone ~~holes~~ = 2 holes (used to be just one)

Venus

* Greenhouse Effect

- carbon dioxide and water in atmosphere trap heat
- Makes Earth warmer than if gases not present
- have to have sun, something to trap that heat (infrared rays = heated)
- carbon dioxide traps heat - absorbs infrared rays
 - trapping heat close to the planet (warms up the planet)
- (heating up 1° every 10 yrs = over our entire planet = Earth)

Global Warming

* Global Warming Controversy:

- No one knows what happened before 100 yrs ago
- could be just a phase the Earth is going through
- Good vs. Bad? Side effects?

* Earth's Magnetic Field:

- charges in motion produce magnetic fields (Generated by)
- magnetic fields - deflect charged particles
- ↓ (ionizing radiation - atmosphere has charged particles)

Earth's = deflects charged particles away

Aurora → Northern Lights → charged particles spiraling down

produces Earth's Magnetic field

Center of the Earth - liquid core; ionized iron = charges in motion

liquid core - spinning rapidly → Earth's Magnetic Field

ex: Jupiter = Gas - spinning, intense

Saturn, Earth → Intense Magnetic Fields

← Earth's Magnetic Field (cont.)

Magnetic field affects motion of gases in upper atmosphere
leads to aurora.

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★ Motions of the Earth

24 hours → • Earth spins on its axis — cause of day and night

Rotation (as opposed to orbit)

(Solar day = sun rise, sun set cycle)

• Angular Momentum = why Earth spins on its own axis

Adjusting to spinning faster vs. slower

cloud condensed out of gas spinning, when formed - spun too.

• orbits around the Sun

• Sun orbits Milky Way Galaxy — Earth follows

Primary manifestation of spin = sun rise, sunset diurnal

Orbit of Earth around ~~the~~ the Sun → yearly cycle

(If Earth's spin axis is perpendicular to planets — no seasons
Distribution always the same, amount of energy same)

Model = of Earth

• Elliptical Orbit around the Sun / spin axis is perpendicular

- perihelion: closest to sun - January

- aphelion: farther from sun - June

tilted axis = rise to seasons

- length of days change with the seasons

winter → shorter days = less energy from the sun = not as much heat

less light - spreading out over area — less heat

Tilt - varies length of days and nights

light that does come in (winter - less heat - spread out)

Northern Hemisphere - extremes of weather found

75% of Earth's Surface is covered with water
- high specific heat capacity = WATER
- water resists the change the temperature

Lake Effect = more moderate^{of} climate

SPIN, ORBIT, AXIS OF EARTH

Why on axis = precession - 24,500 yrs. for Earth to do that once.
Changes the way the sky looks
Upgrade sky maps / star maps

Air / Ocean Circulation

Rotation of Earth creates the Coriolis Effect = large scale circulation
Coriolis Effect = responsible for large scale circulation patterns on planet
Hurricane size = impacted