ASTR 160

now open to ALL non-science majors

Problem Set #1 due THURSDAY (available on classes server)

TF office hrs tomorrow

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classes forum for questions (on V2 click "discussion")

CB's Starbucks hours Mondays 10 - 11:45

Catagories of Solar System Objects

1) Sun

2) inner "terrestial" planets
rocks (silicon, iron)
very thin coating of ice (melted gaseous)
masses $10^{-7} - 10^{-5}$ of Sun
circular orbits

3) asteroid irregular small rocks

4) outer "jovian" planets
gas/ice
↙ H, He ↘ water, ammonia, methane
$10^{-4} - 10^{-3}$ of Sun
rings, many moons,
circular orbits

5) Kuiper Belt object
Pluto etc

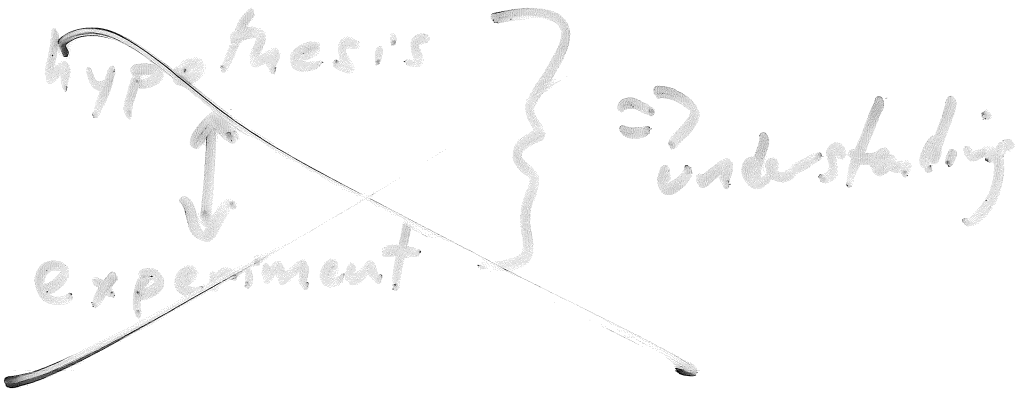
rocky $< 10^{-7} M_\odot$
elliptical inclined orbits

6) Oort cloud - comets
balls of ice.

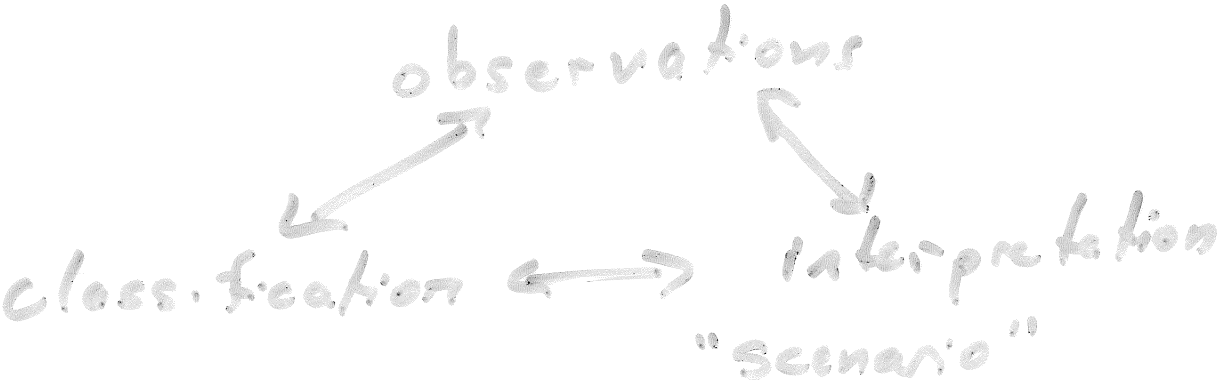
INTERPRETATION
(next time)

What do you do with all this solar system info?

scientific method.



observational sciences



Can't See Exoplanets Directly

Newton's 3rd Law:

"every action has equal & opposite reaction"

"conservation of momentum"

momentum: $M \times V$

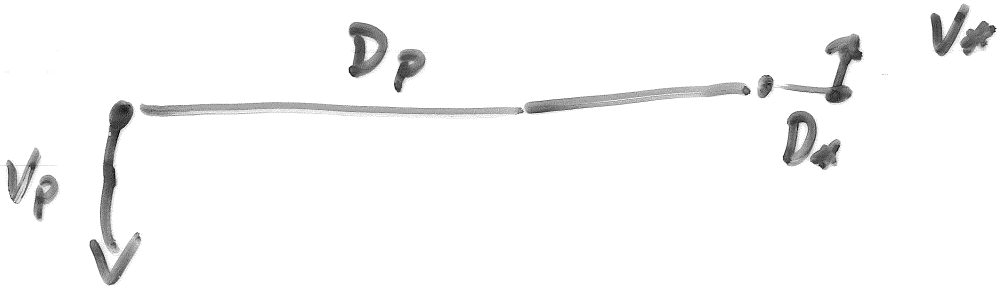
↳ speed & direction

over ½ orbit Momentum is reversed

STAR MOVES TOO

$M_p V_p = M_* V_*$

~~go~~ orbit around "center of mass"



$$V_{TOT} = V_p + V_*$$

$$D_{TOT} = D_p + D_*$$

$$D_{max} = a$$

can measure this

$$V_p M_p = V_* M_*$$

$$D_p M_p = D_* M_*$$

large

small

Sun = 2×10^{30} kg

Earth = 6×10^{24} kg

Jupiter = 2×10^{27} kg

$V_* << V_{planet}$ but can be detected