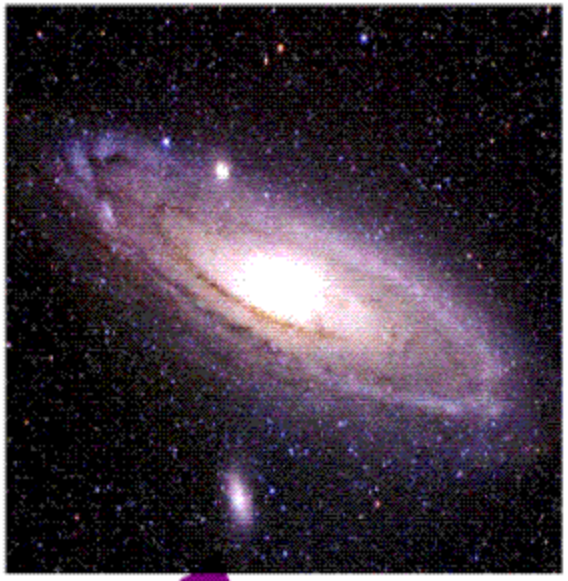
Physics 100 – January 21, 2009

- Problem Set 1 posted on class website
  Due Monday at end of class
- Recitations begin Next week

Last time

The Human Experience is a very tiny fraction of what the universe offers



large

Perhaps we should expect surprises

Small

The Human Experience

Science – A methodology for seeking to understand the universe around us.

Science
laws
before
Experiment

Position

coordinate system

time

$\frac{\Delta x}{\Delta t}$ Average Speed

$\Delta \equiv$ change in

velocity $\equiv$ speed + direction

$\frac{\Delta V}{\Delta t} \equiv$ Average Acceleration

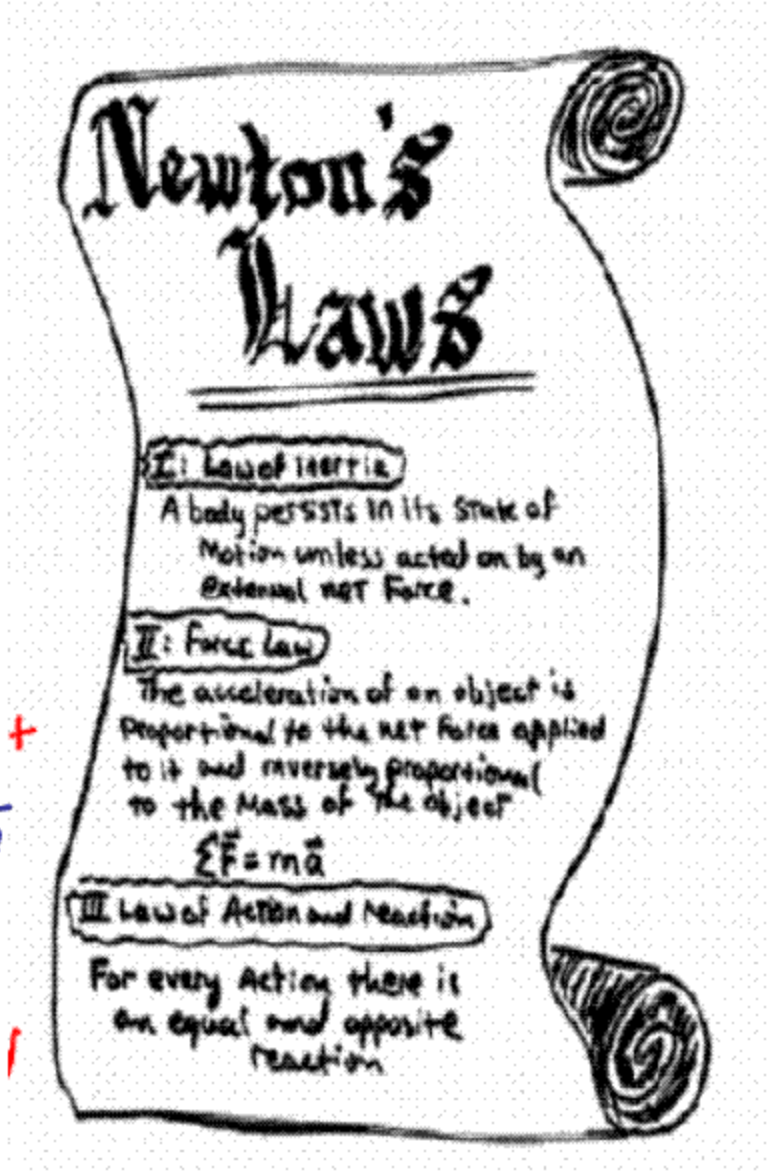
x, v, a, t kinematic variables

Isaac Newton

How kinematic variables relate to forces

In Newton's world, if we know x, v, a or Force on an object we can calculate the future motion of the object

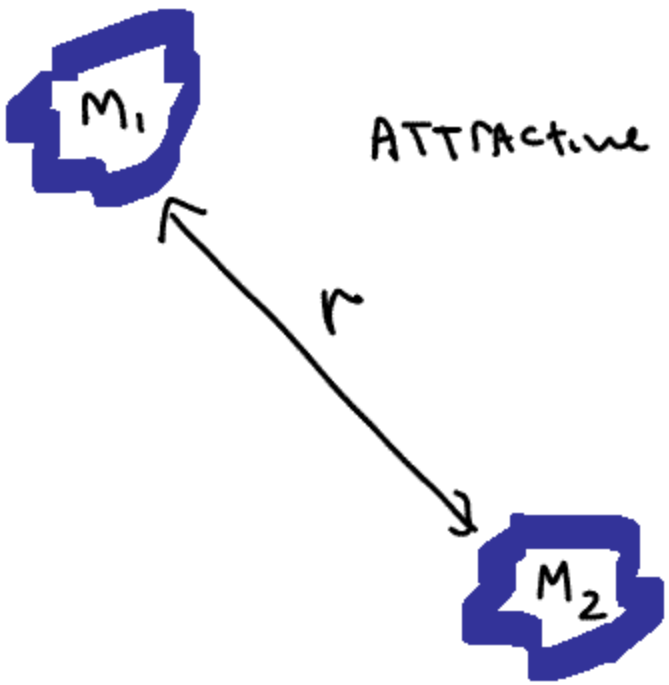
$\Rightarrow$ Deterministic universe



What kinds of forces exist?

gravitation

$$F_{grav} = \frac{G m_1 m_2}{r^2}$$



ATTRACTIVE

Electromagnetic Force

$$F = \frac{k q_1 q_2}{r^2}$$

Repulsive and ATTRACTIVE