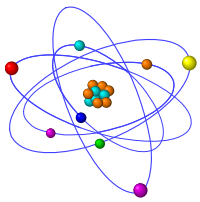
WELCOME TO PHYSICS 211

Portland State University Andres La Rosa

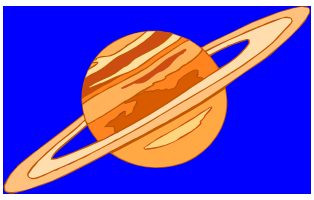
Generation and Evolution of Technology

PHYSICS

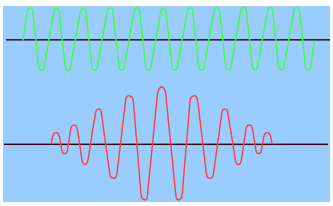
Discovery of Fundamental Laws in Nature



ATOM



ASTRONOMY



ELECTROMAG-NETIC WAVES

PHYSICS 211

Working plan **From the simpler to the more complicated**

For one particle

KINEMATICS

Study of motion

DYNAMICS

Forces

For many particles (10^{23})

The concept of **Center of Mass**

Use of the same tools developed in the one-particle case.

A. KINEMATICS

Studying the motion of particles

We do not worry about what causes the motion

We are interested in developing a formalism to classify and measure the motion of particles

<u>Working plan</u> **From the simpler to the more complicated**

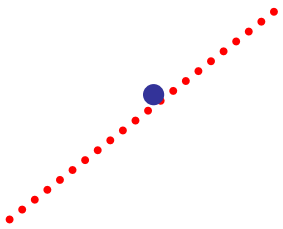
Terminology **Units**
Systems of
Coordinates

Motion of Particles
(Complicated. We'll do it later)

Motion of <u>one</u> particle

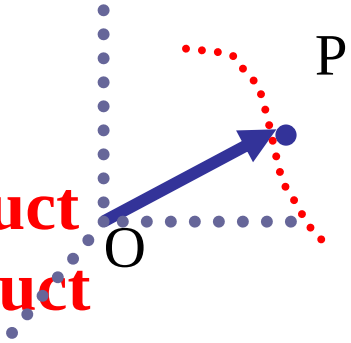
Linear Motion

Velocity
Speed
Acceleration

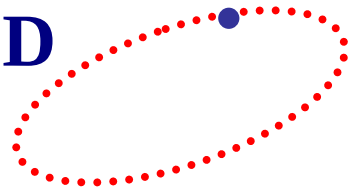


Tools (Math)

Vectors
Scalar product
Vector product

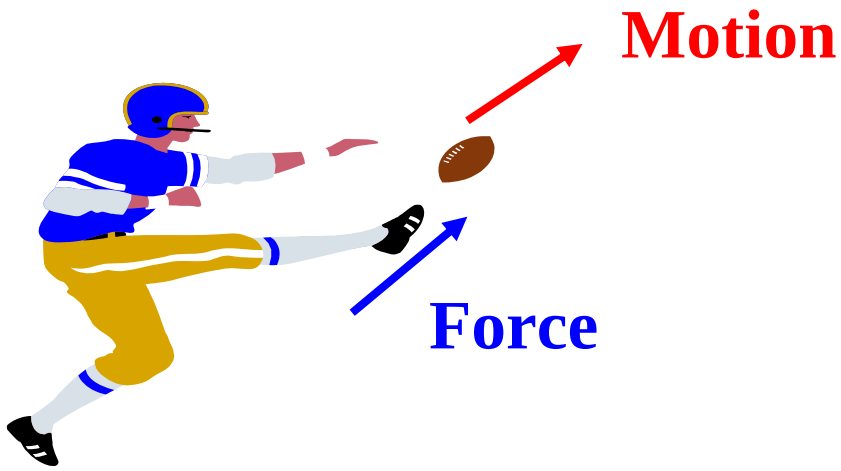


Motion in 2D and 3D



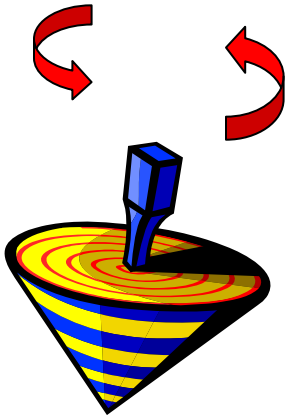
B. DYNAMICS

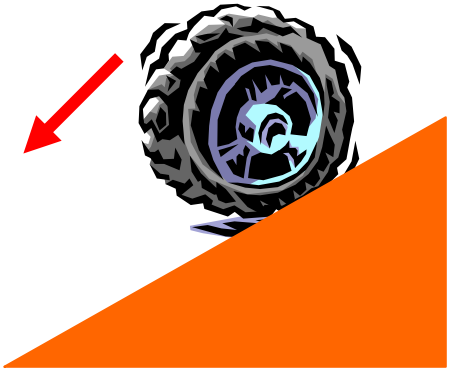
Studying FORCE and MOTION

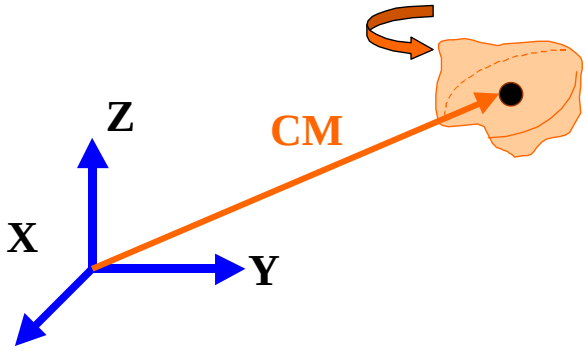


- Newton's Laws (1^{st}, 2^{nd}, 3^{rd}) and Inertial System of Reference
- Conservative forces and No conservative forces (friction)
- Conservation of Mechanical Energy
  Linear Momentum
  Angular Momentum

C. SYSTEM OF PARTICLES







- Center of mass
- Translation + Rotation
- Rotational Inertia