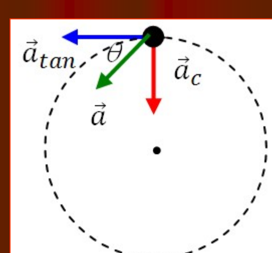
Today:

Today – Return of Momentum + ImPULSE

PHYS 210
Genevil Physics I

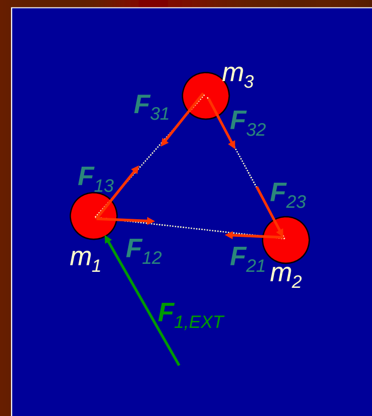
Non-Uniform Circular Motion

- **In general, acceleration vector will have a component <u>perpendicular</u> to the path (i.e., a *centripetal* component) and a component <u>parallel</u> (or anti-parallel) to the path.**



More with force …

Suppose we have a system of three particles as shown. Each particle interacts with every other, and in addition there is an external force pushing on particle 1.



All of the **"internal"** forces **cancel** !!

Only the **"external"** force **matters** !!

$$m\vec{a} = \sum_i \vec{F}_{i,net} = \left(\vec{F}_{13} + \vec{F}_{12} + \vec{F}_{1,EXT}\right) + \left(\vec{F}_{21} + \vec{F}_{23}\right) + \left(\vec{F}_{31} + \vec{F}_{32}\right) = \vec{F}_{1,EXT}$$

IMPULSE

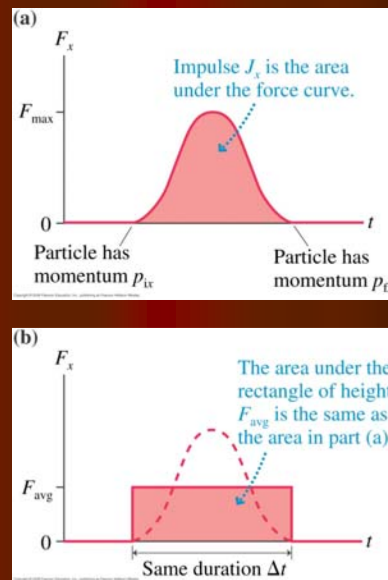
The change in momentum from a collision is equal to the impulse:

$$\Delta\vec{p} = \vec{J} = \int_{t_i}^{t_f} \vec{F}(t)\, dt = \vec{F}_{ave}\Delta t$$

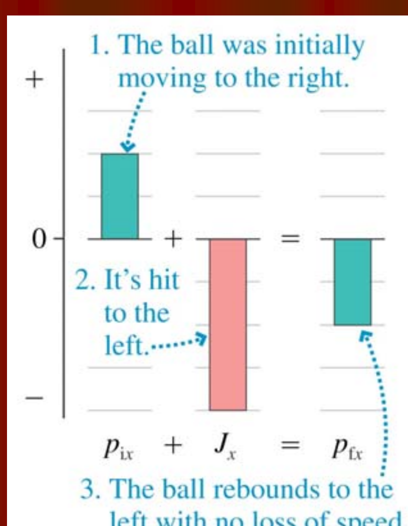
IMPULSE

- On a force vs. time plot, the IMPULSE is the area under the curve
- The integral of F(t) with respect to dt finds this area under the curve

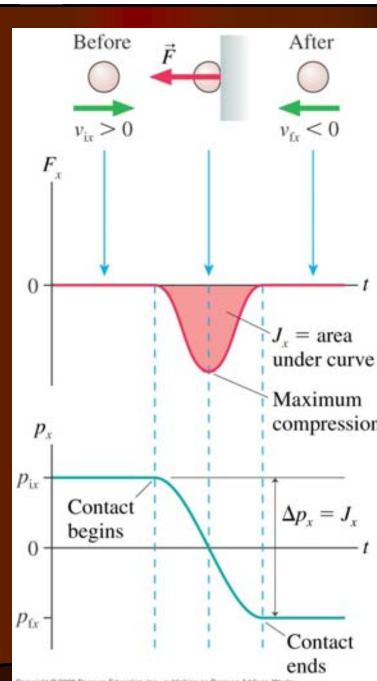
$$\Delta\vec{p} = \vec{J} = \int_{t_i}^{t_f} \vec{F}(t)\,dt = \vec{F}_{ave}\Delta t$$



IMPULSE



$_{ve}\Delta t$




HAPPY
HALLOWEEN