

This week, we will use the concept of momentum to analyze some more advanced situations.

Namely, systems in which there is a continuous flow of mass rather than just the motion of discrete objects.

The classic example of this is the thrust due to exhaust from a rocket engine.

Once again, we will appeal to a differential analysis technique.

Breaking the flow down into a large number of small elements, analyzing one of the elements in detail, and then generalizing.

This is an important example of a situation where the point mass form of Newton's Second Law of Motion-- $f = ma$ -- is inadequate, and one must instead use the more general form of the law-- $f = dp/dt$ -- or the force is equal to the time derivative of the momentum.