

MECHANICS - The three laws of Newton

At the base of the theoretical mechanics stay a few fundamental principles (laws or axioms) that cannot be proved theoretical but they are checked in practice. These principles were formulated by Sir Isaac Newton in the year 1687 in its work named “*Philosophiae naturalis principia mathematica*”.

With a few small explanations these principles are used under the same shape also today, in some cases are added a few principles for to explain the behavior of a non deformable body.

1) Principle of inertia (*Lex prima*). This principle says that: a body keeps its state of rest or of rectilinear and uniformly motion if does not act a force (or more forces) to change this state. We make the remark that, Newton understands through a body in fact a particle (a small body without dimensions). The statement of this principle may be kept if we say that the motion is a rectilinear uniformly translation motion. This principle does not leave out the possibility of the action of forces about the body, but the forces have to be in equilibrium.

2) Principle of the independent action of the force (*Lex secunda*) has the following statement: if about a body acts a force, this produces an acceleration proportional with them, having the same direction and sense as the force, independently by the action of other forces. This principle is the fundamental law of the mechanics: $F = m a$

3) Principle of the action and the reaction (*Lex tertia*) is the Newton's third law, and says: for each action corresponds a reaction having the same magnitude, direction and opposite sense, or: the mutual actions of two bodies are equal, with the same directions and opposite senses.