Brief Overview on Conservation of Energy

Nathaniel Walton*

Department of Applied Physics, Ain Shams University, Cairo, Egypt

Editorial

Received: 08-Aug-2022, Manuscript No. JPAP-22-71400; **Editor assigned:** 10-Aug-2022, PreQC No. JPAP-22-71400 (PQ); **Reviewed:** 24-Aug-2022, QC No. JPAP-22-71400; **Revised:** 21-Nov-2022, Manuscript No. JPAP-22-71400 (R); **Published:** 30-Nov-2022, DOI: 10.4172/2320-2459.10.8.001

***For Correspondence :** Nathaniel Walton, Department of Applied Physics, Ain Shams University, Cairo, Egypt;

Email: walton.nathaniel@gmail.com

EDITORIAL

The law of conservation of energy states in physics and chemistry that the total energy of an isolated system remains constant; it is said to be conserved over time. This law first proposed and tested by Émilie du Chatelet, states that energy could be created or destroyed, but only transformed or transferred from one form to another. When a stick of dynamite explodes, for example, chemical energy is converted to kinetic energy. If all forms of energy released in the explosion are added together, such as the kinetic and potential energy of the pieces, as well as heat and sound, the exact decrease in chemical energy in the combustion of the dynamite is obtained. Historically, energy conservation was distinct from mass conservation. Special relativity, on the other hand, demonstrated that mass is related to energy and vice versa by $E=mc^2$ and science now believes that mass energy as a whole is conserved. In theory, this means that any object with mass can be converted to pure energy and vice versa. This is thought to be possible only under the most extreme physical conditions, such as those that likely existed in the universe shortly after the big bang or when black holes emit Hawking radiation. Noether's theorem rigorously proves energy conservation as a result of continuous time translation symmetry; that is, the fact that physical laws do not change over time. A perpetual motion machine of the first kind cannot exist as a result of the law of conservation of energy; that is, no system without an external energy supply can deliver an infinite amount of energy to its surroundings. It may be impossible to define energy conservation in systems that lack time translation symmetry. Curved space times in general relativity and time crystals in condensed matter physics are two examples. Thales of Miletus, around 550 BCE, had inklings of the conservation of some underlying substance from which everything is made. However, there is no reason to associate their theories with what we now call "mass energy" (for example, Thales thought it was water).

Empedocles (490-430 BCE) stated that in his universal system of four roots (earth, air, water, and fire), "nothing comes to be or perishes"; rather, these elements undergo constant rearrangement. Epicurus (c. 350 BCE), on the other hand, believed that everything in the universe was made up of indivisible units of matter the ancient precursor to atoms and he, too, recognized the importance of conservation, stating that "the sum total of things was always such as it is now, and such it will ever remain." Simon Stevinus was able to solve a number of statics problems in 1605 using the principle that perpetual motion was impossible. Galileo published his analysis of several situations, including the famous "interrupted pendulum," in 1639, which can be described as conservatively converting potential energy to kinetic energy and back again. He basically stated that the height from which a moving body rises is equal to the height from which it falls, and he used this observation to infer the concept of inertia. The remarkable feature of this observation is that the height to which a moving body ascends on a frictionless surface is independent of surface shape. Christiaan Huygens published his collision laws in 1669. He listed the sum of the linear momenta as well as the sum of the kinetic energies as being invariant before and after the collision of bodies. The distinction between elastic and inelastic collisions, however, was not understood at the time. Later researchers disagreed about which of these conserved quantities was the more fundamental. He made a much clearer statement about the height of ascent of a moving body in his Horologium Oscillatorium, and linked this idea with the impossibility of perpetual motion. Huygens study of the dynamics of pendulum motion was founded on a single principle: The center of gravity of a heavy object cannot lift itself.