

## Summary

From Ancient Times mankind was interested in science. Thus, many noble men tried to discover and share the knowledge of the environment and its secrets. This seeking of knowledge has led many people to developing a system of different and yet interacting subjects devoted to different fields of life. Many have shaped the development of the humankind. But on top of everything else was physics and developments in magnetism and electricity.

In the 17<sup>th</sup> Century Hans Christian Orsted found out that an electrical current in a wire produces a magnetic field. Another physicist, Michael Faraday, later found, that moving a magnet into and out of the loop induces an electrical current. Only because of this the means of producing electrical energy were achieved.

The development of Direct-Current and Alternative-Current Motors and Generators revolutionized many production industries. Basically, a motor is a simple device that converts electrical energy into mechanical energy. A generator works vice versa – i.e. converts mechanical energy into electrical energy. The components of this convertors are: the magnet with North and South poles, the armature with coils (the rotor and the stator), the commutator (the split ring, two halves of which are insulated from each other), the fixed brushes of metal or carbon and the external circuit. The difference between DC and AC convertors is that in DC device the magnet is fixed and the armature revolves either way (motor or generator) while in AC the armature is fixed and the magnet revolves around the armature, creating either electric current or mechanical force. Thanks to the commutator, the current in DC flows only in one direction (according to some physics laws). Hence in an AC device the direction of the electric current is not fixed and changes constantly with time.

To sum up, DC and AC Motors and Generators have shaped not only the fields of physics, but have also made it possible to create some important nowadays devices and applications, without which some of us wouldn't be able to survive. One of the best examples of such a device is Magnetic Resonance Imaging (MRI), which consists of huge magnet, radio-frequency coils, gradient coils etc. and which is hugely used in medical purposes to ensure the condition of the internal organs and tela.