

## NEUTRINOS SEARCHES

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The discovery of neutrinos is among the most important discoveries made by physicists at the beginning of the 21st century. Neutrinos are responsible for many important processes that take place in stars. Moreover, it provides information on the formation of the Universe and the evolution of stars, as well as on the structure of the nucleus.

Before this particle was predicted only theoretically and was introduced to explain the excess energy that comes from the Sun when thermonuclear reactions take place on it. Although such particles constantly bombard the Earth, it is very difficult to observe low mass neutrinos directly.

Since cosmic rays consist not only of neutrinos, they interact with the magnetic field of our planet. This interaction changes their trajectory and makes it difficult to determine the radiation source. Apart from this these particles almost don't interact with matter, with the exception of rare cases of collision of neutrinos with the nucleus of an atom and the subsequent nuclear reaction.

When a neutrino collides with the nucleus of an atom, Cherenkov radiation is produced which is a faint blue glow and it is visible only in perfectly pure water or ice. The radiation stores information about the trajectory of the neutrino and allows to calculate the energy of the particle.

Nevertheless, these almost imperceptible nuclear reactions are possible to observe by scientists by making ultra-precise measurements in special laboratories such as IceCube, Super-Kamiokande, SNO. They're located at a depth of 1000 meters underground and they are structures sized with 15-story building.

Summing up, we can definitely say that the search for neutrinos will lead to progress in the study of many particles. And perhaps this is a new perspective to synthesize particles and use them as a new alternative inexhaustible source of energy.