

Physics beyond the Standard Model with IceCube

Friday 10 September 2021 10:00 (1 hour)

The IceCube neutrino observatory is a neutrino telescope situated near the South Pole in Antarctica. A cubic kilometer of ice is instrumented with optical modules sensitive to photons. When high energetic particles produce light in interactions with the ice, the signature can be recorded and used for reconstruction of the primary particle.

The design of IceCube not only facilitates the detection of astrophysical neutrinos up to PeV energies but also the direct and indirect probe of physics beyond the Standard Model with leading sensitivities. Exotic particles which can penetrate through the ice sheet or even the entire Earth can be measured directly, these include magnetic monopoles, Q-Balls, or partially charged particles. Dark matter is indirectly searched for by investigating its effect on neutrino spectra as well as arrival directions.

The discovery of astrophysical neutrinos enables the measurement of neutrino interactions at unprecedented energies where new physics might emerge such as Lorentz Invariance Violation. The recent achievements of IceCube in the search for beyond Standard Model physics will be presented.

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