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Neutrino and beyond standard model physics with IceCube

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The IceCube Neutrino Observatory is situated at the geographic South Pole where 1km³ of ice is instrumented with 5160 optical sensors. Neutrinos are detected via their charged interaction secondaries which produce light in various ways when passing through ice. Likewise additional kinds of particles can be detected, such as muons originating from cosmic ray air showers or particles proposed beyond the standard model.

Since 2013 highly energetic neutrinos (> 1 PeV) of astrophysical origin have been observed with IceCube. This was mainly enabled by the large instrumented volume which additionally makes IceCube highly sensitive in searches for new physics.

An overview of the recent results of IceCube is given with an emphasis on new findings in the field of neutrino and beyond standard model physics. This includes the high energy neutrino cross section as well as non-standard interactions, searches for dark matter and exotic signatures.

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