0.9 MILES BELOW 1.5 KM ICE | 1 KM² FOOTPRINT | 86 LINES | 5,160 LIGHT SENSORS

IceCube

> 500,000,000 MUONS/MONTH | 7,500 ATMOSPHERIC NEUTRINOS/MONTH | ABOUT 3 COSMOGENIC NEUTRINOS/MONTH | 0.9 MILES BELOW 1.5 KM ICE

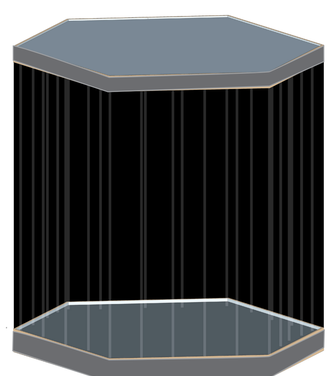
1.5 MILES BELOW 2.5 KM ICE

IceCube

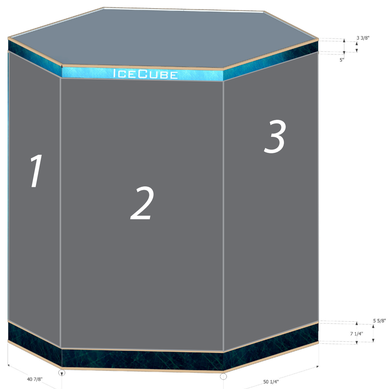
EVENTS LAST ABOUT 0.000003 SECONDS

icecube.wisc.edu

1.5 MILES BELOW 2.5 KM ICE



Front View



Back View

IceCube Lab, ICL

The ICL is the only visible part of the IceCube Neutrino Observatory at the South Pole. Below the ice, IceCube sensors are always busy. On average, each of the 5,160 IceCube sensors sees something 500 times per second, recording the passage of thousands of superenergetic particles.

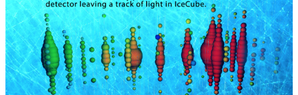
IceCube

2

Cosmic neutrinos can produce different patterns of light in IceCube. Event displays tell us about important properties of these neutrinos.

TRACK

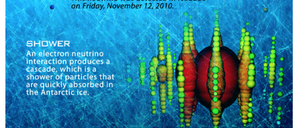
When a muon neutrino interacts with the ice, it creates a muon as a secondary particle. The muon crosses the detector leaving a track of light in IceCube.



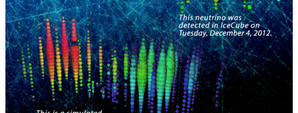
This neutrino was detected in IceCube on Friday, November 12, 2010.

SHOWER

An electron neutrino interaction produces a cascade, which is a shower of particles that are quickly absorbed in the Antarctic ice.



This neutrino was detected in IceCube on Tuesday, December 4, 2012.



This is a simulated tau neutrino.

DOUBLE BANG

A tau neutrino produces a cascade pattern with two large energy deposits. A double-bang pattern would be an unambiguous signature of a tau neutrino but it has not yet been observed in IceCube.

DIGITAL OPTICAL MODULE, DOM

IceCube sensors are the size of a basketball. They work as an inverse light bulb that turns the blue shimmering light produced by a neutrino interacting with the ice into a digital signal.

Kilometer-long cables connect DOMs to the IceCube Lab, where data is prepared for satellite transmission to IceCube headquarters at the University of Wisconsin–Madison.